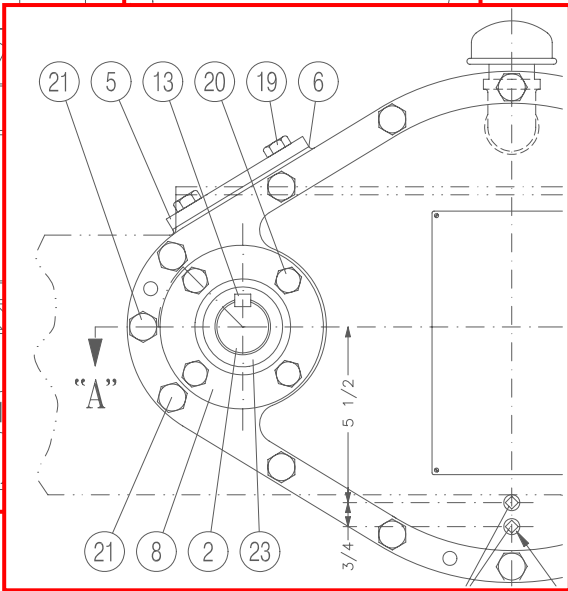
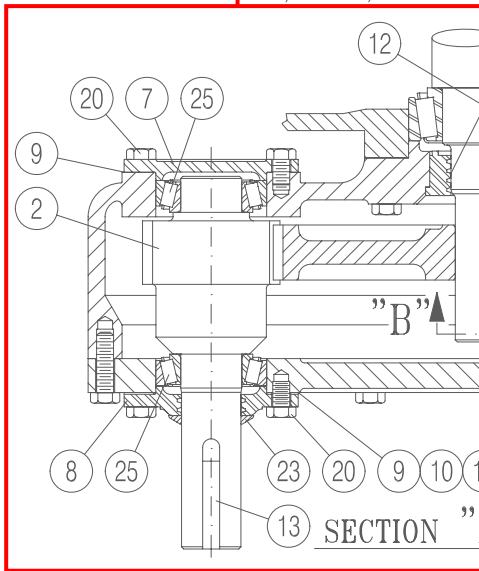
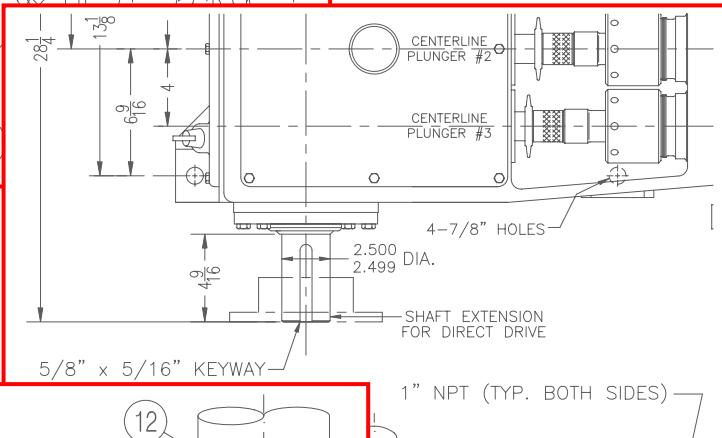
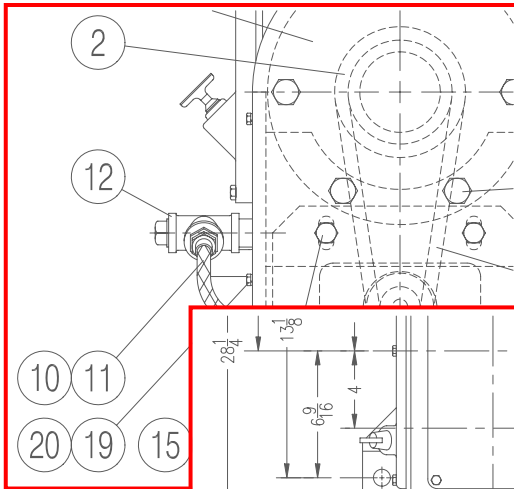
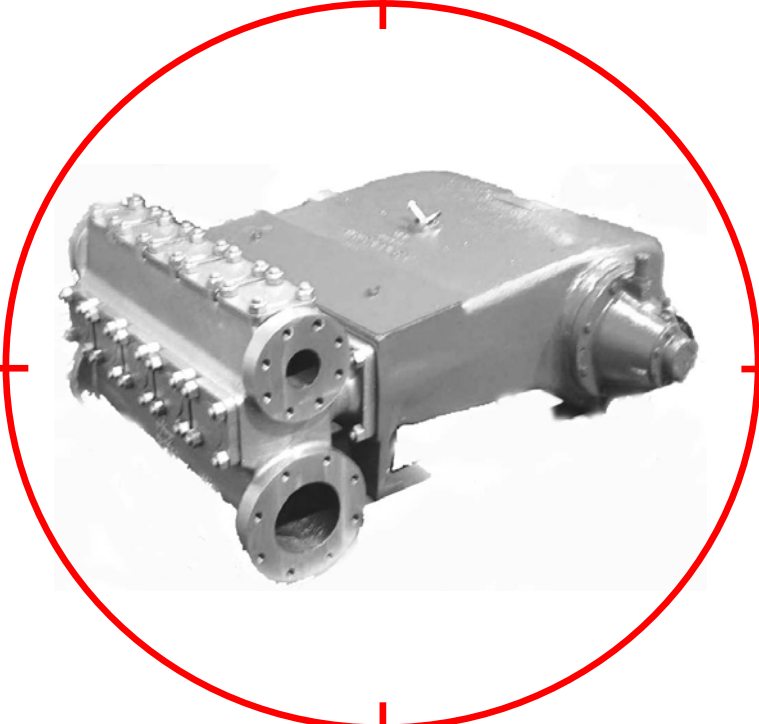


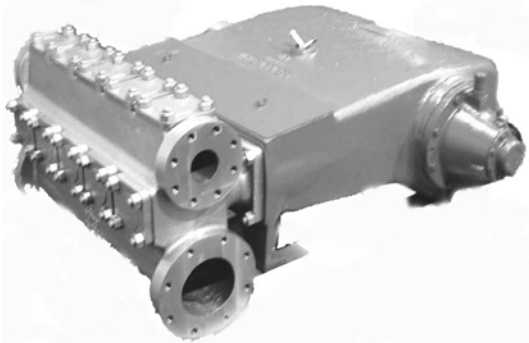
217Q-4 Multiplex Plunger Pumps Parts List



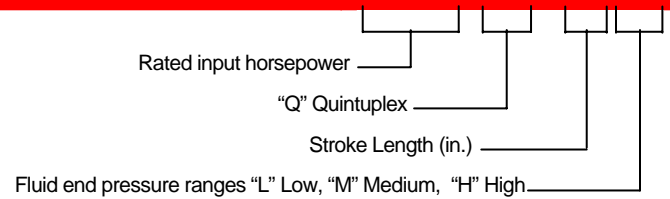
Types:
217Q-4L
217Q-4M
217Q-4H

Sales / Technical Information

USA Tollfree: 1 (800) 324-4706
 Phone: 1 (918) 447-4600
 Fax: 1 (918) 447-4677
 Internet: <http://www.nov.com>



217Q-4



Index and Check List:

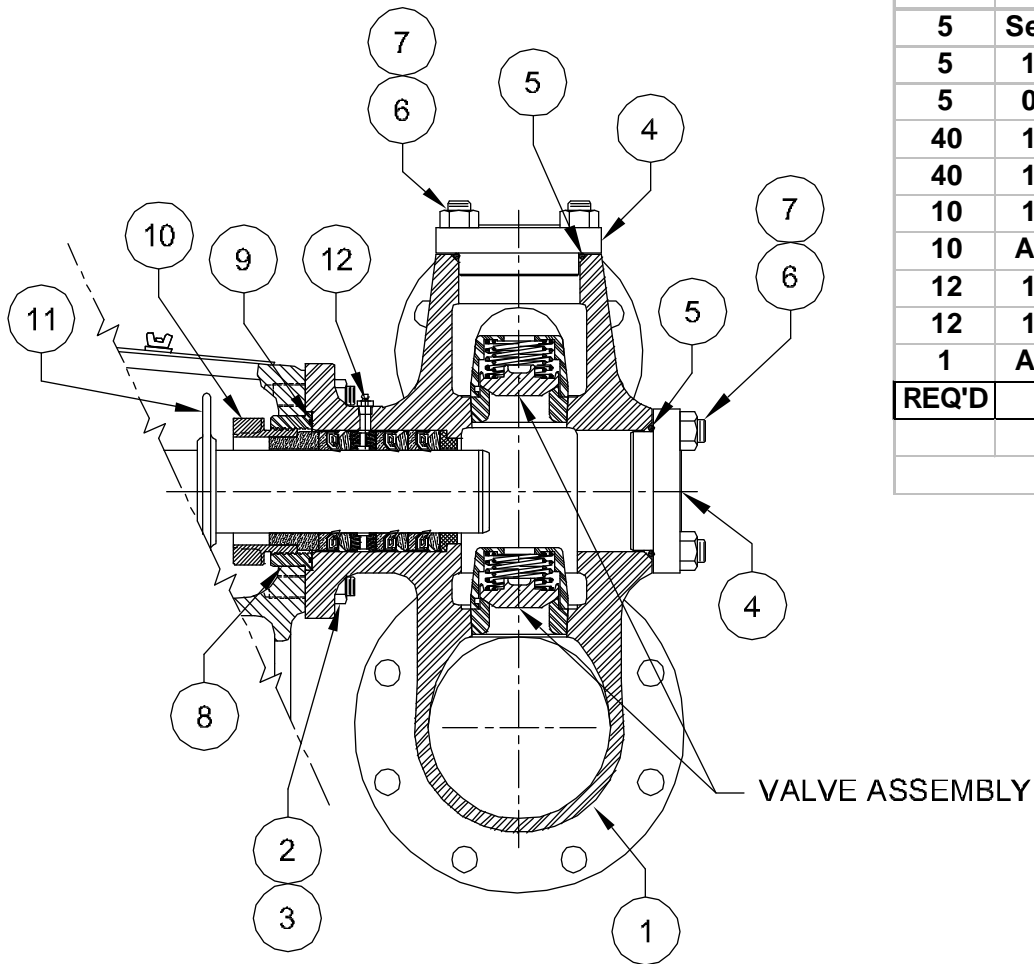
| PAGE | DWG. NUMBER | DESCRIPTION | SERIES OF ISSUE | DATE OF ISSUE |
|------|-------------|---|-----------------|---------------|
| 1 | 118563 | ASSEMBLY, CAST FLUID END, BRONZE (L) | FIRST | 02-02-07 |
| 2 | 118562 | ASSEMBLY, CAST FLUID END, STAINLESS STEEL (L) | FIRST | 02-02-07 |
| 3 | 118564 | ASSEMBLY, CAST FLUID END, DUCTILE IRON (L) | FIRST | 02-02-07 |
| 4 | 118565 | ASSEMBLY, STEEL BILLET FLUID END (L) | FIRST | 02-02-07 |
| 5 | 118567 | ASSEMBLY, CAST FLUID END, BRONZE (M) FLANGED CONNECTION | FIRST | 02-02-07 |
| 6 | 118566 | ASSEMBLY, CAST FLUID END, STAINLESS STEEL (M) FLANGED CONNECTION | FIRST | 02-02-07 |
| 7 | 118568 | ASSEMBLY, CAST FLUID END, DUCTILE IRON (M) THREADED CONNECTION | FIRST | 02-02-07 |
| 8 | 118569 | ASSEMBLY, BLOCK FLUID END, STEEL (M) FLANGED CONNECTION | FIRST | 02-02-07 |
| 9 | 118570 | ASSEMBLY, BLOCK FLUID END, CLAMPED STUFING BOX, STAINLESS STEEL (H) FLANGED | FIRST | 02-02-07 |
| 10 | 118571 | ASSEMBLY, BLOCK FLUID END, CLAMPED STUFFING BOX, STEEL (H) FLANGED | FIRST | 02-02-07 |
| 11 | 118560 | ASSEMBLY, POWER END, 217Q-4 | FIRST | 02-02-07 |
| 12 | 118561 | ASSEMBLY, CRANKSHAFT POWER END, 217Q-4 | FIRST | 02-02-07 |
| 13 | 118572 | ASSEMBLY, GEAR REDUCER UNIT, 217Q-4 | FIRST | 02-02-07 |
| 15 | 118607 | ASSEMBLY, GEAR REDUCER UNIT FOR LUBRICATOR, 217Q-4 | FIRST | 02-02-07 |
| 17 | 118575 | ASSEMBLY, SPHERICAL VALVE, (L) | FIRST | 02-02-07 |
| 18 | 118576 | ASSEMBLY, SPHERICAL VALVE, SEVERE DUTY (L) | FIRST | 02-02-07 |
| 19 | 118577 | ASSEMBLY, DISC VALVE (L) | FIRST | 02-02-07 |
| 20 | 118578 | ASSEMBLY, SEVERE DUTY VALVE (L) | FIRST | 02-02-07 |
| 21 | 118579 | ASSEMBLY, SPHERICAL VALVE (M) | FIRST | 02-02-07 |
| 22 | 118580 | ASSEMBLY, SPHERICAL VALVE, SEVERE DUTY (M) | FIRST | 02-02-07 |
| 23 | 118581 | ASSEMBLY, DISC VALVE (M) | FIRST | 02-02-07 |
| 24 | 118582 | ASSEMBLY, SEVERE DUTY VALVE (M) | FIRST | 02-02-07 |
| 25 | 118583 | ASSEMBLY, SPHERICAL VALVE (H) | FIRST | 02-02-07 |
| 26 | 118585 | ASSEMBLY, SPHERICAL VALVE, SEVERE DUTY (H) | FIRST | 02-02-07 |
| 27 | 118586 | ASSEMBLY, DISC VALVE (H) | FIRST | 02-02-07 |

Index and Check List Multiplex Plunger Pump (Continued)



| PAGE | DWG. NUMBER | DESCRIPTION | SERIES OF ISSUE | DATE OF ISSUE |
|------|-------------|--|-----------------|---------------|
| 28 | 118584 | ASSEMBLY, SEVERE DUTY VALVE (H) | FIRST | 02-02-07 |
| 29 | 118587 | TOOL KIT, (L) CLASS FLUID END | FIRST | 02-02-07 |
| 30 | 118588 | TOOL KIT, (M) CLASS FLUID END | FIRST | 02-02-07 |
| 31 | 118589 | TOOL KIT, (H) CLASS FLUID END | FIRST | 02-02-07 |
| 32 | 118590 | ASSEMBLY, PLUNGER KIT 2-3/4" – 3-3/8" J-STYLE PACKING (L) FLUID END | FIRST | 02-02-07 |
| 37 | 118591 | ASSEMBLY, PLUNGER KIT 2-3/4" – 3-3/8" BRAID STYLE PACKING (L) FLUID END | FIRST | 02-02-07 |
| 42 | 118592 | ASSEMBLY, PLUNGER KIT 2-3/4" – 3-3/8" SSF-4 STYLE PACKING (L) FLUID END | FIRST | 02-02-07 |
| 47 | 118593 | ASSEMBLY, PLUNGER KIT 1-5/8" - 2-1/2" J-STYLE PACKING (M) FLUID END | FIRST | 02-02-07 |
| 55 | 118594 | ASSEMBLY, PLUNGER KIT 1-5/8" – 2-1/2" BRAID STYLE PACKING (M) FLUID END | FIRST | 02-02-07 |
| 63 | 118595 | ASSEMBLY, PLUNGER KIT 1-5/8" – 2-1/2" SSF-4 STYLE PACKING (M) FLUID END | FIRST | 02-02-07 |
| 71 | 118596 | ASSEMBLY, PLUNGER KIT 1-1/4" – 1-3/4" J-STYLE PACKING, (H) FLUID END | FIRST | 02-02-07 |
| 76 | 118597 | ASSEMBLY, PLUNGER KIT 1-1/4" – 1-3/4" BRAID STYLE PACKING, (H) FLUID END | FIRST | 02-02-07 |
| 81 | 118598 | ASSEMBLY, PLUNGER KIT 1-1/4" – 1-3/4" SSF-4 STYLE PACKING, (H) FLUID END | FIRST | 02-02-07 |
| 86 | 118599 | PLUNGERS, 2-3/4" THRU 3-3/8", HARD SURFACE (L) | FIRST | 02-02-07 |
| 87 | 118600 | PLUNGERS, 2-3/4" THRU 3-3/8", CERAMIC (L) | FIRST | 02-02-07 |
| 88 | 118601 | PLUNGERS, 1-5/8" THRU 2-1/2", HARD SURFACE (M) | FIRST | 02-02-07 |
| 89 | 118602 | PLUNGERS, 1-5/8" THRU 2-1/2", CERAMIC (M) | FIRST | 02-02-07 |
| 90 | 118603 | PLUNGERS, 1-1/4" THRU 1-3/4", HARD SURFACE (H) | FIRST | 02-02-07 |
| 91 | 118573 | ASSEMBLY, PACKING LUBRICATOR, 217Q-4 | FIRST | 02-02-07 |
| 92 | 118574 | ASSEMBLY, PACKING LUBRICATOR, D.O. H. 217Q-4 | FIRST | 02-02-07 |
| 93 | 118625 | ASSEMBLY, PACKING LUBRICATOR WITH GEAR REDUCER, 217Q-4 | FIRST | 02-02-07 |
| 94 | 118626 | ASSEMBLY, PACKING LUBRICATOR WITH GEAR REDUCER, D.O.H., 217Q-4 | FIRST | 02-02-07 |
| 95 | 118604 | GENERAL DIMENSION, RHD, 163Q-4L | FIRST | 02-02-07 |
| 96 | 118605 | GENERAL DIMENSION, RHD, 163Q-4M | FIRST | 02-02-07 |
| 97 | 118606 | GENERAL DIMENSION, RHD, 163Q-4H | FIRST | 02-02-07 |
| 98 | 118610 | GENERAL DIMENSION, LHD, WITH GEAR REDUCER, 217Q-4 | FIRST | 02-02-07 |
| 99 | 118609 | GENERAL DIMENSION, LHD, WITH GEAR REDUCER AND LUBRICATOR, 163Q-4H | FIRST | 02-02-07 |

| | | | |
|------------------|--------------------|--|------|
| 10 | 118578 | SEVERE DUTY (L) - (AR) | |
| 10 | 118576 | SPHERICAL VALVE (L) - SEVERE DUTY | |
| 10 | 118575 | SPHERICAL VALVE (L) | |
| 10 | 118577 | DISC VALVE (L) | |
| | <u>DRAWING No:</u> | <u>VALVE ASSEMBLY:</u> | |
| 5 | 180-165000-220 | LUBE FITTING | 12 |
| 5 | 001-007986-201 | BAFFLE DISC | 11 |
| 5 | See Plunger Kits | GLAND NUT, 2-3/4" THRU 3-3/8" | 10 |
| 5 | 110-000246-200 | O-RING (ADAPTER) | 9 |
| 5 | 001-024959-316 | POWER END / FLUID END ADAPTER | 8 |
| 40 | 133-034010-286 | NUT | 7 |
| 40 | 104-034300-286 | STUD (VALVE COVER / CYLINDER HEAD) | 6 |
| 10 | 110-000345-201 | O-RING (VALVE COVER / CYLINDER HEAD) | 5 |
| 10 | AAB-115922-316 | CYLINDER HEAD / VALVE COVER | 4 |
| 12 | 133-034010-286 | NUT | 3 |
| 12 | 102-034234-286 | STUD | 2 |
| 1 | AAD-115921-316 | FLUID END, CAST BRONZE | 1 |
| REQ'D | Part No. | | ITEM |
| BILL OF MATERIAL | | | |

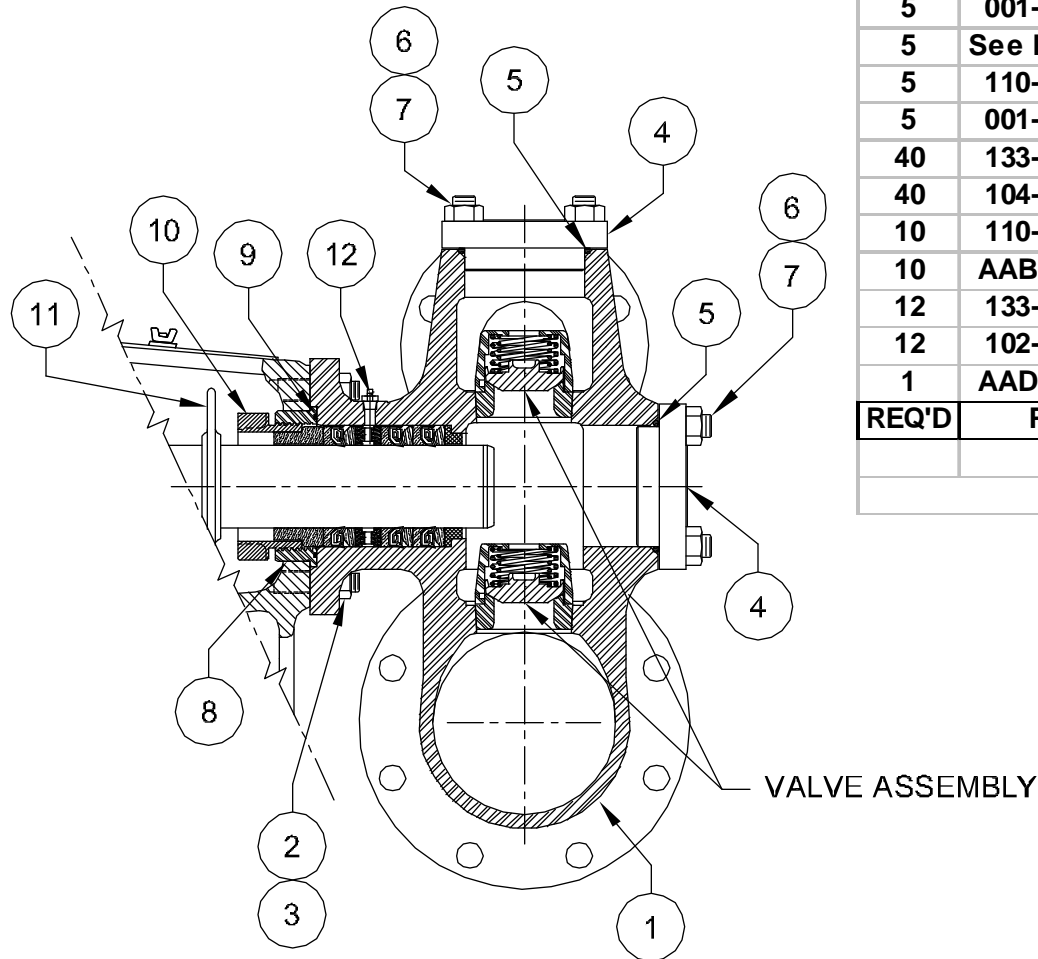


1

NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
**ASSEMBLY, CAST FLUID END
BRONZE, 2-3/4" THRU 3-3/8" PLUNGERS
217Q-4L, 163Q-4L (HP200AL, HP165AL)**

| | | | |
|-----------------|-------------|-------|--------------|
| DWG No.: 118563 | SCALE: NONE | REV A | SHT.: 1 OF 1 |
|-----------------|-------------|-------|--------------|



| | | | |
|------------------|--------------------|--|------|
| 10 | 118578 | SEVERE DUTY (L) - (AR) | |
| 10 | 118576 | SPHERICAL VALVE (L) - SEVERE DUTY | |
| 10 | 118575 | SPHERICAL VALVE (L) | |
| 10 | 118577 | DISC VALVE (L) | |
| | <u>DRAWING No:</u> | <u>VALVE ASSEMBLY:</u> | |
| 5 | 180-165000-220 | LUBE FITTING | 12 |
| 5 | 001-007986-201 | BAFFLE DISC | 11 |
| 5 | See Plunger Kits | GLAND NUT | 10 |
| 5 | 110-000246-200 | O-RING (ADAPTER) | 9 |
| 5 | 001-024959-278 | POWER END / FLUID END ADAPTER | 8 |
| 40 | 133-034010-287 | NUT | 7 |
| 40 | 104-034300-287 | STUD (VALVE COVER / CYLINDER HEAD) | 6 |
| 10 | 110-000345-201 | O-RING (VALVE COVER / CYLINDER HEAD) | 5 |
| 10 | AAB-115922-594 | CYLINDER HEAD / VALVE COVER | 4 |
| 12 | 133-034010-287 | NUT | 3 |
| 12 | 102-034234-287 | STUD | 2 |
| 1 | AAD-115921-594 | FLUID END, CAST STAINLESS STEEL | 1 |
| REQ'D | Part No. | | ITEM |
| BILL OF MATERIAL | | | |

2

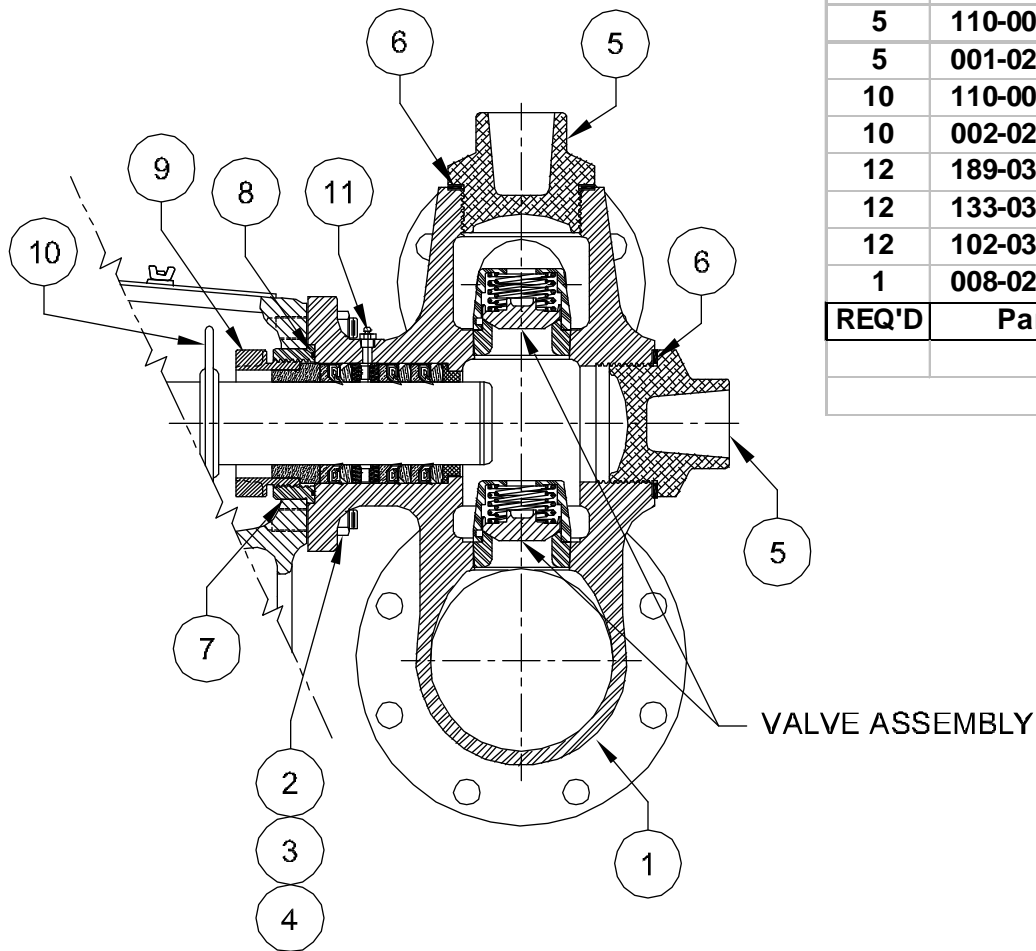


HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, CAST FLUID END, STAINLESS
 STEEL, 2-3/4" THRU 3-3/8" PLUNGERS
 217Q-4L, 163Q-4L, (HP200AL, HP165AL)

| | | | |
|-----------------|-------------|-------|-------------|
| DWG No.: 118562 | SCALE: NONE | REV A | SHT: 1 OF 1 |
|-----------------|-------------|-------|-------------|

| | | | |
|--------------|--------------------|--|-------------|
| 10 | 118578 | SEVERE DUTY (L) - (AR) | |
| 10 | 118576 | SPHERICAL VALVE (L) - SEVERE DUTY | |
| 10 | 118575 | SPHERICAL VALVE (L) | |
| 10 | 118577 | DISC VALVE (L) | |
| | <u>DRAWING No:</u> | <u>VALVE ASSEMBLY:</u> | |
| 5 | 180-165000-220 | LUBE FITTING | 11 |
| 5 | 001-007986-201 | BAFFLE DISC | 10 |
| 5 | See Plunger Kits | GLAND NUT | 9 |
| 5 | 110-000246-200 | O-RING (ADAPTER) | 8 |
| 5 | 001-024959-236 | POWER END / FLUID END ADAPTER | 7 |
| 10 | 110-000244-200 | O-RING (VALVE COVER / CYLINDER HEAD) | 6 |
| 10 | 002-028452-351 | CYLINDER HEAD / VALVE COVER | 5 |
| 12 | 189-034112-220 | WASHER | 4 |
| 12 | 133-034010-286 | NUT | 3 |
| 12 | 102-034234-286 | STUD | 2 |
| 1 | 008-025003-351 | FLUID END, CAST DUCTILE IRON | 1 |
| REQ'D | Part No. | | ITEM |



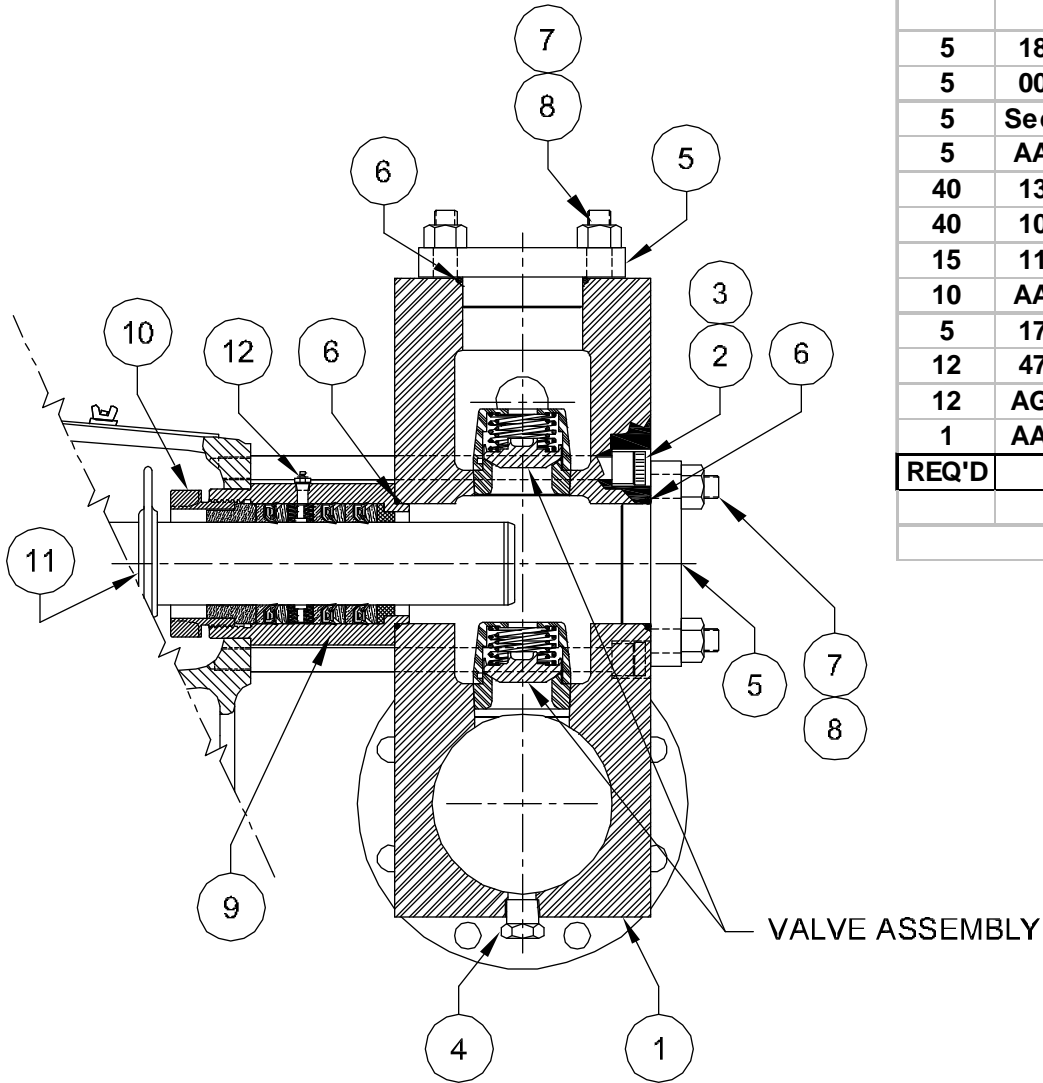
BILL OF MATERIAL



HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, CAST FLUID END
DUCTILE IRON, 2-3/4" THRU 3-3/8" PLUNGERS
217Q-4L, 163Q-4L (HP200L, HP165L)

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118564 | SCALE: NONE | REV A | SHT.: 1 OF 1 |
|--------------------|----------------|----------|-----------------|



| | | | |
|------------------|--------------------|-------------------------------------|------|
| 10 | 118578 | SEVERE DUTY (L) - (AR) | |
| 10 | 118576 | SPHERICAL VALVE (L) - SEVERE DUTY | |
| 10 | 118575 | SPHERICAL VALVE (L) | |
| 10 | 118577 | DISC VALVE (L) | |
| | <u>DRAWING No:</u> | <u>VALVE ASSEMBLY:</u> | |
| 5 | 180-165000-220 | LUBE FITTING | 12 |
| 5 | 001-007986-201 | BAFFLE DISC | 11 |
| 5 | See Plunger Kits | GLAND NUT | 10 |
| 5 | AAB-115660-270 | STUFFING BOX | 9 |
| 40 | 133-034010-286 | NUT (VALVE COVER/CYLINDER HEAD) | 8 |
| 40 | 104-034300-286 | STUD (VALVE COVER/CYLINDER HEAD) | 7 |
| 15 | 110-000345-200 | O-RING (VALVE COVER/ CYLINDER HEAD) | 6 |
| 10 | AAB-115133-231 | CYLINDER HEAD / VALVE COVER | 5 |
| 5 | 170-034002-405 | DRAIN PLUG | 4 |
| 12 | 471-034010-286 | NUT | 3 |
| 12 | AGB-030410-286 | STUD | 2 |
| 1 | AAC-115661-H02 | FLUID END | 1 |
| REQ'D | Part No. | | ITEM |
| BILL OF MATERIAL | | | |

4

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, BILLET FLUID END
 STEEL, 2-3/4" THRU 3-3/8" PLUNGER
 217Q-4L, 163Q-4L (HP200AL, HP165AL)

DWG No.:

118565

SCALE:

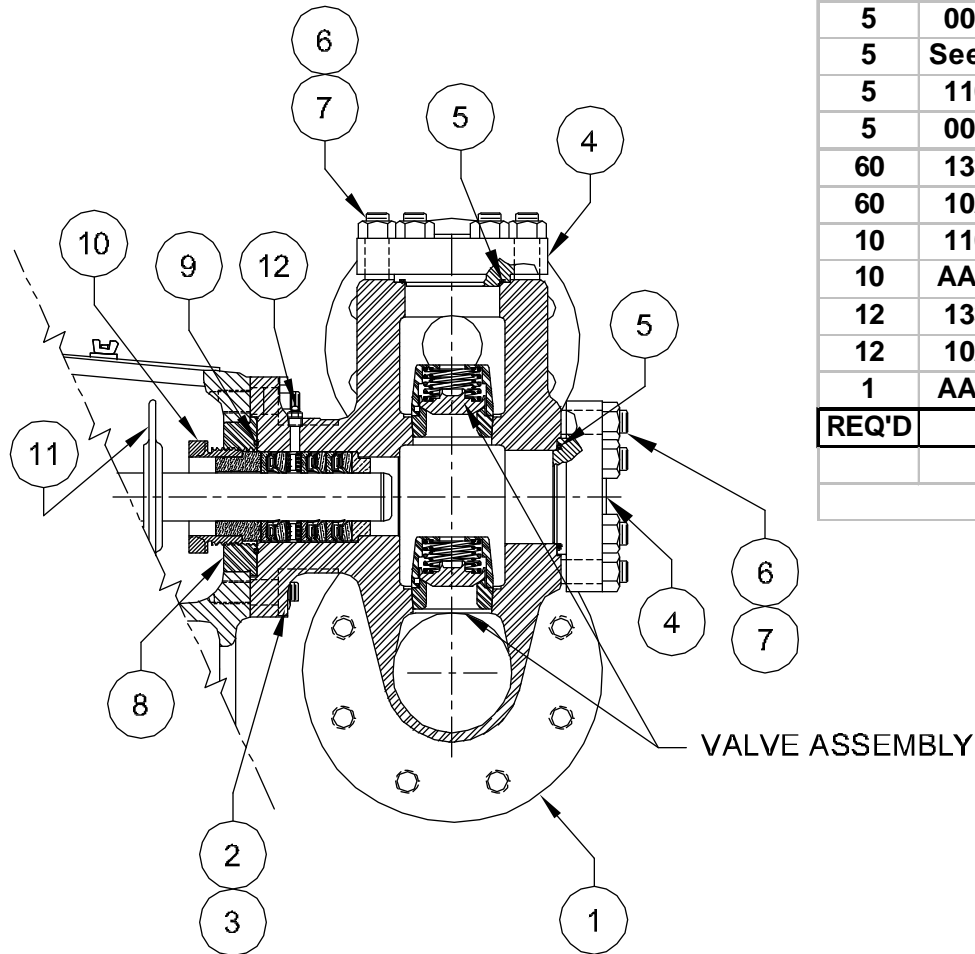
NONE

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SHT.:

1 OF 1



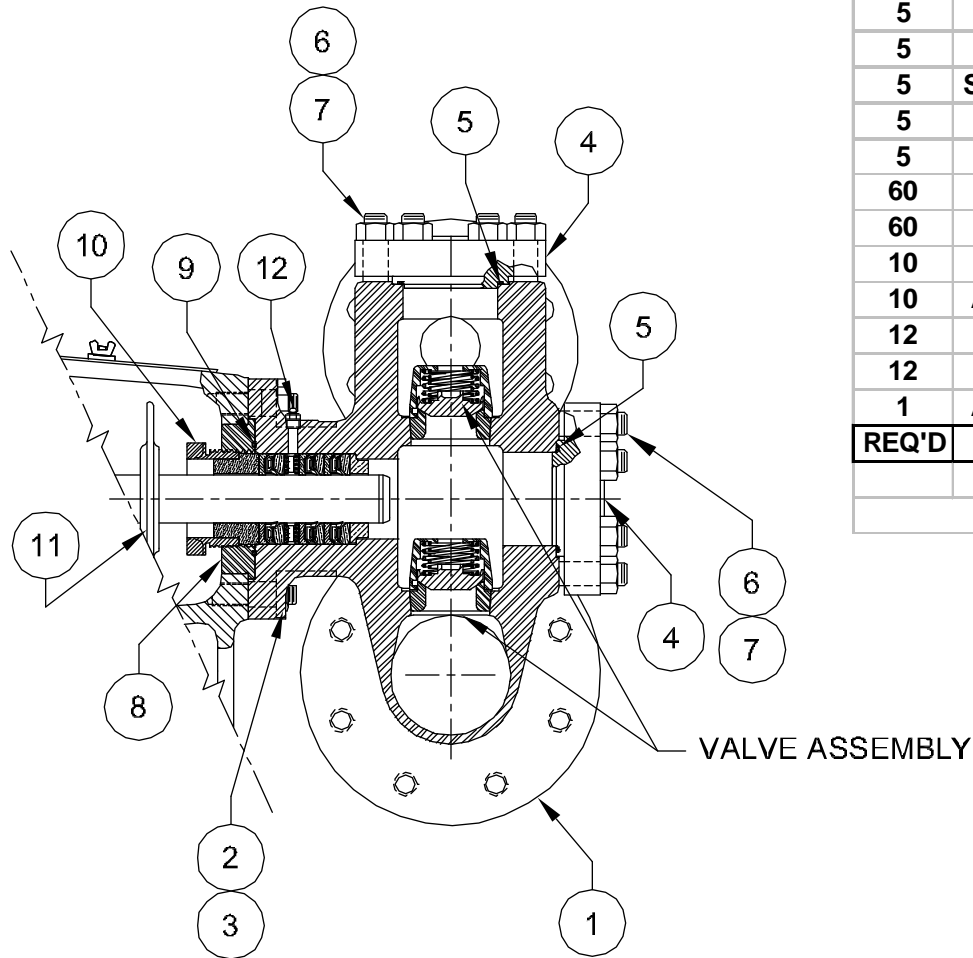
| | | | |
|-------------------------|------------------|--|-------------|
| 10 | 118582 | SEVERE DUTY (M) - (AR) | |
| 10 | 118580 | SPHERICAL VALVE (M) - SEVERE DUTY | |
| 10 | 118579 | SPHERICAL VALVE (M) | |
| 10 | 118581 | DISC VALVE (M) | |
| DRAWING No: | | VALVE ASSEMBLY: | |
| 5 | 180-165000-220 | LUBE FITTING | 12 |
| 5 | 001-007986-201 | BAFFLE DISC | 11 |
| 5 | See Plunger Kits | GLAND NUT | 10 |
| 5 | 110-000238-201 | O-RING (ADAPTER) | 9 |
| 5 | 001-023574-316 | POWER END / FLUID END ADAPTER | 8 |
| 60 | 133-034010-286 | NUT (CYLINDER HEAD / VALVE COVER) | 7 |
| 60 | 102-034314-286 | STUD (CYLINDER HEAD / VALVE COVER) | 6 |
| 10 | 110-000236-200 | O-RING (VALVE COVER / CYLINDER HEAD) | 5 |
| 10 | AAB-029608-316 | CYLINDER HEAD / VALVE COVER | 4 |
| 12 | 133-034010-286 | NUT | 3 |
| 12 | 102-034234-286 | STUD | 2 |
| 1 | AAD-029613-316 | FLUID END, CAST BRONZE | 1 |
| REQ'D | Part No. | | ITEM |
| BILL OF MATERIAL | | | |

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NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, CAST FLUID END
 BRONZE, 1-5/8" THRU 2-1/2" PLUNGER
 217Q-4M, 163Q-4M (HP200AM, HP165AM)

| | | | |
|-----------------|-------------|-------|--------------|
| DWG No.: 118567 | SCALE: NONE | REV A | SHT.: 1 OF 1 |
|-----------------|-------------|-------|--------------|



| | | | |
|-------------------------|--------------------|--|------|
| 10 | 118582 | SEVERE DUTY (M) - (AR) | |
| 10 | 118580 | SPHERICAL VALVE (M) - SEVERE DUTY | |
| 10 | 118579 | SPHERICAL VALVE (M) | |
| 10 | 118581 | DISC VALVE (M) | |
| | <u>DRAWING No:</u> | <u>VALVE ASSEMBLY:</u> | |
| 5 | 180-165000-220 | LUBE FITTING | 12 |
| 5 | 001-007986-201 | BAFFLE DISC | 11 |
| 5 | See Plunger Kits | GLAND NUT | 10 |
| 5 | 110-000238-201 | O-RING (ADAPTER) | 9 |
| 5 | 001-023574-278 | POWER END / FLUID END ADAPTER | 8 |
| 60 | 133-034010-287 | NUT (CYLINDER HEAD / VALVE COVER) | 7 |
| 60 | 102-034314-287 | STUD (CYLINDER HEAD / VALVE COVER) | 6 |
| 10 | 110-000236-200 | O-RING (VALVE COVER / CYLINDER HEAD) | 5 |
| 10 | AAB-029608-594 | CYLINDER HEAD / VALVE COVER | 4 |
| 12 | 133-034010-287 | NUT | 3 |
| 12 | 102-034234-287 | STUD | 2 |
| 1 | AAD-029613-594 | FLUID END, CAST - STAINLESS STEEL | 1 |
| REQ'D | Part No. | | ITEM |
| BILL OF MATERIAL | | | |

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, CAST FLUID END
 STAINLESS STEEL, 1-5/8" THRU 2-1/2" PLUNGER
 217Q-4M, 163Q-4M (HP200AM, HP165AM)

DWG No.:

118566

SCALE:

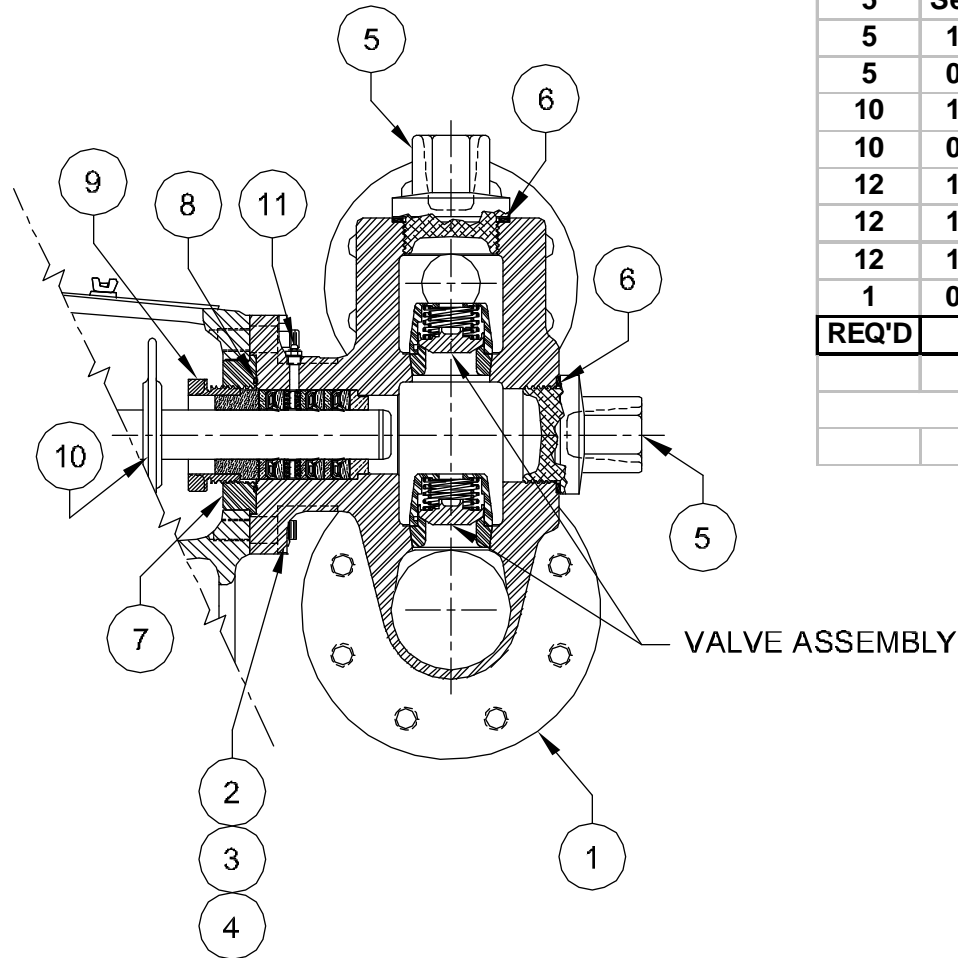
NONE

REV

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SHT.:

1 OF 1



| 10 | 118582 | SEVERE DUTY (M) - (AR) | |
|------------------|--------------------|--|------|
| 10 | 118580 | SPHERICAL VALVE (M) - SEVERE DUTY | |
| 10 | 118579 | SPHERICAL VALVE (M) | |
| 10 | 118581 | DISC VALVE (M) | |
| | <u>DRAWING No:</u> | <u>VALVE ASSEMBLY:</u> | |
| 5 | 180-165000-220 | LUBE FITTING | 11 |
| 5 | 001-007986-201 | BAFFLE DISC | 10 |
| 5 | See Plunger Kits | GLAND NUT | 9 |
| 5 | 110-000238-201 | O-RING (ADAPTER) | 8 |
| 5 | 001-023574-236 | POWER END / FLUID END ADAPTER | 7 |
| 10 | 110-000237-200 | O-RING (CYLINDER HEAD / VALVE COVER) | 6 |
| 10 | 002-027612-351 | CYLINDER HEAD / VALVE COVER | 5 |
| 12 | 189-034112-220 | WASHER | 4 |
| 12 | 133-034010-286 | NUT | 3 |
| 12 | 102-034234-286 | STUD | 2 |
| 1 | 008-024255-351 | FLUID END, CAST DUCTILE IRON | 1 |
| REQ'D | Part No. | | ITEM |
| BILL OF MATERIAL | | | |

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, CAST FLUID END
DUCTILE IRON, 1-5/8" THRU 2-1/2" PLUNGER
217Q-4M, 163Q-4M (HP200AM, HP165AM)

DWG No.:

118568

SCALE:

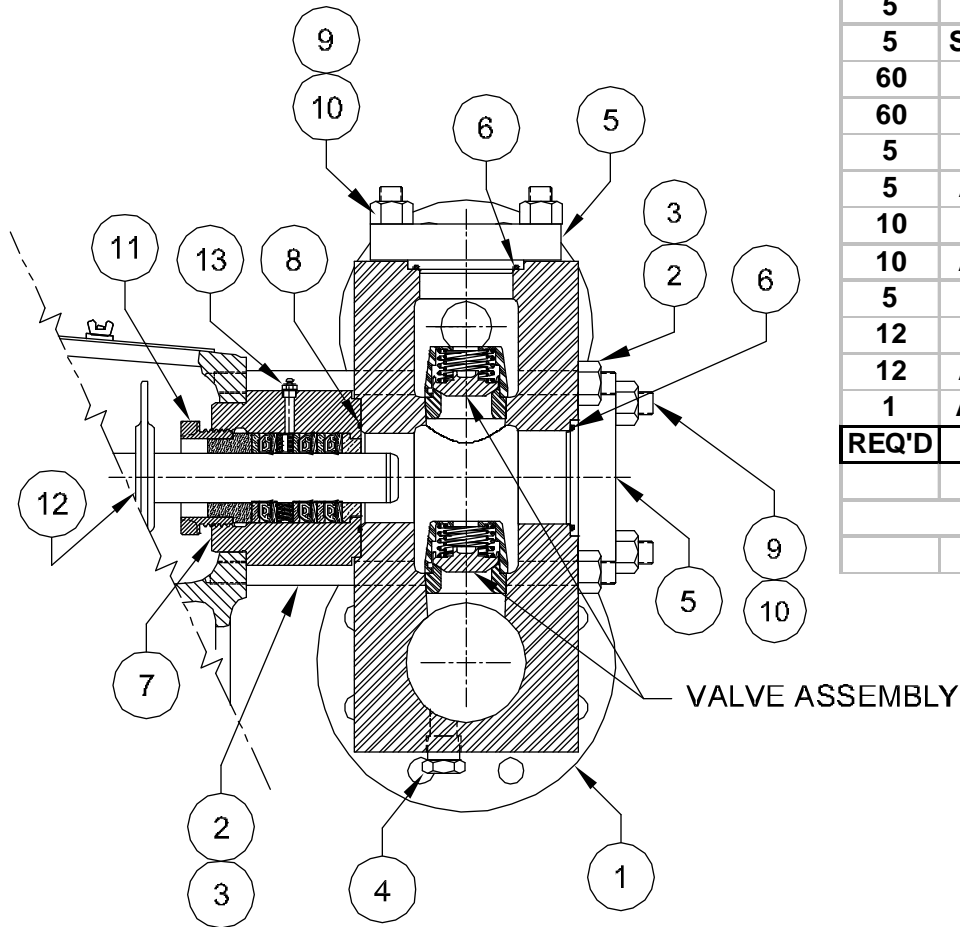
NONE

REV

A

SHT.:

1 OF 1



| | | | |
|-------------------------|--------------------|--|-------------|
| 10 | 118582 | SEVERE DUTY (M) - (AR) | |
| 10 | 118580 | SPHERICAL VALVE (M) - SEVERE DUTY | |
| 10 | 118579 | SPHERICAL VALVE (M) | |
| 10 | 118581 | DISC VALVE (M) | |
| | <u>DRAWING No:</u> | <u>VALVE ASSEMBLY:</u> | |
| 5 | 180-165000-220 | LUBE FITTING | 13 |
| 5 | 001-007986-201 | BAFFLE DISC | 12 |
| 5 | See Plunger Kits | GLAND NUT | 11 |
| 60 | 133-034010-286 | NUT (CYLINDER HEAD / VALVE COVER) | 10 |
| 60 | 102-034300-286 | STUD (CYLINDER HEAD / VALVE COVER) | 9 |
| 5 | 110-000237-200 | O-RING (STUFFING BOX) | 8 |
| 5 | AAC-116324-270 | STUFFING BOX | 7 |
| 10 | 110-000236-200 | O-RING (CYLINDER HEAD / VALVE COVER) | 6 |
| 10 | AAB-115123-231 | CYLINDER HEAD / VALVE COVER | 5 |
| 5 | 170-034002-278 | DRAIN PLUG | 4 |
| 12 | 133-034010-286 | NUT | 3 |
| 12 | AAB-030410-286 | STUD | 2 |
| 1 | AAC-116323-H02 | FLUID END, PLATE STEEL | 1 |
| REQ'D | Part No. | | ITEM |
| BILL OF MATERIAL | | | |

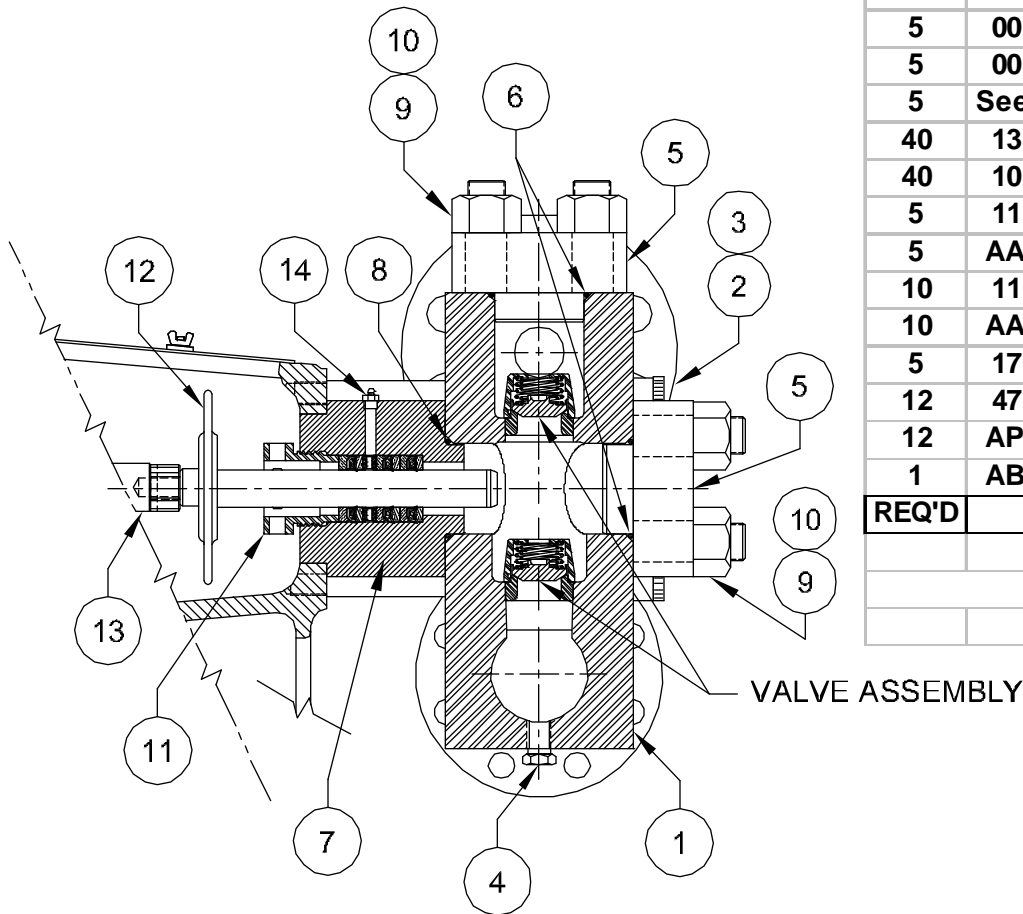
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NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE: ASSEMBLY, BLOCK FLUID END
 STEEL, 1-5/8" THRU 2-1/2" PLUNGER
 217Q-4M, 163Q-4M (HP200AM, HP165AM)

| | | | |
|-----------------|-------------|--------|--------------|
| DWG No.: 118569 | SCALE: NONE | REV: A | SHT.: 1 OF 1 |
|-----------------|-------------|--------|--------------|

| | | | |
|-------|--------------------|--|------|
| 10 | 118584 | SEVERE DUTY (H) - (AR) | |
| 10 | 118585 | SPHERICAL VALVE (H) - SEVERE DUTY | |
| 10 | 118583 | SPHERICAL VALVE (H) | |
| 10 | 118586 | DISC VALVE (H) | |
| | <u>DRAWING No:</u> | <u>VALVE ASSEMBLY:</u> | |
| 5 | 180-165000-220 | LUBE FITTING | 14 |
| 5 | 001-028470-402 | ADAPTER ROD | 13 |
| 5 | 001-007986-201 | BAFFLE DISC | 12 |
| 5 | See Plunger Kits | GLAND NUT | 11 |
| 40 | 133-114007-287 | NUT (CYLINDER HEAD / VALVE COVER) | 10 |
| 40 | 102-114500-287 | STUD (CYLINDER HEAD / VALVE COVER) | 9 |
| 5 | 110-000337-200 | O-RING (STUFFING BOX) | 8 |
| 5 | AAC-118464-402 | STUFFING BOX | 7 |
| 10 | 110-000337-200 | O-RING (CYLINDER HEAD / VALVE COVER) | 6 |
| 10 | AAC-117768-276 | CYLINDER HEAD / VALVE COVER | 5 |
| 5 | 170-012002-278 | DRAIN PLUG | 4 |
| 12 | 471-034010-287 | NUT | 3 |
| 12 | APB-030410-287 | STUD | 2 |
| 1 | ABC-117767-276 | FLUID END, FORGED STAINLESS STEEL | 1 |
| REQ'D | Part No. | | ITEM |



BILL OF MATERIAL

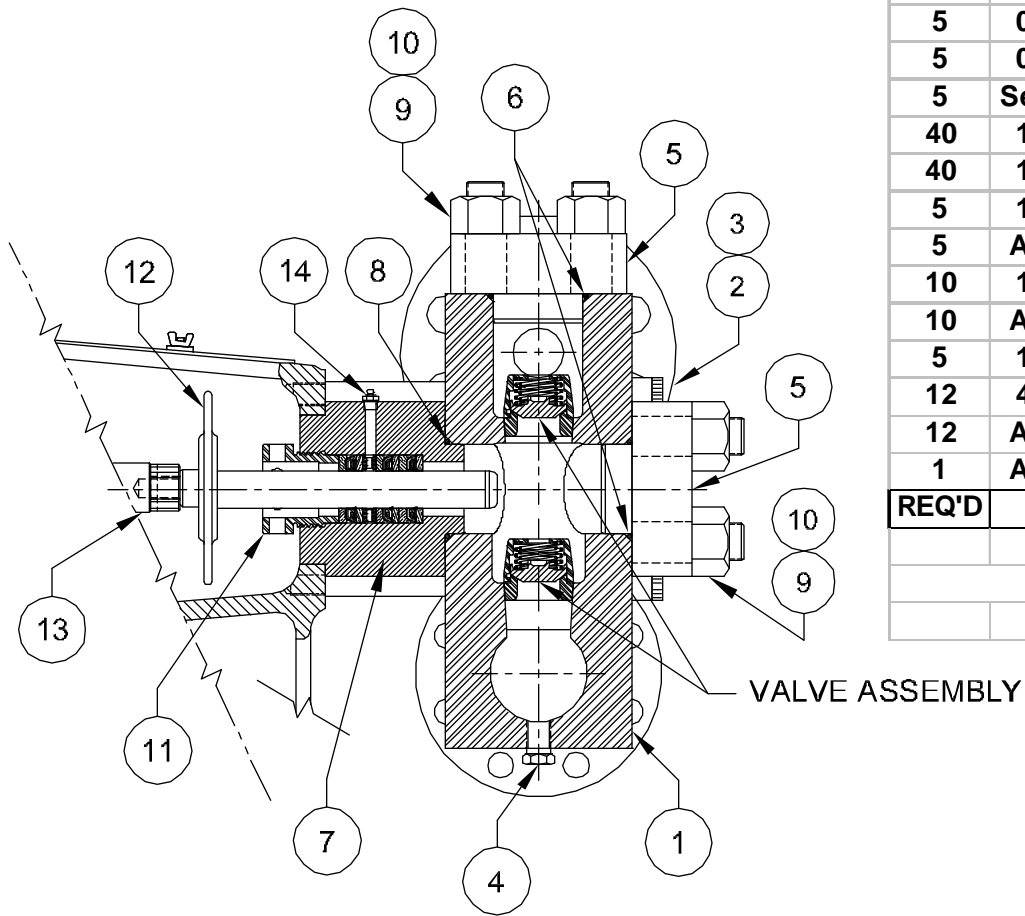


HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
**ASSEMBLY, BLOCK FLUID END
 STAINLESS STEEL, 1-1/4" THRU 1-3/4"
 PLUNGER, 217Q-4H & 163Q-4H**

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118570 | SCALE: NONE | REV A | SHT.: 1 of 1 |
|--------------------|----------------|----------|-----------------|

| | | | |
|------------------|--------------------|--|------|
| 10 | 118584 | SEVERE DUTY (H) - (AR) | |
| 10 | 118585 | SPHERICAL VALVE (H) - SEVERE DUTY | |
| 10 | 118583 | SPHERICAL VALVE (H) | |
| 10 | 118586 | DISC VALVE (H) | |
| | <u>DRAWING No:</u> | <u>VALVE ASSEMBLY:</u> | |
| 5 | 180-165000-220 | LUBE FITTING | 14 |
| 5 | 001-028470-402 | ADAPTER ROD | 13 |
| 5 | 001-007986-201 | BAFFLE DISC | 12 |
| 5 | See Plunger Kits | GLAND NUT | 11 |
| 40 | 133-114007-286 | NUT (CYLINDER HEAD / VALVE COVER) | 10 |
| 40 | 102-114500-286 | STUD (CYLINDER HEAD / VALVE COVER) | 9 |
| 5 | 110-000337-200 | O-RING (STUFFING BOX) | 8 |
| 5 | AAC-118464-270 | STUFFING BOX | 7 |
| 10 | 110-000337-200 | O-RING (CYLINDER HEAD / VALVE COVER) | 6 |
| 10 | AAC-117768-270 | CYLINDER HEAD / VALVE COVER | 5 |
| 5 | 170-012002-278 | DRAIN PLUG | 4 |
| 12 | 471-034010-286 | NUT | 3 |
| 12 | APB-030410-286 | STUD | 2 |
| 1 | AAD-118242-220 | FLUID END, FORGED STEEL | 1 |
| REQ'D | Part No. | | ITEM |
| BILL OF MATERIAL | | | |

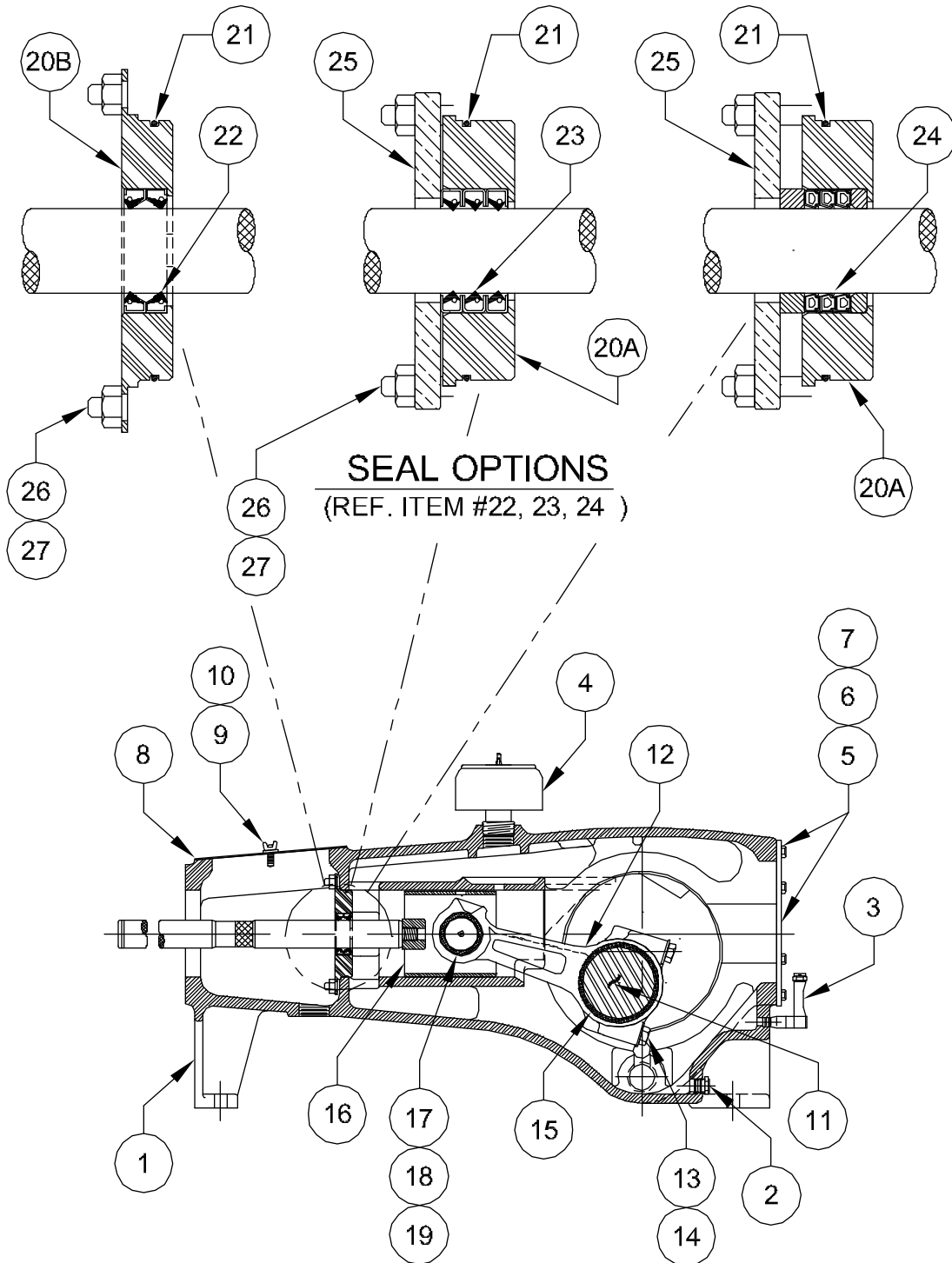


10

NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, BLOCK FLUID END
FORGED STEEL, 1-1/4" THRU 1-3/4"
PLUNGER, 217Q-4H & 163Q-4H

| | | | |
|-----------------|-------------|--------|--------------|
| DWG No.: 118571 | SCALE: NONE | REV: A | SHT.: 1 OF 1 |
|-----------------|-------------|--------|--------------|



| 5 | 150-038016-306 | LOCK NUT (GLAND) | 27 |
|-------|----------------|---|------|
| 10 | 104-038134-287 | STUD (GLAND) | 26 |
| 5 | 002-025365-231 | GLAND | 25 |
| 5 | 001-028755-370 | PACKING (OPTION) | 24 |
| 15 | 145-158238-999 | 3 - SEAL WIPER BOX (OPTION) | 23 |
| 10 | 145-158238-999 | 2 - SEAL WIPER BOX (OPTION) | 22 |
| 5 | 110-000248-201 | O-RING (STUFFING BOX) | 21 |
| 5 | 002-028308-260 | WIPER BOX (2 - SEAL OPTION)-SS | 20B |
| 5 | 002-025366-237 | WIPER BOX (3-SEAL / PACKING OPTION)-STL | 20A |
| 10 | 001-028408-263 | SNAP RING < * > | 19 |
| 5 | 001-023129-302 | BUSHING (CONNECTING ROD) | 18 |
| 5 | 001-028390-999 | WRIST PIN | 17 |
| 5 | 004-028404-359 | CROSSHEAD | 16 |
| 5 | 002-028392-999 | SHELL BEARING (CONNECTING ROD) | 15 |
| 10 | 154-058108-286 | WASHER (CONNECTING ROD) | 14 |
| 10 | 100-058314-290 | CAP SCREW (CONNECTING ROD) | 13 |
| 5 | 998-Q42400-004 | CONN. ROD & CAP - COMPLETE (SEE NOTE) | 12 |
| 1 | 008-029261-348 | CRANKSHAFT | 11 |
| 2 | 187-038016-286 | WING NUT (CRADLE COVER) | 10 |
| 2 | 104-038100-286 | STUD (CRADLE COVER) | 9 |
| 1 | AAA-029923-231 | CRADLE COVER | 8 |
| 16 | 100-038034-290 | CAP SCREW (CRANKCASE COVER) | 7 |
| 1 | 001-024271-204 | GASKET (CRANKCASE COVER) | 6 |
| 1 | 001-024270-231 | CRANK CASE COVER | 5 |
| 1 | ABB-113766-000 | AIR BREATHER | 4 |
| 1 | 001-010803-999 | OIL LEVEL SITE GLASS | 3 |
| 1 | 170-012005-353 | DRAIN PLUG | 2 |
| 1 | AAD-029630-356 | POWER FRAME | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |

BILL OF MATERIAL

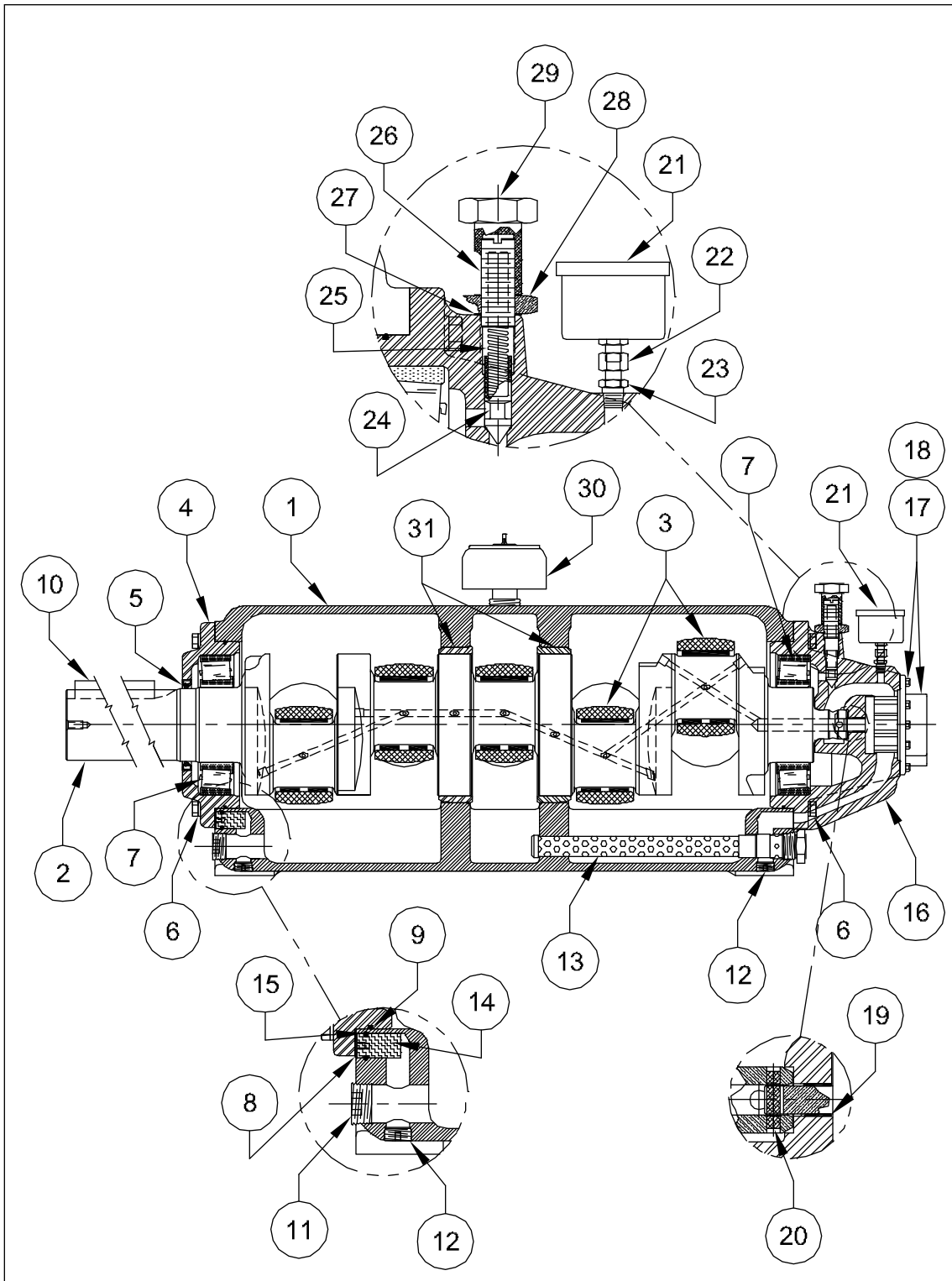
ITEM 12 INCLUDES ITEMS 13,14, & 18
< * > NOT SHOWN



HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
**ASSEMBLY, POWER END
217Q-4 (HP200)**

| | | | | | | | |
|---------|--------|--------|------|-----|---|-------|--------|
| DWG No: | 118560 | SCALE: | NONE | REV | A | SHT.: | 1 of 1 |
|---------|--------|--------|------|-----|---|-------|--------|



| 5 | 998-Q42400-022 | WIPER BOX KIT (PACKING) < * > | BB |
|-------|----------------|--------------------------------------|--------|
| 5 | 998-Q42400-003 | WIPER BOX KIT (3-SEAL - STL) < * > | FF |
| 5 | 998-Q42400-001 | WIPER BOX KIT (2-SEAL - SS) < * > | EE |
| 5 | 998-Q42400-002 | CONN, ROD w/ NDL BEARING < * > | DD |
| 1 | 998-HP2000-038 | POWER END GASKET KIT < * > | AA |
| REQ'D | Part No. | DESCRIPTION | OPTION |

OPTIONAL PARTS AND KITS

| 2 | 002-024251-999 | MAIN BEARING | 31 |
|-------|-----------------|-------------------------------------|------|
| 1 | ABB-113766-000 | AIR BREATHER | 30 |
| 1 | 001-014243-271 | CAP (RELIEF VALVE) | 29 |
| 1 | 130-078014-243 | JAM NUT (RELIEF VALVE) | 28 |
| 2 | 001-0144251-206 | WASHER / GASKET (RELIEF VALVE) | 27 |
| 1 | 001-014242-271 | ADJ. SCREW (RELIEF VALVE) | 26 |
| 1 | 001-014241-363 | SPRING (RELIEF VALVE) | 25 |
| 1 | 001-014244-278 | BODY (RELIEF VALVE) | 24 |
| 1 | 227-014018-405 | PIPE BUSHING (PRESSURE GAUGE) | 23 |
| 1 | 469-080202-305 | ADAPTER (PRESSURE GAUGE) | 22 |
| 1 | AAA-030205-999 | PRESSURE GAUGE | 21 |
| 1 | 001-014240-220 | DRIVE PIN (LUBE PUMP) | 20 |
| 1 | 001-011122-999 | BUSHING (LUBE PUMP) | 19 |
| 8 | 100-516034-290 | CAP SCREW (LUBE PUMP) | 18 |
| 1 | 001-012157-999 | LUBE PUMP | 17 |
| 1 | 008-029252-350 | BEARING HOUSING (LUBE SIDE) | 16 |
| 1 | 110-000210-201 | O-RING (PLUG) | 15 |
| 1 | 001-016981-237 | PLUG | 14 |
| 1 | 002-016950-220 | LUBE OIL FILTER | 13 |
| 2 | 170-034003-220 | PIPE PLUG (SOCKET HEAD) | 12 |
| 1 | 170-114003-220 | PIPE PLUG (SOCKET HEAD) | 11 |
| 1 | 146-100900-236 | KEY (CRANKSHAFT) < * > | 10 |
| 2 | 110-000272-200 | O-RING (BEARING HOUSING) | 9 |
| 1 | 998-HP2000-037 | SHIM / GASKET KIT (BEARING HOUSING) | 8 |
| 2 | 120-450084-999 | MAIN BEARING (END BEARING) < * > | 7 |
| 16 | 100-012112-290 | CAP SCREW (BEARING HOUSING) | 6 |
| 1 | 145-438538-999 | OIL SEAL (CRANKSHAFT) | 5 |
| 1 | 002-028318-356 | BEARING HOUSING (DRIVE SIDE) | 4 |
| 5 | 998-Q42400-004 | CONNECTING ROD (COMPLETE) | 3 |
| 1 | 008-029261-348 | CRANKSHAFT < * > | 2 |
| 1 | AAD-029630-356 | POWER FRAME | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |

BILL OF MATERIAL

< * > NOT SHOWN

< * * > SEE DRAWING 118572 WHEN USING BOLT ON GEAR REDUCER

12



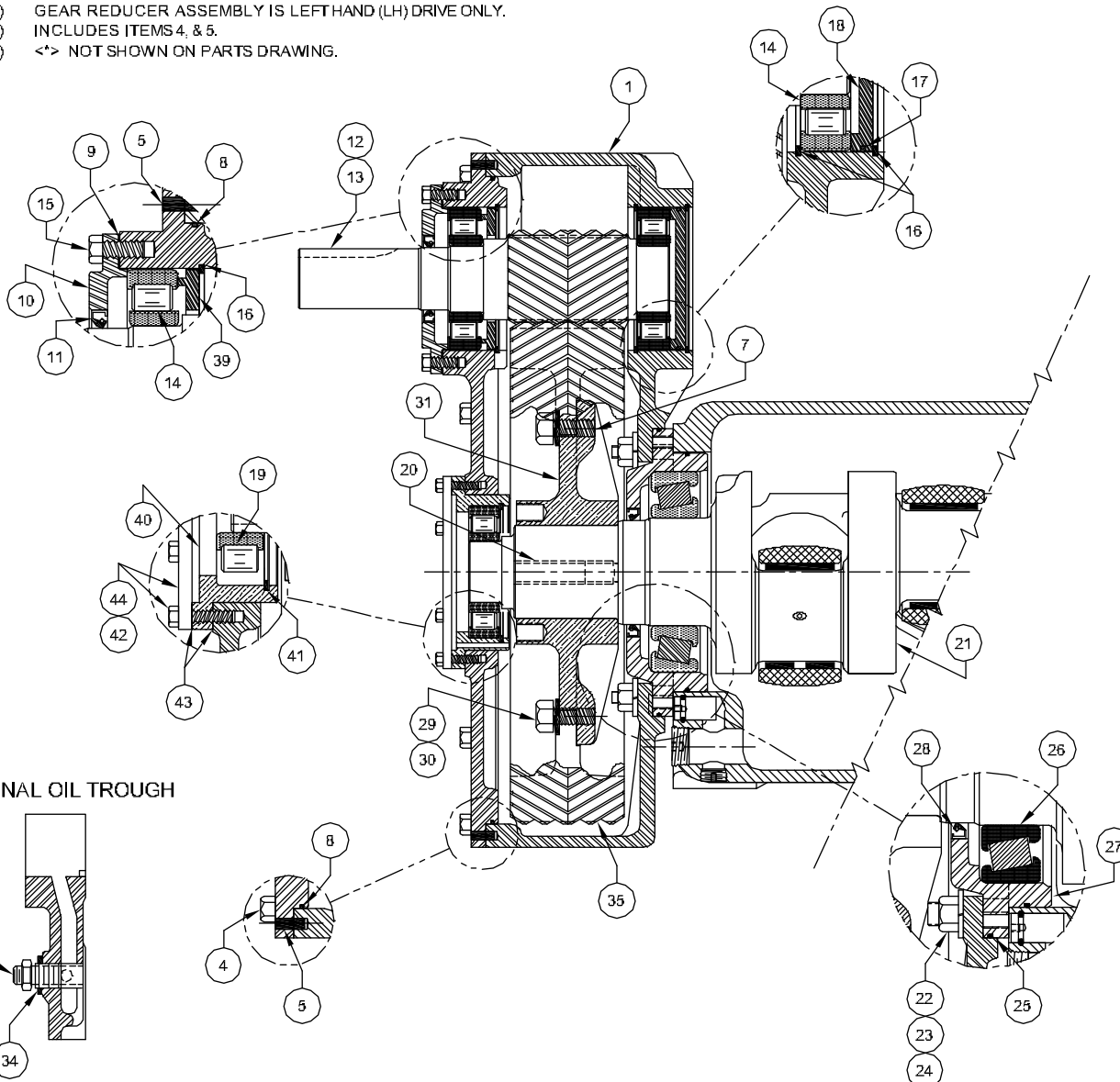
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
**ASSEMBLY, CRANKSHAFT
 POWER END
 217Q-4 (HP200)**

| | | | | | | | |
|----------|--------|--------|------|------|---|-------|--------|
| DWG No.: | 118561 | SCALE: | NONE | REV: | A | SHT.: | 1 OF 1 |
|----------|--------|--------|------|------|---|-------|--------|

NOTE:

- 1.) FOR RATIOS, LUBRICATION INFORMATION, & NOTES SEE SHEET 2 OF 2.
- 2.) GEAR REDUCER ASSEMBLY IS LEFT HAND (LH) DRIVE ONLY.
- 3.) INCLUDES ITEMS 4, & 5.
- 4.) <*> NOT SHOWN ON PARTS DRAWING.



| 6 | 100-038112-290 | CAP SCREW | 44 |
|-------|----------------|---------------------------------------|------|
| 2 | 001-011004-206 | GASKET (CRANKSHAFT COVER) | 43 |
| 1 | 001-011008-231 | COVER (CRANKSHAFT) | 42 |
| 1 | 177-000550-999 | BEARING RETAINER | 41 |
| 1 | 004-017140-351 | BEARING HOUSING (OUTER CRANK SHAFT) | 40 |
| 1 | 001-014396-231 | RETAINER, (PINION GEAR) | 39 |
| 6 | 100-038058-290 | CAP SCREW (ACCESS COVER) < * > | 38 |
| 1 | 001-001873-204 | GASKET (ACCESS COVER) < * > | 37 |
| 1 | 001-013849-220 | ACCESS COVER < * > | 36 |
| 1 | - | BULL GEAR < SEE NOTE 1 > | 35 |
| 1 | 001-012117-999 | THREAD SEAL (OIL SCOOP) | 34 |
| 1 | 170-012002-220 | PLUG (OIL SCOOP) | 33 |
| 1 | 001-025629-305 | OIL SCOOP | 32 |
| 1 | AAB-115743-351 | HUB (BULL GEAR) | 31 |
| 8 | 100-034134-290 | CAP SCREW (BULL GEAR) | 30 |
| 8 | 154-034127-220 | LOCK WASHER (BULL GEAR) | 29 |
| 1 | 145-438538-999 | OIL SEAL (CRANKSHAFT) | 28 |
| 1 | AAB-028958-356 | BEARING HOUSING, MAIN (CRANKSHAFT) | 27 |
| 2 | 120-450084-999 | END BEARING (CRANKSHAFT) | 26 |
| 1 | 110-000277-201 | O-RING (BEARING HOUSING, MAIN) | 25 |
| 8 | 151-012013-220 | NUT (CASING, GEAR REDUCER) | 24 |
| 8 | 102-012234-286 | STUD (CASING, GEAR REDUCER) | 23 |
| 8 | 154-012078-220 | LOCK WASHER (GEAR CASE) | 22 |
| 1 | AAC-028957-348 | CRANKSHAFT | 21 |
| 1 | ABA-011592-236 | KEY (CRANKSHAFT) | 20 |
| 1 | 121-256055-999 | BEARING (OUTER CRANKSHAFT) | 19 |
| 1 | 001-013787-231 | BEARING RETAINER (PINION) | 18 |
| 1 | 110-000254-201 | O-RING (BEARING RETAINER) | 17 |
| 3 | 177-000600-999 | RETAINING RING | 16 |
| 6 | 100-012114-290 | CAP SCREW (PINION COVER) | 15 |
| 2 | 121-275059-999 | BEARING (PINION GEAR) | 14 |
| 1 | 146-058312-236 | KEY (PINION GEAR) | 13 |
| 1 | - | PINION GEAR < SEE NOTE 1 > | 12 |
| 1 | 145-258358-999 | SEAL (PINION SHAFT) | 11 |
| 1 | 002-019883-231 | COVER, PINION SHAFT | 10 |
| 1 | 001-013788-204 | GASKET (BEARING RETAINER COVER) | 9 |
| 1 | 254-260034-201 | O-RING (COVER, GEAR REDUCER) | 8 |
| 1 | 147-012100-220 | DOWELL PIN | 7 |
| 1 | 001-010803-999 | OIL LEVEL GAUGE < * > | 6 |
| 2 | 147-038100-220 | DOWELL PIN (COVER, GEAR REDUCER) | 5 |
| 12 | 100-012114-290 | CAP SCREW | 4 |
| 1 | 001-011039-999 | AIR BREATHER < * > | 3 |
| 1 | 170-034005-220 | DRAIN PLUG (CASING) < * > | 2 |
| 1 | AAC-028959-350 | GEAR CASE ASSEMBLY | 1 |
| REQ'D | Part No. | | ITEM |

BILL OF MATERIAL

| | |
|--|---|
| NOV NATIONAL OILWELL VARCO | |
| <small>HOUSTON, TEXAS, U.S.A.</small> | <small>ENGINEERING, TULSA, OKLAHOMA</small> |
| TITLE: GEAR REDUCER UNIT POWER END, LEFT HAND DRIVE 217Q-4 (HP200) | |
| DWG No. 118572 | SCALE: NONE |
| REV A | SHT.: 1 of 2 |

| | | | | |
|--------------------------|--------------|----------------|-----------|----------------|
| 5.69:1 | 22 | 004-021088-274 | 125 | 004-021089-351 |
| 5.40:1 | 23 | 004-021773-274 | 124 | 004-021772-351 |
| 5.13:1 | 24 | 004-015657-274 | 123 | 004-015656-351 |
| 4.88:1 | 25 | 004-014364-274 | 122 | 004-014363-351 |
| 4.65:1 | 26 | 004-021691-274 | 121 | 004-021690-351 |
| 4.25:1 | 28 | 004-019852-274 | 119 | 004-019853-351 |
| 4.07:1 | 29 | 004-028180-274 | 118 | 004-028179-351 |
| 3.90:1 | 30 | 004-028159-274 | 117 | 004-028158-351 |
| 3.74:1 | 31 | 004-028996-274 | 116 | 004-028995-351 |
| 3.60:1 | 32 | 004-014683-274 | 115 | 004-014682-351 |
| 2.26:1 | 45 | 004-014515-274 | 102 | 004-014514-351 |
| 2.06:1 | 48 | 004-017919-274 | 99 | 004-017918-351 |
| GEAR RATIO | No. TEETH | PART No. | No. TEETH | PART No. |
| | PINION SHAFT | | BULL GEAR | |
| GEAR CHART 163Q-4 | | | | |

LUBRICATION:

- 1.) USE EXTREME PRESSURE GEAR LUBRICANT PER A.G.M.A. STD.. 252.01 AGMA, LUBRICANT No. 4EP YEAR ROUND.
- 2.) LUBRICANT IS SEPARATE FROM PUMP CRANKCASE OIL.
- 3.) PINION SHAFT BEARINGS ARE FED FROM OIL TROUGHS. THE TROUGHS COLLECT OIL FROM GEAR MESH FLOWS.
- 4.) DRAIN FLUSH & REFILL AFTER FIRST TWO WEEKS OF OPERATION, THEN EVERY 6 MONTHS THEREAFTER.

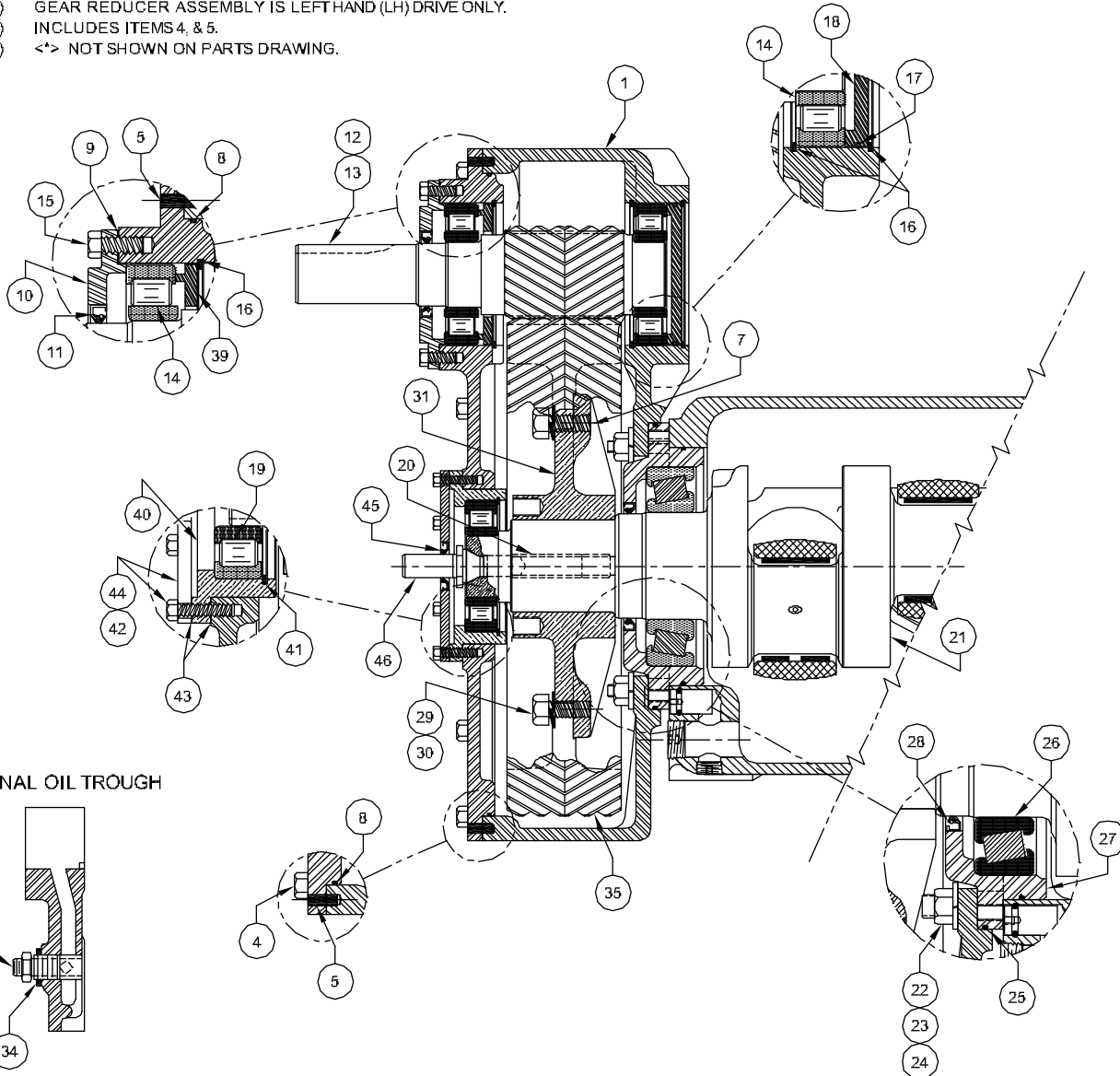
NOTES:

- 1.) CRANKSHAFT PART NO.: **AAC-028957-348** MUST BE USED WITH GEAR REDUCER.
- 2.) PINION MAY BE REMOVED IF DESIRED WITHOUT PULLING GEAR OR DISTURBING CRANKSHAFT.
- 3.) PINION SHAFT IS NOT DESIGNED FOR OVERHUNG LOADS.

| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS. U.S.A. | | ENGINEERING. TULSA, OKLAHOMA | |
| TITLE: GEAR RATIO CHART FOR BULL GEAR & PINION GEAR 217Q-4 (HP200) | | | |
| DWG No.: | 118572 | SCALE: | NONE |
| REV: | A | SHT.: | 2 OF 2 |

NOTE:

- 1.) FOR RATIOS, LUBRICATION INFORMATION, & NOTES SEE SHEET 2 OF 2.
- 2.) GEAR REDUCER ASSEMBLY IS LEFT HAND (LH) DRIVE ONLY.
- 3.) INCLUDES ITEMS 4, & 5.
- 4.) <*> NOT SHOWN ON PARTS DRAWING.



| | | | |
|-------|----------------|--------------------------------------|------|
| 1 | 001-010581-267 | EXTENSION, CRANKSHAFT | 46 |
| 1 | 145-100200-999 | OIL SEAL (CRANKSHAFT EXTENSION) | 45 |
| 6 | 100-038112-290 | CAP SCREW | 44 |
| 2 | 001-011004-206 | GASKET (CRANKSHAFT COVER) | 43 |
| 1 | AAA-116601-231 | COVER (CRANKSHAFT) | 42 |
| 1 | 177-000550-999 | BEARING RETAINER | 41 |
| 1 | 004-017140-351 | BEARING HOUSING (OUTER CRANKSHAFT) | 40 |
| 1 | 001-014396-231 | RETAINER, (PINIONGEAR) | 39 |
| 6 | 100-038058-290 | CAP SCREW (ACCESS COVER) < * > | 38 |
| 1 | 001-001873-204 | GASKET (ACCESS COVER) < * > | 37 |
| 1 | 001-013849-220 | ACCESS COVER < * > | 36 |
| 1 | - | BULL GEAR < SEE NOTE1 > | 35 |
| 1 | 001-012117-999 | THREAD SEAL (OIL SCOOP) | 34 |
| 1 | 170-012002-220 | PLUG (OIL SCOOP) | 33 |
| 1 | 001-025629-305 | OIL SCOOP | 32 |
| 1 | AAB-115743-351 | HUB (BULL GEAR) | 31 |
| 8 | 100-034134-290 | CAP SCREW (BULL GEAR) | 30 |
| 8 | 154-034127-220 | LOCK WASHER (BULL GEAR) | 29 |
| 1 | 145-438538-999 | OIL SEAL (CRANKSHAFT) | 28 |
| 1 | AAB-028958-356 | BEARING HOUSING, MAIN (CRANKSHAFT) | 27 |
| 2 | 120-450084-999 | END BEARING (CRANKSHAFT) | 26 |
| 1 | 110-000277-201 | O-RING (BEARING HOUSING, MAIN) | 25 |
| 8 | 151-012013-220 | NUT (CASING, GEAR REDUCER) | 24 |
| 8 | 102-012234-286 | STUD (CASING, GEAR REDUCER) | 23 |
| 8 | 154-012078-220 | LOCK WASHER (GEAR CASE) | 22 |
| 1 | AAC-116602-348 | CRANKSHAFT | 21 |
| 1 | ABA-011592-236 | KEY (CRANKSHAFT) | 20 |
| 1 | 121-256055-999 | BEARING (OUTER CRANKSHAFT) | 19 |
| 1 | 001-013787-231 | BEARING RETAINER (PINION) | 18 |
| 1 | 110-000254-201 | O-RING (BEARING RETAINER) | 17 |
| 3 | 177-000600-999 | RETAINING RING | 16 |
| 6 | 100-012114-290 | CAP SCREW (PINION COVER) | 15 |
| 2 | 121-275059-999 | BEARING (PINION GEAR) | 14 |
| 1 | 146-058312-236 | KEY (PINION GEAR) | 13 |
| 1 | - | PINION GEAR < SEE NOTE1 > | 12 |
| 1 | 145-258358-999 | SEAL (PINION SHAFT) | 11 |
| 1 | 002-019883-231 | COVER, PINION SHAFT | 10 |
| 1 | 001-013788-201 | GASKET (BEARING RETAINER COVER) | 9 |
| 1 | 254-260034-201 | O-RING (COVER, GEAR REDUCER) | 8 |
| 1 | 147-012100-220 | DOWELL PIN | 7 |
| 1 | 001-010803-999 | OIL LEVEL GAUGE < * > | 6 |
| 2 | 147-038100-220 | DOWELL PIN (COVER, GEAR REDUCER) | 5 |
| 12 | 100-012114-290 | CAP SCREW | 4 |
| 1 | 001-011039-999 | AIR LEVEL GAUGE < * > | 3 |
| 1 | 170-034005-220 | DRAIN PLUG (CASING) < * > | 2 |
| 1 | AAC-028959-350 | GEAR CASE ASSEMBLY | 1 |
| REQ'D | Part No. | | ITEM |

BILL OF MATERIAL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLA-HOMA

TITLE:
GEAR REDUCER UNIT
 LEFT HAND DRIVE, W/LUBRICATOR DRIVE SHAFT
 217Q-4 (HP200)

DWG No: **118607** SCALE: **NONE** REV: **A** SHEET: **1** OF **2**

| | | | | |
|------------|--------------|----------------|-----------|----------------|
| 5.69:1 | 22 | 004-021088-274 | 125 | 004-021089-351 |
| 5.40:1 | 23 | 004-021773-274 | 124 | 004-021772-351 |
| 5.13:1 | 24 | 004-015657-274 | 123 | 004-015656-351 |
| 4.88:1 | 25 | 004-014364-274 | 122 | 004-014363-351 |
| 4.65:1 | 26 | 004-021691-274 | 121 | 004-021690-351 |
| 4.25:1 | 28 | 004-019852-274 | 119 | 004-019853-351 |
| 4.07:1 | 29 | 004-028180-274 | 118 | 004-028179-351 |
| 3.90:1 | 30 | 004-028159-274 | 117 | 004-028158-351 |
| 3.74:1 | 31 | 004-028996-274 | 116 | 004-028995-351 |
| 3.60:1 | 32 | 004-014683-274 | 115 | 004-014682-351 |
| 2.26:1 | 45 | 004-014515-274 | 102 | 004-014514-351 |
| 2.06:1 | 48 | 004-017919-274 | 99 | 004-017918-351 |
| GEAR RATIO | No. TEETH | PART No. | No. TEETH | PART No. |
| | PINION SHAFT | | BULL GEAR | |


GEAR CHART 163Q-4

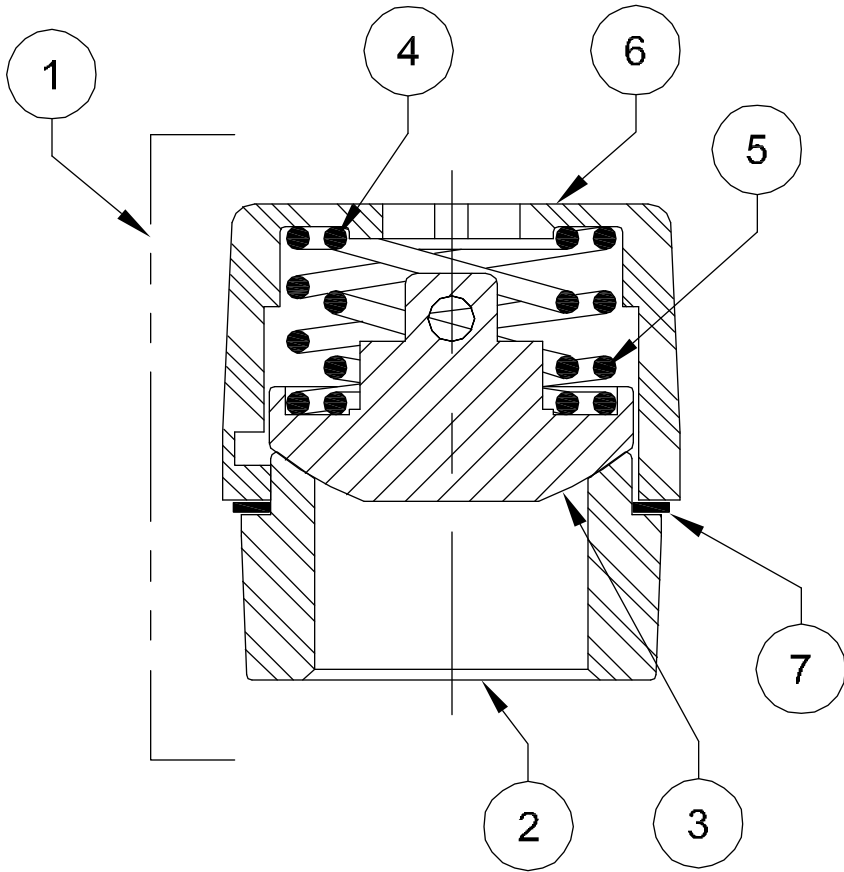
LUBRICATION:

- 1.) USE EXTREME PRESSURE GEAR LUBRICANT PER A.G.M.A. STD., 252.01 AGMA, LUBRICANT No. 4EP YEAR ROUND.
- 2.) LUBRICANT IS SEPARATE FROM PUMP CRANKCASE OIL.
- 3.) PINION SHAFT BEARINGS ARE FED FROM OIL TROUGHS. THE TROUGHS COLLECT OIL FROM GEAR MESH FLOWS.
- 4.) DRAIN FLUSH & REFILL AFTER FIRST TWO WEEKS OF OPERATION, THEN EVERY 6 MONTHS THEREAFTER.

NOTES:

- 1.) CRANKSHAFT PART NO.: AAC-116602-348 MUST BE USED WITH GEAR REDUCER.
- 2.) PINION MAY BE REMOVED IF DESIRED WITHOUT PULLING GEAR OR DISTURBING CRANKSHAFT.
- 3.) PINION SHAFT IS NOT DESIGNED FOR OVERHUNG LOADS.

| | | | |
|---|--------|------------------------------|--------|
|  | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: GEAR RATIO CHART FOR BULL GEAR & PINION GEAR w/ LUBRICATOR SHAFT 217Q-4 (HP200) | | | |
| DWG No.: | SCALE: | REV | SHT.: |
| 118607 | NONE | A | 2 OF 2 |



| 1 | 9707082 | WAVE RING | 7 |
|------------------|------------|---------------------------|------|
| 1 | 17930246WX | RETAINER | 6 |
| 1 | 1793025 | SPRING, OUTER | 5 |
| 1 | 1793026 | SPRING, INNER | 4 |
| 1 | 179302725 | BODY (VALVE) < * > | 3 |
| 1 | 179303725 | SEAT < * > | 2 |
| 1 | 179303625W | ASSEMBLY, SPHERICAL VALVE | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

< * > NOT SOLD SEPERATELY

17

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, SPHERICAL VALVE
217Q-4L, 163Q-4L (HP200AL, HP165AL)

DWG No.:

118575

SCALE:

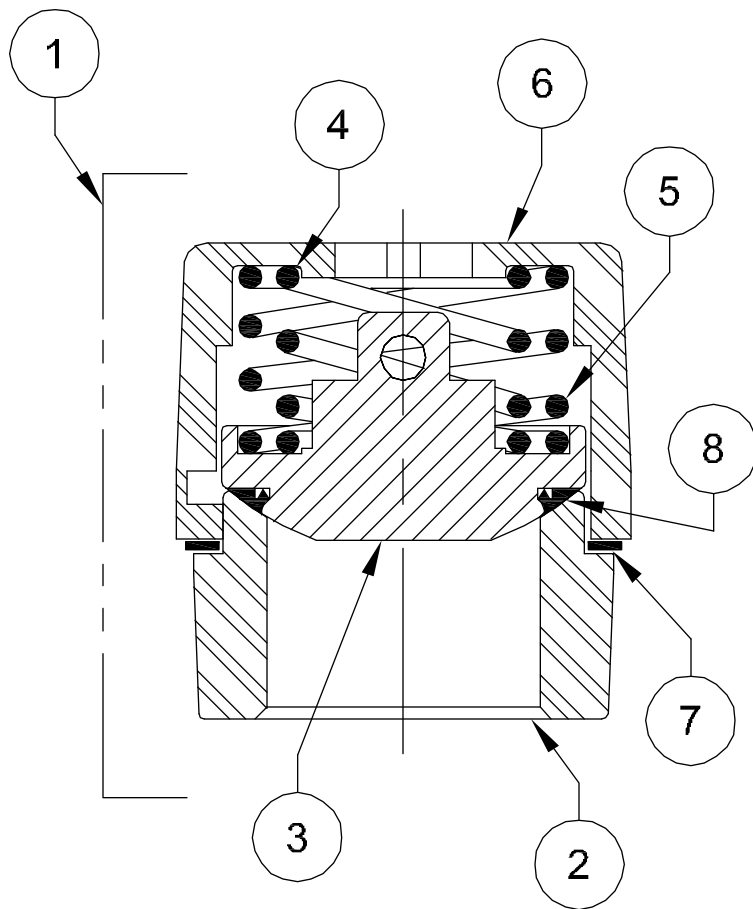
NONE

REV

A

SHT.:

1 OF 1



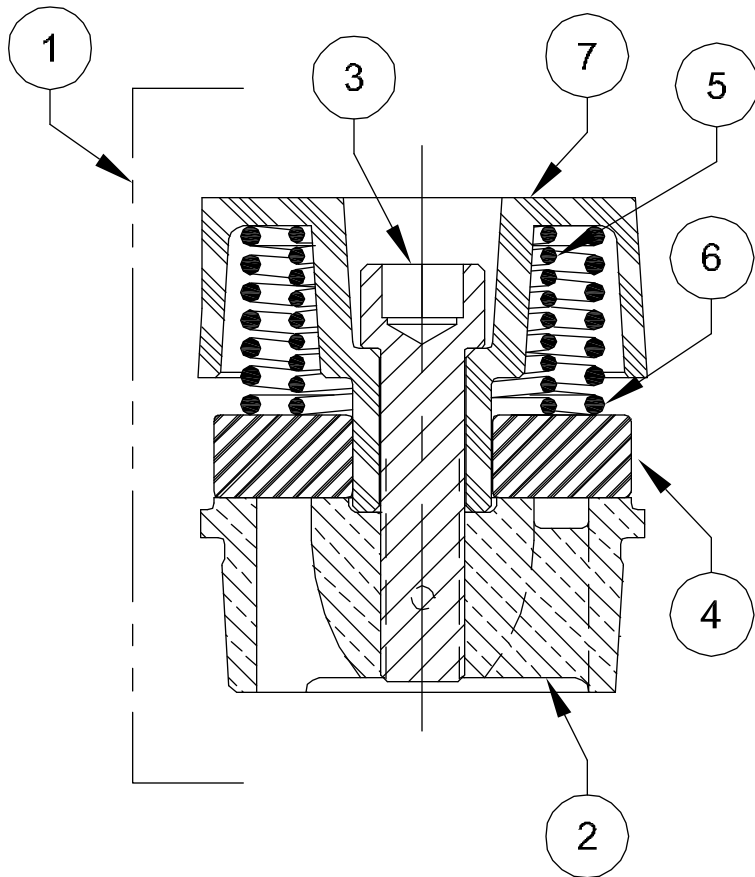
| 1 | 9707086 | VAVLE INSERT | 8 |
|------------------|-------------|----------------------------------|------|
| 1 | 9707082 | WAVE RING | 7 |
| 1 | 17930246WX | RETAINER | 6 |
| 1 | 1793025 | SPRING, OUTER | 5 |
| 1 | 1793026 | SPRING, INNER | 4 |
| 1 | 179302725SD | BODY (VALVE) | 3 |
| 1 | 179303725 | SEAT | 2 |
| 1 | 179303625SD | ASSEMBLY, SPHERICAL, SEVERE DUTY | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

18

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, SPHERICAL VALVE
 SEVERE DUTY
 217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | |
|-----------------|-------------|-------|--------------|
| DWG No.: 118576 | SCALE: NONE | REV A | SHT.: 1 OF 1 |
|-----------------|-------------|-------|--------------|



| 1 | SR01S | RETAINER | 7 |
|-------|-----------|-------------------------------|------|
| 1 | IS011 | SPRING, OUTER | 6 |
| 1 | IS022 | SPRING, INNER | 5 |
| 1 | TP05 | DISC (TITANIUM) | 4 |
| 1 | 38178M | FASTENER | 3 |
| 1 | 0010809 | SEAT | 2 |
| | | (TITANIUM) | |
| 1 | 001TP0809 | ASSEMBLY, TI/CF8M DISC VALVE | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| 1 | SR01S | RETAINER | 7 |
| 1 | IS011 | SPRING, OUTER | 6 |
| 1 | IS022 | SPRING, INNER | 5 |
| 1 | DP08 | DISC (DELRIN) | 4 |
| 1 | 38178M | FASTENER | 3 |
| 1 | 0010809 | SEAT | 2 |
| | | (DELRIN) | |
| 1 | 001DP0809 | ASSEMBLY, DEL/CF8M DISC VALVE | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |

BILL OF MATERIAL

19

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, DISC VALVE
217Q-4L, 163Q-4L (HP200AL, HP165AL)

DWG No.: 118577

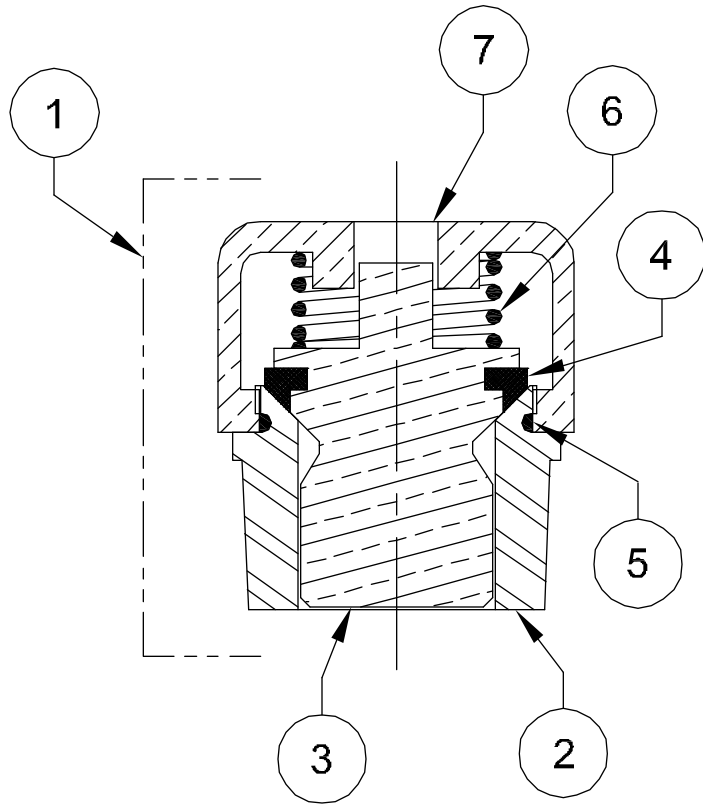
SCALE: NONE

REV A

SHT.: 1 OF 1

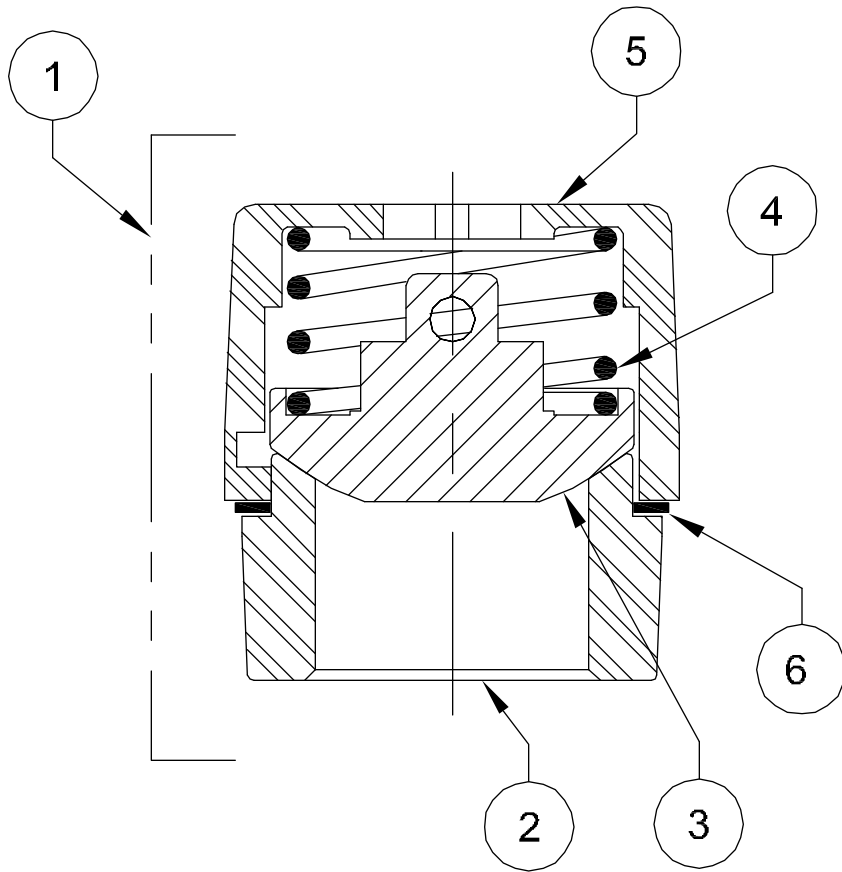
| 1 | SDR08 | RETAINER | 7 |
|-------|-----------|-----------------------|------|
| 1 | IS011 | SPRING | 6 |
| 1 | SDL09 | THREAD LOCK | 5 |
| 1 | SDI08 | INSERT | 4 |
| 1 | SD08 | VALVE L/INSERT | 3 |
| 1 | 1000809 | SEAT | 2 |
| 1 | 100SD0809 | ASSEMBLY, SEVERE DUTY | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| | | | |

BILL OF MATERIAL



| | | | |
|--|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, SEVERE DUTY 217Q-4L, 163Q-4L (HP200AL, HP165AL) | | | |
| DWG No.: | SCALE: | REV | SHT.: |
| 118578 | NONE | A | 1 OF 1 |

| | | | |
|------------------|------------|---------------------------|------|
| 1 | 9707083 | WAVE RING | 6 |
| 1 | 17925246W | RETAINER | 5 |
| 1 | 1792525 | SPRING | 4 |
| 1 | 179252725 | BODY (VALVE) < * > | 3 |
| 1 | 179253525 | SEAT < * > | 2 |
| 1 | 179253425W | ASSEMBLY, SPHERICAL VALVE | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |



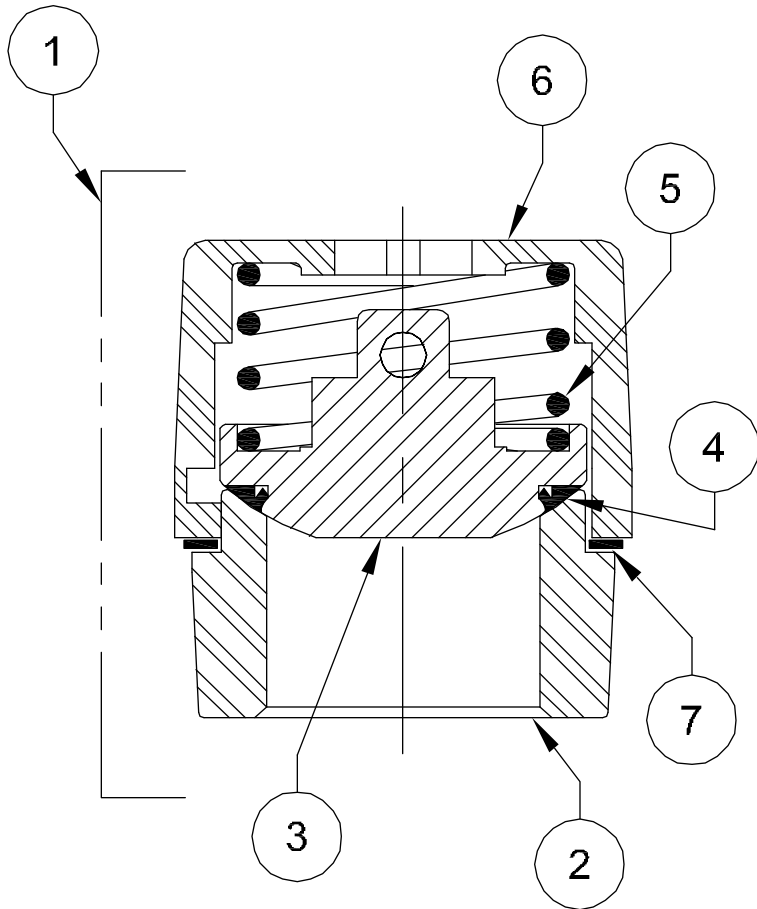
< * > NOT SOLD SEPERATELY

NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, SPHERICAL VALVE
217Q-4M, 163Q-4M (HP200AM, HP165AM)

| | | | |
|----------|--------|-----|--------|
| DWG No.: | SCALE: | REV | SHT.: |
| 118579 | NONE | A | 1 OF 1 |

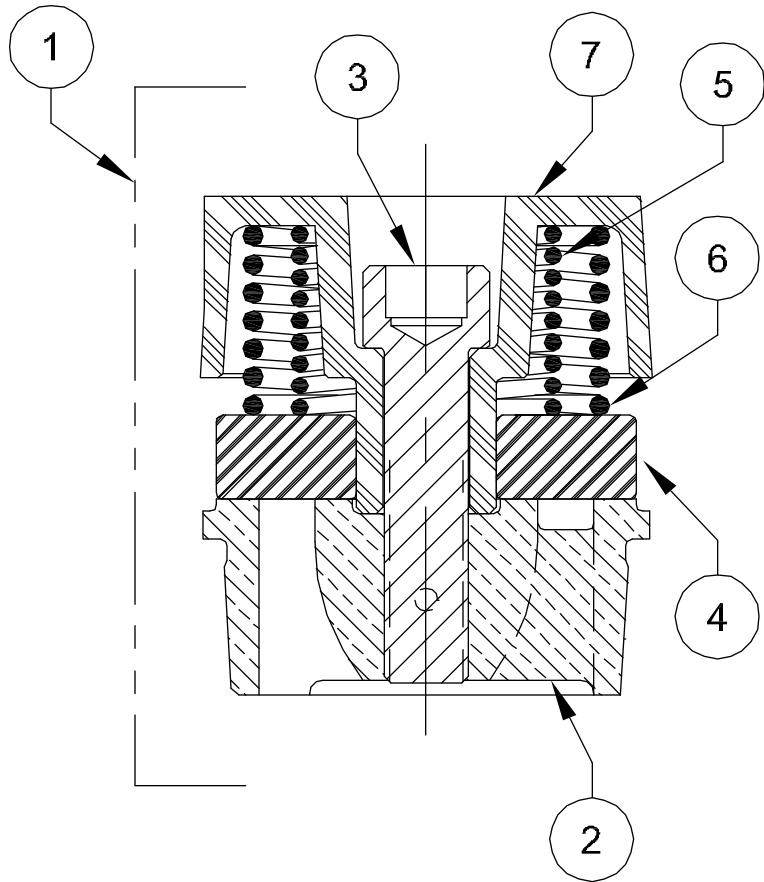
| 1 | 9707083 | WAVE RING | 7 |
|------------------|-------------|----------------------------------|------|
| 1 | 17925246W | RETAINER | 6 |
| 1 | 1792525 | SPRING | 5 |
| 1 | 9707087 | VAVLE INSERT | 4 |
| 1 | 179252725SD | BODY (VALVE) | 3 |
| 1 | 179253525SD | SEAT | 2 |
| 1 | 179253425SD | ASSEMBLY, SPHERICAL, SEVERE DUTY | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |



NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, SPHERICAL VALVE
SEVERE DUTY
217Q-4M, 163Q-4M (HP200AM, HP165AM)

DWG No.: 118580 SCALE: NONE REV A SHT.: 1 OF 1

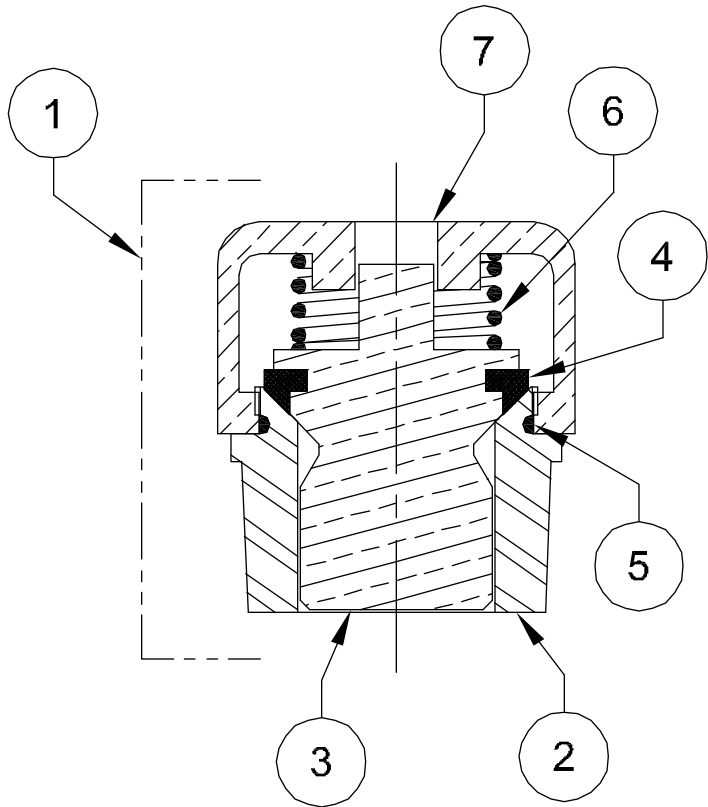


| 1 | SR01S | RETAINER | 7 |
|-------------------------|-----------|-------------------------------|------|
| 1 | IS011 | SPRING, OUTER | 6 |
| 1 | IS022 | SPRING, INNER | 5 |
| 1 | TP07 | DISC - TITANIUM | 4 |
| 1 | 38178M | FASTENER | 3 |
| 1 | 0010402 | SEAT | 2 |
| | | (TITANIUM) | |
| 1 | 00ITP0402 | ASSEMBLY, TI/CF8M DISC VALVE | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| 1 | SR01S | RETAINER | 7 |
| 1 | IS011 | SPRING, OUTER | 6 |
| 1 | IS022 | SPRING, INNER | 5 |
| 1 | DP07 | DISC - DELRIN | 4 |
| 1 | 38178M | FASTENER | 3 |
| 1 | 0010402 | SEAT | 2 |
| | | (DELRIN) | |
| 1 | 001DP0402 | ASSEMBLY, DEL/CF8M DISC VALVE | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

23

| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, DISC VALVE 217Q-4M, 163Q-4M (HP200AM, HP165AM) | | | |
| DWG No.: | 118581 | SCALE: | NONE |
| REV | A | SHT.: | 1 OF 1 |

| 1 | SDR07 | RETAINER | 7 |
|-------------------------|-----------|-----------------------|------|
| 1 | SDS071 | SPRING | 6 |
| 1 | SDL07 | THREAD LOCK | 5 |
| 1 | SDI07 | INSERT | 4 |
| 1 | SD07 | VALVE L/INSERT | 3 |
| 1 | 1000402 | SEAT | 2 |
| 1 | 100SD0402 | ASSEMBLY, SEVERE DUTY | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |



24

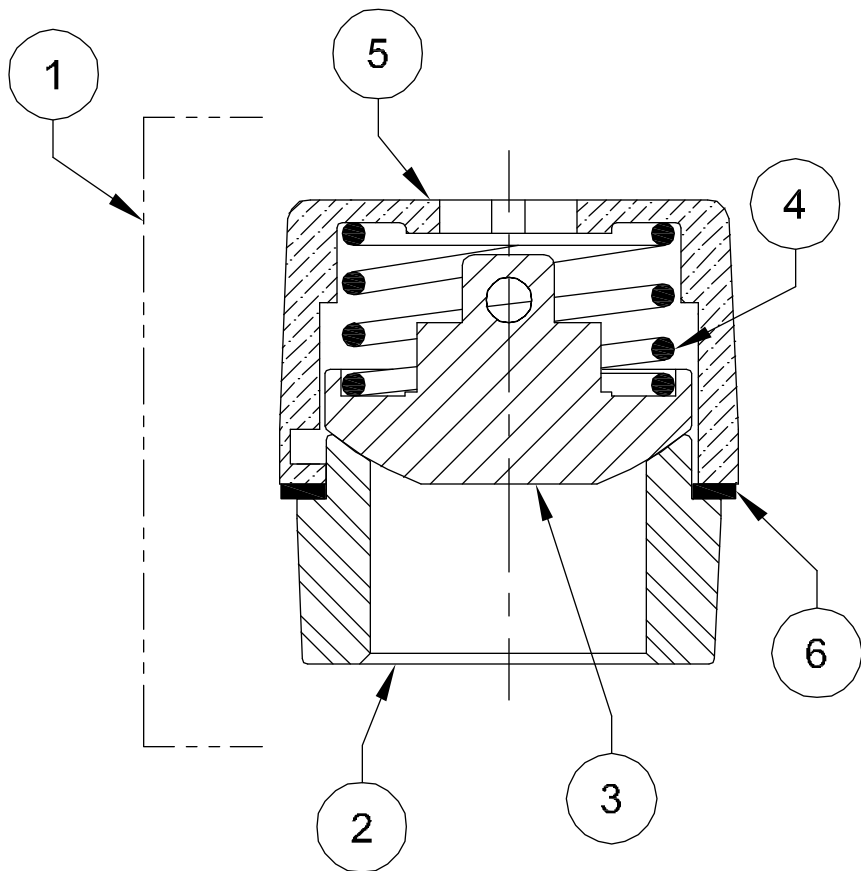
NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, SEVERE DUTY
217Q-4M, 163Q-4M (HP200AM, HP165AM)

| | | | |
|--------------------|----------------|-----------|-----------------|
| DWG No.: 118582 | SCALE: NONE | REV: A | SHT.: 1 OF 1 |
|--------------------|----------------|-----------|-----------------|

| 1 | 9707072 | WAVE RING | 6 |
|------------------|------------|---------------------------|------|
| 1 | 17910036W | RETAINER | 5 |
| 1 | 1792525 | SPRING | 4 |
| 1 | 179100225 | BODY (VALVE) <*> | 3 |
| 1 | 179100125M | SEAT <*> | 2 |
| 1 | 179100025M | ASSEMBLY, SPHERICAL VALVE | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

<*> NOT SOLD SEPERATELY

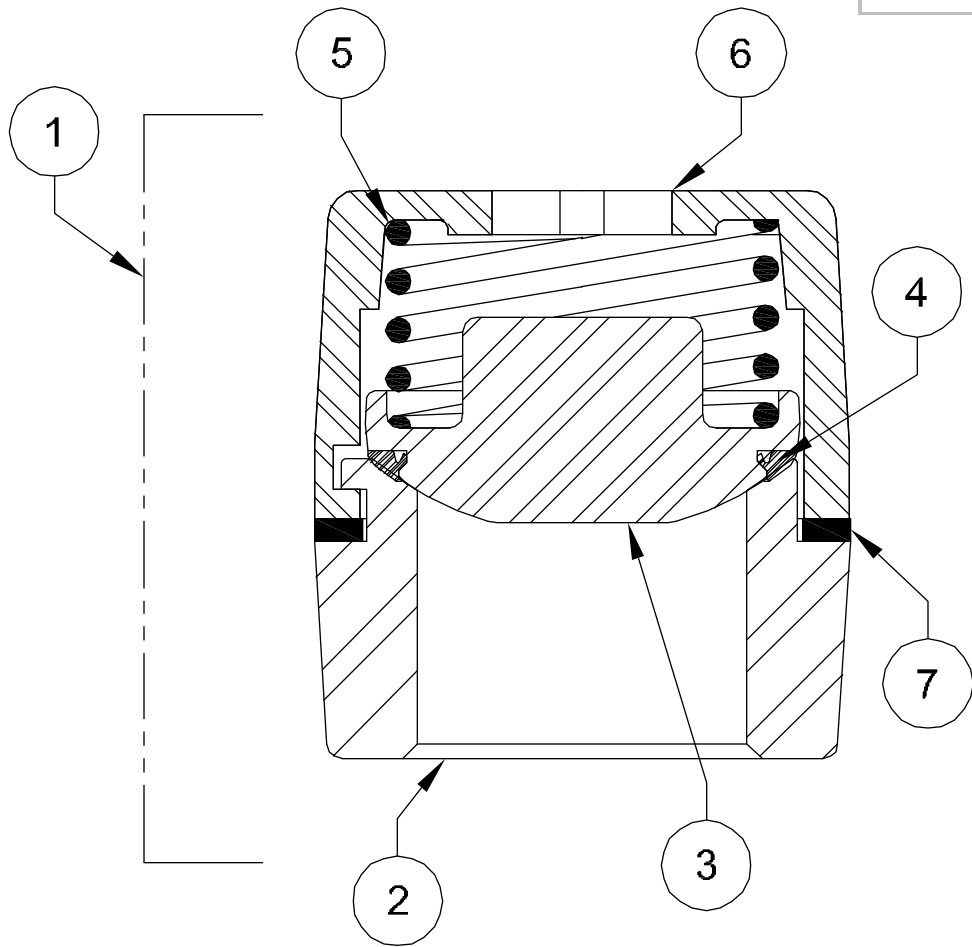


NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, SPHERICAL VALVE
217Q-4H, 163Q-4H

| | | | |
|-----------------|-------------|-------|--------------|
| DWG No.: 118583 | SCALE: NONE | REV A | SHT.: 1 OF 1 |
|-----------------|-------------|-------|--------------|

| 1 | 9707072 | WAVE RING | 7 |
|------------------|--------------|----------------------------------|------|
| 1 | 17910036W | RETAINER | 6 |
| 1 | 1792525 | SPRING | 5 |
| 1 | 9707071 | VALVE INSERT | 4 |
| 1 | 179100225SD | BODY (VALVE) | 3 |
| 1 | 179100125M | SEAT | 2 |
| 1 | 179100025SDM | ASSEMBLY, SPHERICAL, SEVERE DUTY | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |



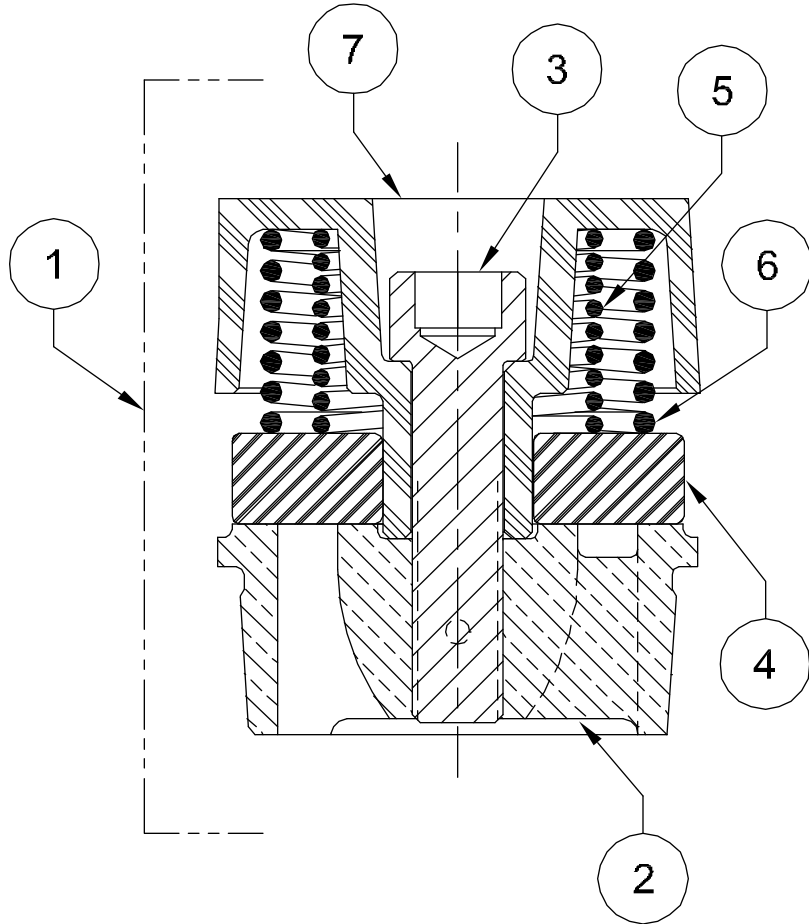
26

NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, SPHERICAL VALVE
"SEVERE DUTY"
217Q-4H, 163Q-4H

| | | | |
|-----------------|-------------|--------|--------------|
| DWG No.: 118585 | SCALE: NONE | REV: A | SHT.: 1 OF 1 |
|-----------------|-------------|--------|--------------|

| | | | |
|-------------------------|----------------|------------------------------|------|
| 1 | CAA-RT36S0-000 | RETAINER | 7 |
| 1 | IS011 | SPRING, OUTER | 6 |
| 1 | IS022 | SPRING, INNER | 5 |
| 1 | TP05 | DISC (TITANIUM) | 4 |
| 1 | 38178M | FASTENER | 3 |
| 1 | CAA-X5S130-000 | SEAT | 2 |
| | | (TITANIUM) | |
| 1 | CAA-X5ST2S-130 | ASSEMBLY, TI/CF8M DISC VALVE | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |



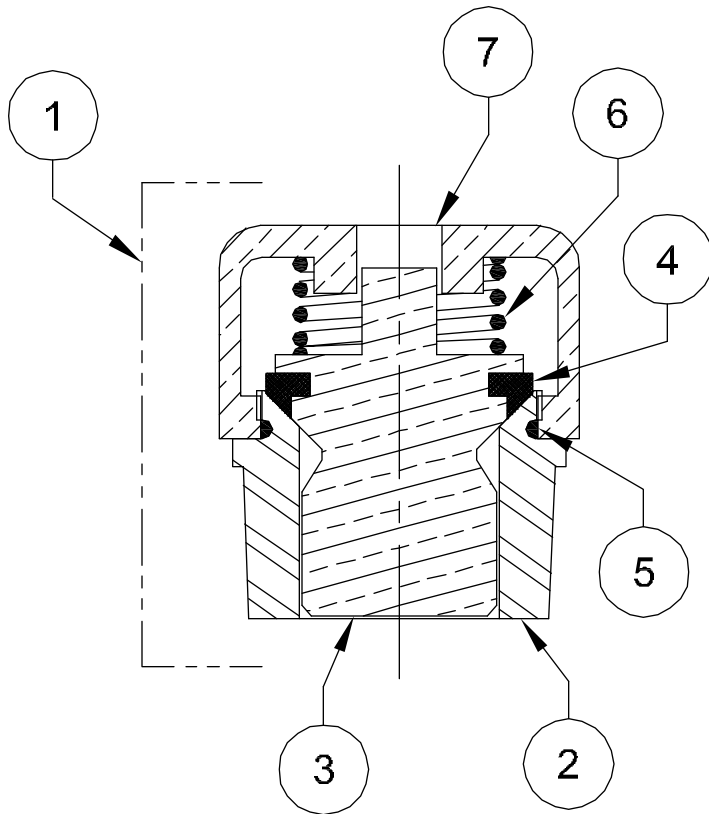
27

NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, DISC VALVE
217Q-4H, 163Q-4H

| | | | |
|----------|--------|-----|--------|
| DWG No.: | SCALE: | REV | SHT.: |
| 118586 | NONE | A | 1 OF 1 |

| 1 | SDR05 | RETAINER | 7 |
|-------------------------|-----------|-----------------------|------|
| 1 | SDS051 | SPRING | 6 |
| 1 | SDL05 | THREAD LOCK | 5 |
| 1 | SDI05 | INSERT | 4 |
| 1 | SD05 | VALVE L/INSERT | 3 |
| 1 | 1000513 | SEAT | 2 |
| 1 | 100SD0513 | ASSEMBLY, SEVERE DUTY | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

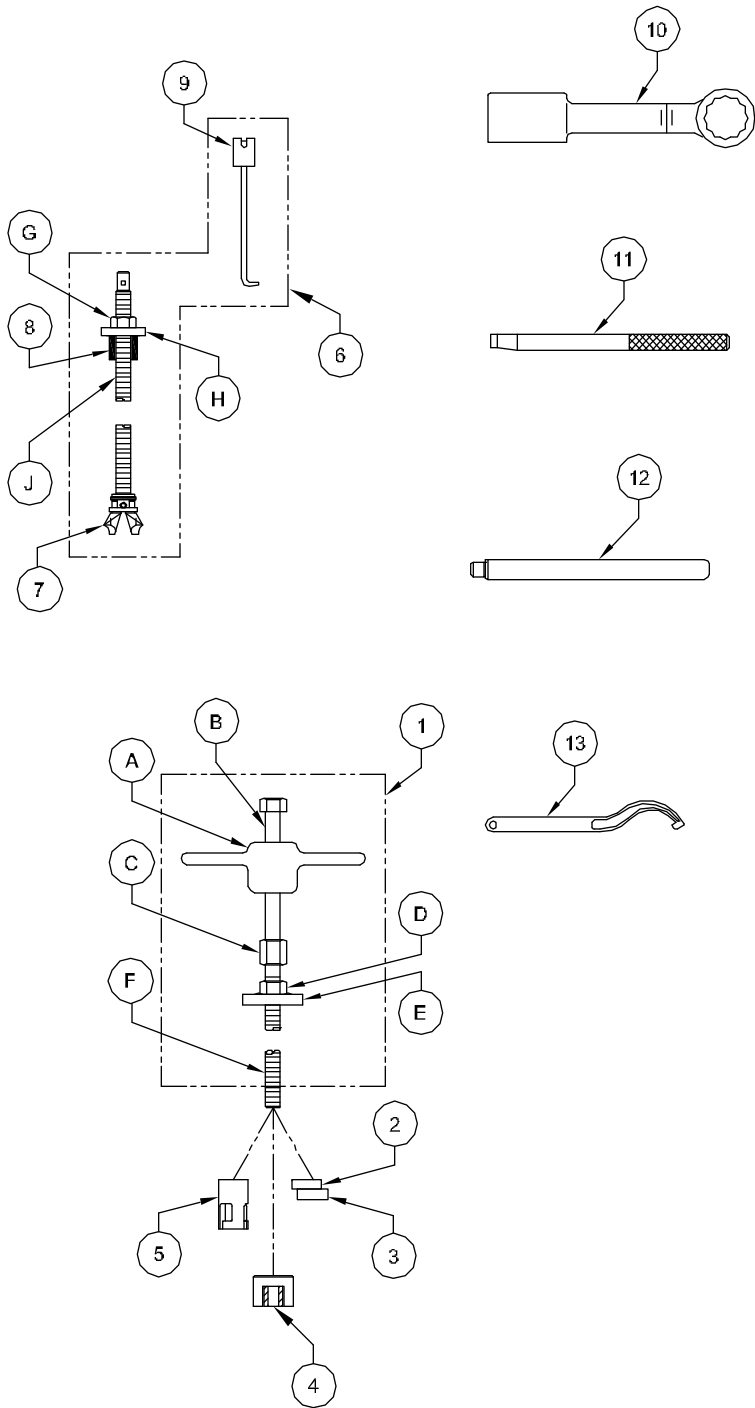


28

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, SEVERE DUTY
 217Q-4H, 63Q-4H

| | | | | | | | |
|----------|--------|--------|------|-----|---|-------|--------|
| DWG No.: | 118584 | SCALE: | NONE | REV | A | SH1.: | 1 OF 1 |
|----------|--------|--------|------|-----|---|-------|--------|

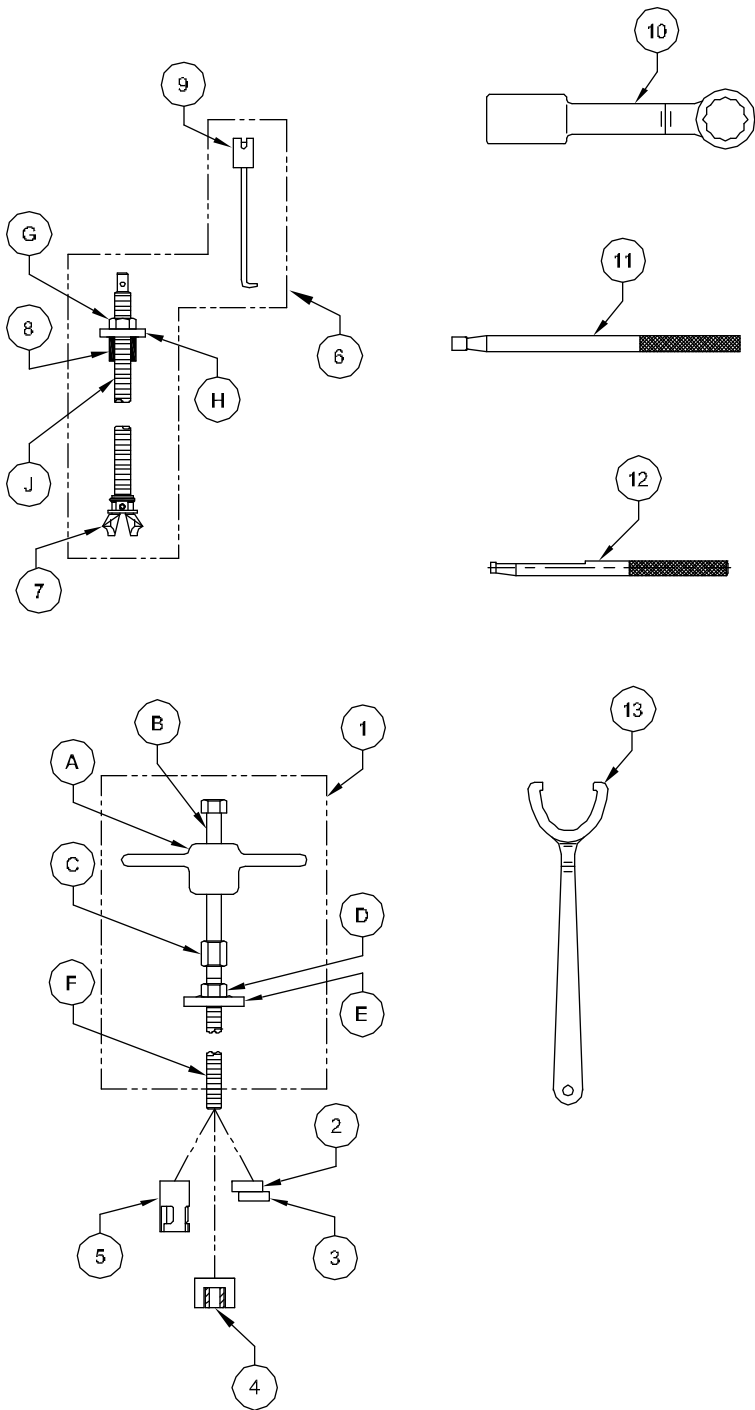


| | | | |
|------------------|----------------|---|------|
| 1 | 002-025720-231 | WRENCH, GLAND NUT (STD. SPANNER) | 13 |
| 1 | AAB-117875-270 | WRENCH, GLAND NUT (PIN TYPE - 0.750 HOLE) | 12 |
| 1 | AAB-051293-274 | WRENCH, GLAND NUT (PIN TYPE - 0.545 HOLE) | 11 |
| 1 | 001-027585-999 | WRENCH, VALVE COVER (HAMMER WRENCH) | 10 |
| 1 | 1790034 | RETRIEVER | 9 |
| 1 | 181205709 | SPACER | 8 |
| 1 | 181259300 | PULLER HEAD | 7 |
| 1 | 20220159 | PULLER STEM | J |
| 1 | 20220194 | STRONG BACK | H |
| 1 | 75518308 | HOLD DOWN NUT | G |
| 1 | 180104127 | ASSEMBLY, VALVE SEAT PULLER - (SPHERICAL) | 6 |
| 1 | AAC-011956-275 | PULLER HEAD | 5 |
| 1 | 008-028546-005 | PULLER STEM | F |
| 1 | 008-028546-035 | STRONG BACK | E |
| 1 | 008-028546-013 | HOLD DOWN NUT | D |
| 1 | 008-028546-016 | ADAPTER NUT | C |
| 1 | 008-028546-002 | BUMPER STEM | B |
| 1 | 008-028546-001 | BUMPER | A |
| 1 | 998-Q4240L-092 | ASSEMBLY, VALVE SEAT PULLER - (DISC VALVE) | 1 |
| 1 | 008-028546-044 | CAGE TOOL | 4 |
| 1 | 008-028546-030 | PULLER GUIDE | 3 |
| 1 | 008-028546-022 | ECCENTRIC, PULLER | 2 |
| 1 | 008-028546-005 | PULLER STEM | F |
| 1 | 008-028546-035 | STRONG BACK | E |
| 1 | 008-028546-013 | HOLD DOWN NUT | D |
| 1 | 008-028546-016 | ADAPTER NUT | C |
| 1 | 008-028546-002 | BUMPER STEM | B |
| 1 | 008-028546-001 | BUMPER | A |
| 1 | 998-Q4240L-091 | ASSEMBLY, VALVE SEAT PULLER - (SEVERE DUTY) | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
TOOL SERVICE KIT
"L" - CLASS FLUID ENDS
217Q-4L, 163Q-4L (HP200AL , HP165AL)

DWG No.: 118587 SCALE: NONE REV: A SHT.: 1 OF 1

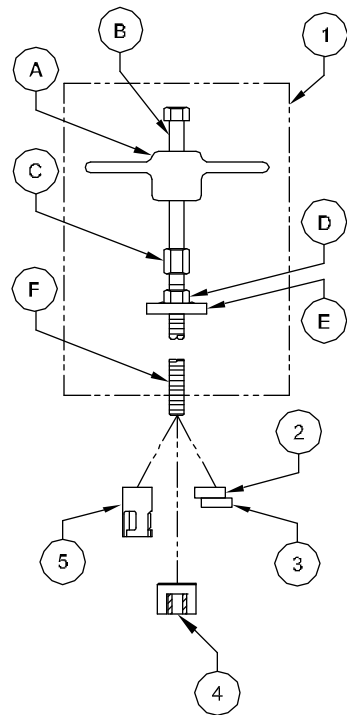
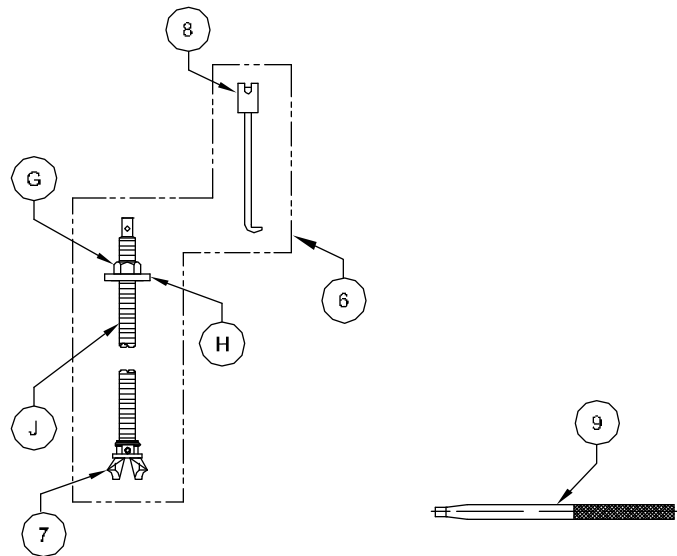


| | | | |
|------------------|----------------|---|------|
| 1 | 002-027780-351 | WRENCH, GLAND NUT (DUCTILE IRON) | 13 |
| 1 | AAB-030945-274 | WRENCH, GLAND NUT (PIN TYPE - 0.531 HOLE) | 12 |
| 1 | 002-051293-274 | WRENCH, GLAND NUT (PIN TYPE - 0.545 HOLE) | 11 |
| 1 | 001-027584-999 | WRENCH, VALVE COVER (HAMMER WRENCH) | 10 |
| 1 | 1790034 | RETRIEVER | 9 |
| 1 | 181205709 | SPACER | 8 |
| 1 | 181259250 | PULLER HEAD | 7 |
| 1 | 20220159 | PULLER STEM | J |
| 1 | 20220194 | STRONG BACK | H |
| 1 | 75518308 | HOLD DOWN NUT | G |
| 1 | 180104119 | ASSEMBLY, VALVE SEAT PULLER - (SPHERICAL) | 6 |
| 1 | 001-012497-274 | PULLER HEAD | 5 |
| 1 | 008-028546-004 | PULLER STEM | F |
| 1 | 008-028546-035 | STRONG BACK | E |
| 1 | 008-028546-012 | HOLD DOWN NUT | D |
| 1 | 008-028546-015 | ADAPTER NUT | C |
| 1 | 008-028546-002 | BUMPER STEM | B |
| 1 | 008-028546-001 | BUMPER | A |
| 1 | 998-Q4240M-092 | ASSEMBLY, VALVE SEAT PULLER - (DISC VALVE) | 1 |
| 1 | 008-028546-043 | CAGE TOOL | 4 |
| 1 | 008-028546-027 | PULLER GUIDE | 3 |
| 1 | 008-028546-019 | ECCENTRIC, PULLER | 2 |
| 1 | 008-028546-005 | PULLER STEM | F |
| 1 | 008-028546-035 | STRONG BACK | E |
| 1 | 008-028546-013 | HOLD DOWN NUT | D |
| 1 | 008-028546-016 | ADAPTER NUT | C |
| 1 | 008-028546-002 | BUMPER STEM | B |
| 1 | 008-028546-001 | BUMPER | A |
| 1 | 998-Q4240M-091 | ASSEMBLY, VALVE SEAT PULLER - (SEVERE DUTY) | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
TOOL SERVICE KIT
"M" - CLASS FLUID ENDS
217Q-4M, 163Q-4M (HP200AM, HP165AM)

DWG No.: 118588 SCALE: NONE REV: A SHT.: 1 OF 1



| | | | |
|------------------|----------------|---|------|
| 1 | AAB-030420-274 | WRENCH, GLAND NUT (PIN TYPE - 0.531 HOLE) | 9 |
| 1 | 1790034 | RETRIEVER | 8 |
| 1 | 181259225 | PULLER HEAD | 7 |
| 1 | 20220331 | PULLER STEM | J |
| 1 | 20220332 | STRONG BACK | H |
| 1 | 75510312 | HOLD DOWN NUT | G |
| 1 | 181259226 | ASSEMBLY, VALVE SEAT PULLER - (SPHERICAL) | 6 |
| 1 | 001-019433-274 | PULLER HEAD | 5 |
| 1 | 008-028546-005 | PULLER STEM | F |
| 1 | 008-028546-035 | STRONG BACK | E |
| 1 | 008-028546-013 | HOLD DOWN NUT | D |
| 1 | 008-028546-016 | ADAPTER NUT | C |
| 1 | 008-028546-002 | BUMPER STEM | B |
| 1 | 008-028546-001 | BUMPER | A |
| 1 | 998-Q3150M-092 | ASSEMBLY, VALVE SEAT PULLER - (DISC VALVE) | 1 |
| 1 | 008-028546-043 | CAGE TOOL | 4 |
| 1 | 008-028546-028 | PULLER GUIDE | 3 |
| 1 | 008-028546-020 | ECCENTRIC, PULLER | 2 |
| 1 | 008-028546-004 | PULLER STEM | F |
| 1 | 008-028546-035 | STRONG BACK | E |
| 1 | 008-028546-012 | HOLD DOWN NUT | D |
| 1 | 008-028546-015 | ADAPTER NUT | C |
| 1 | 008-028546-002 | BUMPER STEM | B |
| 1 | 008-028546-001 | BUMPER | A |
| 1 | 998-Q3150M-091 | ASSEMBLY, VALVE SEAT PULLER - (SEVERE DUTY) | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

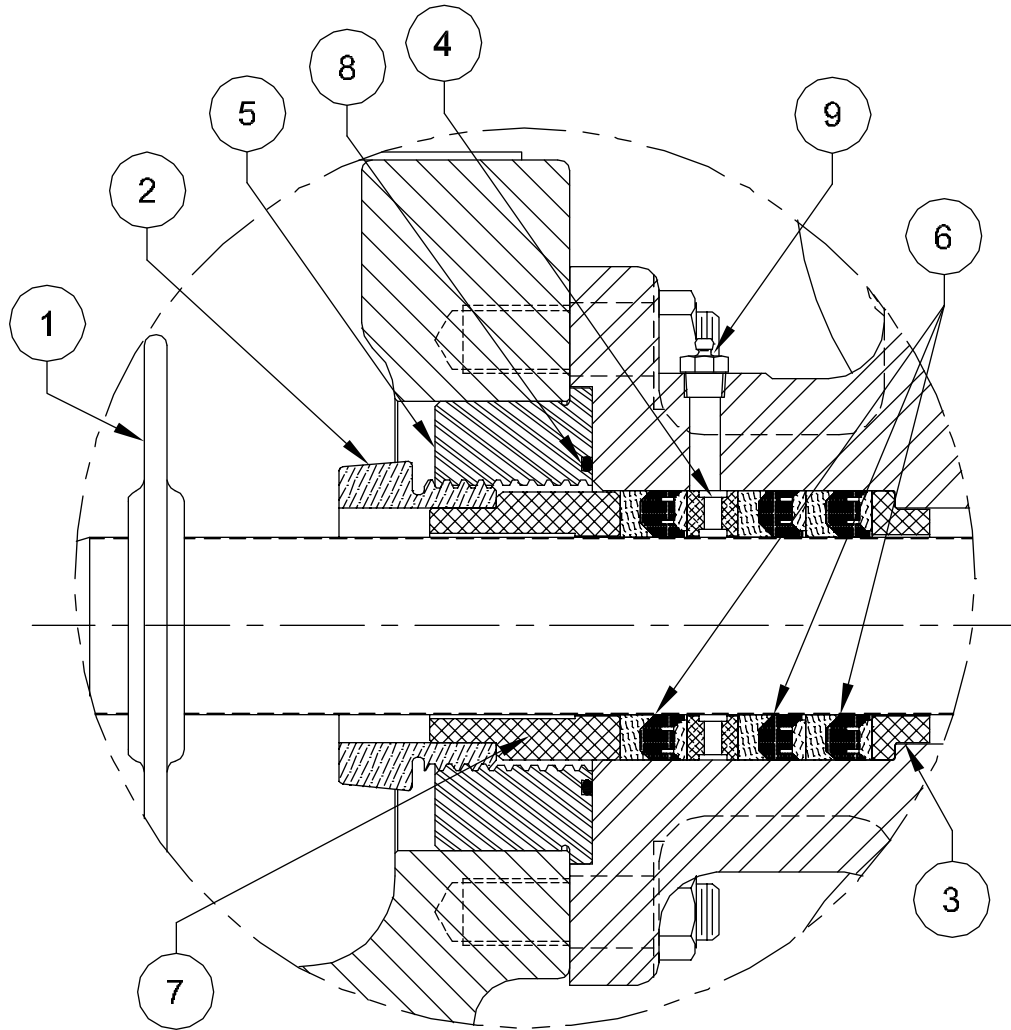
TOOL SERVICE KIT
"H" - CLASS FLUID ENDS
217Q-4H, 163Q-4H

DWG No.: 118589

SCALE: NONE

REV A

SHT.: 1 OF 1



NOTE

1) FOR ALL " J " STYLE PACKING SEE DRAWING 118590, SHEETS 1 THRU 5.

| | | | | |
|-------------------------|----------------|----------------|-------|------|
| 5 | 180-165000-220 | LUBE FITTING | | 9 |
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | 001-024974-575 | | (SS) | |
| 5 | 001-024974-235 | | (STL) | |
| 5 | 001-024974-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 218-234318-477 | | 858 | |
| 5 | 218-234318-374 | | 845 | |
| 5 | 218-234318-386 | | 842 | |
| 5 | 218-234318-370 | PACKING | 838 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-024972-575 | | (SS) | |
| 5 | 001-024972-235 | | (STL) | |
| 5 | 001-024972-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-024973-575 | | (SS) | |
| 5 | 001-024973-235 | | (STL) | |
| 5 | 001-024973-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-014155-351 | | (DI) | |
| 5 | 001-014155-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (2-3/4" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT
 "J"-STYLE PKG, 2-3/4" THRU 3-3/8" PLUNGER
 217Q-4L, 163Q-4L (HP200AL, HP165AL)

DWG No.:

118590

SCALE:

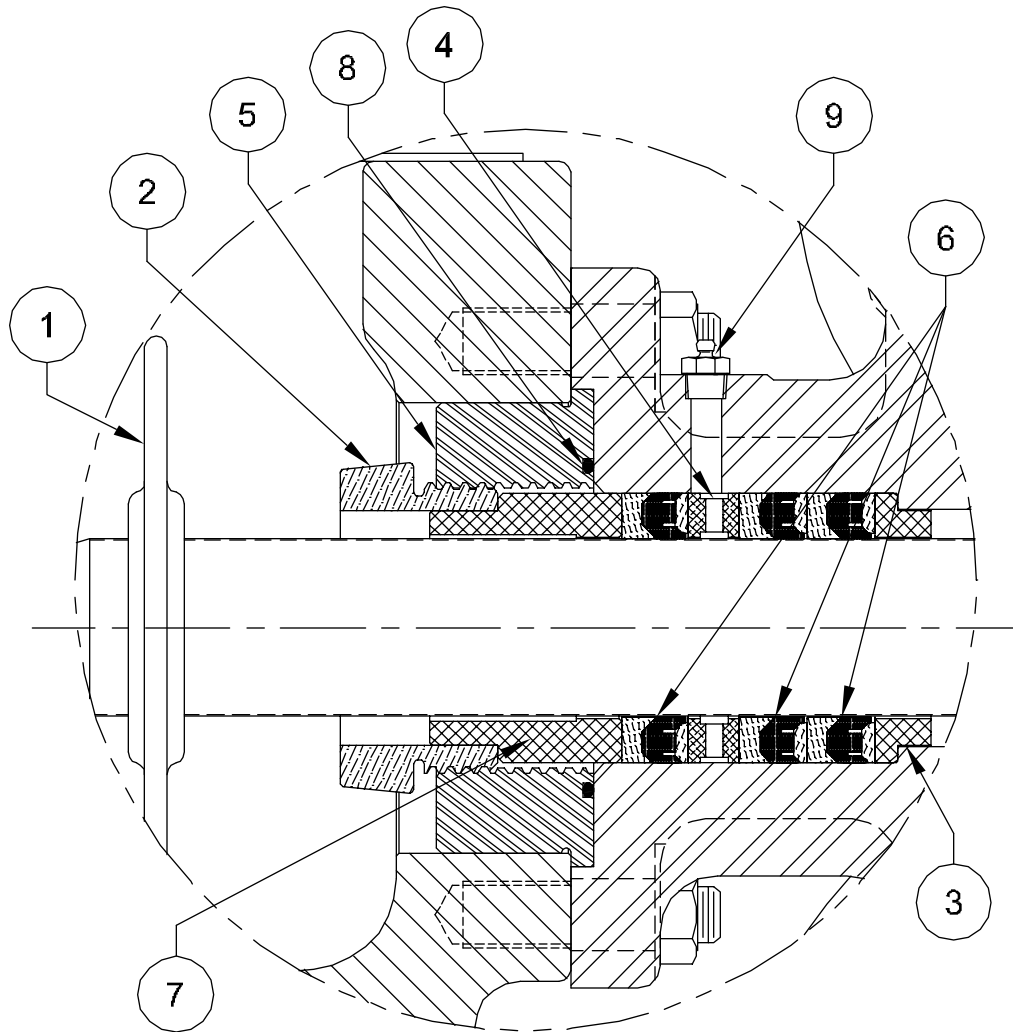
NONE

REV

A

SHT.:

1 OF 5



| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165000-220 | LUBE FITTING | | 9 |
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | BCC-116333-575 | | (SS) | 7 |
| 5 | 001-008353-235 | | (STL) | |
| 5 | 001-008353-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 218-278318-477 | | 858 | |
| 5 | 218-278318-374 | | 845 | |
| 5 | 218-278318-386 | | 842 | |
| 5 | 218-278318-370 | PACKING | 838 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-011194-575 | | (SS) | |
| 5 | 001-011194-235 | | (STL) | |
| 5 | 001-011194-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-028783-575 | | (SS) | |
| 5 | 001-028783-235 | | (STL) | |
| 5 | 001-028783-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-014155-351 | | (DI) | |
| 5 | 001-014155-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

| (2-7/8" PLUNGER) | | | |
|--------------------|----------|-------------|------|
| REQ'D | Part No. | DESCRIPTION | ITEM |
| | | | |

BILL OF MATERIAL

<*> COATED STAINLESS STEEL

NOTE

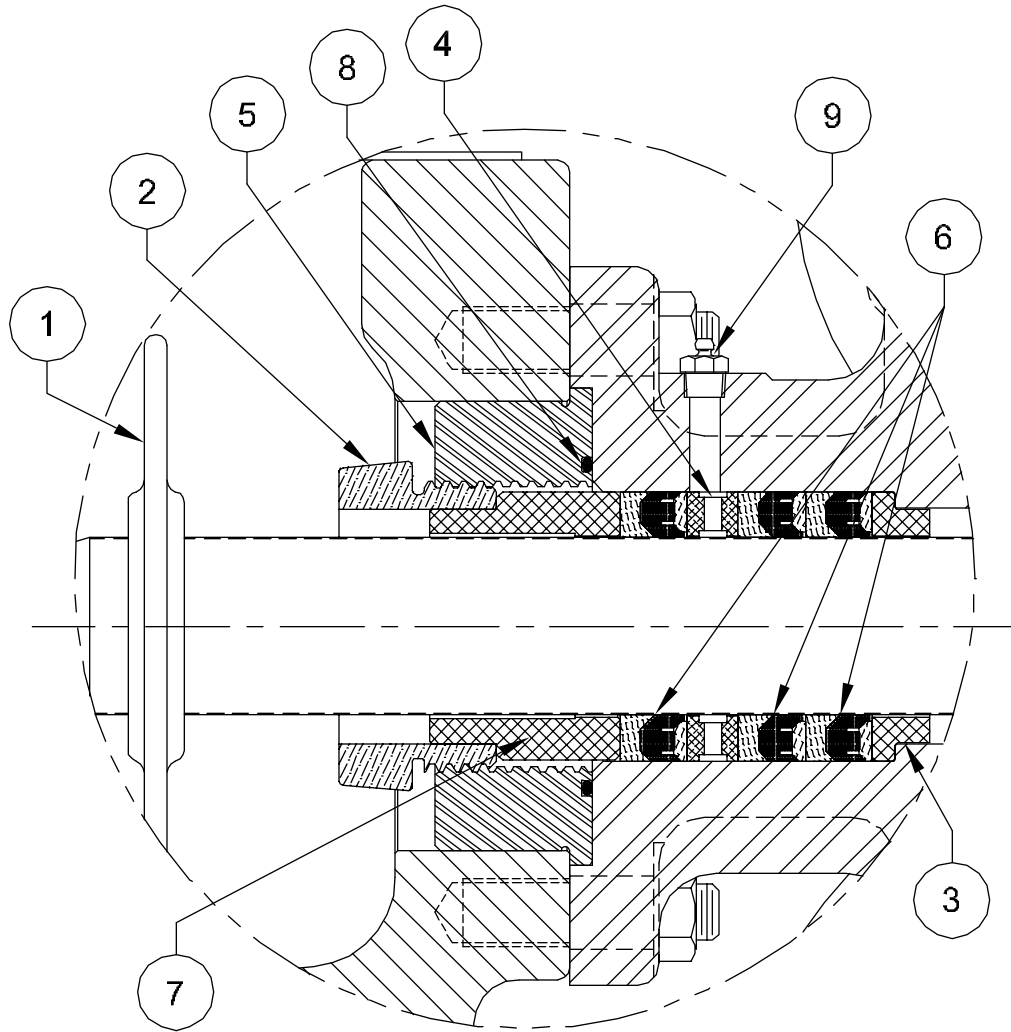
1) FOR ALL " J " STYLE PACKING SEE DRAWING 118590, SHEETS 1 THRU 5.



HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
 "J"-STYLE PKG, 2-3/4" THRU 3-3/8" PLUNGER
 217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | | | | | | | |
|----------|--------|--------|------|-----|---|-------|---|----|---|
| DWG No.: | 118590 | SCALE: | NONE | REV | A | SHT.: | 2 | OF | 5 |
|----------|--------|--------|------|-----|---|-------|---|----|---|



NOTE

1) FOR ALL " J " STYLE PACKING SEE DRAWING 118590, SHEETS 1 THRU 5.

| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165000-220 | LUBE FITTING | | 9 |
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | BEC-116333-575 | | (SS) | |
| 5 | 001-011188-235 | | (STL) | |
| 5 | 001-011188-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 218-300281-477 | | 858 | |
| 5 | 218-300281-374 | | 845 | |
| 5 | 218-300281-386 | | 842 | |
| 5 | 218-300281-370 | PACKING | 838 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-011195-575 | | (SS) | |
| 5 | 001-011195-235 | | (STL) | |
| 5 | 001-011195-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-025961-575 | | (SS) | |
| 5 | 001-025961-235 | | (STL) | |
| 5 | 001-025961-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-014155-351 | | (DI) | |
| 5 | 001-014155-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

| (3" PLUNGER) | | | |
|----------------|----------|-------------|------|
| REQ'D | Part No. | DESCRIPTION | ITEM |

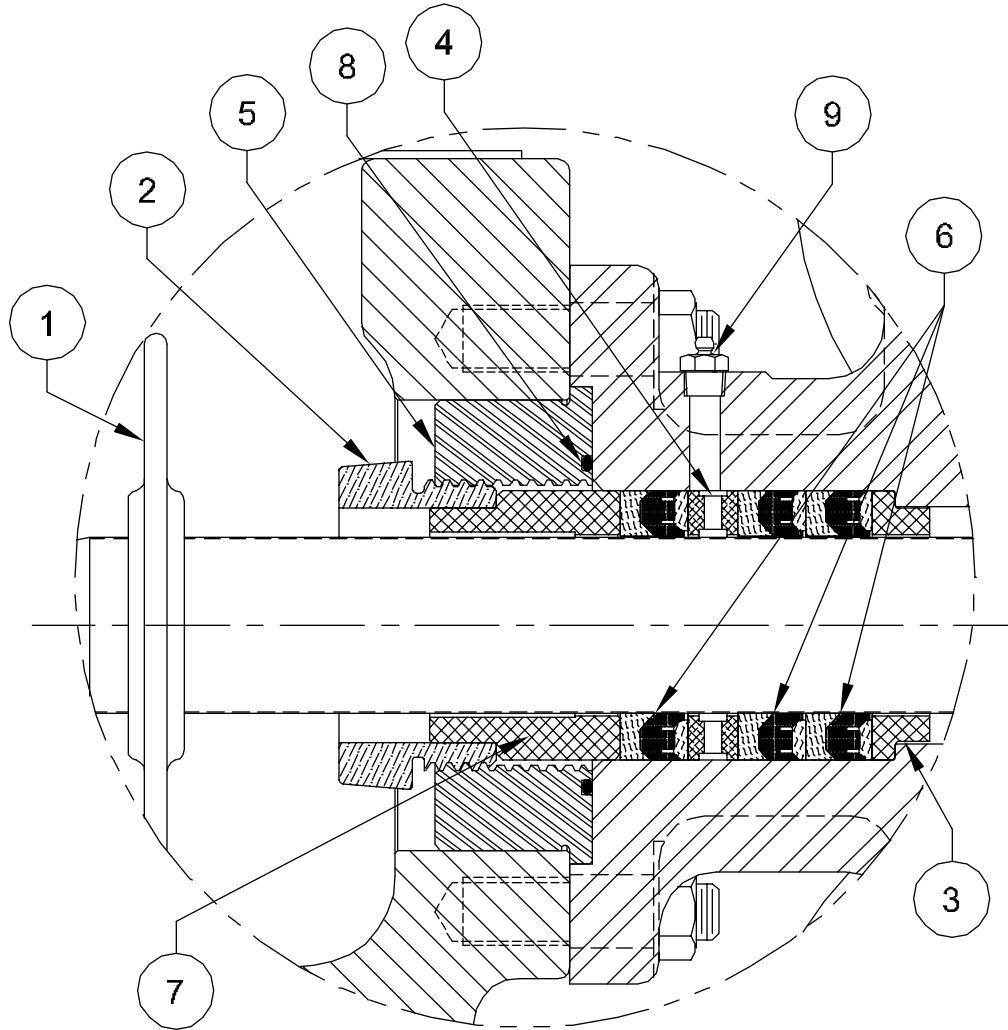
BILL OF MATERIAL

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
"J"-STYLE PKG, 2-3/4" THRU 3-3/8" PLUNGER
217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | |
|-----------------|-------------|-------|--------------|
| DWG No.: 118590 | SCALE: NONE | REV A | SHT.: 3 OF 5 |
|-----------------|-------------|-------|--------------|



NOTE

1) FOR ALL " J " STYLE PACKING SEE DRAWING 118590, SHEETS 1 THRU 5.

| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165000-220 | LUBE FITTING | | 9 |
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | BJC-116333-575 | | (SS) | |
| 5 | 001-011190-235 | | (STL) | |
| 5 | 001-011190-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 218-314214-477 | | 858 | |
| 5 | 218-314214-374 | | 845 | |
| 5 | 218-314214-386 | | 842 | |
| 5 | 218-314214-370 | PACKING | 838 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-011197-575 | | (SS) | |
| 5 | 001-011197-235 | | (STL) | |
| 5 | 001-011197-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-025962-575 | | (SS) | |
| 5 | 001-025962-235 | | (STL) | |
| 5 | 001-025962-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-014155-351 | | (DI) | |
| 5 | 001-014155-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(3-1/4" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |

BILL OF MATERIAL

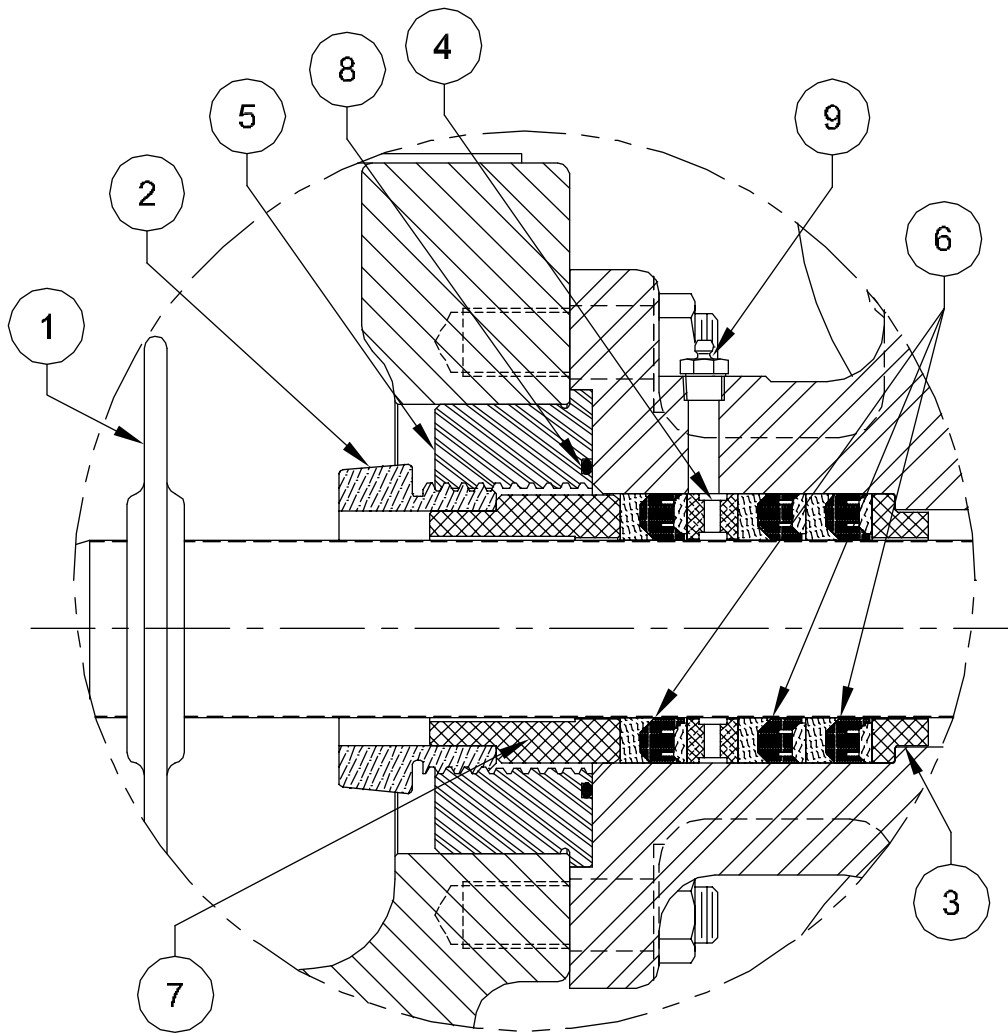
<*> COATED STAINLESS STEEL



HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
"J"-STYLE PKG, 2-3/4" THRU 3-3/8" PLUNGER
217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | |
|----------|--------|-----|--------|
| DWG No.: | SCALE: | REV | SHT.: |
| 118590 | NONE | A | 4 OF 5 |

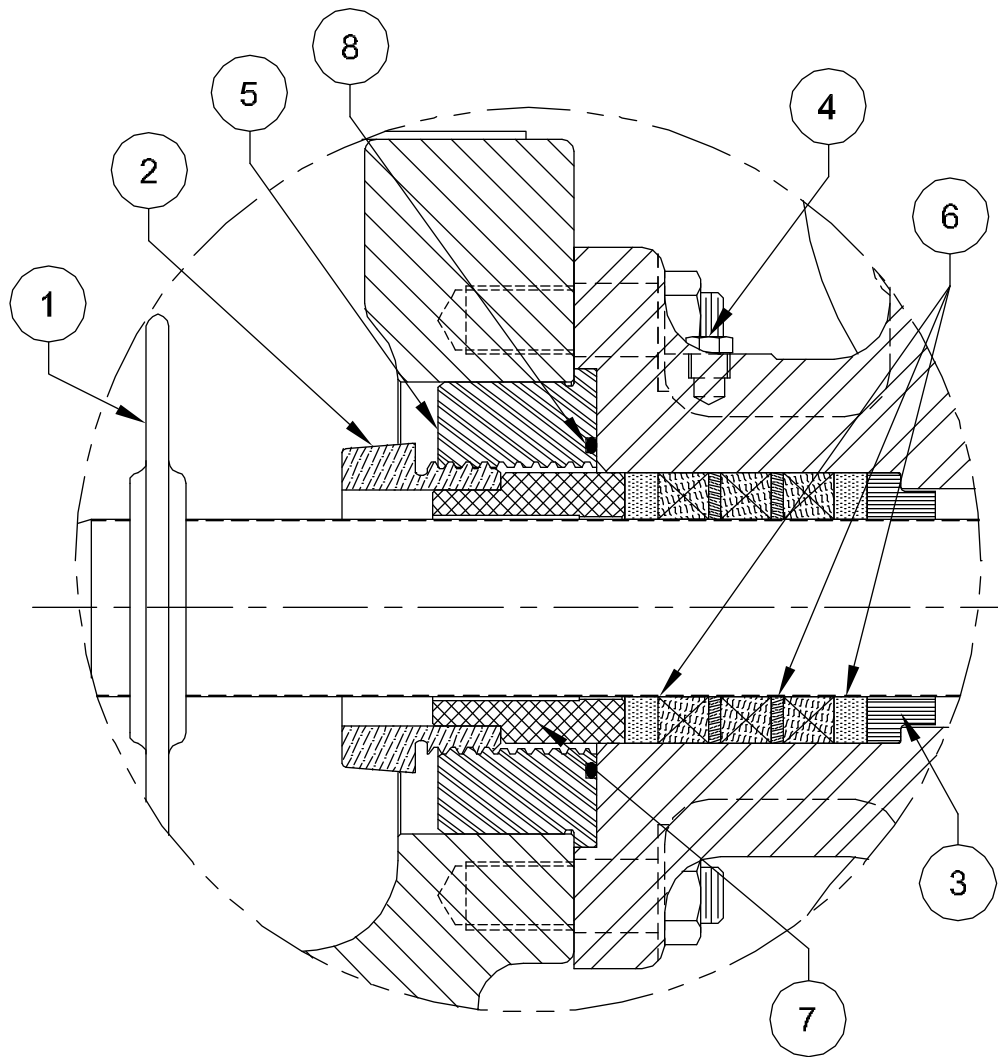


NOTE
 1) FOR ALL " J " STYLE PACKING SEE DRAWING 118590,
 SHEETS 1 THRU 5.

| 5 | 180-165000-220 | LUBE FITTING | | 9 |
|-------------------------|----------------|----------------|-------|------|
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | 001-024977-575 | | (SS) | |
| 5 | 001-024977-235 | | (STL) | |
| 5 | 001-024977-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 218-338214-477 | | 858 | |
| 5 | 218-338214-374 | | 845 | |
| 5 | 218-338214-386 | | 842 | |
| 5 | 218-338214-370 | PACKING | 838 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-024975-575 | | (SS) | |
| 5 | 001-024975-235 | | (STL) | |
| 5 | 001-024975-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-024976-575 | | (SS) | |
| 5 | 001-024976-235 | | (STL) | |
| 5 | 001-024976-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-014155-351 | | (DI) | |
| 5 | 001-014155-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (3-3/8" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, PLUNGER KIT "J"-STYLE PKG, 2-3/4" THRU 3-3/8" PLUNGER 217Q-4L, 163Q-4L (HP200AL, HP165AL) | | | |
| DWG No.: | 118590 | SCALE: | NONE |
| REV | A | SHT.: | 5 OF 5 |



NOTE
 1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118591,
 SHEETS 1 THRU 5.

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | 001-024974-575 | | (SS) | |
| 5 | 001-024974-235 | | (STL) | |
| 5 | 001-024974-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 437-234438-458 | | 8921-K | |
| 5 | 437-234438-339 | | 249 | |
| 5 | 437-234438-337 | | 241 | |
| 5 | 437-234438-395 | PACKING | 238 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-220 | | (STL) | |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-024973-575 | | (SS) | |
| 5 | 001-027619-235 | | (STL) | |
| 5 | 001-024973-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-024095-351 | | (DI) | |
| 5 | 001-014155-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(2-3/4" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |
| | | | |
| | | | |

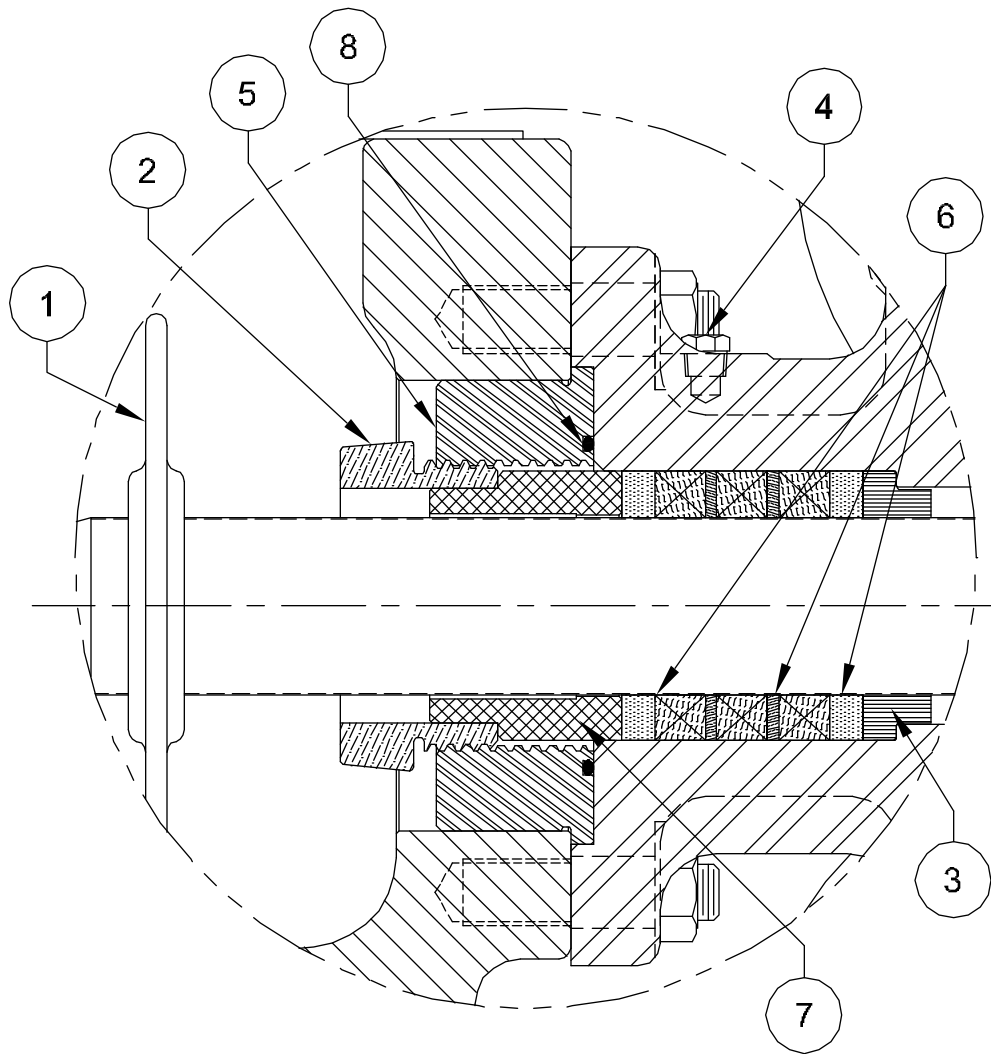
BILL OF MATERIAL

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
BRAID STYLE PKG, 2-3/4" - 3-3/8" PLUNGER
217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118591 | SCALE: NONE | REV A | SHT.: 1 OF 5 |
|--------------------|----------------|----------|-----------------|



NOTE

1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118591, SHEETS 1 THRU 5.

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | BCC-116333-575 | | (SS) | |
| 5 | 001-008358-235 | | (STL) | |
| 5 | 001-008358-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 437-278356-458 | | 8921-K | |
| 5 | 437-278356-339 | | 249 | |
| 5 | 437-278356-337 | | 241 | |
| 5 | 437-278356-395 | PACKING | 238 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-220 | | (STL) | |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-028783-575 | | (SS) | |
| 5 | 001-028783-235 | | (STL) | |
| 5 | 001-028783-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-014155-351 | | (DI) | |
| 5 | 001-014155-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(2-7/8" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |

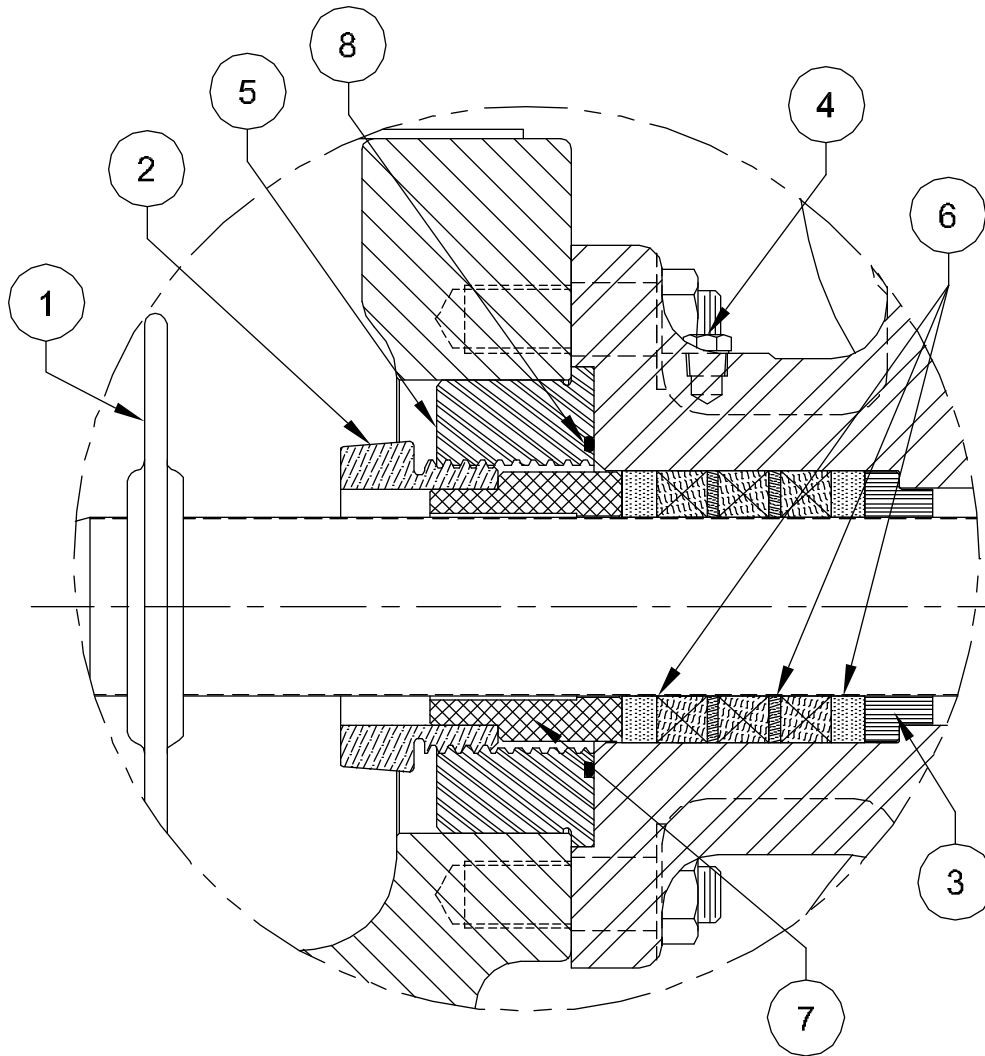
BILL OF MATERIAL

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
BRAID STYLE PKG, 2-3/4" - 3-3/8" PLUNGER
217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | |
|----------|--------|------|--------|
| DWG No.: | SCALE: | REV: | SHT.: |
| 118591 | NONE | A | 2 OF 5 |



NOTE

1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118591, SHEETS 1 THRU 5.

| 5 | 110-000246-200 | O-RING | | 8 |
|-------------------------|----------------|----------------|--------|------|
| 5 | BEC-116333-575 | | (SS) | |
| 5 | 001-011188-235 | | (STL) | |
| 5 | 001-011188-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 437-300438-458 | | 8921-K | |
| 5 | 437-300438-339 | | 249 | |
| 5 | 437-300438-337 | | 241 | |
| 5 | 437-300438-395 | PACKING | 238 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-220 | | (STL) | |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-025961-575 | | (SS) | |
| 5 | 001-025961-235 | | (STL) | |
| 5 | 001-025961-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-014155-351 | | (DI) | |
| 5 | 001-014155-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (3" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

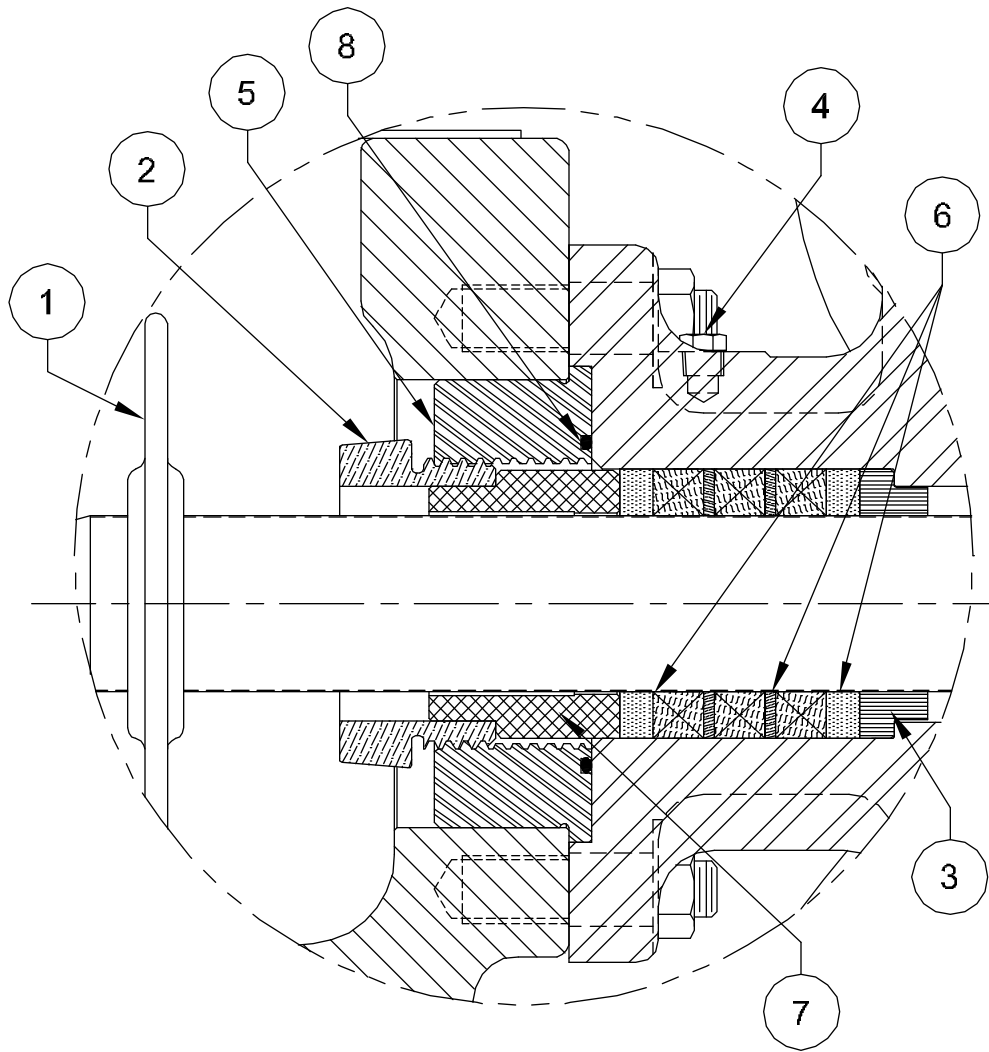
<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
BRAID STYLE PKG, 2-3/4" - 3-3/8" PLUNGER
217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | |
|----------|--------|-----|--------|
| DWG No.: | SCALE: | REV | SHT.: |
| 118591 | NONE | A | 3 OF 5 |



NOTE

1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118591, SHEETS 1 THRU 5.

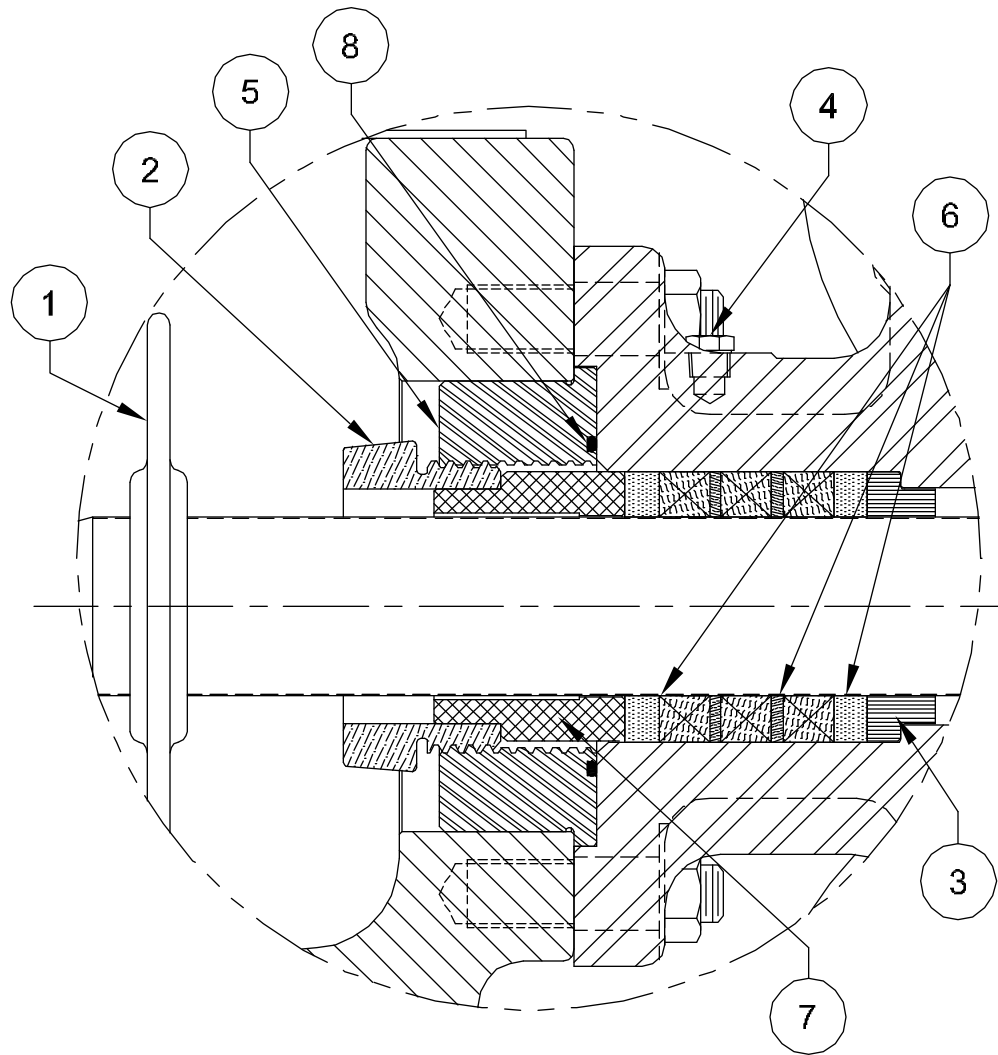
| | | | | |
|---------------------------|-----------------|--------------------|--------|-------------|
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | 001-011190-575 | | (SS) | |
| 5 | 001-011190-235 | | (STL) | |
| 5 | 001-011190-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 437-314312-458 | | 8921-K | |
| 5 | 437-314312-339 | | 249 | |
| 5 | 437-314312-337 | | 241 | |
| 5 | 437-314312-395 | PACKING | 238 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-220 | | (STL) | |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-025962-575 | | (SS) | |
| 5 | 001-025962-235 | | (STL) | |
| 5 | 001-025962-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-014155-351 | | (DI) | |
| 5 | 001-024095-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (3-1/4" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| | | | | |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
BRAID STYLE PKG, 2-3/4" - 3-3/8" PLUNGER
217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | |
|-----------------|-------------|--------|--------------|
| DWG No.: 118591 | SCALE: NONE | REV: A | SHT.: 4 OF 5 |
|-----------------|-------------|--------|--------------|



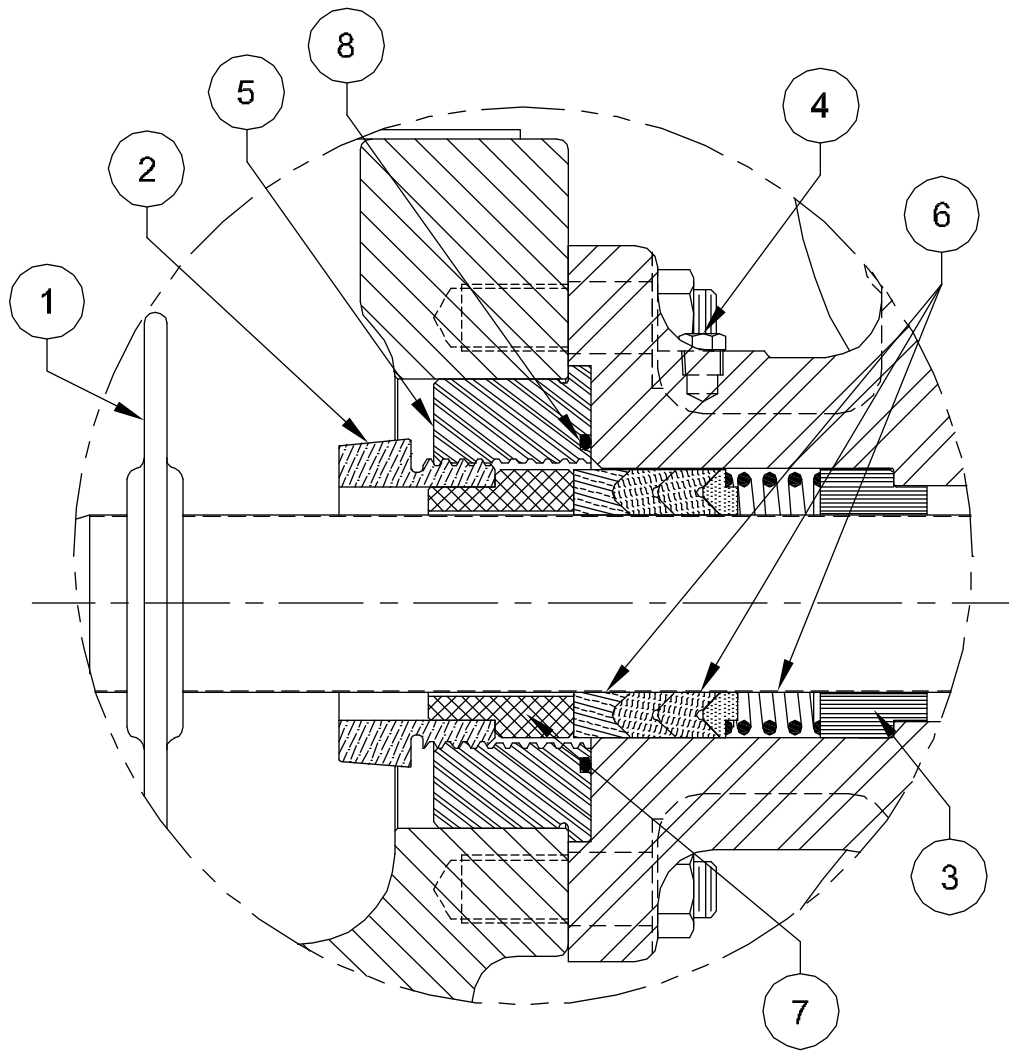
NOTE
 1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118591,
 SHEETS 1 THRU 5.

| | | | | |
|---------------------------|-----------------|--------------------|--------|-------------|
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | 001-024977-575 | | (SS) | |
| 5 | 001-024977-235 | | (STL) | |
| 5 | 001-024977-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 437-338312-458 | | 8921-K | |
| 5 | 437-338312-339 | | 249 | |
| 5 | 437-338312-337 | | 241 | |
| 5 | 437-338312-395 | PACKING | 238 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-220 | | (STL) | |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-024976-575 | | (SS) | |
| 5 | 001-024976-235 | | (STL) | |
| 5 | 001-024976-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-014155-351 | | (DI) | |
| 5 | 001-014155-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (3-3/8" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

41

| | | | |
|--|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, PLUNGER KIT BRAID STYLE PKG, 2-3/4" - 3-3/8" PLUNGER 217Q-4L, 163Q-4L (HP200AL, HP165AL) | | | |
| DWG No.: | 118591 | SCALE: | NONE |
| REV | A | SHT.: | 5 OF 5 |



NOTE

1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118592, SHEETS 1 THRU 5.

| 5 | 110-000246-200 | O-RING | | 8 |
|--------------------|----------------|----------------|--------|------|
| 5 | 001-024974-575 | | (SS) | |
| 5 | 001-024974-235 | | (STL) | |
| 5 | 001-024974-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 430-234378-473 | | 1043-4 | |
| 5 | 430-234378-340 | PACKING | 1068-4 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-220 | | (STL) | |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-024973-575 | | (SS) | |
| 5 | 001-024973-235 | | (STL) | |
| 5 | 001-024973-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-024095-351 | | (DI) | |
| 5 | 001-024095-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (2-3/4" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |

BILL OF MATERIAL

<*> COATED STAINLESS STEEL

42

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT
 "SSF-4" STYLE PKG, 2-3/4" - 3-3/8" PLUNGER
 217Q-4L, 163Q-4L (HP200AL, HP165AL)

DWG No.:

118592

SCALE:

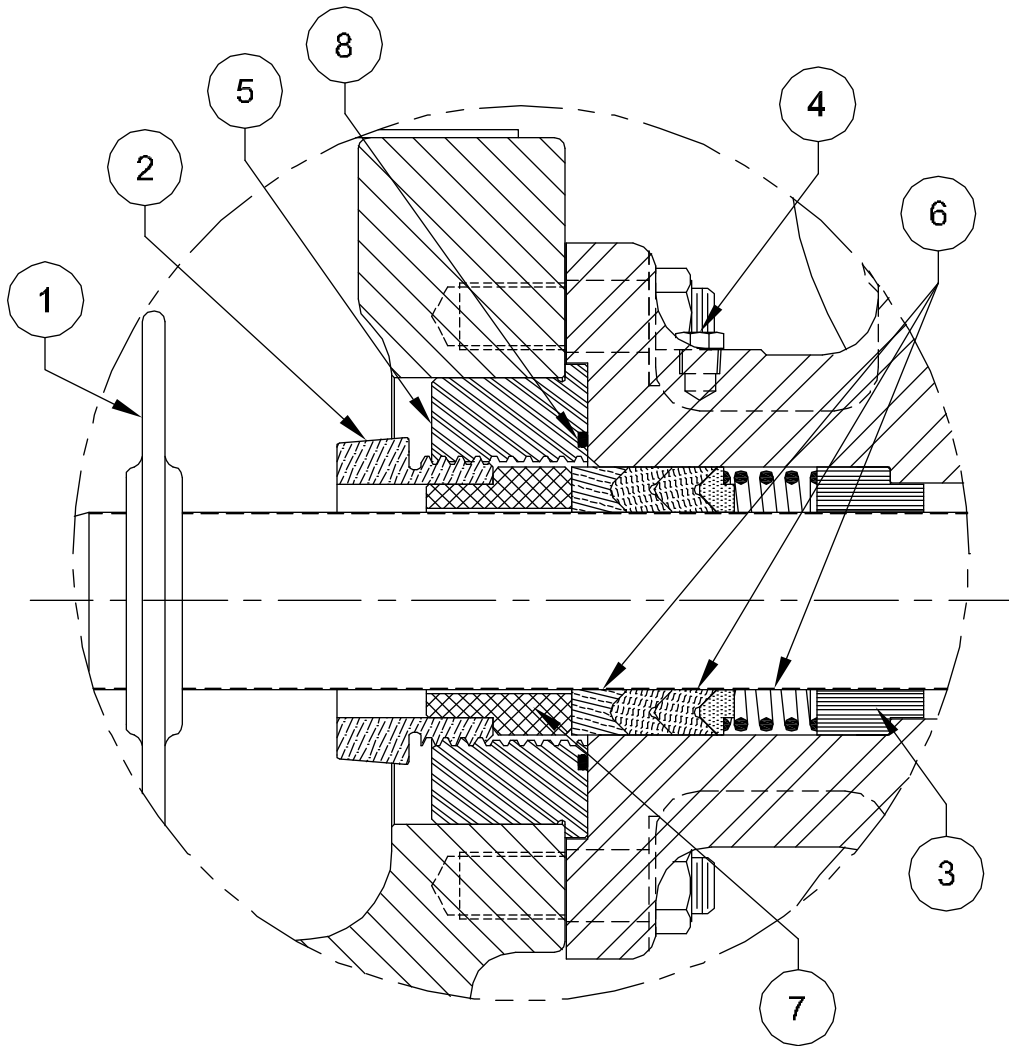
NONE

REV

A

SHT.:

1 OF 5



NOTE
 1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118592,
 SHEETS 1 THRU 5.

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | BCC-116333-575 | | (SS) | |
| 5 | 001-008353-235 | | (STL) | |
| 5 | 001-008353-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 430-278338-473 | | 1043-4 | |
| 5 | 430-278356-430 | PACKING | 1068-4 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-220 | | (STL) | |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-028783-575 | | (SS) | |
| 5 | 001-028783-235 | | (STL) | |
| 5 | 001-028783-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-014155-351 | | (DI) | |
| 5 | 001-014155-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(2-7/8" PLUNGER)

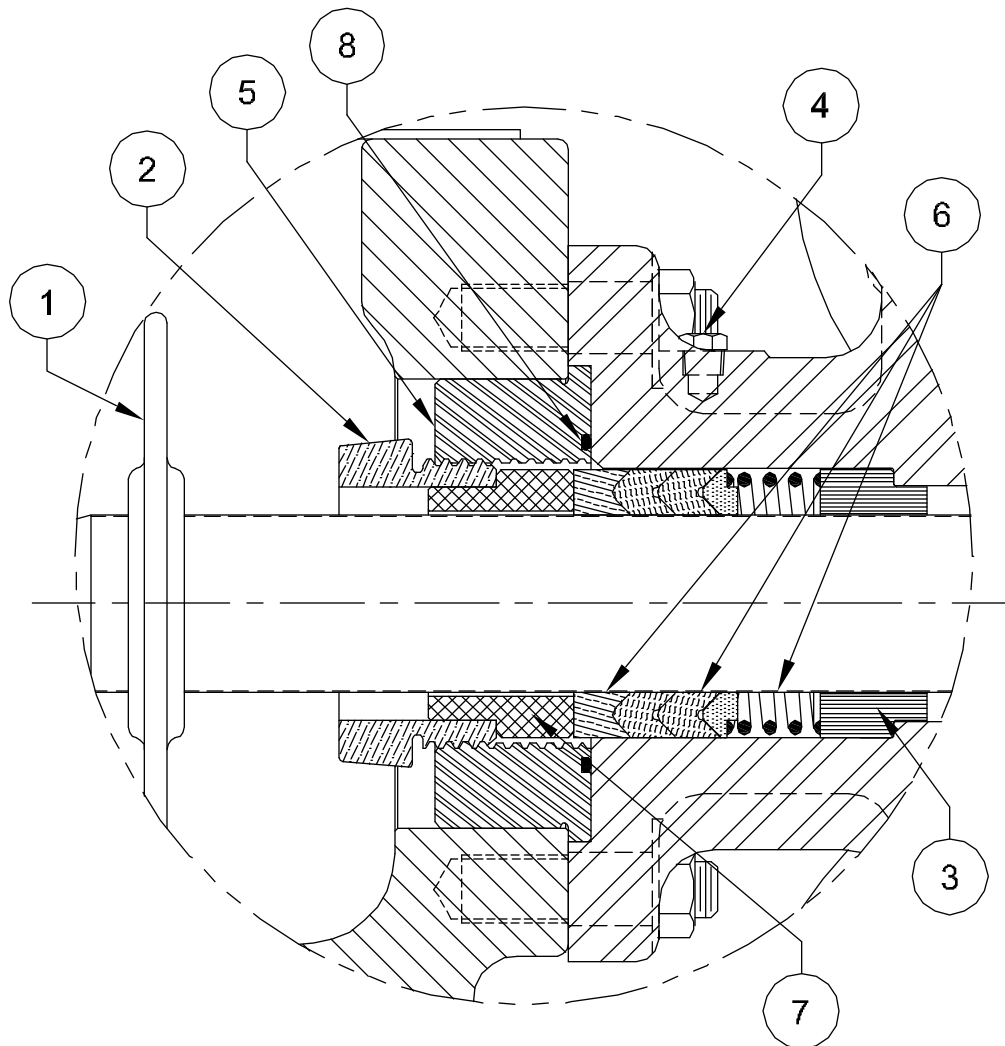
| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------------------------|----------|-------------|------|
| BILL OF MATERIAL | | | |

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 "SSF-4" STYLE PKG, 2-3/4" - 3-3/8" PLUNGER
 217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118592 | SCALE: NONE | REV A | SHT.: 2 OF 5 |
|--------------------|----------------|----------|-----------------|



NOTE
 1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118592,
 SHEETS 1 THRU 5.

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | 001-027717-575 | | (SS) | |
| 5 | 001-027717-235 | | (STL) | |
| 5 | 001-027717-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 430-300358-473 | | 1043-4 | |
| 5 | 430-300358-340 | PACKING | 1068-4 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-220 | | (STL) | |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-025961-575 | | (SS) | |
| 5 | 001-025961-235 | | (STL) | |
| 5 | 001-025961-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-024095-351 | | (DI) | |
| 5 | 001-024095-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(3" PLUNGER)

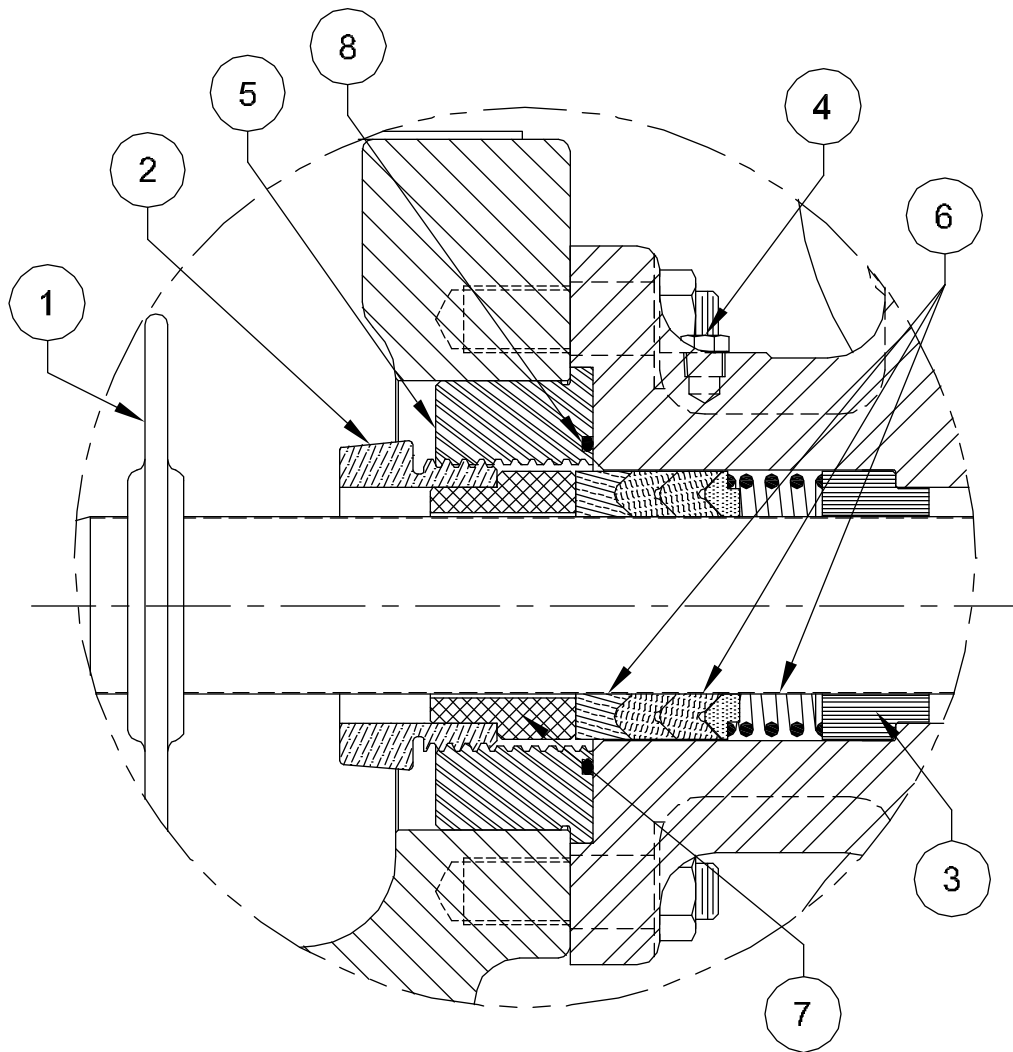
| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------------------------|----------|-------------|------|
| BILL OF MATERIAL | | | |

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 "SSF-4" STYLE PKG, 2-3/4" - 3-3/8" PLUNGER
 217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118592 | SCALE: NONE | REV A | SHT.: 3 OF 5 |
|--------------------|----------------|----------|-----------------|



NOTE

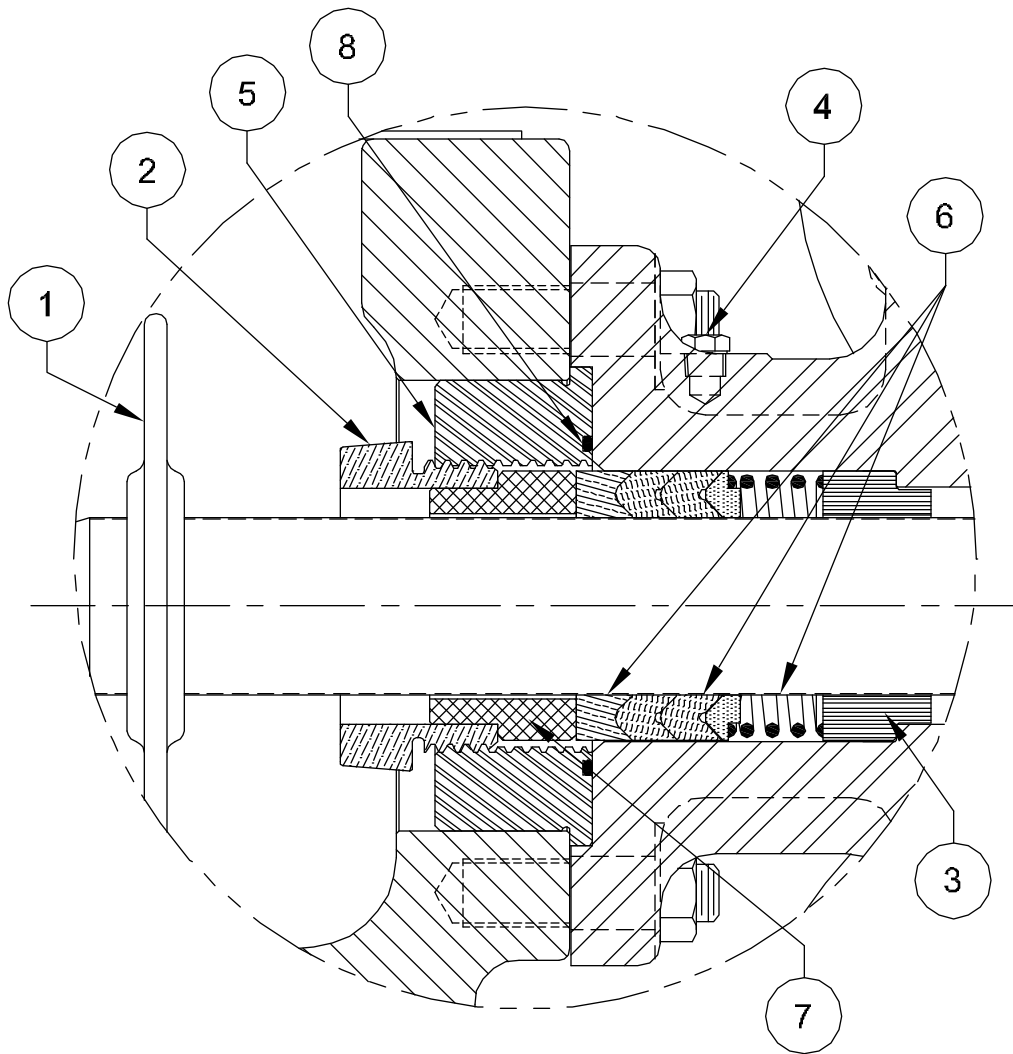
1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118592, SHEETS 1 THRU 5.

| | | | | |
|-------------------------|----------------|----------------|--------|------|
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | BJC-116333-575 | | (SS) | |
| 5 | 001-011190-235 | | (STL) | |
| 5 | 001-011190-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 430-314300-473 | | 1043-4 | |
| 5 | 430-314300-340 | PACKING | 1068-4 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-302 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-220 | | (STL) | |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-025962-575 | | (SS) | |
| 5 | 001-025962-235 | | (STL) | |
| 5 | 001-025962-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-024095-351 | | (DI) | |
| 5 | 001-024095-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (3-1/4" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

45

| | | | |
|--|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, PLUNGER KIT "SSF-4" STYLE PKG, 2-3/4" - 3-3/8" PLUNGER 217Q-4L, 163Q-4L (HP200AL, HP165AL) | | | |
| DWG No.: | 118592 | SCALE: | NONE |
| REV | A | SHT.: | 4 OF 5 |



NOTE
 1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118592,
 SHEETS 1 THRU 5.

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 110-000246-200 | O-RING | | 8 |
| 5 | 001-024976-575 | | (SS) | |
| 5 | 001-024976-235 | | (STL) | |
| 5 | 001-024976-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 430-338319-473 | | 1043-4 | |
| 5 | 430-338319-340 | PACKING | 1068-4 | 6 |
| 5 | 001-024959-278 | | (SS) | |
| 5 | 001-024959-236 | | (STL) | |
| 5 | 001-024959-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-220 | | (STL) | |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-024976-575 | | (SS) | |
| 5 | 001-024976-235 | | (STL) | |
| 5 | 001-024976-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAB-030494-E16 | <*> | (XSS) | |
| 5 | 001-024095-351 | | (DI) | |
| 5 | 001-024095-310 | GLAND NUT | (BRZ) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(3-3/8" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |

BILL OF MATERIAL

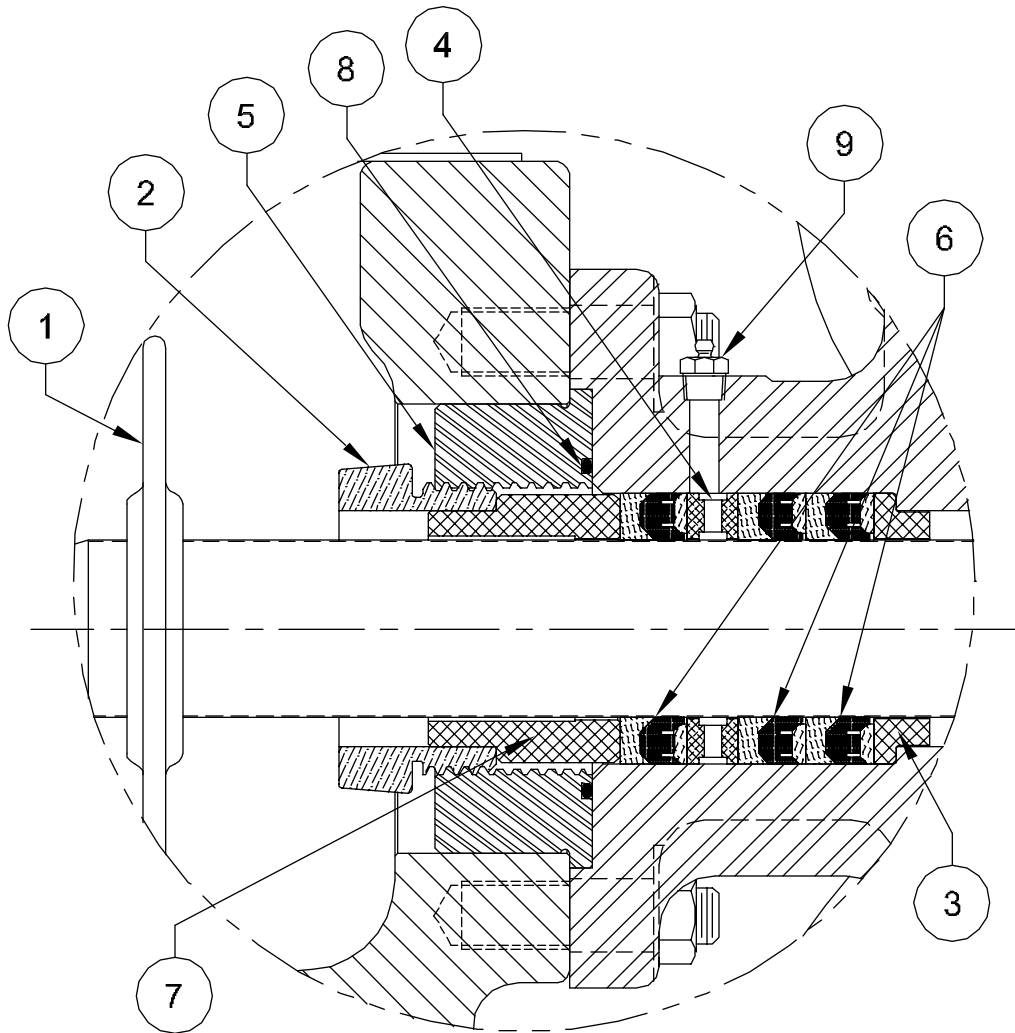
<*> COATED STAINLESS STEEL



HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 "SSF-4" STYLE PKG, 2-3/4" - 3-3/8" PLUNGER
 217Q-4L, 163Q-4L (HP200AL, HP165AL)

| | | | | | | | |
|----------|--------|--------|------|-----|---|-------|--------|
| DWG No.: | 118592 | SCALE: | NONE | REV | A | SHT.: | 5 OF 5 |
|----------|--------|--------|------|-----|---|-------|--------|



NOTE
 1) FOR ALL " J " STYLE PACKING SEE DRAWING 118593,
 SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165000-220 | LUBE FITTING | (STL) | 9 |
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-023661-575 | | (SS) | |
| 5 | 001-023661-235 | | (STL) | |
| 5 | 001-023661-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 181-158253-477 | | 858 | |
| 5 | 181-158253-374 | | 845 | |
| 5 | 181-158253-386 | | 842 | |
| 5 | 181-158253-370 | PACKING | 838 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-023663-575 | | (SS) | |
| 5 | 001-023663-235 | | (STL) | |
| 5 | 001-023663-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-023662-575 | | (SS) | |
| 5 | 001-023662-235 | | (STL) | |
| 5 | 001-023662-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-5/8" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |
| | | | |
| | | | |

BILL OF MATERIAL

<*> COATED STAINLESS STEEL

47



HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT
 "J"-STYLE PKG, 1-5/8" THRU 2-1/2" PLUNGER
 217Q-4M, 163Q-4M (HP200AM, HP165AM)

DWG No.:

118593

SCALE:

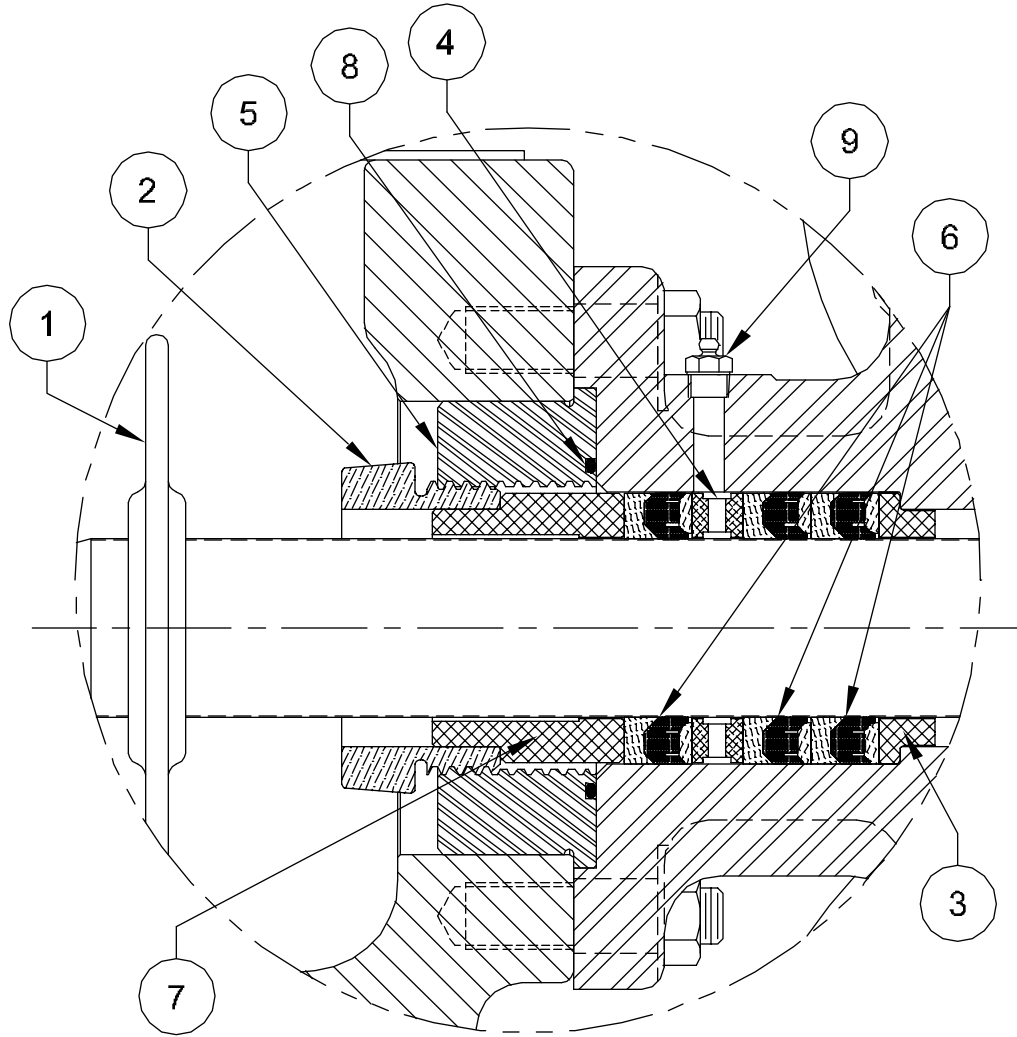
NONE

REV

A

SHT.:

1 OF 8



NOTE
1) FOR ALL " J " STYLE PACKING SEE DRAWING 118593,
SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165000-220 | LUBE FITTING | (STL) | 9 |
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-010933-575 | | (SS) | |
| 5 | 001-010933-235 | | (STL) | |
| 5 | 001-010933-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 181-134244-477 | | 858 | |
| 5 | 181-134244-374 | | 845 | |
| 5 | 181-134244-386 | | 842 | |
| 5 | 181-134244-370 | PACKING | 838 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-010990-575 | | (SS) | |
| 5 | 001-010990-235 | | (STL) | |
| 5 | 001-010990-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-010897-575 | | (SS) | |
| 5 | 001-010897-235 | | (STL) | |
| 5 | 001-010897-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-3/4" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |

BILL OF MATERIAL

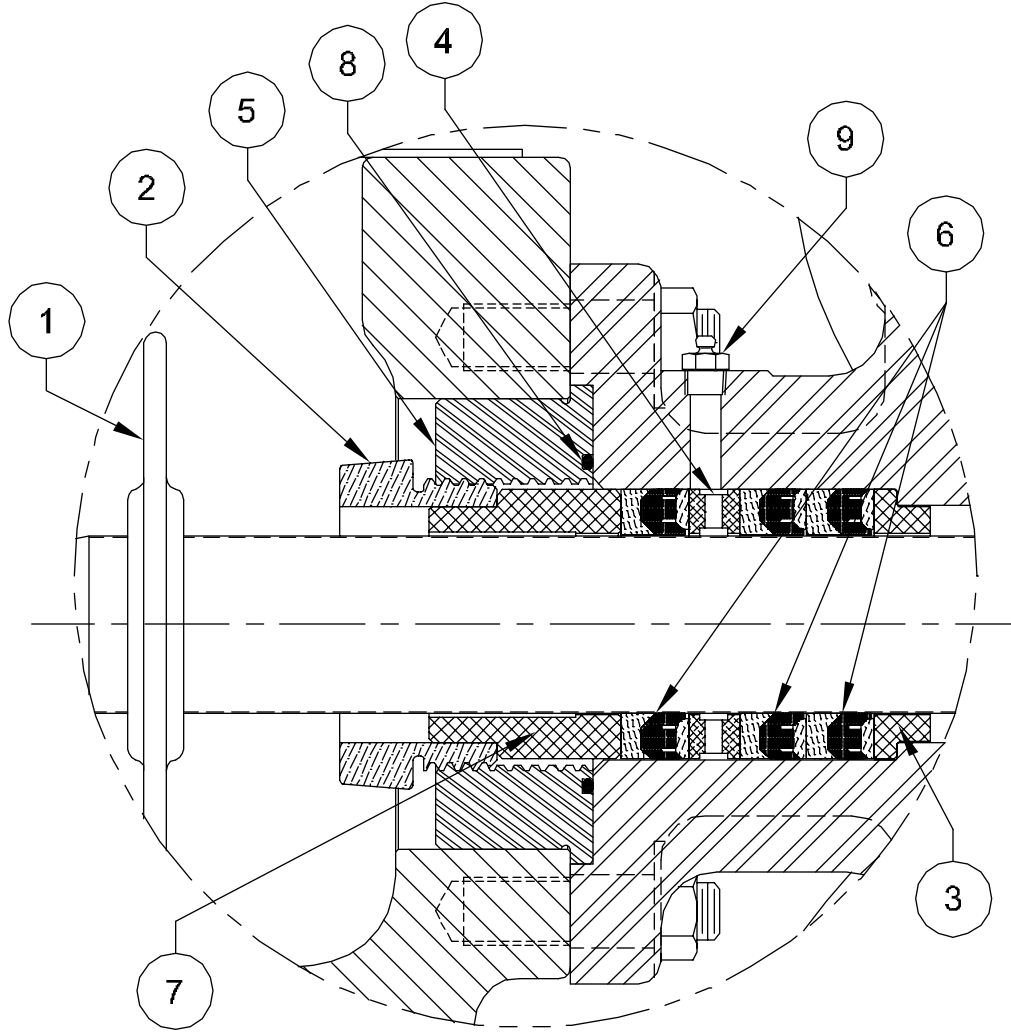
<*> COATED STAINLESS STEEL



HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
"J"-STYLE PKG, 1-5/8" THRU 2-1/2" PLUNGER
217Q-4M, 163Q-4M (HP200AM, HP165AM)

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118593 | SCALE: NONE | REV A | SHT.: 2 OF 8 |
|--------------------|----------------|----------|-----------------|



NOTE
 1) FOR ALL " J " STYLE PACKING SEE DRAWING 118593,
 SHEETS 1 THRU 8.

| 5 | 180-165000-220 | LUBE FITTING | (STL) | 9 |
|---------------------------|----------------|----------------|-------|------|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-014459-575 | | (SS) | |
| 5 | 001-014459-235 | | (STL) | |
| 5 | 001-014459-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 181-178244-477 | | | 858 |
| 5 | 181-178244-374 | | | 845 |
| 5 | 181-178244-386 | | | 842 |
| 5 | 181-178244-370 | PACKING | | 838 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-014457-575 | | (SS) | |
| 5 | 001-014457-235 | | (STL) | |
| 5 | 001-014457-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-010899-575 | | (SS) | |
| 5 | 001-010899-235 | | (STL) | |
| 5 | 001-010899-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-7/8" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT
 "J"-STYLE PKG, 1-5/8" THRU 2-1/2" PLUNGER
 217Q-4M, 163Q-4M (HP200AM, HP165AM)

DWG No.:

118593

SCALE:

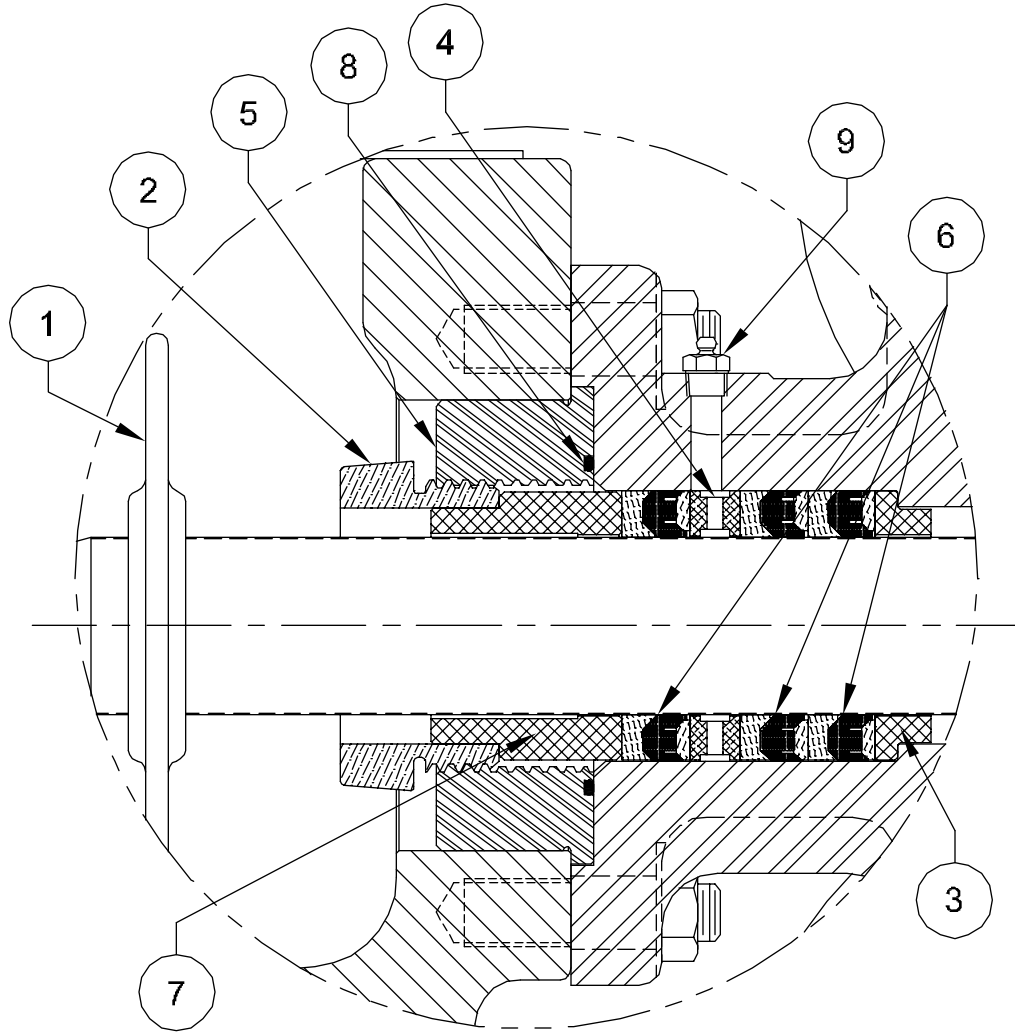
NONE

REV

A

SHT.:

3 OF 8



NOTE

1) FOR ALL " J " STYLE PACKING SEE DRAWING 118593, SHEETS 1 THRU 8.

| | | | | |
|-------------------------|----------------|----------------|-------|------|
| 5 | 180-165000-220 | LUBE FITTING | (STL) | 9 |
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-010931-575 | | (SS) | |
| 5 | 001-010931-235 | | (STL) | |
| 5 | 001-010931-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 181-200214-477 | | 858 | |
| 5 | 181-200214-374 | | 845 | |
| 5 | 181-200214-386 | | 842 | |
| 5 | 181-200214-370 | PACKING | 838 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-010991-575 | | (SS) | |
| 5 | 001-010991-235 | | (STL) | |
| 5 | 001-010991-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-010901-575 | | (SS) | |
| 5 | 001-010901-235 | | (STL) | |
| 5 | 001-010901-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (2" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

50



HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT

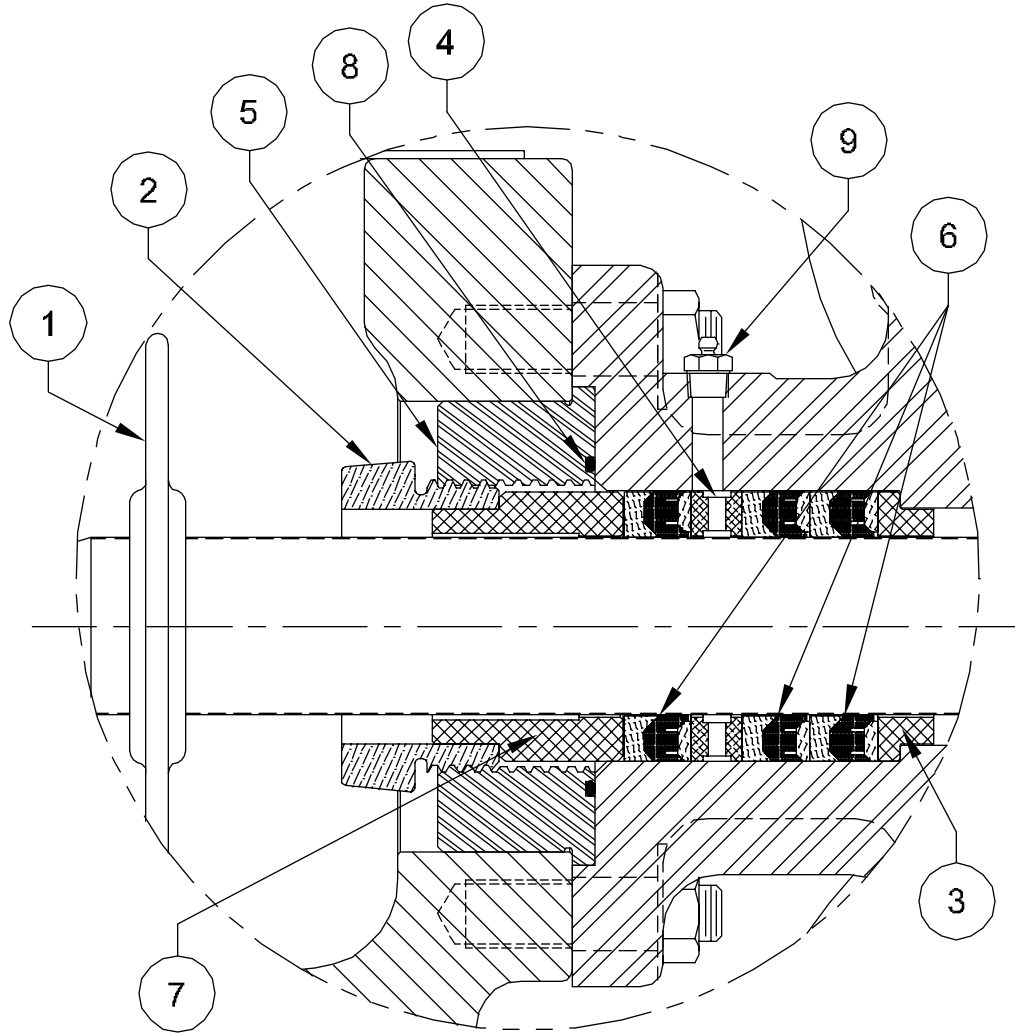
"J"-STYLE PKG, 1-5/8" THRU 2-1/2" PLUNGER
217Q-4M, 163Q-4M (HP200AM, HP165AM)

DWG No.: 118593

SCALE: NONE

REV A

SHT.: 4 OF 8



NOTE
 1) FOR ALL " J " STYLE PACKING SEE DRAWING 118593,
 SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165002-220 | LUBE FITTING | (STL) | 9 |
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-014458-575 | | (SS) | |
| 5 | 001-014458-235 | | (STL) | |
| 5 | 001-014458-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 181-218214-477 | | 858 | |
| 5 | 181-218214-374 | | 845 | |
| 5 | 181-218214-386 | | 842 | |
| 5 | 181-218214-370 | PACKING | 838 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-014456-575 | | (SS) | |
| 5 | 001-014456-235 | | (STL) | |
| 5 | 001-014456-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-010902-575 | | (SS) | |
| 5 | 001-010902-235 | | (STL) | |
| 5 | 001-010902-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(2-1/8" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |

BILL OF MATERIAL

<*> COATED STAINLESS STEEL

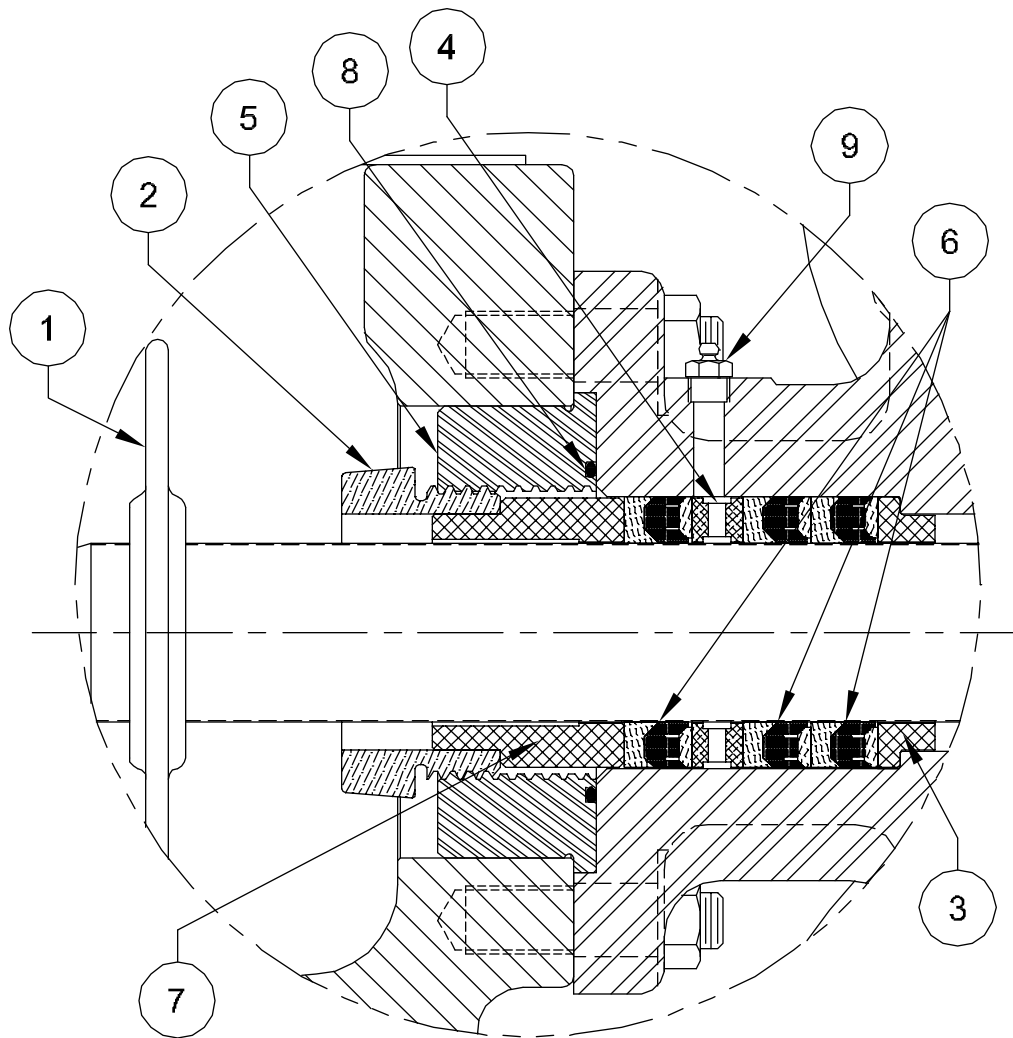
51

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
"J"-STYLE PKG, 1-5/8" THRU 2-1/2" PLUNGER
217Q-4M, 163Q-4M (HP200AM, HP165AM)

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118593 | SCALE: NONE | REV A | SHT.: 5 OF 8 |
|--------------------|----------------|----------|-----------------|



NOTE

1) FOR ALL " J " STYLE PACKING SEE DRAWING 118593, SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165000-220 | LUBE FITTING | (STL) | 9 |
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-007983-575 | | (SS) | |
| 5 | 001-007983-235 | | (STL) | |
| 5 | 001-007983-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 181-214214-477 | | 858 | |
| 5 | 181-214214-374 | | 845 | |
| 5 | 181-214214-386 | | 842 | |
| 5 | 181-214214-370 | PACKING | 838 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-010266-575 | | (SS) | |
| 5 | 001-010266-235 | | (STL) | |
| 5 | 001-010266-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-007979-575 | | (SS) | |
| 5 | 001-007979-235 | | (STL) | |
| 5 | 001-007979-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(2-1/4" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
|-------|----------|-------------|------|

BILL OF MATERIAL

<*> COATED STAINLESS STEEL

52

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT
 "J"-STYLE PKG, 1-5/8" THRU 2-1/2" PLUNGER
 217Q-4M, 163Q-4M (HP200AM, HP165AM)

DWG No.:

118593

SCALE:

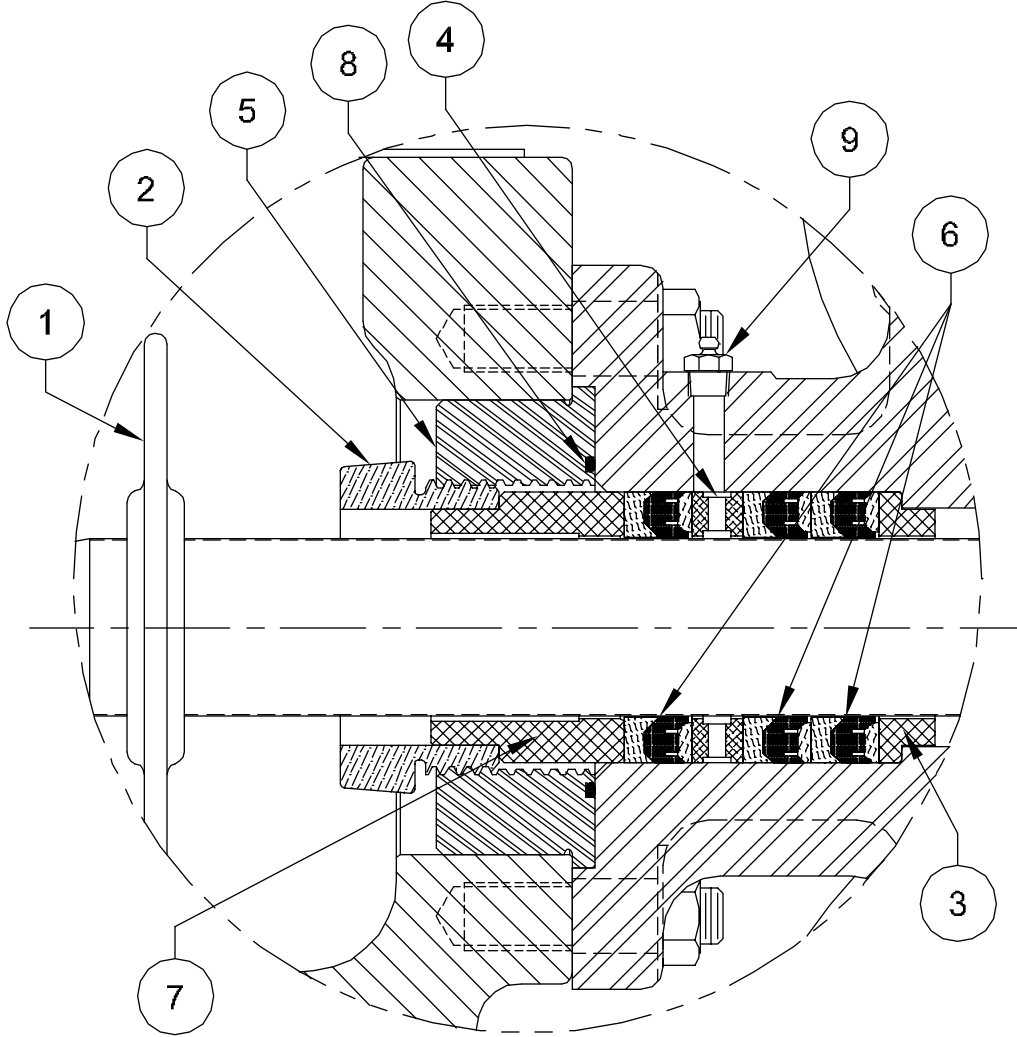
NONE

REV

A

SHT.:

6 of 8



NOTE

1) FOR ALL " J " STYLE PACKING SEE DRAWING 118593, SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165000-220 | LUBE FITTING | (STL) | 9 |
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-024393-575 | | (SS) | |
| 5 | 001-024393-235 | | (STL) | |
| 5 | 001-024393-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 181-238258-477 | | 858 | |
| 5 | 181-238258-374 | | 845 | |
| 5 | 181-238258-386 | | 842 | |
| 5 | 181-238258-370 | PACKING | 838 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-028072-575 | | (SS) | |
| 5 | 001-028072-235 | | (STL) | |
| 5 | 001-028072-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-024394-575 | | (SS) | |
| 5 | 001-024394-235 | | (STL) | |
| 5 | 001-024394-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(2-3/8" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |

BILL OF MATERIAL

<*> COATED STAINLESS STEEL

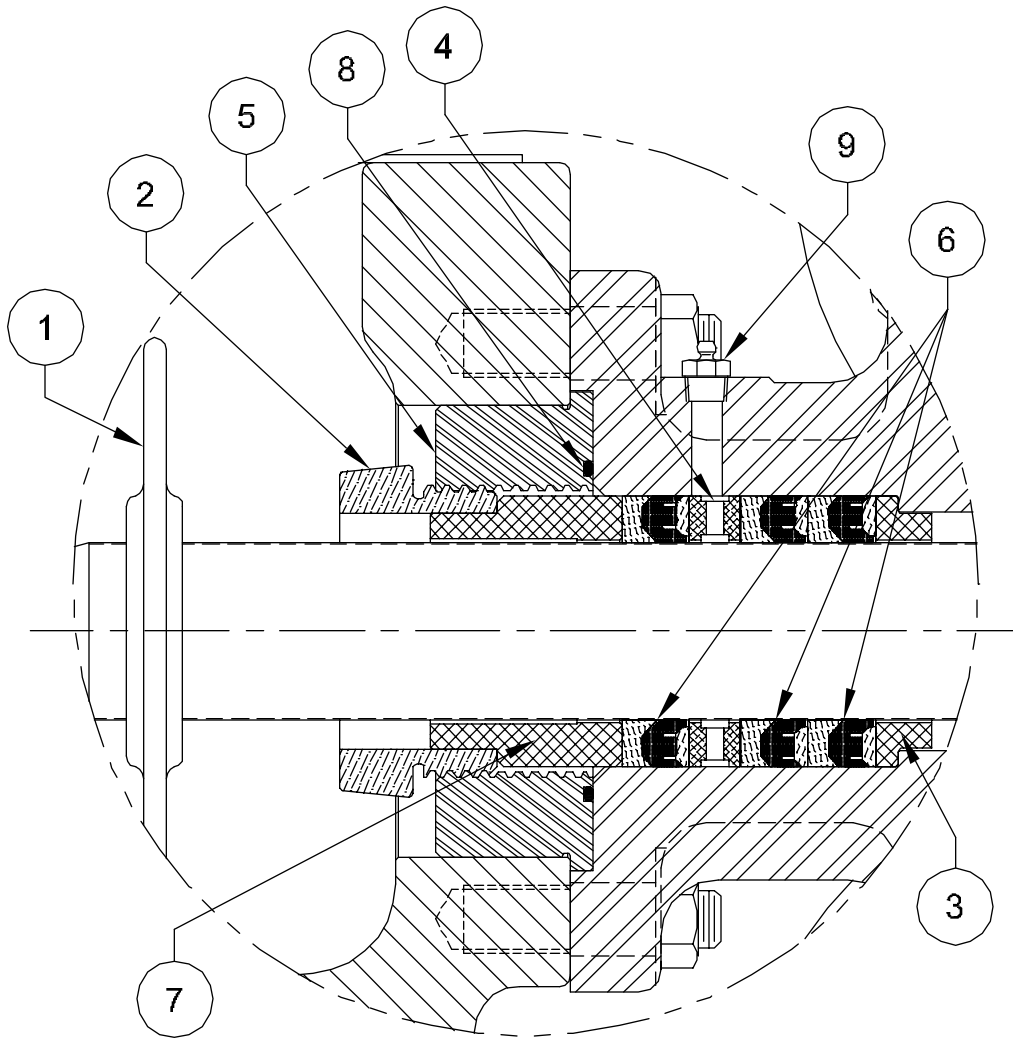
53



HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
 "J"-STYLE PKG, 1-5/8" THRU 2-1/2" PLUNGER
 217Q-4M, 163Q-4M (HP200AM, HP165AM)

| | | | |
|----------|--------|-----|--------|
| DWG No.: | SCALE: | REV | SHT.: |
| 118593 | NONE | A | 7 OF 8 |



NOTE

1) FOR ALL " J " STYLE PACKING SEE DRAWING 118593, SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165000-220 | LUBE FITTING | (STL) | 9 |
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-008745-575 | | (SS) | |
| 5 | 001-008745-235 | | (STL) | |
| 5 | 001-008745-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 181-212178-477 | | 858 | |
| 5 | 181-212178-374 | | 845 | |
| 5 | 181-212178-386 | | 842 | |
| 5 | 181-212178-370 | PACKING | 838 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 001-010904-575 | | (SS) | |
| 5 | 001-010904-235 | | (STL) | |
| 5 | 001-010904-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-025918-575 | | (SS) | |
| 5 | 001-025918-235 | | (STL) | |
| 5 | 001-025918-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(2-1/2" PLUNGER)

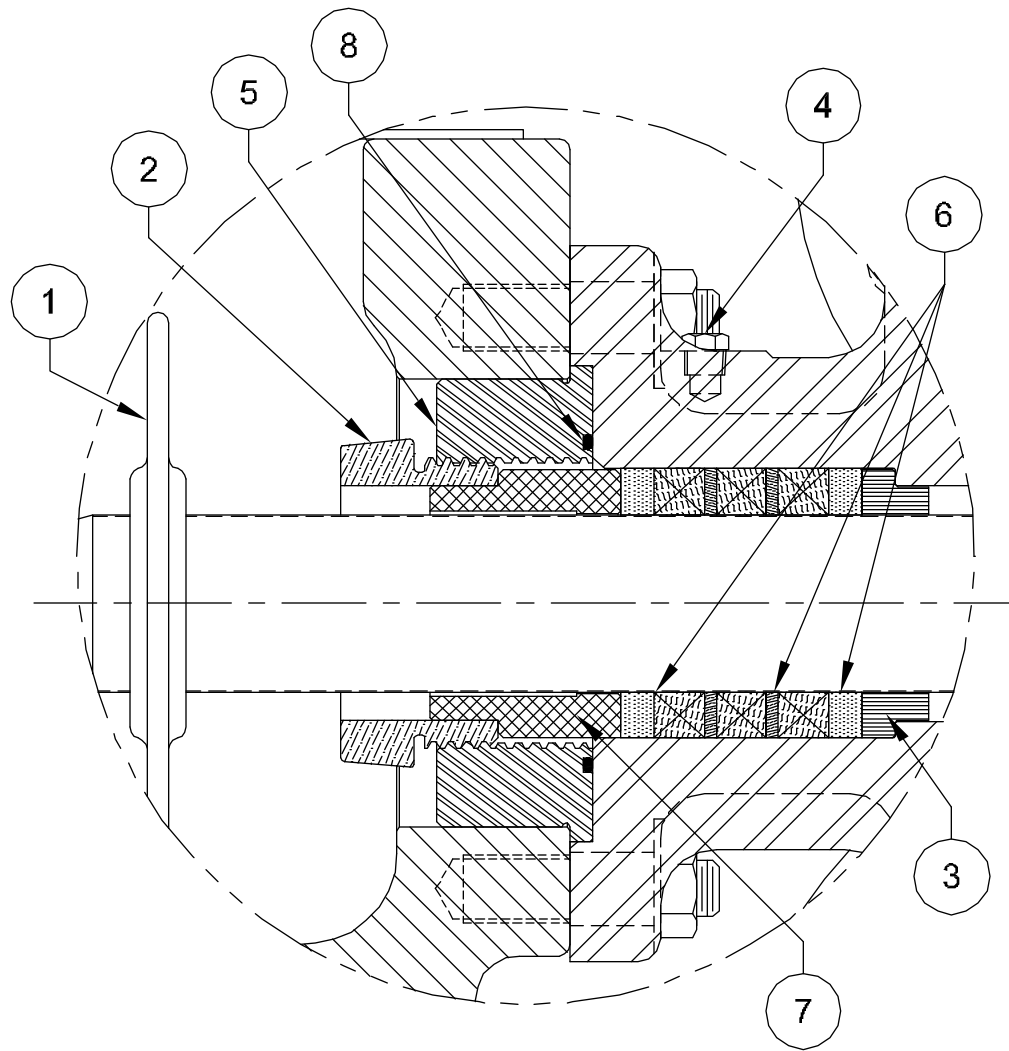
| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------------------------|----------|-------------|------|
| | | | |
| BILL OF MATERIAL | | | |

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE: ASSEMBLY, PLUNGER KIT
 "J"-STYLE PKG, 1-5/8" THRU 2-1/2" PLUNGER
 217Q-4M, 163Q-4M (HP200AM, HP165AM)

| | | | |
|-----------------|-------------|--------|--------------|
| DWG No.: 118593 | SCALE: NONE | REV: A | SHT.: 8 OF 8 |
|-----------------|-------------|--------|--------------|



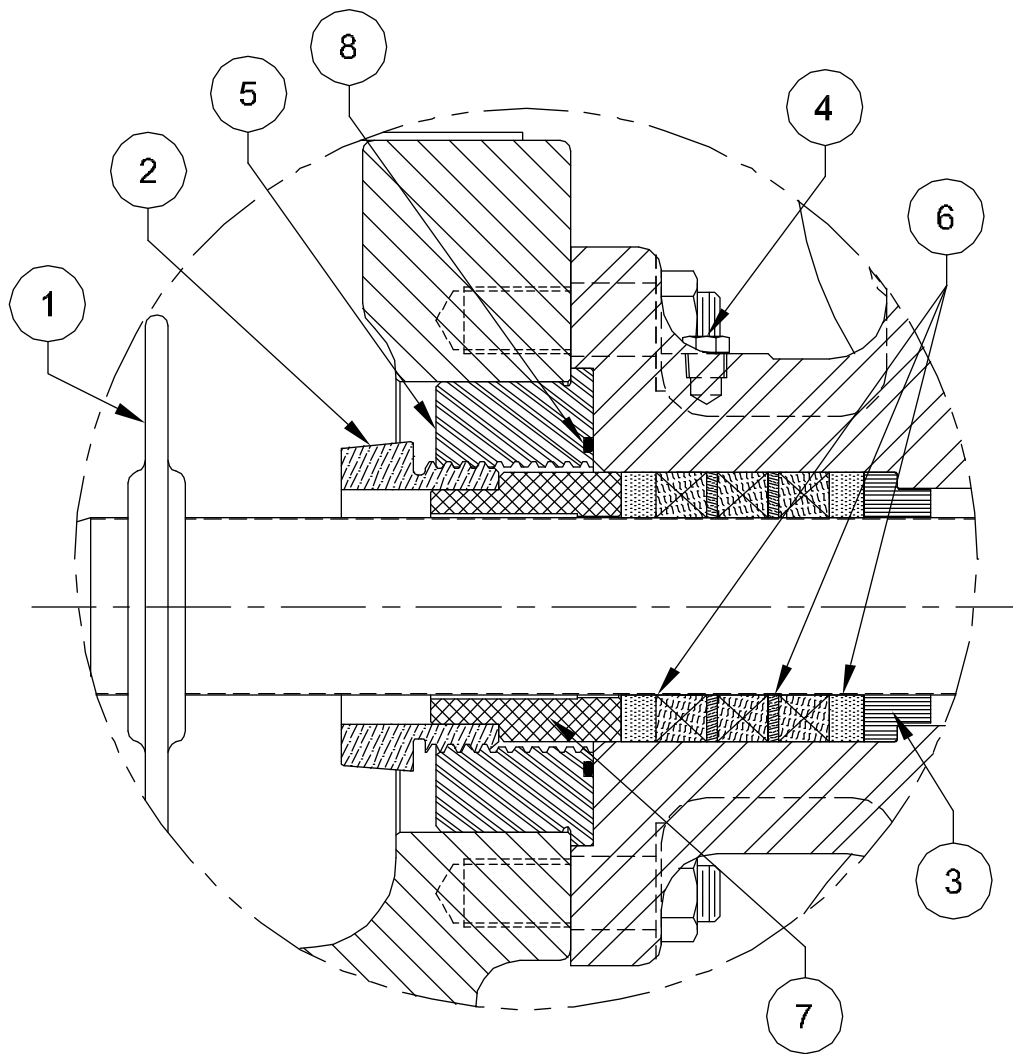
NOTE
 1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118594,
 SHEETS 1 THRU 8.

| 5 | 110-000238-201 | O-RING | | 8 |
|--------------------|----------------|----------------|--------|------|
| 5 | 001-023661-575 | | (SS) | |
| 5 | 001-023661-235 | | (STL) | |
| 5 | 001-023661-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 288-158234-458 | | 8921-K | |
| 5 | 288-158234-339 | | 249 | |
| 5 | 288-158234-337 | | 241 | |
| 5 | 288-158234-395 | PACKING | | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-023662-575 | | (SS) | |
| 5 | 001-023662-235 | | (STL) | |
| 5 | 001-023662-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-5/8" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

55

| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, PLUNGER KIT BRAID STYLE PKG, 1-5/8" THRU 2-1/2" PLGR 217Q-4M, 163Q-4M (HP200AM , HP165AM) | | | |
| DWG No.: | 118594 | SCALE: | NONE |
| REV: | A | SHT.: | 1 OF 8 |



NOTE
 1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118594,
 SHEETS 1 THRU 8.

| 5 | 110-000238-201 | O-RING | | 8 |
|--------------------|----------------|----------------|--------|------|
| 5 | 001-010933-575 | | (SS) | |
| 5 | 001-010933-235 | | (STL) | |
| 5 | 001-010933-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 288-134258-458 | | 8921-K | |
| 5 | 288-134258-339 | | 249 | |
| 5 | 288-134258-337 | | 241 | |
| 5 | 288-134258-395 | PACKING | 238 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010897-575 | | (SS) | |
| 5 | 001-010897-235 | | (STL) | |
| 5 | 001-010897-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-3/4" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

56

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT
 BRAID STYLE PKG, 1-5/8" THRU 2-1/2" PLGR
 217Q-4M, 163Q-4M (HP200AM , HP165AM)

DWG No.:

118594

SCALE:

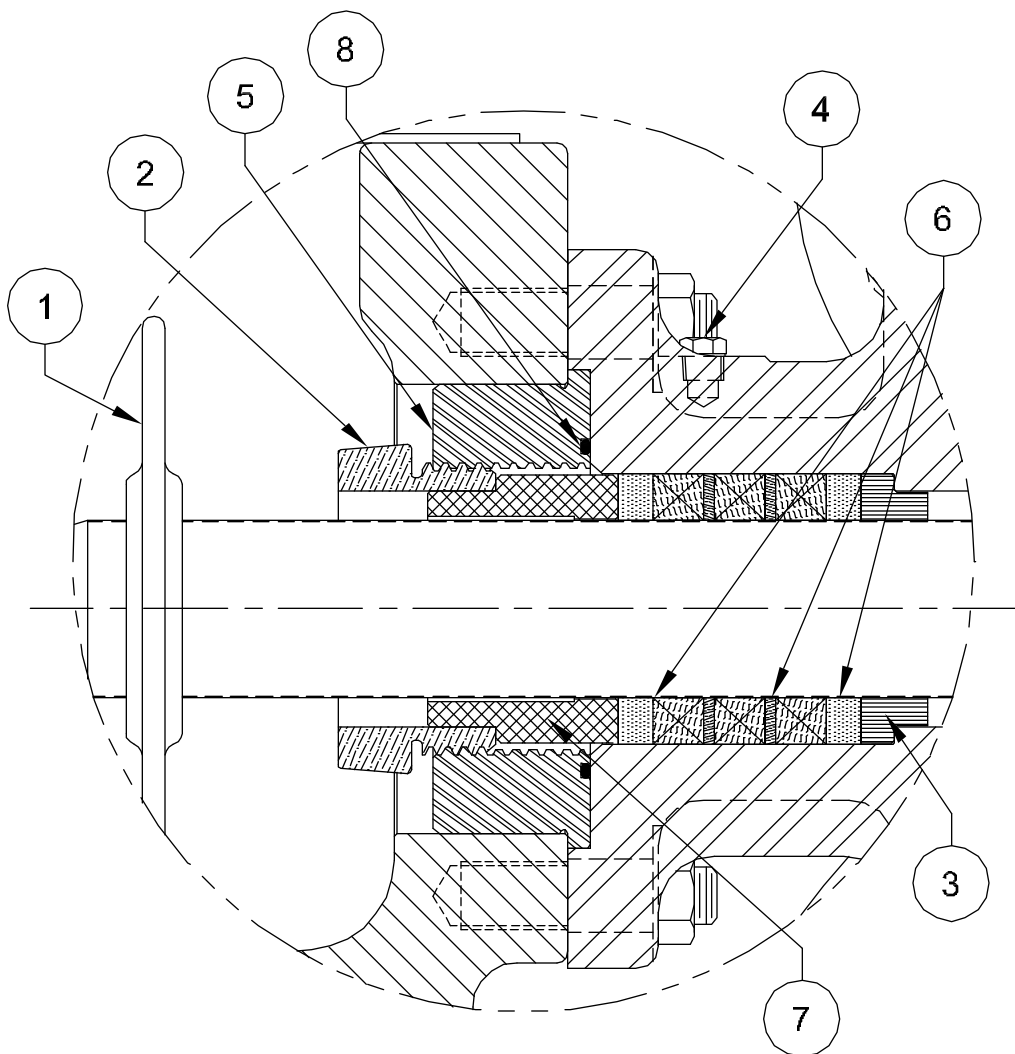
NONE

REV

A

SHT.:

2 OF 8



NOTE
 1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118594,
 SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-014459-575 | | (SS) | |
| 5 | 001-014459-235 | | (STL) | |
| 5 | 001-014459-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 288-178234-458 | | 8921-K | |
| 5 | 288-178234-339 | | 249 | |
| 5 | 288-178234-337 | | 241 | |
| 5 | 288-178234-395 | PACKING | 238 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010899-575 | | (SS) | |
| 5 | 001-010899-235 | | (STL) | |
| 5 | 001-010899-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-7/8" PLUNGER)

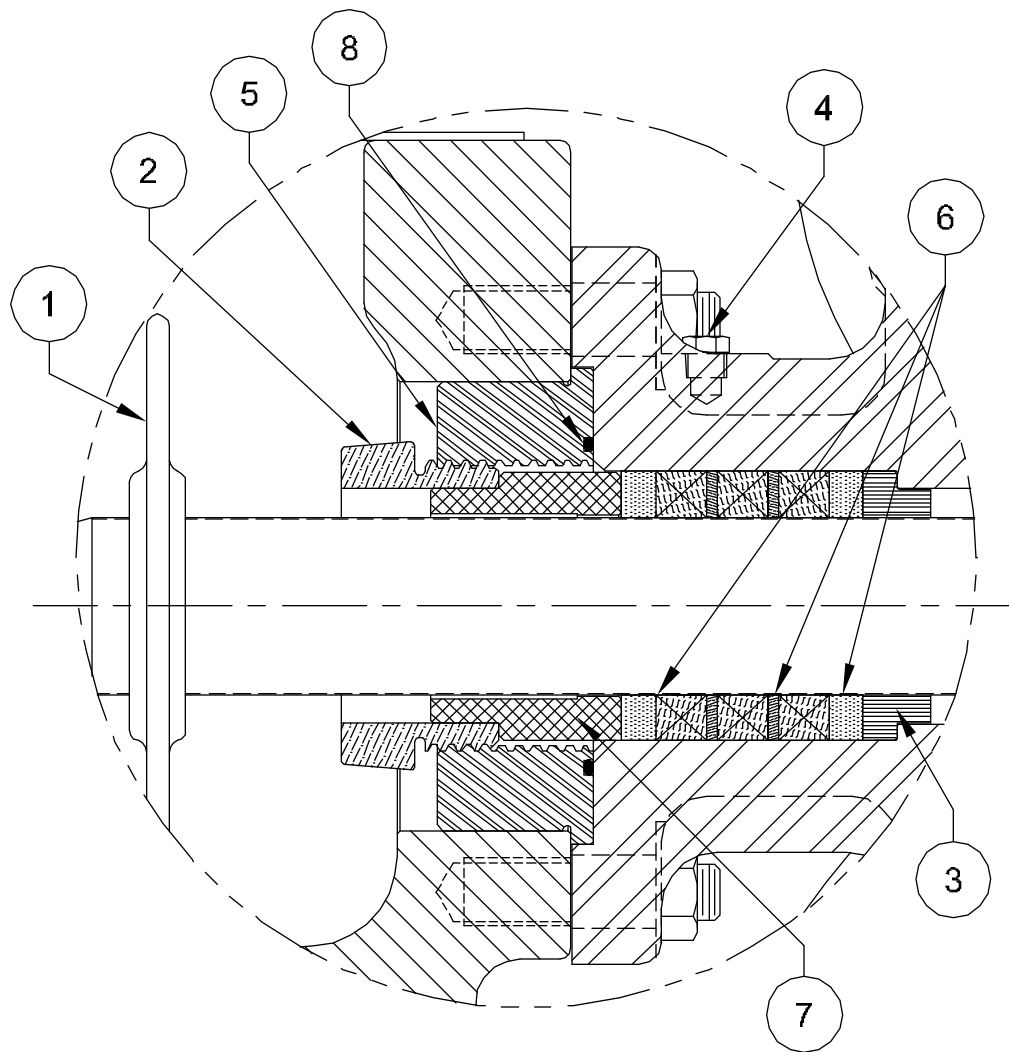
| REQ'D | Part No. | DESCRIPTION | ITEM |
|------------------|----------|-------------|------|
| BILL OF MATERIAL | | | |

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 BRAID STYLE PKG, 1-5/8" THRU 2-1/2" PLGR
 217Q-4M, 163Q-4M (HP200AM , HP165AM)

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118594 | SCALE: NONE | REV A | SHT.: 3 OF 8 |
|--------------------|----------------|----------|-----------------|



NOTE

1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118594, SHEETS 1 THRU 8.

| | | | | |
|-------------------------|-----------------|--------------------|--------|-------------|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-010931-575 | | (SS) | |
| 5 | 001-010931-235 | | (STL) | |
| 5 | 001-010931-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 288-200258-458 | | 8921-K | |
| 5 | 288-200258-339 | | 249 | |
| 5 | 288-200258-337 | | 241 | |
| 5 | 288-200258-395 | PACKING | | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010901-575 | | (SS) | |
| 5 | 001-010901-235 | | (STL) | |
| 5 | 001-010901-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (2" PLUNGER) | | | | |
| DDA | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

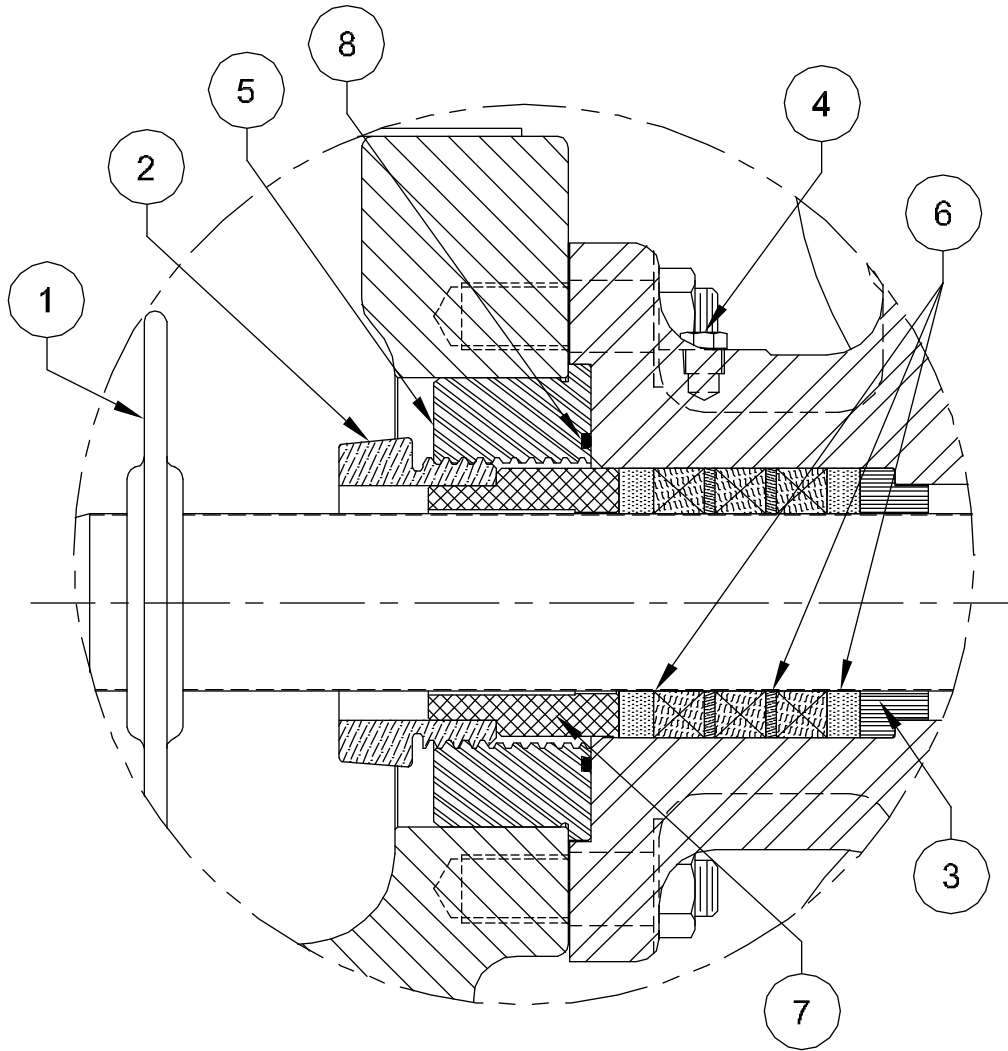
ASSEMBLY, PLUNGER KIT
BRAID STYLE PKG, 1-5/8" THRU 2-1/2" PLGR
217Q-4M, 163Q-4M (HP200AM , HP165AM)

DWG No.: 118594

SCALE: NONE

REV A

SHT.: 4 OF 8



NOTE

1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118594, SHEETS 1 THRU 8.

| | | | | |
|---------------------------|-----------------|--------------------|--------|-------------|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-014458-575 | | (SS) | |
| 5 | 001-014458-235 | | (STL) | |
| 5 | 001-014458-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 288-218234-458 | | 8921-K | |
| 5 | 288-218234-339 | | 249 | |
| 5 | 288-218234-337 | | 241 | |
| 5 | 288-218234-395 | PACKING | 238 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010902-575 | | (SS) | |
| 5 | 001-010902-235 | | (STL) | |
| 5 | 001-010902-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (2-1/8" PLUNGER) | | | | |
| DDA | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL



HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT
BRAID STYLE PKG, 1-5/8" THRU 2-1/2" PLGR
217Q-4M, 163Q-4M (HP200AM , HP165AM)

DWG No.:

118594

SCALE:

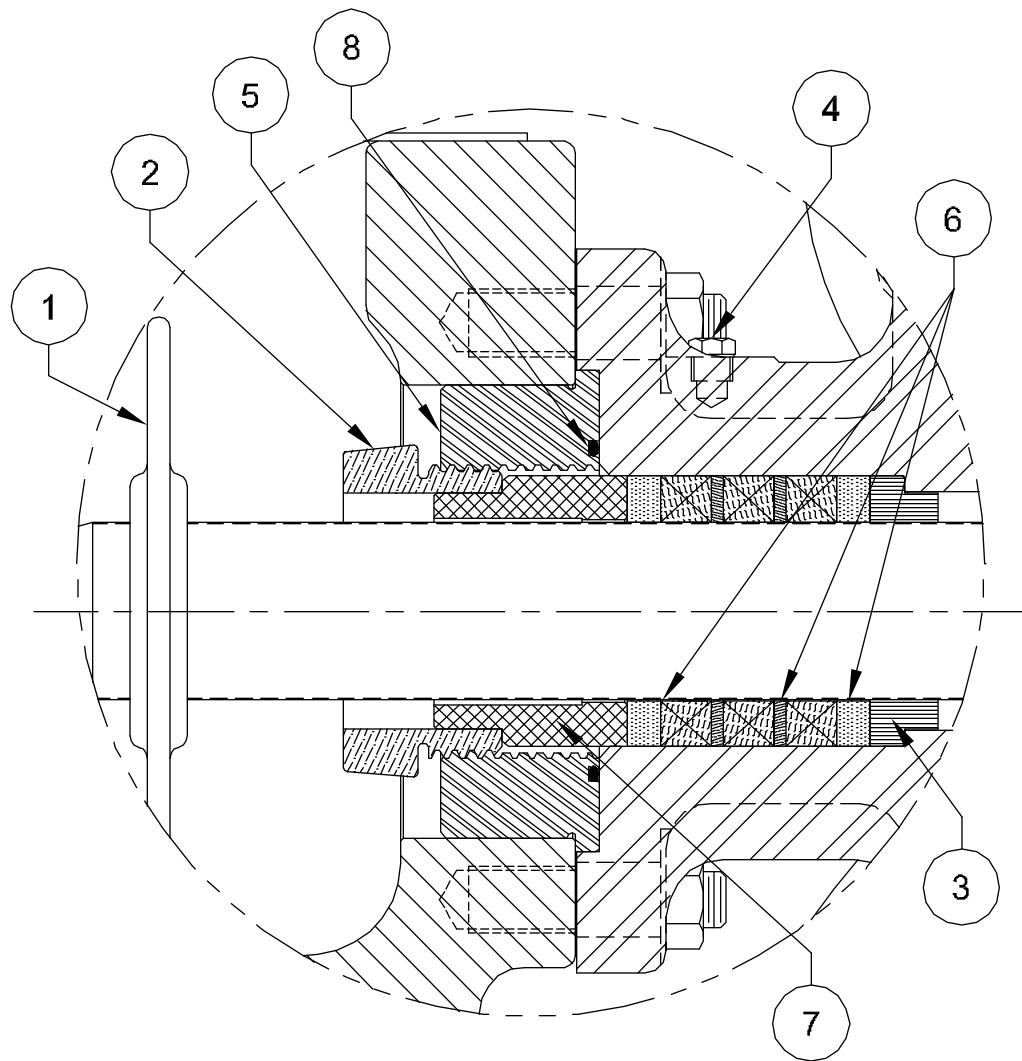
NONE

REV

A

SHT.:

5 OF 8



NOTE

1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118594, SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-007983-575 | | (SS) | |
| 5 | 001-007983-235 | | (STL) | |
| 5 | 001-007983-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 288-214234-458 | | 8921-K | |
| 5 | 288-214234-339 | | 249 | |
| 5 | 288-214234-337 | | 241 | |
| 5 | 288-214234-395 | PACKING | 238 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-007979-575 | | (SS) | |
| 5 | 001-007979-235 | | (STL) | |
| 5 | 001-007979-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(2-1/4" PLUNGER)

| DDA | Part No. | DESCRIPTION | ITEM |
|-------------------------|----------|-------------|------|
| BILL OF MATERIAL | | | |

<*> COATED STAINLESS STEEL

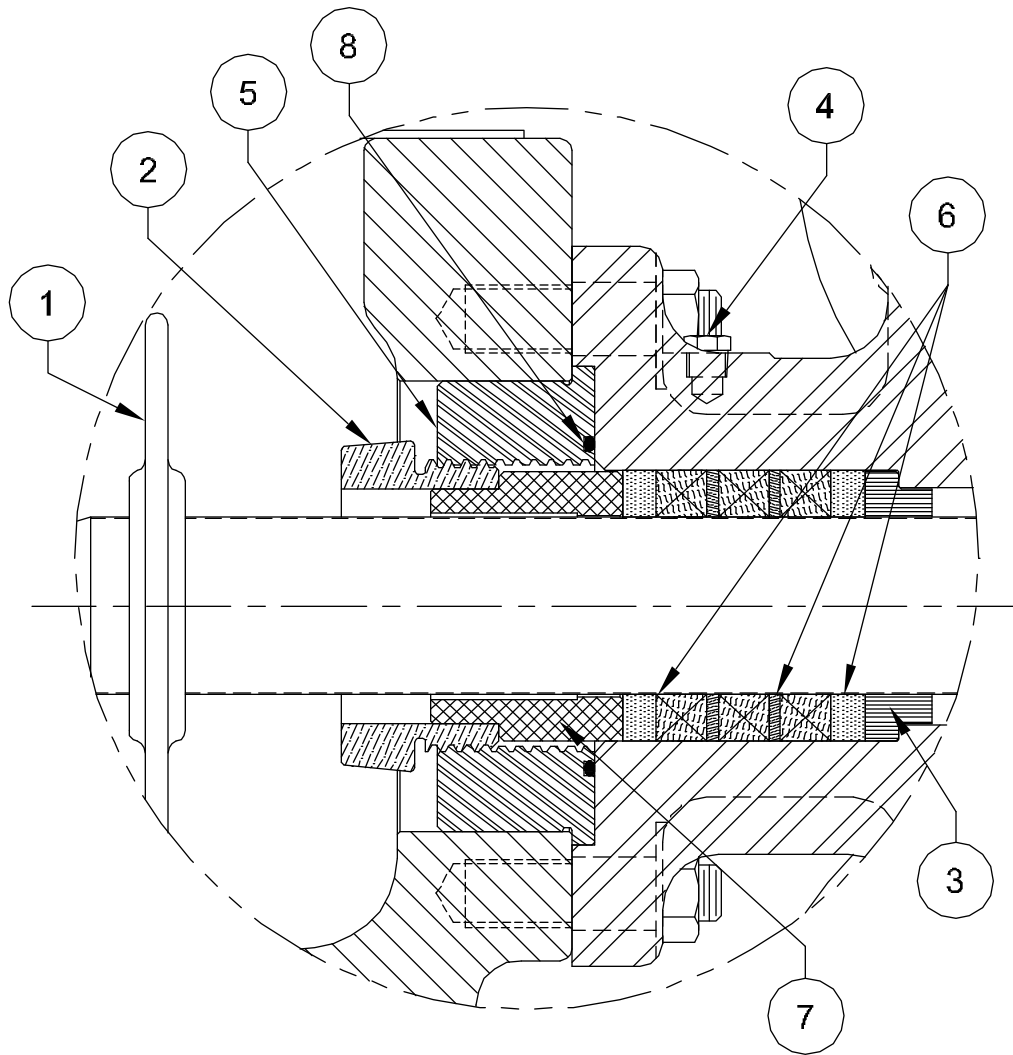
60



HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
 BRAID STYLE PKG, 1-5/8" THRU 2-1/2" PLGR
 217Q-4M, 163Q-4M (HP200AM , HP165AM)

| | | | |
|----------|--------|-----|--------|
| DWG No.: | SCALE: | REV | SHT.: |
| 118594 | NONE | A | 6 OF 8 |



NOTE
 1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118594,
 SHEETS 1 THRU 8.

| 5 | 110-000238-201 | O-RING | | 8 |
|--------------------|----------------|----------------|--------|------|
| 5 | 001-024393-575 | | (SS) | |
| 5 | 001-024393-235 | | (STL) | |
| 5 | 001-024393-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 288-238234-458 | | 8921-K | |
| 5 | 288-238234-339 | | 249 | |
| 5 | 288-238234-337 | | 241 | |
| 5 | 288-238234-395 | PACKING | 238 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-024394-575 | | (SS) | |
| 5 | 001-024394-235 | | (STL) | |
| 5 | 001-024394-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (2-3/8" PLUNGER) | | | | |
| DDA | Part No. | DESCRIPTION | | ITEM |

BILL OF MATERIAL

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT
 BRAID STYLE PKG, 1-5/8" - 2-1/2" PLGR
 217Q-4M, 163Q-4M (HP200AM , HP165AM)

DWG No.:

118594

SCALE:

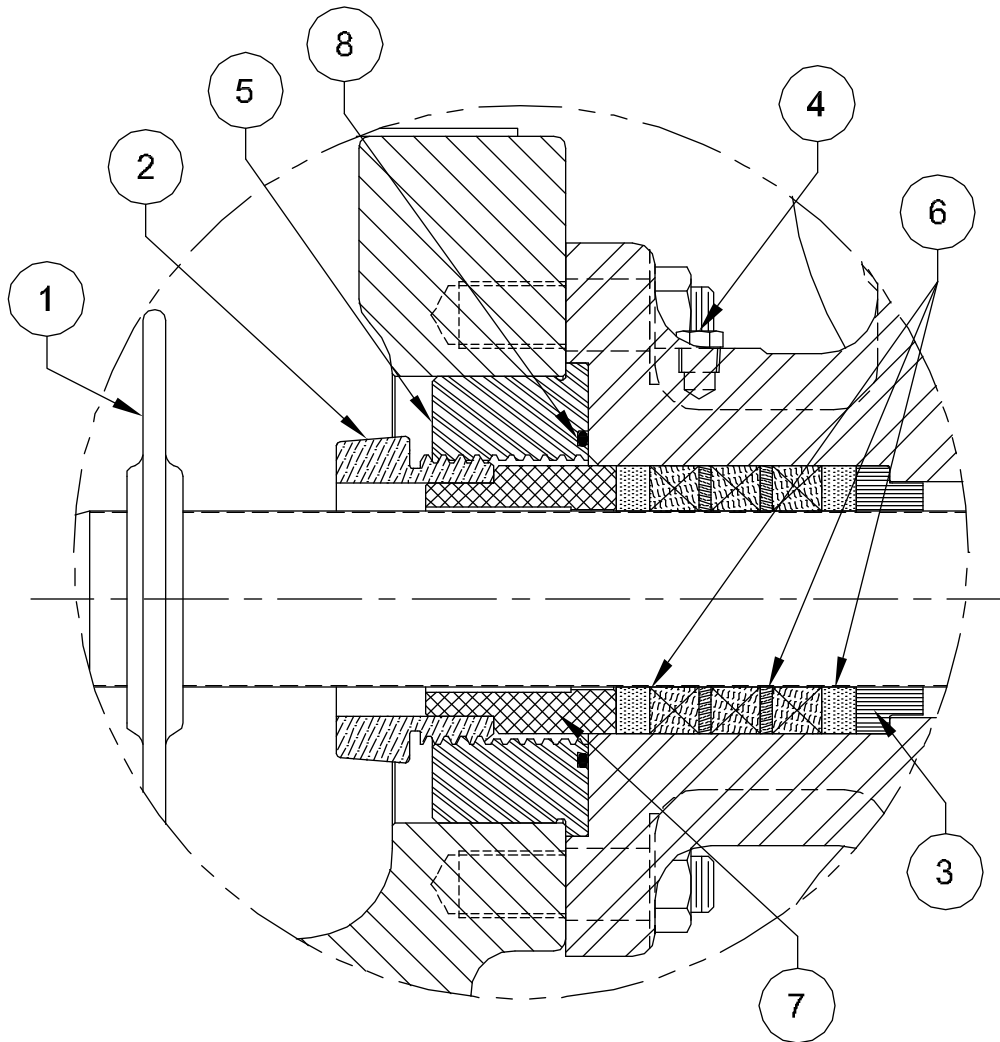
NONE

REV

A

SHT.:

7 OF 8



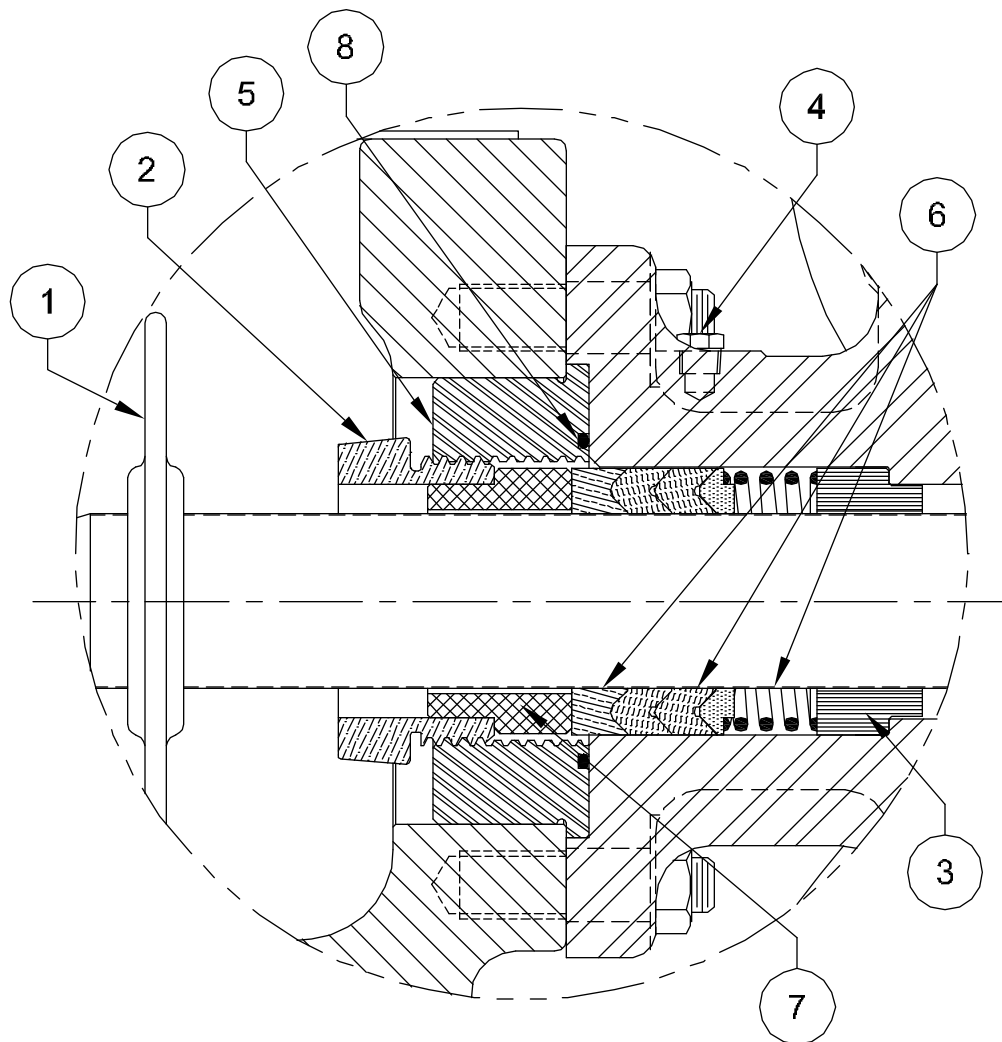
NOTE
 1) FOR ALL " BRAID " STYLE PACKING SEE DRAWING 118594,
 SHEETS 1 THRU 8.

| | | | | |
|---------------------------|-----------------|--------------------|-------------|---|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-008745-575 | | (SS) | |
| 5 | 001-008745-235 | | (STL) | |
| 5 | 001-008745-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 288-212234-458 | | 8921-K | |
| 5 | 288-212234-339 | | 249 | |
| 5 | 288-212234-337 | | 241 | |
| 5 | 288-212234-395 | PACKING | 238 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-025918-575 | | (SS) | |
| 5 | 001-025918-235 | | (STL) | |
| 5 | 001-025918-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (2-1/2" PLUNGER) | | | | |
| DDA | Part No. | DESCRIPTION | ITEM | |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

62

| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, PLUNGER KIT BRAID STYLE PKG, 1-5/8" THRU 2-1/2" PLGR 217Q-4M, 163Q-4M (HP200AM , HP165AM) | | | |
| DWG No.: | SCALE: | REV | SHT.: |
| 118594 | NONE | A | 8 OF 8 |



NOTE

1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118595, SHEETS 1 THRU 8.

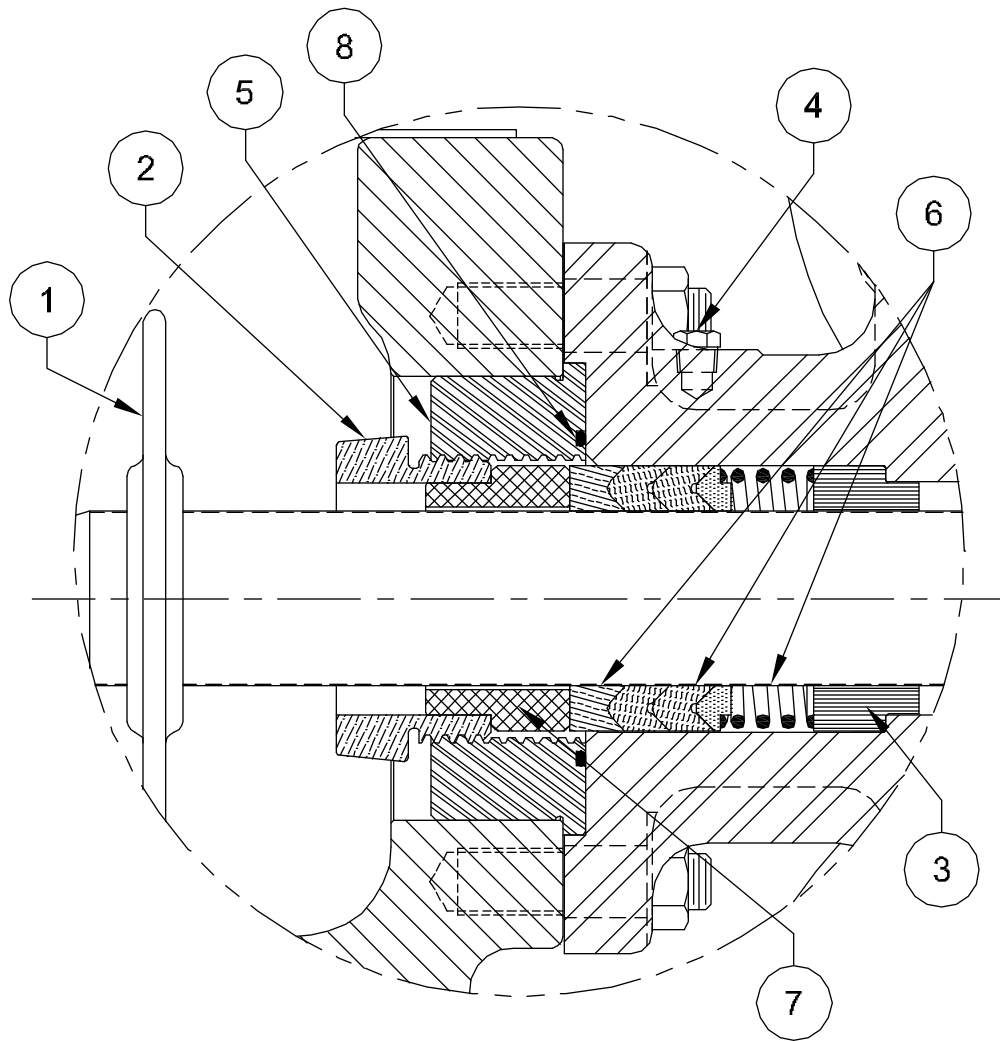
| 5 | 110-000238-201 | O-RING | | 8 |
|--------------------|----------------|----------------|--------|------|
| 5 | 001-023661-575 | | (SS) | |
| 5 | 001-023661-235 | | (STL) | |
| 5 | 001-023661-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 428-158212-473 | | 1043-4 | |
| 5 | 428-158212-340 | PACKING | 1068-4 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-023662-575 | | (SS) | |
| 5 | 001-023662-235 | | (STL) | |
| 5 | 001-023662-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-5/8" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |

BILL OF MATERIAL

<*> COATED STAINLESS STEEL

63

| | | | |
|---|--------|------------------------------|--------|
| | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: | | | |
| ASSEMBLY, PLUNGER KIT "SSF-4" STYLE PKG, 1-5/8" THRU 2-1/2" PLGR 217Q-4M, 163Q-4M (HP200AM , HP165AM) | | | |
| DWG No.: | SCALE: | REV: | SHT.: |
| 118595 | NONE | A | 1 OF 8 |



NOTE

1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118595, SHEETS 1 THRU 8.

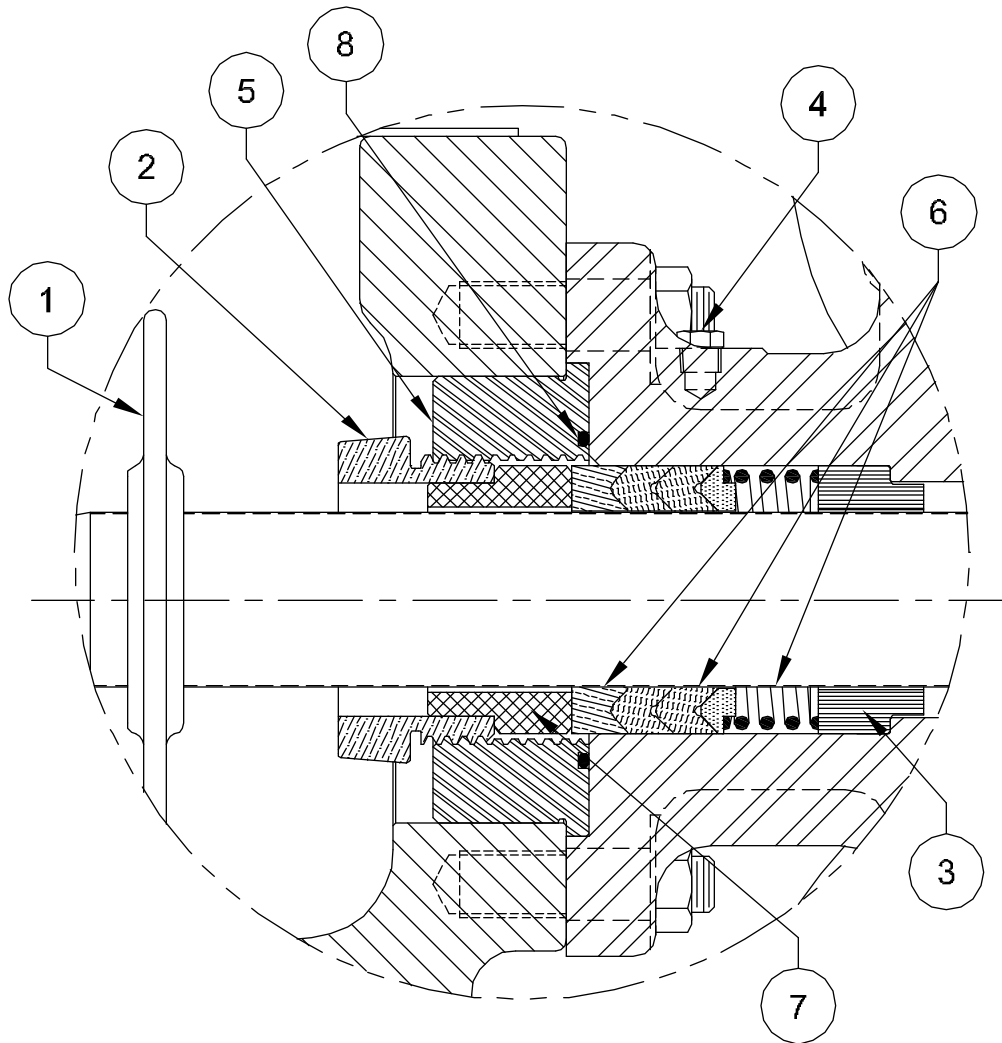
| | | | | |
|---------------------------|-----------------|--------------------|--------|-------------|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-010933-575 | | | |
| 5 | 001-010933-235 | | (STL) | |
| 5 | 001-010933-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 428-134212-473 | | 1043-4 | |
| 5 | 428-134212-340 | PACKING | 1068-4 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010897-575 | | (SS) | |
| 5 | 001-010897-235 | | (STL) | |
| 5 | 001-010897-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-3/4" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |

BILL OF MATERIAL

<*> COATES STAINLESS STEEL

64

| | | | |
|--|--------|------------------------------|--------|
| | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, PLUNGER KIT | | | |
| "SSF-4" STYLE PKG, 1-5/8" THRU 2-1/2" PLGR 217Q-4M, 163Q-4M (HP200AM , HP165AM) | | | |
| DWC No.: | SCALE: | REV: | SHT.: |
| 118595 | NONE | A | 2 OF 8 |



NOTE

1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118595, SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-014459-575 | | (SS) | |
| 5 | 001-014459-235 | | (STL) | |
| 5 | 001-014459-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 428-178212-473 | | 1043-4 | |
| 5 | 428-178212-340 | PACKING | 1068-4 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010899-575 | | (SS) | |
| 5 | 001-010899-235 | | (STL) | |
| 5 | 001-010899-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-7/8" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
|-------|----------|-------------|------|

BILL OF MATERIAL

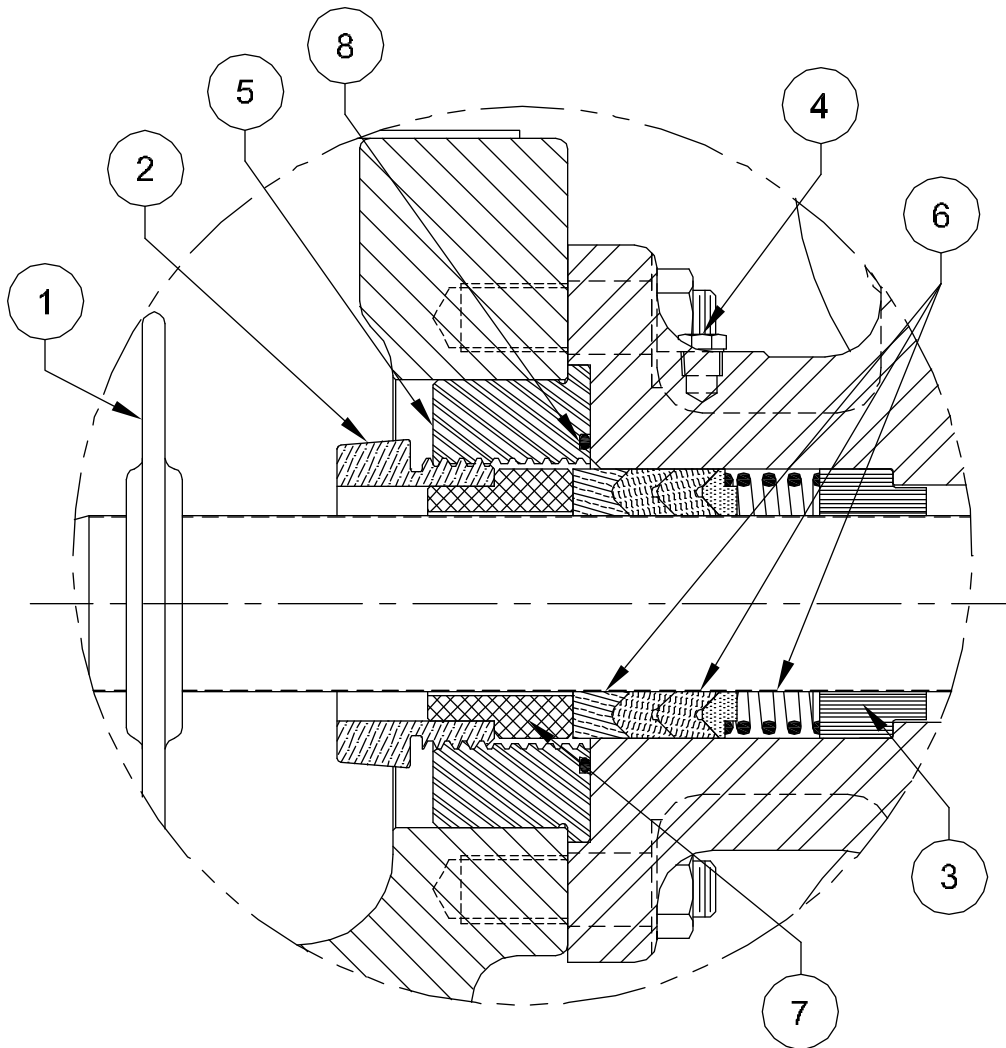
<*> COATED STAINLESS STEEL

65

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 "SSF-4" STYLE PKG, 1-5/8" THRU 2-1/2" PLGR
 217Q-4M, 163Q-4M (HP200AM , HP165AM)

DWG No.: 118595 SCALE: NONE REV A SHT.: 3 OF 8



NOTE
 1) FOR ALL "SSF-4" STYLE PACKING SEE DRAWING 118595,
 SHEETS 1 THRU 8.

| 5 | 110-000238-201 | O-RING | | 8 |
|-----------------------|----------------|----------------|--------|------|
| 5 | 001-010931-575 | | (SS) | |
| 5 | 001-010931-235 | | (STL) | |
| 5 | 001-010931-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 428-200238-473 | | 1043-4 | |
| 5 | 428-200238-340 | PACKING | 1068-4 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010901-575 | | (SS) | |
| 5 | 001-010901-235 | | (STL) | |
| 5 | 001-010901-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (2" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |

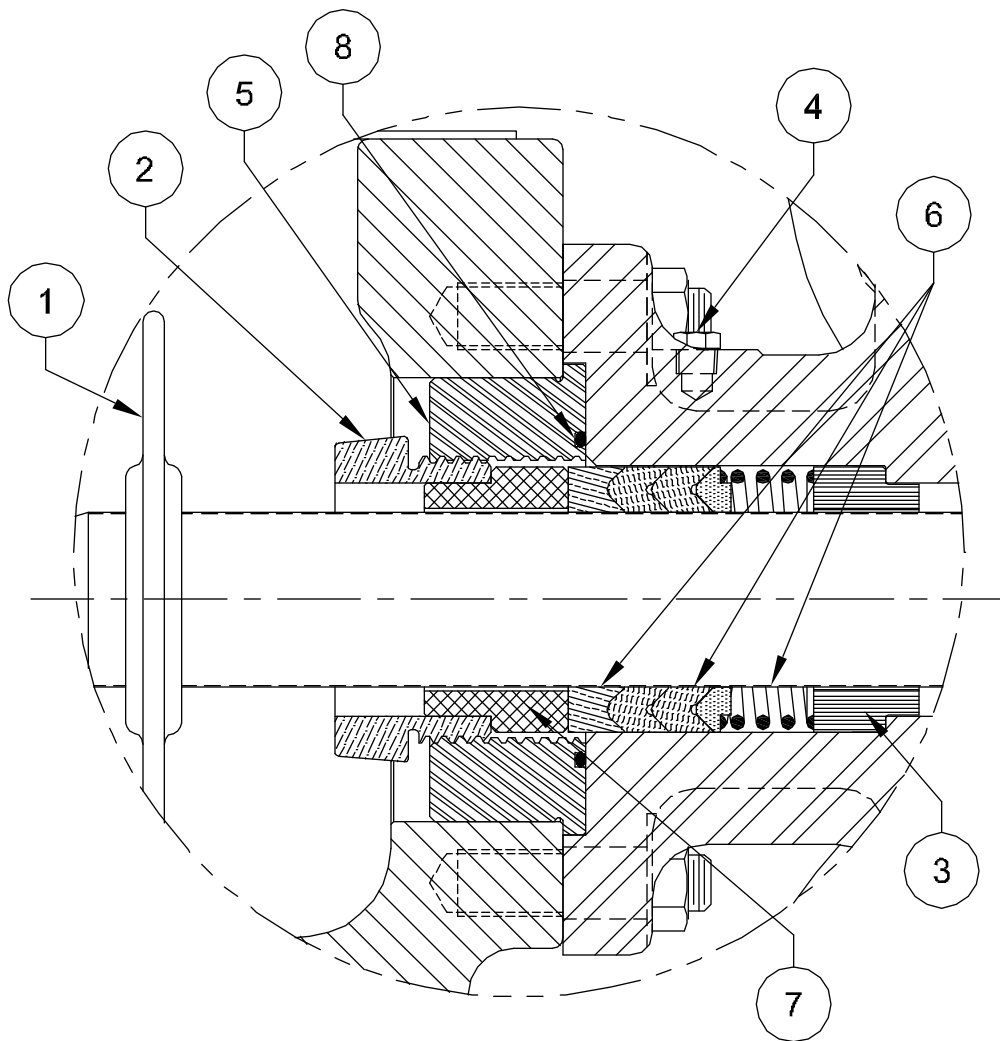
BILL OF MATERIAL

<*> COATED STAINLESS STEEL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
"SSF-4" STYLE PKG, 1-5/8" THRU 2-1/2" PLGR
217Q-4M, 163Q-4M (HP200AM , HP165AM)

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118595 | SCALE: NONE | REV A | SHT.: 4 OF 8 |
|--------------------|----------------|----------|-----------------|



NOTE

1) FOR ALL "SSF-4" STYLE PACKING SEE DRAWING 118595, SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-014458-575 | | (SS) | |
| 5 | 001-014458-235 | | (STL) | |
| 5 | 001-014458-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 428-218212-473 | | 1043-4 | |
| 5 | 428-218212-340 | PACKING | 1068-4 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010902-575 | | (SS) | |
| 5 | 001-010902-235 | | (STL) | |
| 5 | 001-010902-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(2-1/8" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
|-------|----------|-------------|------|

BILL OF MATERIAL

<*> COATED STAINLESS STEEL

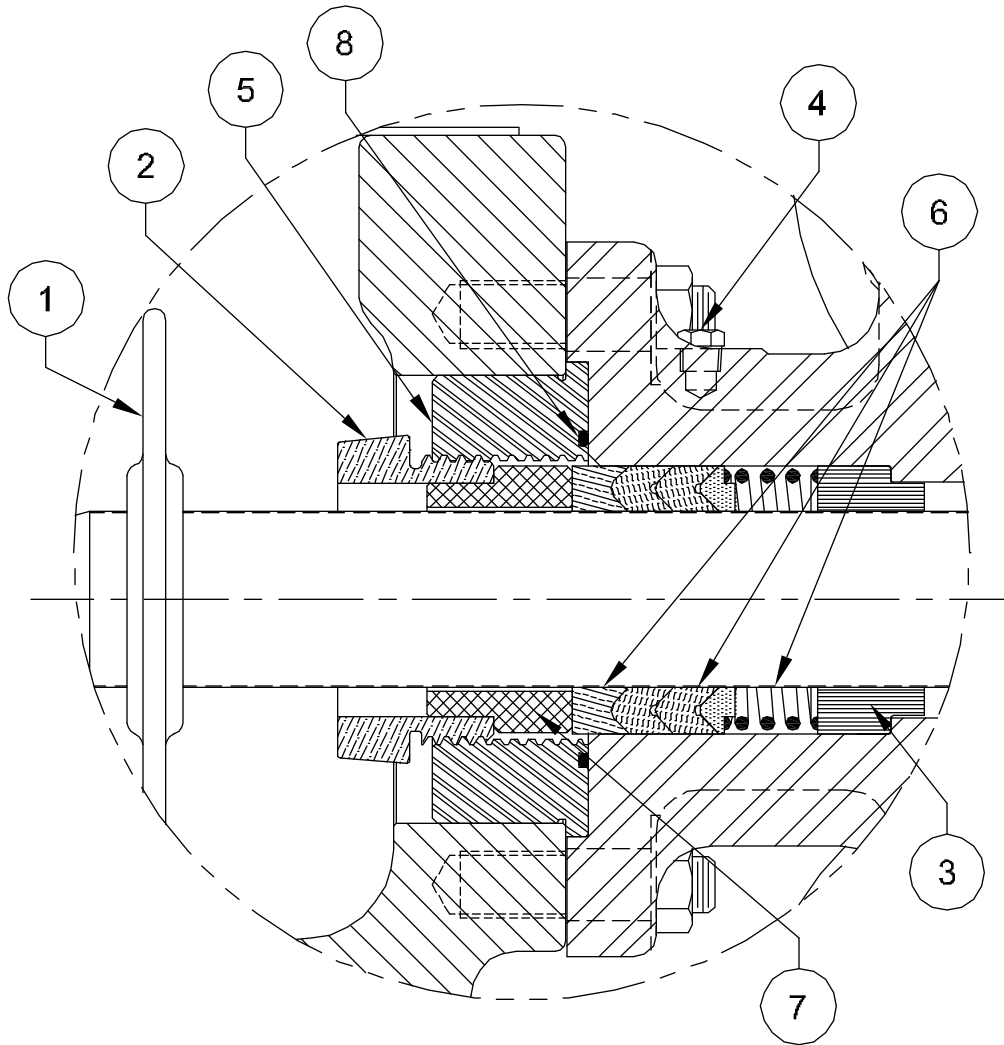
67



HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 "SSF-4" STYLE PKG, 1-5/8" THRU 2-1/2" PLGR
 217Q-4M, 163Q-4M (HP200AM , HP165AM)

| | | | | | | | | | |
|----------|--------|--------|------|------|---|-------|---|----|---|
| DWG No.: | 118595 | SCALE: | NONE | REV: | A | SHT.: | 5 | OF | 8 |
|----------|--------|--------|------|------|---|-------|---|----|---|



NOTE

1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118595, SHEETS 1 THRU 8.

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-007983-575 | | (SS) | |
| 5 | 001-007983-235 | | (STL) | |
| 5 | 001-007983-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 428-214212-473 | | 1043-4 | |
| 5 | 428-214212-340 | PACKING | 1068-4 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-007979-575 | | (SS) | |
| 5 | 001-007979-235 | | (STL) | |
| 5 | 001-007979-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(2-1/4" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
|-------|----------|-------------|------|

BILL OF MATERIAL

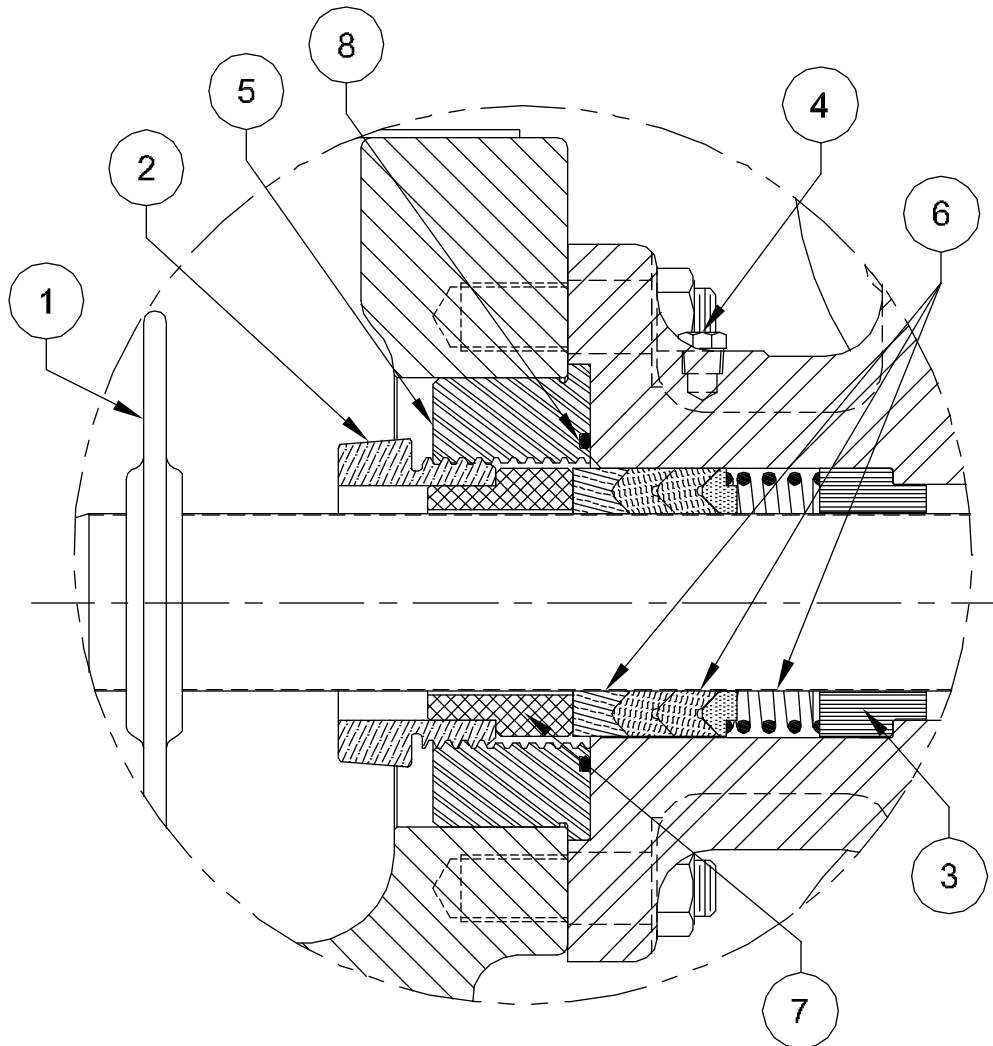
<*> COATED STAINLESS STEEL

68

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE: ASSEMBLY, PLUNGER KIT
 "SSF-4" STYLE PKG, 1-5/8" THRU 2-1/2" PLGR
 217Q-4M, 163Q-4M (HP200AM , HP165AM)

DWG No.: 118595 SCALE: NONE REV: A SHEET: 6 OF 8



NOTE
 1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118595,
 SHEETS 1 THRU 8.

| 5 | 110-000238-201 | O-RING | | 8 |
|--------------------|----------------|----------------|--------|------|
| 5 | 001-024393-575 | | (SS) | |
| 5 | 001-024393-235 | | (STL) | |
| 5 | 001-024393-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 428-238212-473 | | 1043-4 | |
| 5 | 428-238212-340 | PACKING | 1068-4 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-024394-575 | | (SS) | |
| 5 | 001-024394-235 | | (STL) | |
| 5 | 001-024394-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (2-3/8" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |

BILL OF MATERIAL

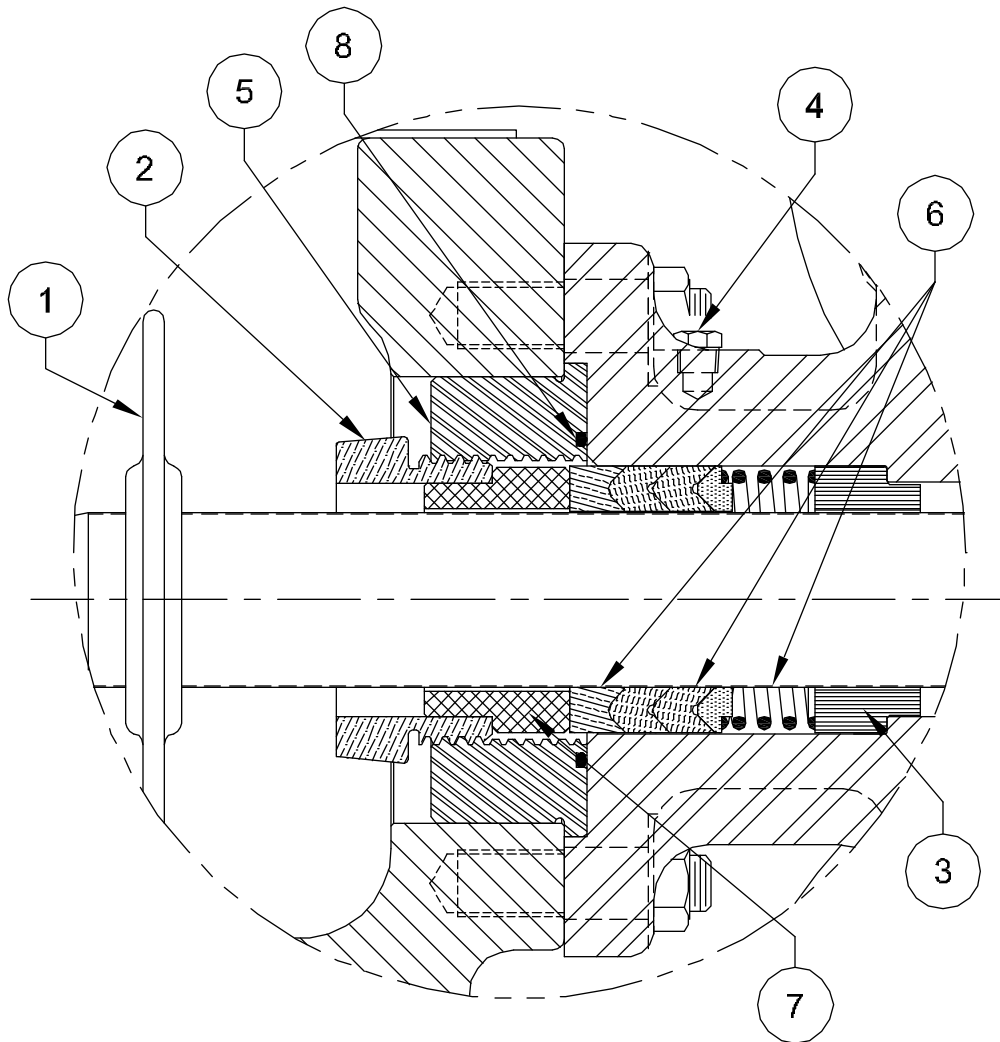
<*> COATED STAINLESS STEEL

69

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 "SSF-4" STYLE PKG, 1-5/8" THRU 2-1/2" PLGR
 217Q-4M, 163Q-4M (HP200AM , HP165AM)

DWG No.: 118595 SCALE: NONE REV A SHT.: 7 OF 8



NOTE

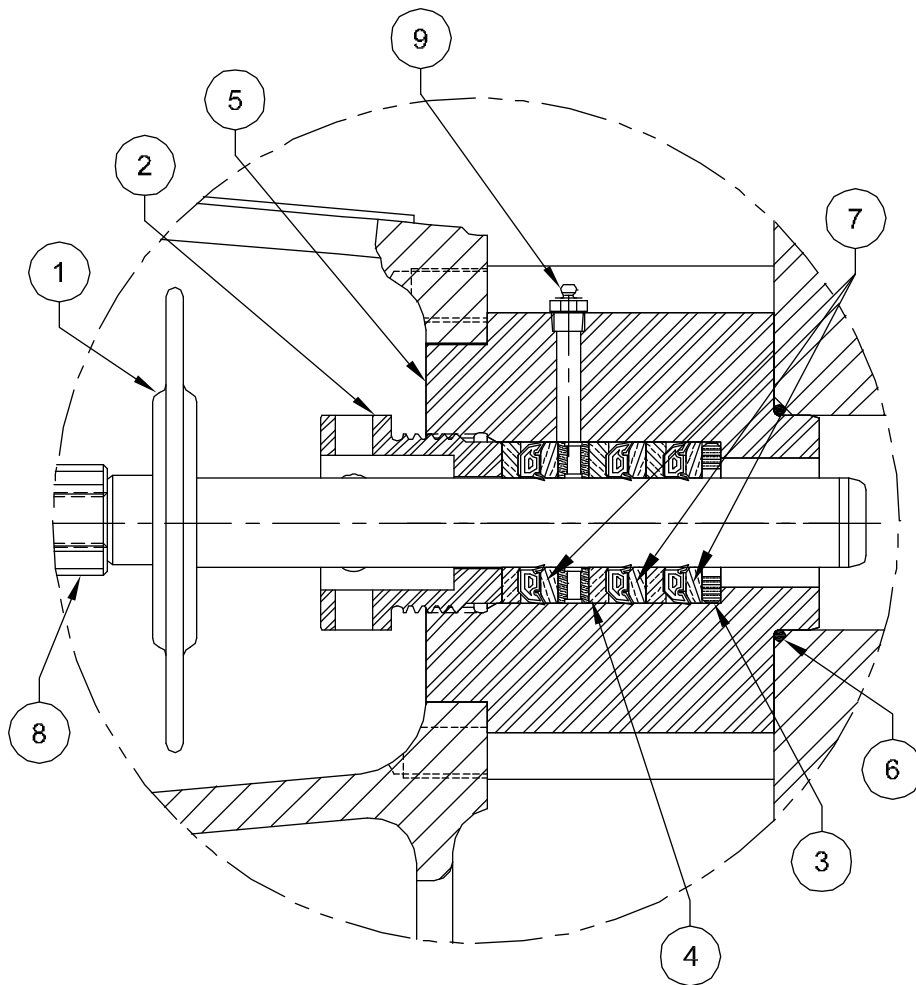
1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118595, SHEETS 1 THRU 8.

| | | | | |
|---------------------------|-----------------|--------------------|--------|-------------|
| 5 | 110-000238-201 | O-RING | | 8 |
| 5 | 001-008745-575 | | (SS) | |
| 5 | 001-008745-235 | | (STL) | |
| 5 | 001-008745-302 | FOLLOWER | (BRZ) | 7 |
| 5 | 428-212244-473 | | 1043-4 | |
| 5 | 428-212244-340 | PACKING | 1068-4 | 6 |
| 5 | 001-023574-278 | | (SS) | |
| 5 | 001-023574-236 | | (STL) | |
| 5 | 001-023574-316 | ADAPTER | (BRZ) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-025918-575 | | (SS) | |
| 5 | 001-025918-235 | | (STL) | |
| 5 | 001-025918-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | 002-007977-E16 | <*> | (XSS) | |
| 5 | 001-007977-351 | | (DI) | |
| 5 | 002-007977-261 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (2-1/2" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

<*> COATED STAINLESS STEEL

70

| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, PLUNGER KIT "SSF-4" STYLE PKG, 1-5/8" THRU 2-1/2" PLGR 217Q-4M, 163Q-4M (HP200AM , HP165AM) | | | |
| DWG No.: | SCALE: | REV | SHT.: |
| 118595 | NONE | A | 8 OF 8 |



NOTE
 1) FOR ALL "J" STYLE PACKING SEE DRAWING 118596,
 SHEETS 1 THRU 5.

| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165000-220 | LUBE FITTING | | 9 |
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 8 |
| 5 | 182-114214-477 | | 858 | |
| 5 | 182-114214-374 | | 845 | |
| 5 | 182-114214-386 | | 842 | |
| 5 | 182-114214-370 | PACKING | 838 | 7 |
| 5 | 110-000337-200 | SEAL | | 6 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 5 |
| 5 | 001-011212-575 | | (SS) | |
| 5 | 001-011212-235 | | (STL) | |
| 5 | 001-011212-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-010950-575 | | (SS) | |
| 5 | 001-010950-235 | | (STL) | |
| 5 | 001-010950-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AEC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-1/4" PLUNGER)

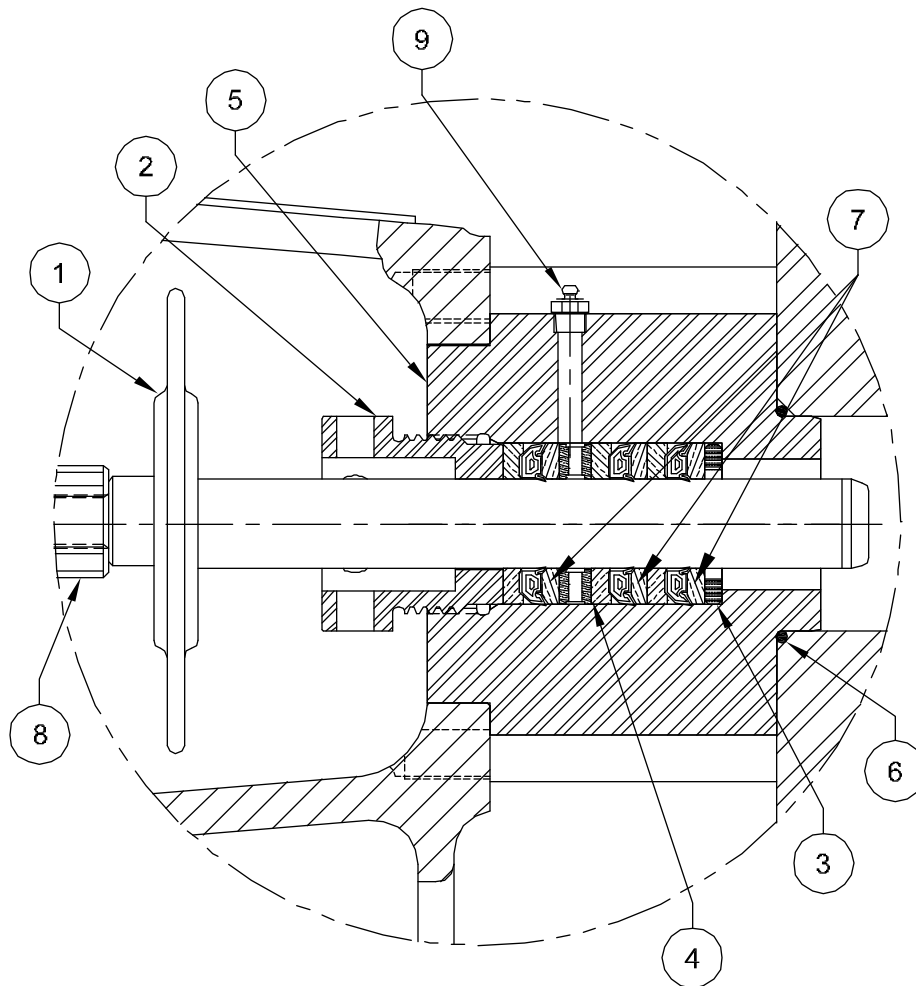
| REQ'D | Part No. | DESCRIPTION | ITEM |
|------------------|----------|-------------|------|
| BILL OF MATERIAL | | | |

71

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 "J" STYLE PACKING, 1-1/4" THRU 1-3/4"
 217Q-4H & 163Q-4H

| | | | |
|----------|--------|-----|--------|
| DWG No.: | SCALE: | REV | SHT.: |
| 118596 | NONE | A | 1 OF 5 |



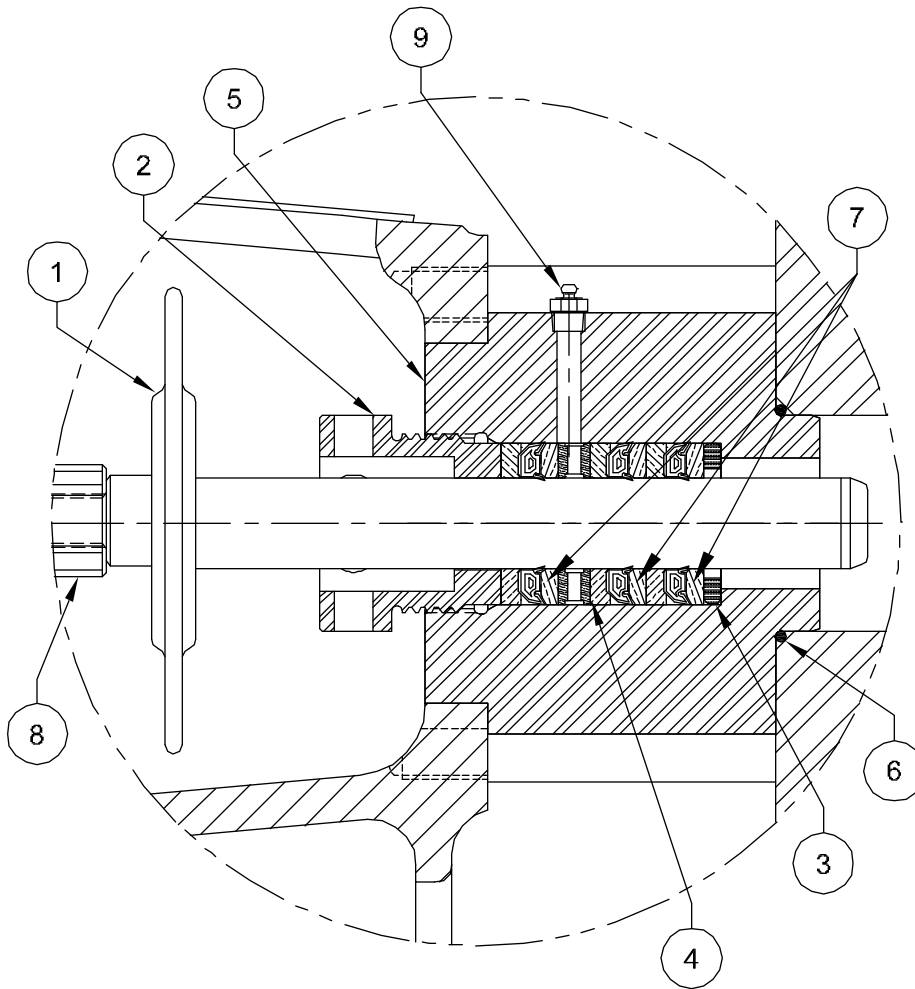
NOTE
 1) FOR ALL "J" STYLE PACKING SEE DRAWING 118596,
 SHEETS 1 THRU 5.

| 5 | 180-165000-220 | LUBE FITTING | | 9 |
|--------------------|----------------|----------------|-------|------|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 8 |
| 5 | 182-138214-477 | | 858 | |
| 5 | 182-138214-374 | | 845 | |
| 5 | 182-138214-386 | | 842 | |
| 5 | 182-138214-370 | PACKING | 838 | 7 |
| 5 | 110-000337-200 | SEAL | | 6 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 5 |
| 5 | 001-011221-575 | | (SS) | |
| 5 | 001-011221-235 | | (STL) | |
| 5 | 001-011221-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-008913-575 | | (SS) | |
| 5 | 001-008913-235 | | (STL) | |
| 5 | 001-008913-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | ADC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-3/8" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |

BILL OF MATERIAL

72

| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, PLUNGER KIT "J" STYLE PACKING, 1-1/4" THRU 1-3/4" 217Q-4H & 163Q-4H | | | |
| DWG No.: | SCALE: | REV | SHT.: |
| 118596 | NONE | A | 2 OF 5 |



NOTE
 1) FOR ALL "J" STYLE PACKING SEE DRAWING 118596,
 SHEETS 1 THRU 5.

| | | | | |
|---|----------------|----------------|-------|---|
| 5 | 180-165000-220 | LUBE FITTING | | 9 |
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 8 |
| 5 | 182-112214-477 | | 858 | |
| 5 | 182-112214-374 | | 845 | |
| 5 | 182-112214-386 | | 842 | |
| 5 | 182-112214-370 | PACKING | 838 | 7 |
| 5 | 110-000337-200 | SEAL | | 6 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 5 |
| 5 | 001-011218-575 | | (SS) | |
| 5 | 001-011218-235 | | (STL) | |
| 5 | 001-011218-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-010949-575 | | (SS) | |
| 5 | 001-010949-235 | | (STL) | |
| 5 | 001-010949-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | ACC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-1/2" PLUNGER)

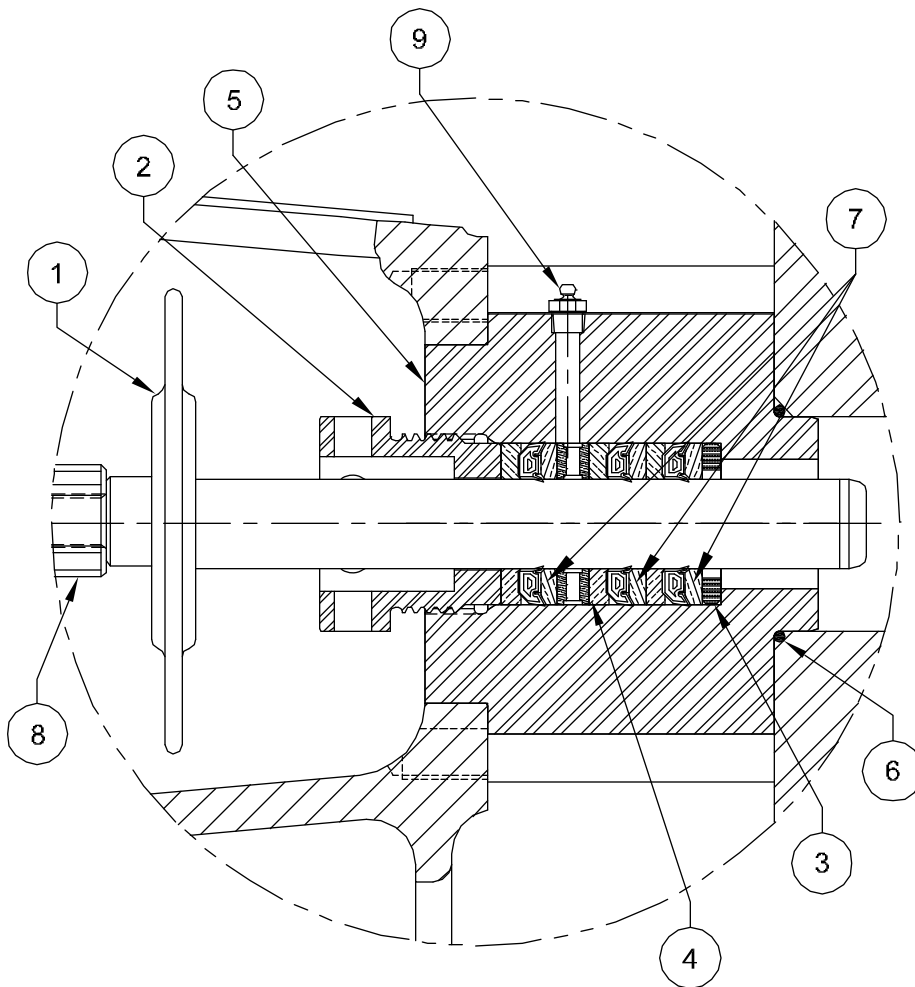
| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |

BILL OF MATERIAL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 "J" STYLE PACKING, 1-1/4" THRU 1-3/4"
 217Q-4H & 163Q-4H

| | | | |
|----------|--------|-----|--------|
| DWG No.: | SCALE: | REV | SHT.: |
| 118596 | NONE | A | 3 OF 5 |

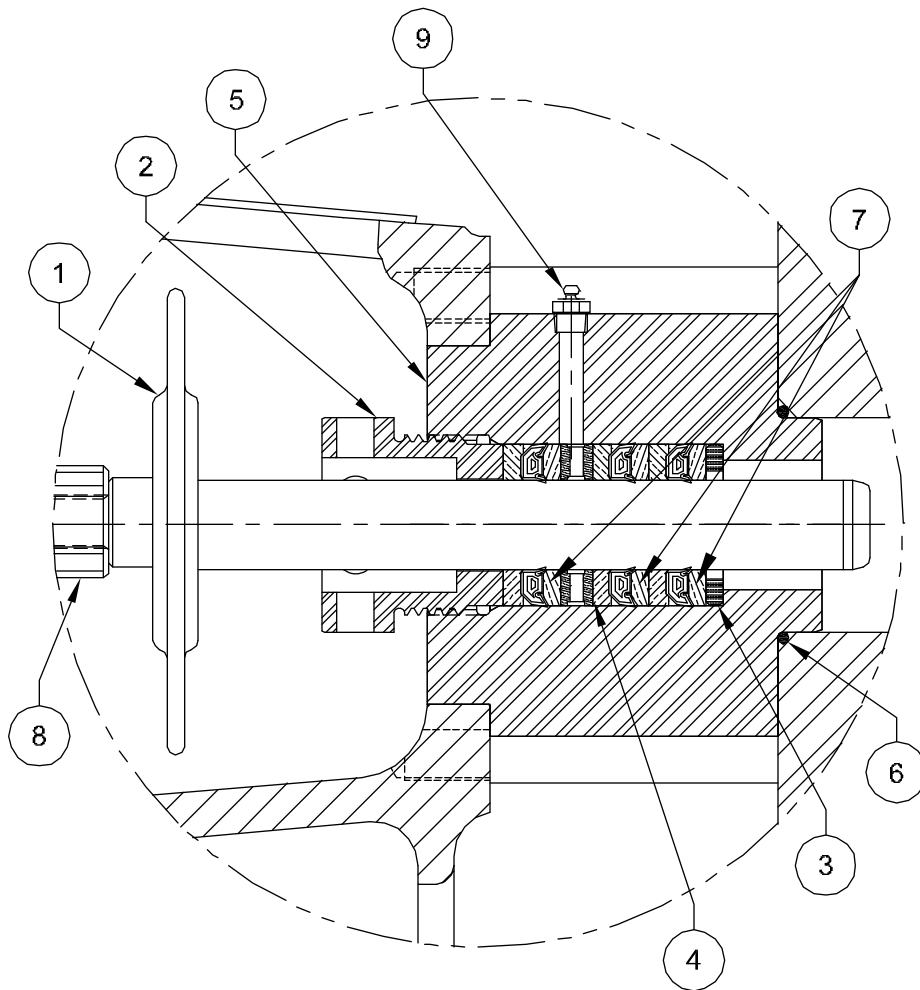


NOTE

1) FOR ALL "J" STYLE PACKING SEE DRAWING 118596, SHEETS 1 THRU 5.

| | | | | |
|---------------------------|-----------------|--------------------|-------|-------------|
| 5 | 180-165000-220 | LUBE FITTING | | 9 |
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 8 |
| 5 | 182-158214-477 | | 858 | |
| 5 | 182-158214-374 | | 845 | |
| 5 | 182-158214-386 | | 842 | |
| 5 | 182-158214-370 | PACKING | 838 | 7 |
| 5 | 110-000337-200 | SEAL | | 6 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 5 |
| 5 | 001-005305-575 | | (SS) | |
| 5 | 001-005305-235 | | (STL) | |
| 5 | 001-005305-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-010962-575 | | (SS) | |
| 5 | 001-010962-235 | | (STL) | |
| 5 | 001-010962-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | ABC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-5/8" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| | | | | |
| BILL OF MATERIAL | | | | |

| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: | | | |
| ASSEMBLY, PLUNGER KIT "J" STYLE PACKING, 1-1/4" THRU 1-3/4" 217Q-4H & 163Q-4H | | | |
| DWG No.: | SCALE: | REV: | SHT.: |
| 118596 | NONE | A | 4 OF 5 |



NOTE

1) FOR ALL "J" STYLE PACKING SEE DRAWING 118596, SHEETS 1 THRU 5.

| 5 | 180-165000-220 | LUBE FITTING | | 9 |
|---------------------------|----------------|----------------|-------|------|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 8 |
| 5 | 182-134178-477 | | 858 | |
| 5 | 182-134178-374 | | 845 | |
| 5 | 182-134178-386 | | 842 | |
| 5 | 182-134178-370 | PACKING | 838 | 7 |
| 5 | 110-000337-200 | SEAL | | 6 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 5 |
| 5 | 001-011220-575 | | (SS) | |
| 5 | 001-011220-235 | | (STL) | |
| 5 | 001-011220-302 | LANTERN RING | (BRZ) | 4 |
| 5 | 001-010894-575 | | (SS) | |
| 5 | 001-010894-235 | | (STL) | |
| 5 | 001-010894-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-3/4" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |

BILL OF MATERIAL

75



HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT
 "J" STYLE PACKING, 1-1/4" THRU 1-3/4"
 217Q-4H & 163Q-4H

DWG No.:

118596

SCALE:

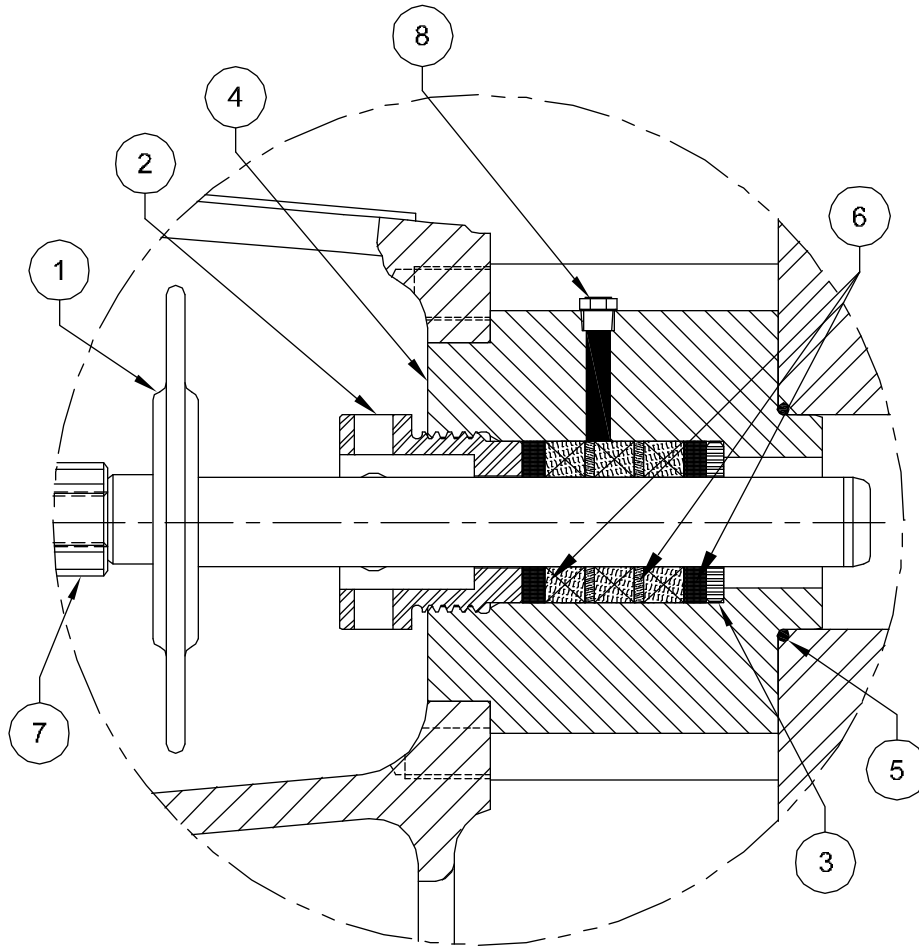
NONE

REV

A

SHT.:

5 OF 5



NOTE
 1) FOR ALL "J" STYLE PACKING SEE DRAWING 118597,
 SHEETS 1 THRU 5.

| 5 | 170-018002-278 | PIPE PLUG | | 8 |
|--------------------|----------------|----------------|--------|------|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 7 |
| 5 | 287-114234-458 | | 8921-K | |
| 5 | 287-114234-339 | | 249 | |
| 5 | 287-114234-337 | | 241 | |
| 5 | 287-114234-395 | PACKING | 238 | 6 |
| 5 | 110-000337-200 | SEAL | | 5 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 4 |
| 5 | 001-010950-575 | | (SS) | |
| 5 | 001-010950-235 | | (STL) | |
| 5 | 001-010950-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AEC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-1/4" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

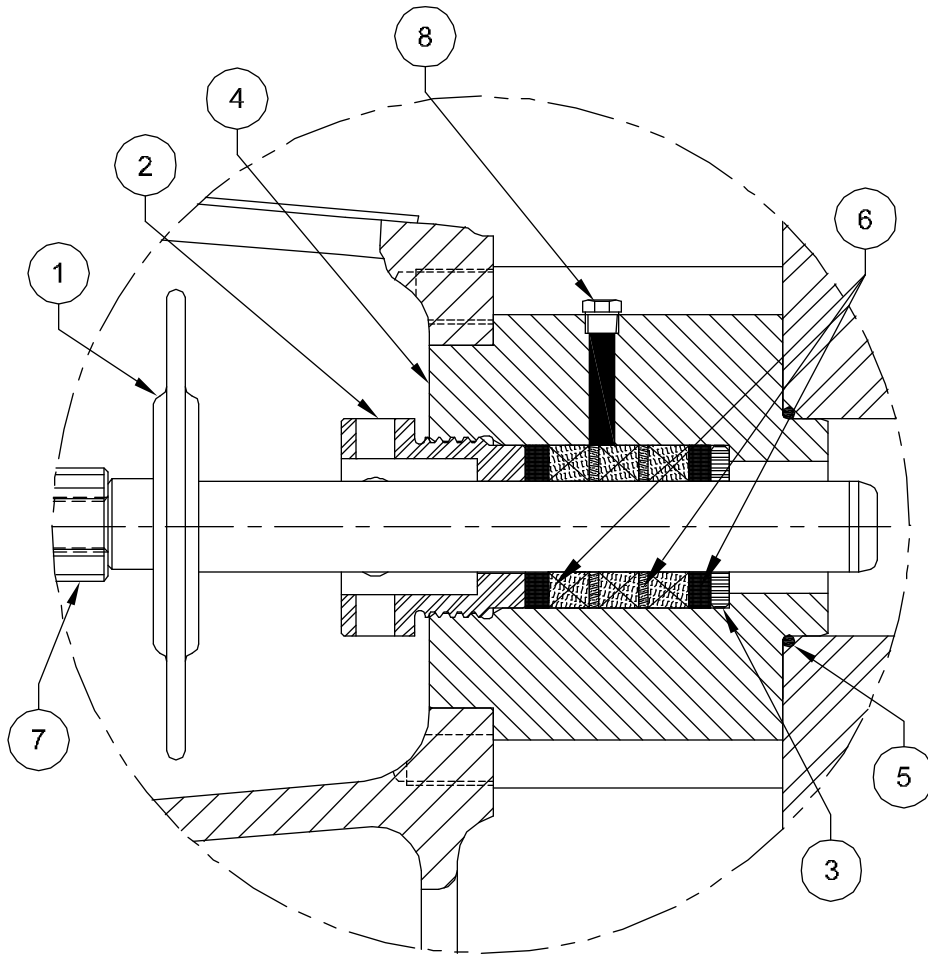
76



HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 BRAID STYLE PACKING, 1-1/4" THRU 1-3/4"
 217Q-4H & 163Q-4H

| | | | |
|-----------------|-------------|-------|--------------|
| DWG No.: 118597 | SCALE: NONE | REV A | SHT.: 1 OF 5 |
|-----------------|-------------|-------|--------------|



NOTE
 1) FOR ALL "J" STYLE PACKING SEE DRAWING 118597,
 SHEETS 1 THRU 5.

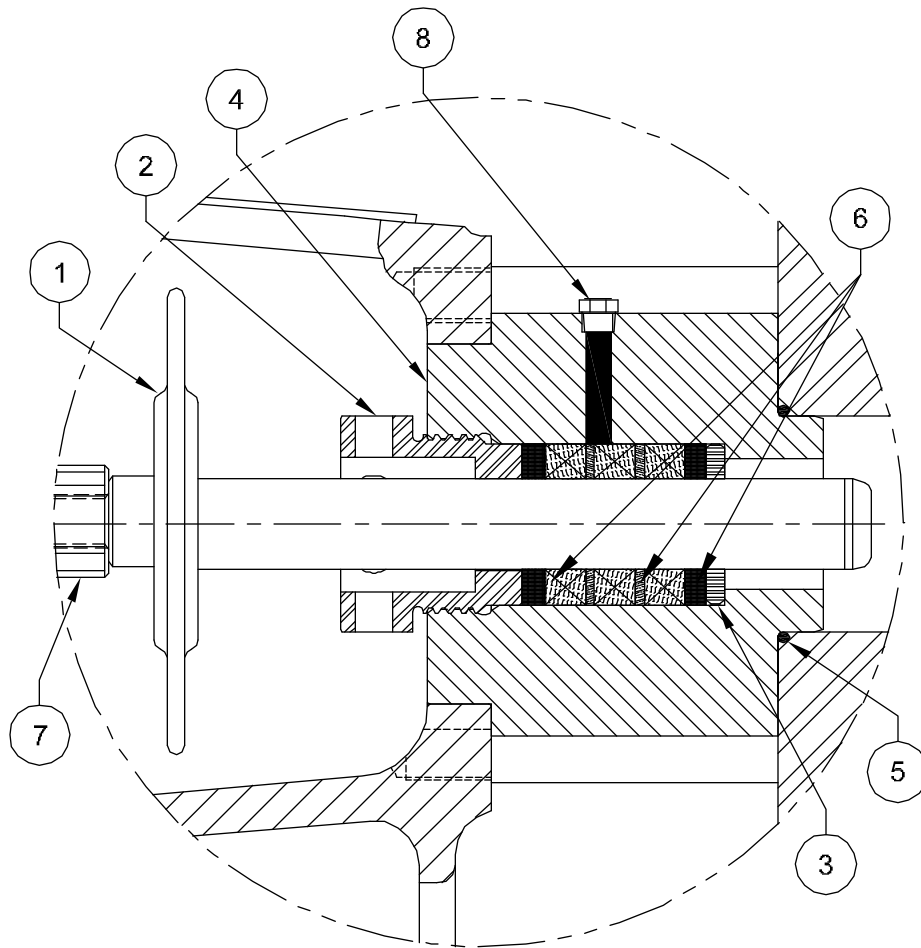
| 5 | 170-018002-278 | PIPE PLUG | | 8 |
|--------------------|----------------|----------------|--------|------|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 7 |
| 5 | 287-138234-458 | | 8921-K | |
| 5 | 287-138234-339 | | 249 | |
| 5 | 287-138234-337 | | 241 | |
| 5 | 287-138234-395 | PACKING | 238 | 6 |
| 5 | 110-000337-200 | SEAL | | 5 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 4 |
| 5 | 001-008913-575 | | (SS) | |
| 5 | 001-008913-235 | | (STL) | |
| 5 | 001-008913-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | ADC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-3/8" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

77

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 BRAID STYLE PACKING, 1-1/4" THRU 1-3/4"
 217Q-4H & 163Q-4H

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118597 | SCALE: NONE | REV A | SHT.: 2 OF 5 |
|--------------------|----------------|----------|-----------------|



NOTE

1) FOR ALL "J" STYLE PACKING SEE DRAWING 118597, SHEETS 1 THRU 5.

| 5 | 170-018002-278 | PIPE PLUG | | 8 |
|---------------------------|----------------|----------------|--------|------|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 7 |
| 5 | 287-112234-458 | | 8921-K | |
| 5 | 287-112234-339 | | 249 | |
| 5 | 287-112234-337 | | 241 | |
| 5 | 287-112234-395 | PACKING | 238 | 6 |
| 5 | 110-000337-200 | SEAL | | 5 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 4 |
| 5 | 001-010949-575 | | (SS) | |
| 5 | 001-010949-235 | | (STL) | |
| 5 | 001-010949-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | ACC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-1/2" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |



HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PLUNGER KIT
BRAID STYLE PACKING, 1-1/4" THRU 1-3/4"
217Q-4H & 163Q-4H

DWG No.:

118597

SCALE:

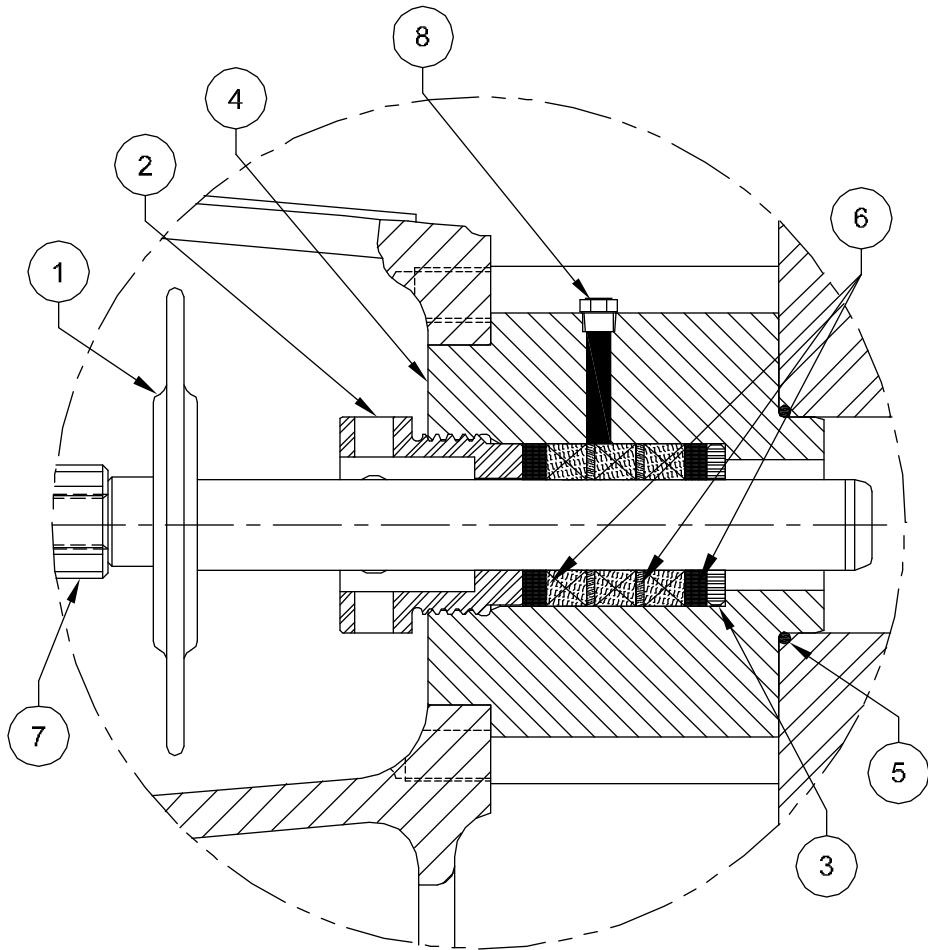
NONE

REV

A

SHT.:

3 OF 5



NOTE

1) FOR ALL "J" STYLE PACKING SEE DRAWING 118597, SHEETS 1 THRU 5.

| | | | | |
|---------------------------|-----------------|--------------------|--------|-------------|
| 5 | 170-018002-278 | PIPE PLUG | | 8 |
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 7 |
| 5 | 287-158234-458 | | 8921-K | |
| 5 | 287-158234-339 | | 249 | |
| 5 | 287-158234-337 | | 241 | |
| 5 | 287-158234-395 | PACKING | 238 | 6 |
| 5 | 110-000337-200 | SEAL | | 5 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 4 |
| 5 | 001-010962-575 | | (SS) | |
| 5 | 001-010962-235 | | (STL) | |
| 5 | 001-010962-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | ABC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-5/8" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| | | | | |
| BILL OF MATERIAL | | | | |

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

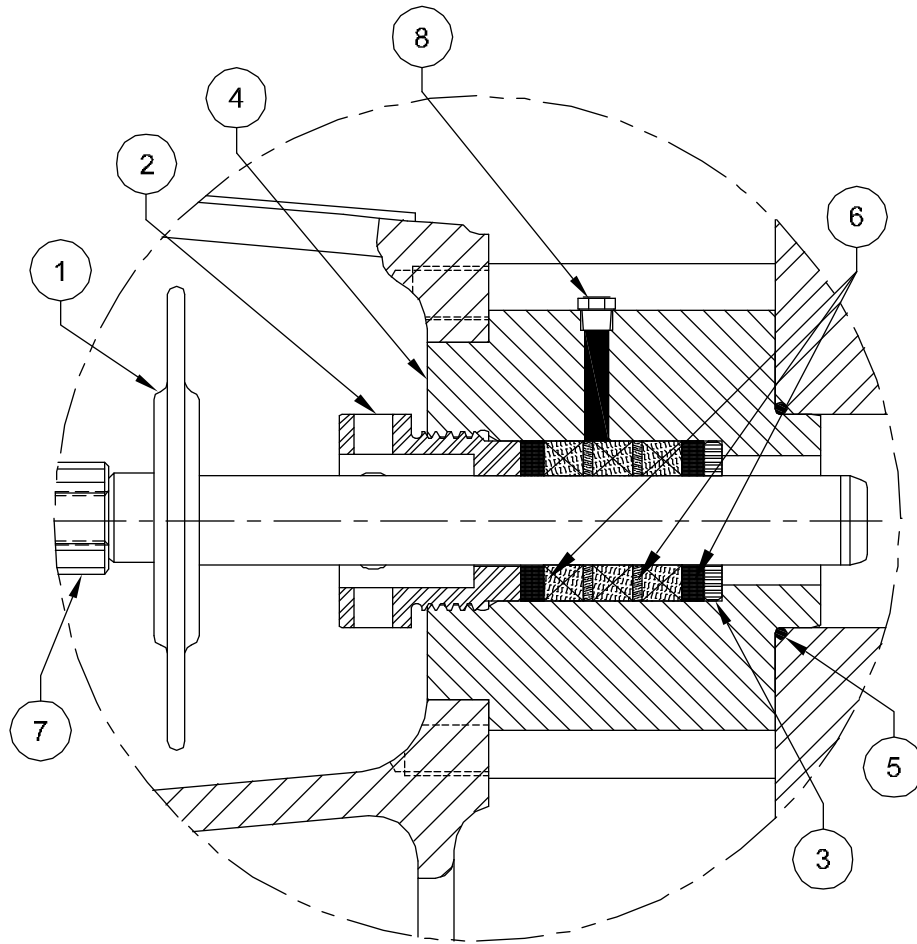
ASSEMBLY, PLUNGER KIT
BRAID STYLE PACKING, 1-1/4" THRU 1-3/4"
217Q-4H & 163Q-4H

DWG No.: 118597

SCALE: NONE

REV A

SHT.: 4 OF 5



NOTE
 1) FOR ALL "J" STYLE PACKING SEE DRAWING 118597,
 SHEETS 1 THRU 5.

| 5 | 170-018002-278 | PIPE PLUG | | 8 |
|--------------------|----------------|----------------|--------|------|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 7 |
| 5 | 287-134234-458 | | 8921-K | |
| 5 | 287-134234-339 | | 249 | |
| 5 | 287-134234-337 | | 241 | |
| 5 | 287-134234-395 | PACKING | 238 | 6 |
| 5 | 110-000337-200 | SEAL | | 5 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 4 |
| 5 | 001-024096-575 | | (SS) | |
| 5 | 001-024096-235 | | (STL) | |
| 5 | 001-024096-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |
| (1-3/4" PLUNGER) | | | | |
| REQ'D | Part No. | DESCRIPTION | | ITEM |
| BILL OF MATERIAL | | | | |

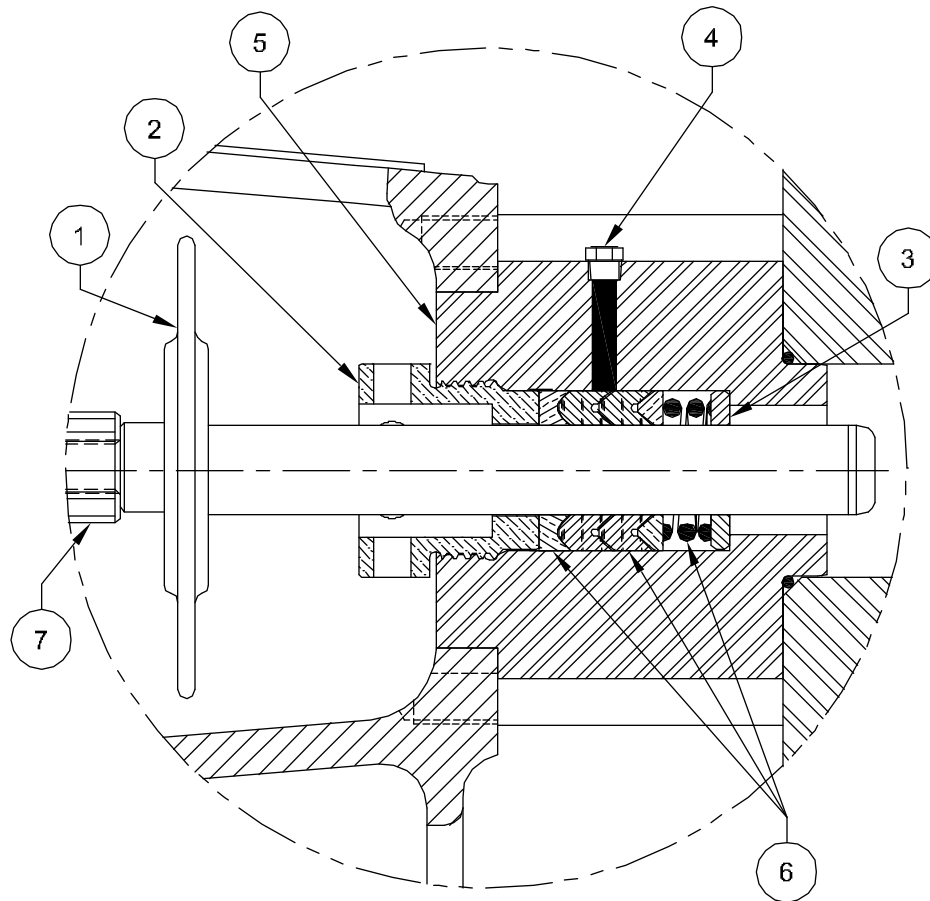
80

| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: ASSEMBLY, PLUNGER KIT BRAID STYLE PACKING, 1-1/4" THRU 1-3/4" 217Q-4H & 163Q-4H | | | |
| DWG No.: | SCALE: | REV | SHT.: |
| 118597 | NONE | A | 5 OF 5 |

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 7 |
| 5 | 432-114238-473 | | 1043-4 | |
| 5 | 432-114238-340 | PACKING | 1068-4 | 6 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010950-575 | | (SS) | |
| 5 | 001-010950-235 | | (STL) | |
| 5 | 001-010950-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AEC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-1/4" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------------------------|----------|-------------|------|
| | | | |
| BILL OF MATERIAL | | | |



NOTE

1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118598, SHEETS 1 THRU 5.

NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
"SSF-4" STYLE PKG, 1-1/4" THRU 1-3/4" PLGR
217Q-4H & 163Q-4H

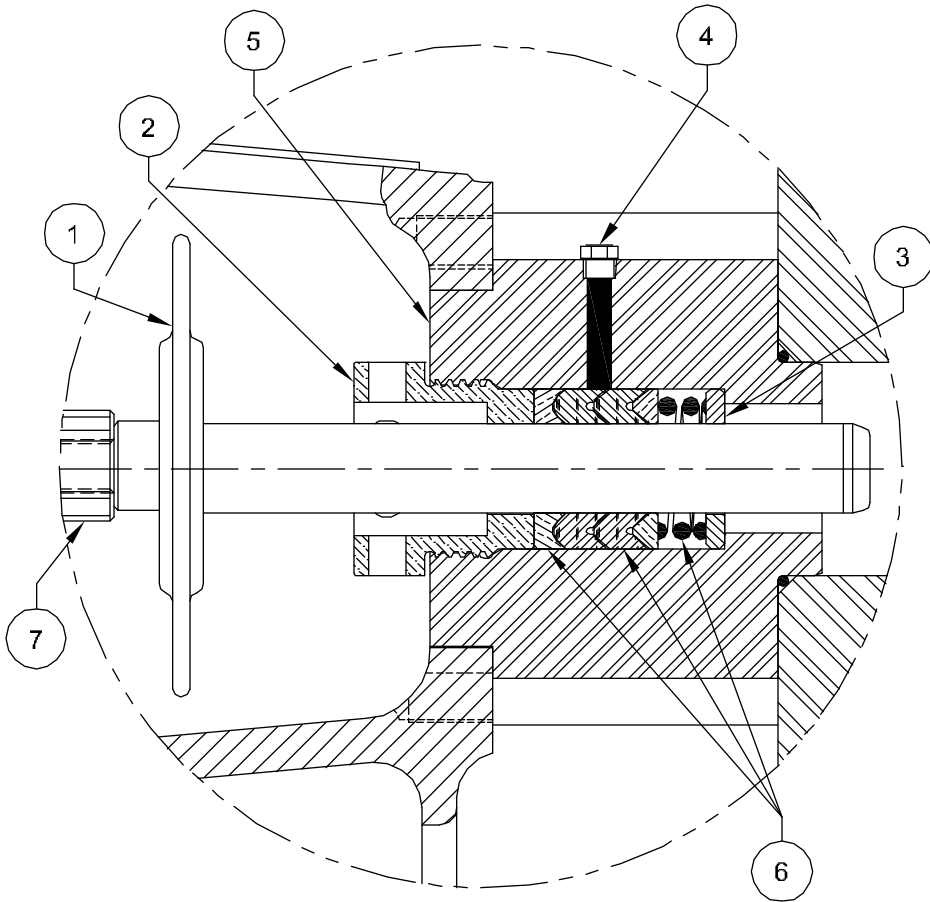
| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118598 | SCALE: NONE | REV A | SHT.: 1 OF 5 |
|--------------------|----------------|----------|-----------------|

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 7 |
| 5 | 432-138238-473 | | 1043-4 | |
| 5 | 432-138238-340 | PACKING | 1068-4 | 6 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-008913-575 | | (SS) | |
| 5 | 001-008913-235 | | (STL) | |
| 5 | 001-008913-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | ADC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-3/8" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |

BILL OF MATERIAL



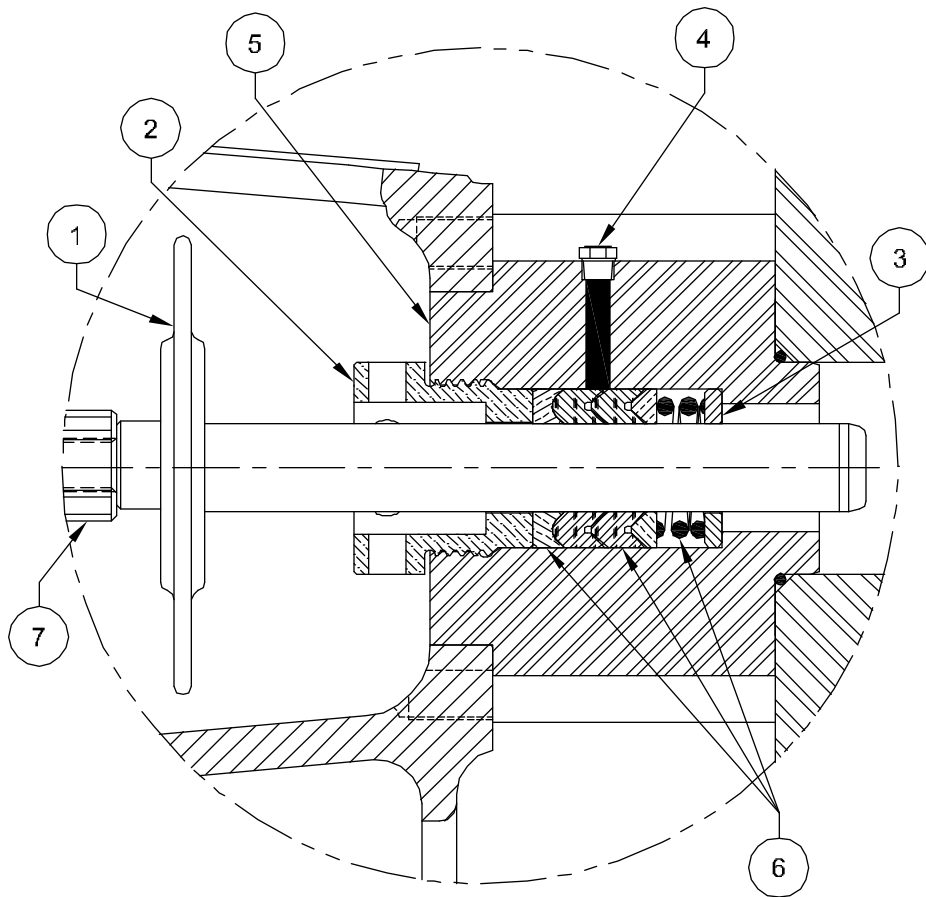
NOTE

1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118598, SHEETS 1 THRU 5.

NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
"SSF-4" STYLE PKG, 1-1/4" THRU 1-3/4" PLGR
217Q-4H & 163Q-4H

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118598 | SCALE: NONE | REV A | SHT.: 2 OF 5 |
|--------------------|----------------|----------|-----------------|



| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 7 |
| 5 | 432-112238-473 | PACKING | 1043-4 | |
| 5 | 432-112238-340 | PACKING | 1068-4 | 6 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010949-575 | | (SS) | |
| 5 | 001-010949-235 | | (STL) | |
| 5 | 001-010949-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | ACC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-1/2" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |

BILL OF MATERIAL

NOTE
 1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118598, SHEETS 1 THRU 5.

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
 ASSEMBLY, PLUNGER KIT
 "SSF-4" STYLE PKG, 1-1/4" THRU 1-3/4" PLGR
 217Q-4H & 163Q-4H

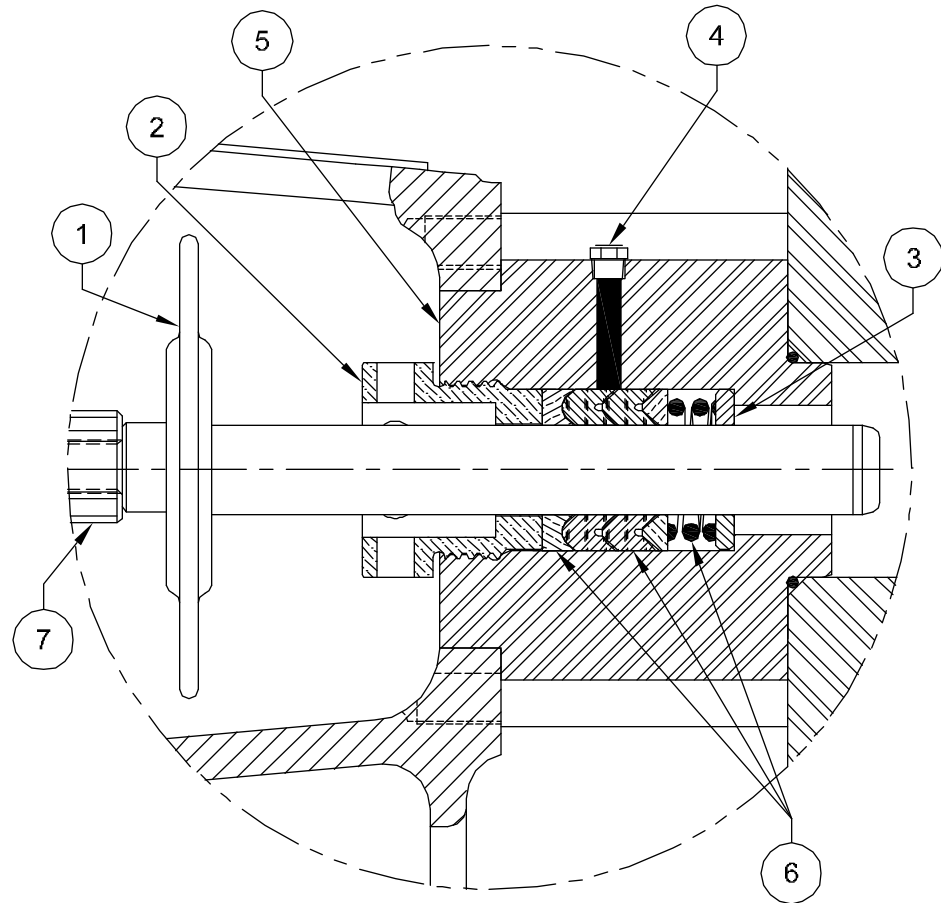
| | | | |
|-----------------|-------------|-------|--------------|
| DWG No.: 118598 | SCALE: NONE | REV A | SHT.: 3 OF 5 |
|-----------------|-------------|-------|--------------|

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 7 |
| 5 | 432-158238-473 | | 1043-4 | |
| 5 | 432-158238-340 | PACKING | 1068-4 | 6 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-010962-575 | | (SS) | |
| 5 | 001-010962-235 | | (STL) | |
| 5 | 001-010962-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | ABC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-5/8" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
|-------|----------|-------------|------|

BILL OF MATERIAL



NOTE
1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118598,
SHEETS 1 THRU 5.

NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
ASSEMBLY, PLUNGER KIT
"SSF-4" STYLE PKG, 1-1/4" THRU 1-3/4" PLGR
217Q-4H & 163Q-4H

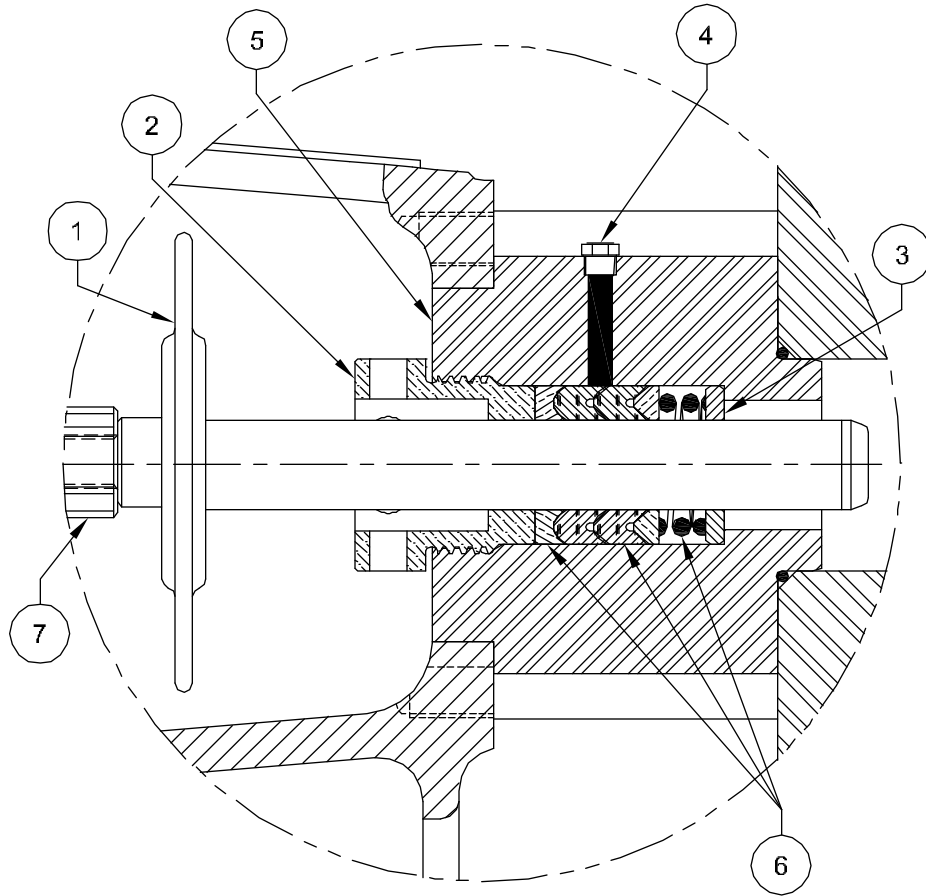
| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118598 | SCALE: NONE | REV A | SHT.: 4 OF 5 |
|--------------------|----------------|----------|-----------------|

| | | | | |
|---|----------------|----------------|--------|---|
| 5 | 001-028470-402 | ADAPTER ROD | (SS) | 7 |
| 5 | 432-134238-473 | | 1043-4 | |
| 5 | 432-134238-340 | PACKING | 1068-4 | 6 |
| 5 | AAC-118464-402 | | (SS) | |
| 5 | AAC-118464-270 | STUFFING BOX | (STL) | 5 |
| 5 | 170-018002-278 | PIPE PLUG | (SS) | 4 |
| 5 | 001-024096-575 | | (SS) | |
| 5 | 001-024096-235 | | (STL) | |
| 5 | 001-024096-302 | THROAT BUSHING | (BRZ) | 3 |
| 5 | AAC-013800-E16 | GLAND NUT | (SS) | 2 |
| 5 | 001-007986-201 | BAFFLE DISC | | 1 |

(1-3/4" PLUNGER)

| REQ'D | Part No. | DESCRIPTION | ITEM |
|-------|----------|-------------|------|
| | | | |

BILL OF MATERIAL



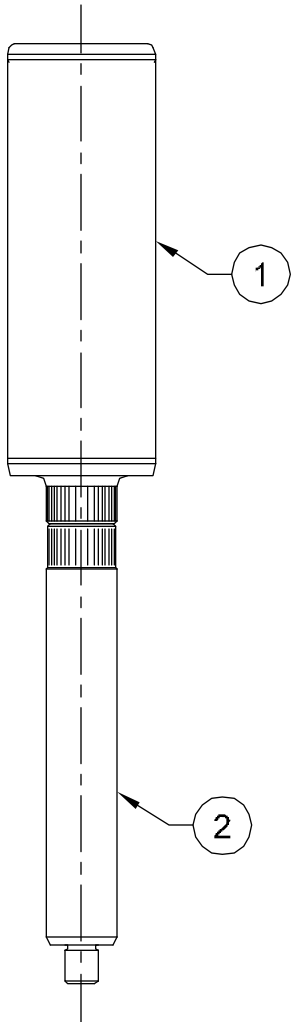
NOTE

1) FOR ALL " SSF-4 " STYLE PACKING SEE DRAWING 118598, SHEETS 1 THRU 5.

NOV NATIONAL OILWELL VARCO
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

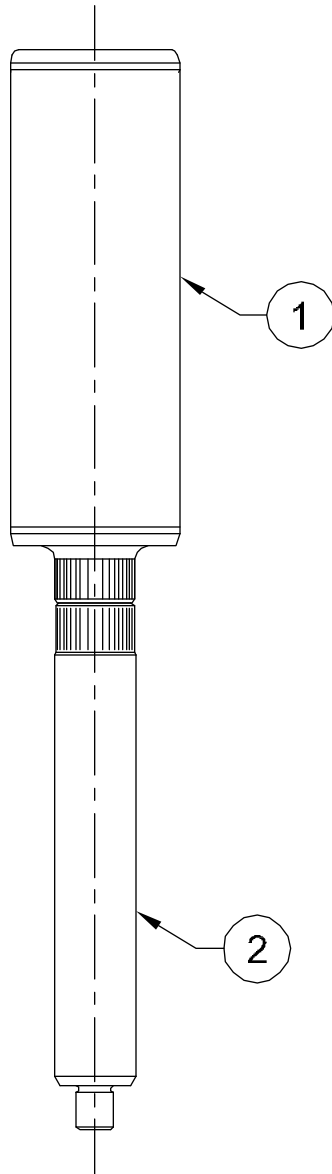
TITLE:
ASSEMBLY, PLUNGER KIT
"SSF-4" STYLE PKG, 1-1/4" THRU 1-3/4" PLGR
217Q-4H & 163Q-4H

| | | | |
|--------------------|----------------|----------|-----------------|
| DWG No.: 118598 | SCALE: NONE | REV A | SHT.: 5 OF 5 |
|--------------------|----------------|----------|-----------------|



| | | | |
|-----------------------------|-----------------|---------------------------------------|-------------|
| 5 | 001-028470-402 | ADAPTER ROD | 2 |
| 5 | 002-028499-E24 | 3-3/8" DIA. PLUNGER, CHROME OXIDE | |
| 5 | AGB-028496-E23 | 3-3/8" DIA. PLUNGER, COBALT | |
| 5 | 002-028499-999 | 3-3/8" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028499-E26 | 3-3/8" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 3-3/8" DIA. PLUNGERS | | | |
| 5 | 002-028498-E24 | 3-1/4" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028498-E23 | 3-1/4" DIA. PLUNGER, COBALT | |
| 5 | 002-028498-999 | 3-1/4" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028498-E26 | 3-1/4" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 3-1/4" DIA. PLUNGERS | | | |
| 5 | AEB-028496-E24 | 3" DIA. PLUNGER, CHROME OXIDE | |
| 5 | AEB-028496-E23 | 3" DIA. PLUNGER, COBALT | |
| 5 | AEB-028496-E22 | 3" DIA. PLUNGER, TUNGSTEN | |
| 5 | AEB-028496-E26 | 3" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 3-1/8" DIA. PLUNGERS | | | |
| 5 | 002-028497-E24 | 3" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028497-E23 | 3" DIA. PLUNGER, COBALT | |
| 5 | 002-028479-999 | 3" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028497-E26 | 3" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 3" DIA. PLUNGERS | | | |
| 5 | 002-028782-E24 | 2-7/8" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028782-E23 | 2-7/8" DIA. PLUNGER, COBALT | |
| 5 | 002-028782-999 | 2-7/8" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028782-E26 | 2-7/8" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 2-7/8" DIA. PLUNGERS | | | |
| 5 | 002-028496-E24 | 2-3/4" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028496-E23 | 2-3/4" DIA. PLUNGER, COBALT | |
| 5 | 002-028496-999 | 2-3/4" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028496-E26 | 2-3/4" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 2-3/4" DIA. PLUNGERS | | | |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: PLUNGERS 2-3/4" THRU 3-3/8" HARD SURFACE 217Q-4L (HP200-AL) | | | |
| DWG No.: | SCALE: | REV | SHT.: |
| 118599 | NONE | A | 1 OF 1 |

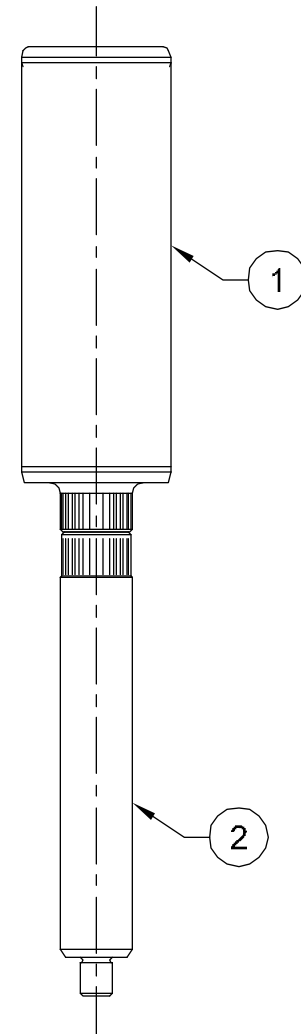


| 5 | 001-028470-402 | ADAPTER ROD | 2 |
|-------------------------|----------------|------------------------------|------|
| 5 | 002-028503-999 | 3-3/8" DIA. PLUNGER, CERAMIC | 1 |
| | | 3-3/8" DIA. PLUNGERS | |
| 5 | 002-028502-999 | 3-1/4" DIA. PLUNGER, CERAMIC | 1 |
| | | 3-1/4" DIA. PLUNGERS | |
| 5 | AEB-028500-E33 | 3-1/8" DIA. PLUNGER, CERAMIC | 1 |
| | | 3-1/8" DIA. PLUNGERS | |
| 5 | 002-028501-999 | 3" DIA. PLUNGER, CERAMIC | 1 |
| | | 3" DIA. PLUNGERS | |
| 5 | ACB-028500-E33 | 2-7/8" DIA. PLUNGER, CERAMIC | 1 |
| | | 2-7/8" DIA. PLUNGERS | |
| 5 | 002-028500-999 | 2-3/4" DIA. PLUNGER, CERAMIC | 1 |
| | | 2-3/4" DIA. PLUNGERS | |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

87

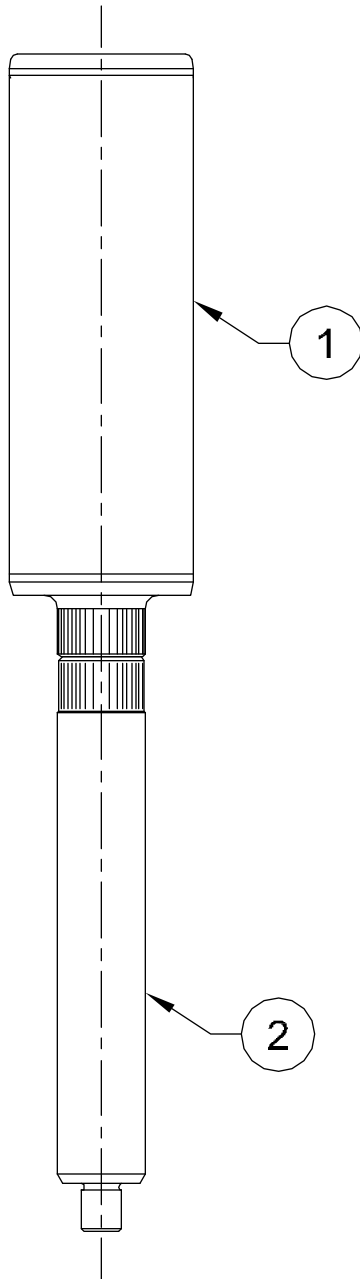
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|--|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: PLUNGERS 2-3/4" THRU 3-3/8" CERAMIC 217Q-4L (HP200-AL) | | | |
| DWG No: | 118600 | SCALE: | NONE |
| REV | A | SHT.: | 1 of 1 |

| | | | |
|----------------------------|----------------|---------------------------------------|------|
| 5 | 002-028470-402 | ADAPTER ROD | 2 |
| 5 | 002-028859-999 | 2-1/2" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028478-E23 | 2-1/2" DIA. PLUNGER, COBALT | |
| 5 | 002-028478-999 | 2-1/2" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028478-E26 | 2-1/2" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 2-1/2" DIA. PLUNGER | | | |
| 5 | 002-028858-999 | 2-3/8" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028477-E23 | 2-3/8" DIA. PLUNGER, COBALT | |
| 5 | 002-028477-999 | 2-3/8" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028477-E26 | 2-3/8" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 2-3/8" DIA. PLUNGER | | | |
| 5 | 002-028857-999 | 2-1/4" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028476-E23 | 2-1/4" DIA. PLUNGER, COBALT | |
| 5 | 002-028476-999 | 2-1/4" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028476-E26 | 2-1/4" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 2-1/4" DIA. PLUNGER | | | |
| 5 | 002-028856-999 | 2-1/8" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028475-E23 | 2-1/8" DIA. PLUNGER, COBALT | |
| 5 | 002-028475-999 | 2-1/8" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028475-E26 | 2-1/8" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 2-1/8" DIA. PLUNGER | | | |
| 5 | 002-028855-999 | 2" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028474-E23 | 2" DIA. PLUNGER, COBALT | |
| 5 | 002-028474-999 | 2" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028474-E26 | 2" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 2" DIA. PLUNGER | | | |
| 5 | 002-028854-999 | 1-7/8" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028473-E23 | 1-7/8" DIA. PLUNGER, COBALT | |
| 5 | 002-028473-999 | 1-7/8" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028473-E26 | 1-7/8" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 1-7/8" DIA. PLUNGER | | | |
| 5 | 002-028853-999 | 1-3/4" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028472-E23 | 1-3/4" DIA. PLUNGER, COBALT | |
| 5 | 002-028472-999 | 1-3/4" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028472-E26 | 1-3/4" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 1-3/4" DIA. PLUNGER | | | |
| 5 | 002-028852-999 | 1-5/8" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-028471-E23 | 1-5/8" DIA. PLUNGER, COBALT | |
| 5 | 002-028471-999 | 1-5/8" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-028471-E26 | 1-5/8" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 1-5/8" DIA. PLUNGER | | | |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |



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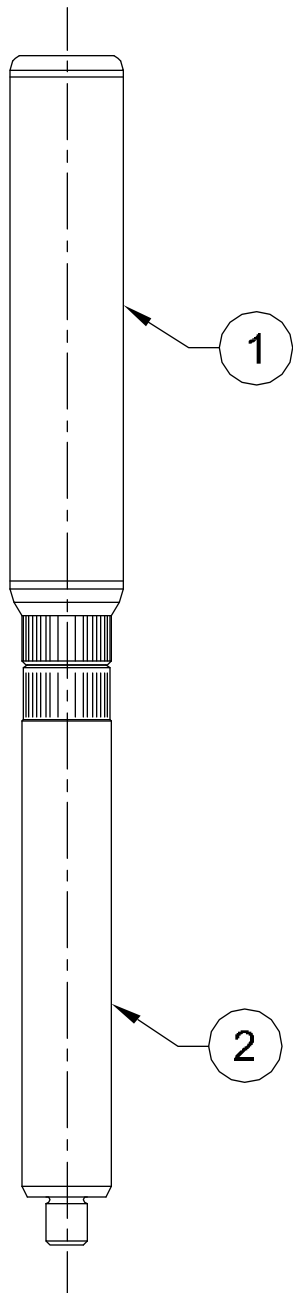
| | | | |
|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: | | | |
| PLUNGERS 1-5/8" THRU 2-1/2" HARD SURFACE 217Q-4M (HP200-4M) | | | |
| DWG No.: | SCALE: | REV | SH1.: |
| 118601 | NONE | A | 1 OF 1 |



| 5 | 002-028470-402 | ADAPTER ROD | 2 |
|-------------------------|----------------|------------------------------|------|
| 5 | 002-028490-999 | 2-1/2" DIA. PLUNGER, CERAMIC | 1 |
| 2-1/2" DIA. PLUNGERS | | | |
| 5 | 002-028489-999 | 2-3/8" DIA. PLUNGER, CERAMIC | 1 |
| 2-3/8" DIA. PLUNGERS | | | |
| 5 | 002-028488-999 | 2-1/4" DIA. PLUNGER, CERAMIC | 1 |
| 2-1/4" DIA. PLUNGERS | | | |
| 5 | 002-028487-999 | 2-1/8" DIA. PLUNGER, CERAMIC | 1 |
| 2-1/8" DIA. PLUNGERS | | | |
| 5 | 002-028486-999 | 2" DIA. PLUNGER, CERAMIC | 1 |
| 2" DIA. PLUNGERS | | | |
| 5 | 002-028485-999 | 1-7/8" DIA. PLUNGER, CERAMIC | 1 |
| 1-7/8" DIA. PLUNGERS | | | |
| 5 | 002-028484-999 | 1-3/4" DIA. PLUNGER, CERAMIC | 1 |
| 1-3/4" DIA. PLUNGERS | | | |
| 5 | 002-028483-999 | 1-5/8" DIA. PLUNGER, CERAMIC | 1 |
| 1-5/8" DIA. PLUNGERS | | | |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

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| | | | |
|--|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: PLUNGERS 1-5/8" THRU 2-1/2" CERAMIC 217Q-4M (HP200-4M) | | | |
| DWG No.: | SCALE: | REV | SHT.: |
| 118602 | NONE | A | 1 OF 1 |



| | | | |
|----------------------------|-----------------|---------------------------------------|-------------|
| 5 | 001-028470-402 | ADAPTER ROD | 2 |
| 5 | 002-029035-E24 | 1-3/4" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-029035-E23 | 1-3/4" DIA. PLUNGER, COBALT | |
| 5 | 002-029035-999 | 1-3/4" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-029035-000 | 1-3/4" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 1-3/4" DIA. PLUNGER | | | |
| 5 | 002-029034-E24 | 1-5/8" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-029034-E23 | 1-5/8" DIA. PLUNGER, COBALT | |
| 5 | 002-029034-999 | 1-5/8" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-029034-000 | 1-5/8" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 1-5/8" DIA. PLUNGER | | | |
| 5 | 002-029033-E24 | 1-1/2" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-029033-E23 | 1-1/2" DIA. PLUNGER, COBALT | |
| 5 | 002-029033-999 | 1-1/2" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-029033-E26 | 1-1/2" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 1-1/2" DIA. PLUNGER | | | |
| 5 | 002-029032-E24 | 1-3/8" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-029032-E23 | 1-3/8" DIA. PLUNGER, COBALT | |
| 5 | 002-029032-999 | 1-3/8" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-029032-E26 | 1-3/8" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 1-3/8" DIA. PLUNGER | | | |
| 5 | 002-029031-E24 | 1-1/4" DIA. PLUNGER, CHROME OXIDE | |
| 5 | 002-029031-E23 | 1-1/4" DIA. PLUNGER, COBALT | |
| 5 | 002-029031-999 | 1-1/4" DIA. PLUNGER, TUNGSTEN | |
| 5 | 002-029031-E26 | 1-1/4" DIA. PLUNGER, PREMIUM TUNGSTEN | 1 |
| 1-1/4" DIA. PLUNGER | | | |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

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NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

PLUNGERS 1-1/4" THRU 1-3/4"
HARD SURFACE
217Q-4H (HP200-4H)

DWG No.:

118603

SCALE:

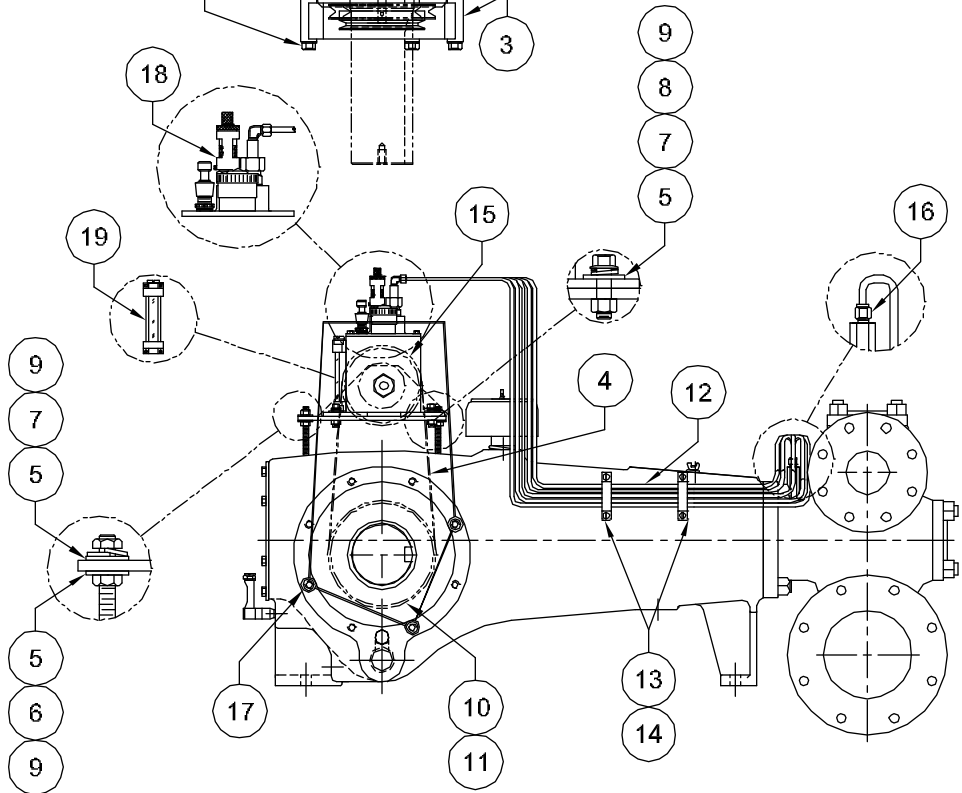
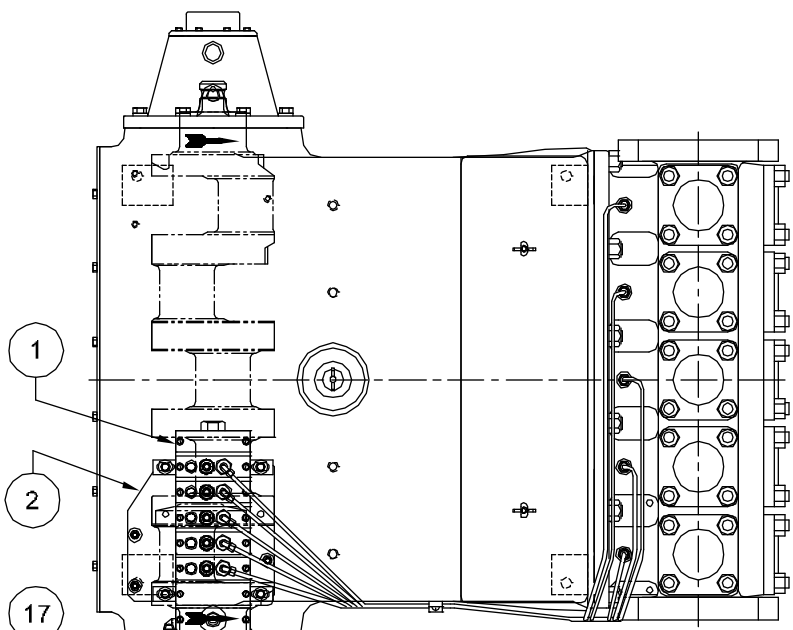
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REV

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SHT.:

1 OF 1



SAME PLUMBING FOR CASTINGS AND BILLETS (CASTING SHOWN).

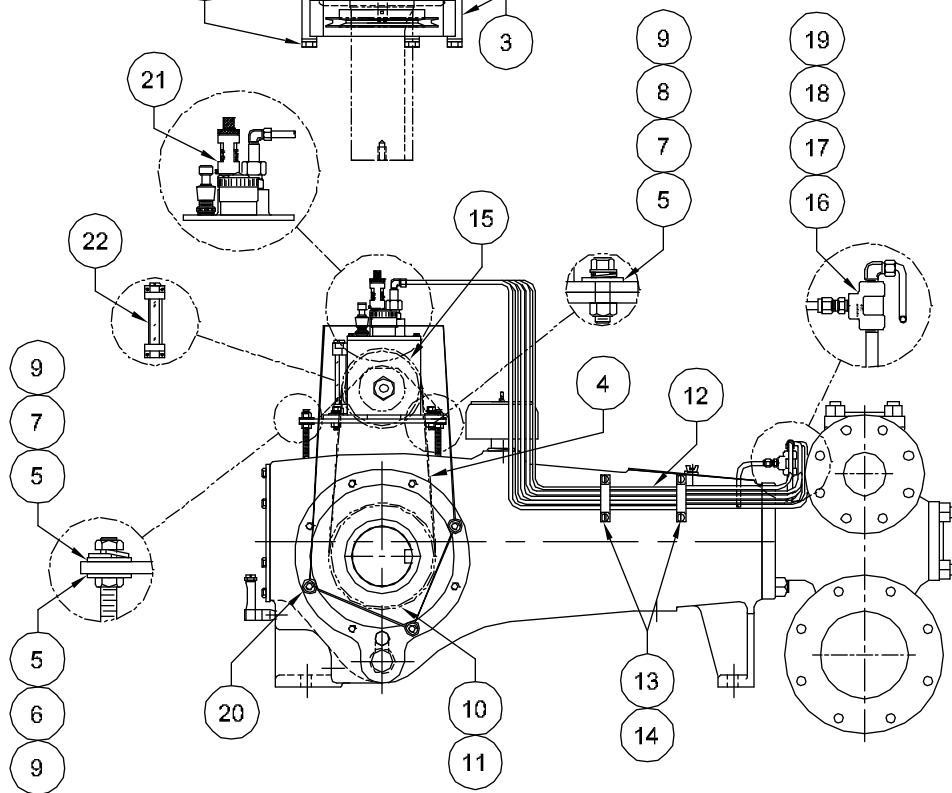
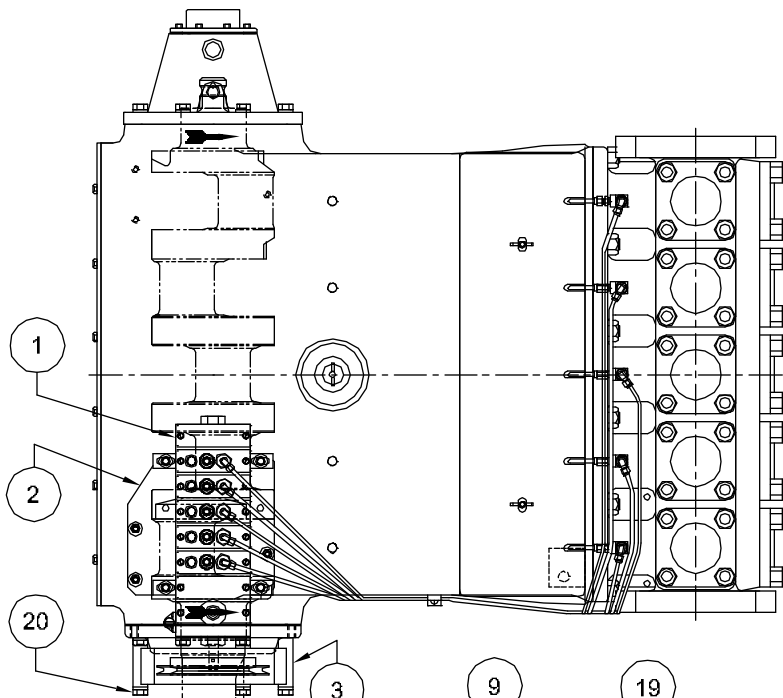
| | | | |
|--------------------------|----------------|-----------------------------|------|
| 1 | GAS-105265-000 | SIGHT GLASS | 19 |
| 1 | GAS-105264-000 | PUMP ASSEMBLY w/ GASKET | 18 |
| REPLACEMENT PARTS | | | |
| 3 | 100-012434-290 | CAP SCREW 1/2" x 4-3/4" | 17 |
| 5 | GAS-105240-000 | CHECK VALVE, 1/8" NPT | 16 |
| 1 | 001-011597-999 | SHEAVE, DRIVEN | 15 |
| 4 | 126-006516-405 | DRIVE SCREW | 14 |
| 2 | 001-025128-405 | LINE CLAMP | 13 |
| 300" | 330-002003-365 | TUBING, 1/4" | 12 |
| 2 | 119-014012-220 | SET SCREW | 11 |
| 1 | 001-028429-231 | SHEAVE, DRIVER | 10 |
| 10 | 155-038100-286 | WASHER, 3/8" | 9 |
| 4 | 100-038114-405 | CAP SCREW 3/8" X 1-1/4" LG. | 8 |
| 7 | 154-038068-286 | LOCK WASHER 3/8" | 7 |
| 3 | 104-038400-286 | STUD, 3/8" X 4" LG | 6 |
| 10 | 133-038016-286 | NUT, ZINC PLATED 3/8" | 5 |
| 1 | 421-100420-001 | V-BELT | 4 |
| 1 | AAB-118614-C02 | BELT GUARD | 3 |
| 1 | 001-001718-231 | LUBRICATOR BRACKET LH/RH | 2 |
| 1 | 001-011154-999 | LUBRICATOR, LHD, (5) FEED | |
| 1 | GAS-105239-000 | LUBRICATOR, RHD, (5) FEED | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

NOTE:
RIGHT HAND DRIVE POWER PUMP (SHOWN) REQUIRES
RIGHT HAND DRIVE LUBRICATOR.

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE:
**ASSEMBLY, PACKING LUBRICATOR
 (RHD OR LHD) RHD SHOWN
 217Q-4 (HP200)**

DWG No.: 118573 SCALE: NONE REV: A SHT.: 1 OF 1



SAME PLUMBING FOR CASTINGS AND BILLETS (CASTING SHOWN).

| | | | |
|--------------------------|-----------------|--|-------------|
| 1 | GAS-105265-000 | SIGHT GLASS | 22 |
| 1 | GAS-105264-000 | PUMP ASSEMBLY w/ GASKET | 21 |
| REPLACEMENT PARTS | | | |
| 3 | 100-012434-290 | CAP SCREW 1/2" x 4-3/4" | 20 |
| 5 | 462-040012-278 | MALE CONN., STR., 1/4" TUBE x 1/8 NPT | 19 |
| 5 | 462-040022-278 | MALE CONN., 90 DEG 1/4" TUBE x 1/8 NPT | 18 |
| 5 | 157-018112-278 | PIPE NIPPLE, 1/8" NPT | 17 |
| 5 | 469-020002-278 | PIPE TEE, 1/8" NPT | 16 |
| 1 | 001-011597-999 | SHEAVE, DRIVEN | 15 |
| 4 | 126-006516-405 | DRIVE SCREW, | 14 |
| 2 | 001-025128-405 | LINE CLAMP | 13 |
| 300" | 330-002003-365 | TUBING, 1/4" | 12 |
| 2 | 119-014012-290 | SET SCREW | 11 |
| 1 | 001-028429-231 | SHEAVE, DRIVER | 10 |
| 10 | 155-038100-286 | WASHER, 3/8" | 9 |
| 4 | 100-038114-405 | CAP SCREW 3/8" X 1-1/4" LG. | 8 |
| 7 | 154-038068-220 | LOCK WASHER 3/8" | 7 |
| 3 | 104-038400-286 | STUD, 3/8" X 4" LG | 6 |
| 10 | 133-038016-286 | NUT, ZINC PLATED 3/8" | 5 |
| 1 | 421-100420-001 | V-BELT | 4 |
| 1 | AAB-118614-C02 | BELT GUARD | 3 |
| 1 | 001-001718-231 | LUBRICATOR BRACKET LH/RH | 2 |
| 1 | 001-011154-999 | LUBRICATOR, LHD, (5) FEED | |
| 1 | GAS-105239-000 | LUBRICATOR, RHD, (5) FEED | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

NOTE:
RIGHT HAND DRIVE POWER PUMP (SHOWN) REQUIRES
RIGHT HAND DRIVE LUBRICATOR.

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, D.O.H. LUBRICATOR
(DRIP ON THE HEEL) - (RHD OR LHD)
217Q-4 (HP200)

DWG No.:

118574

SCALE:

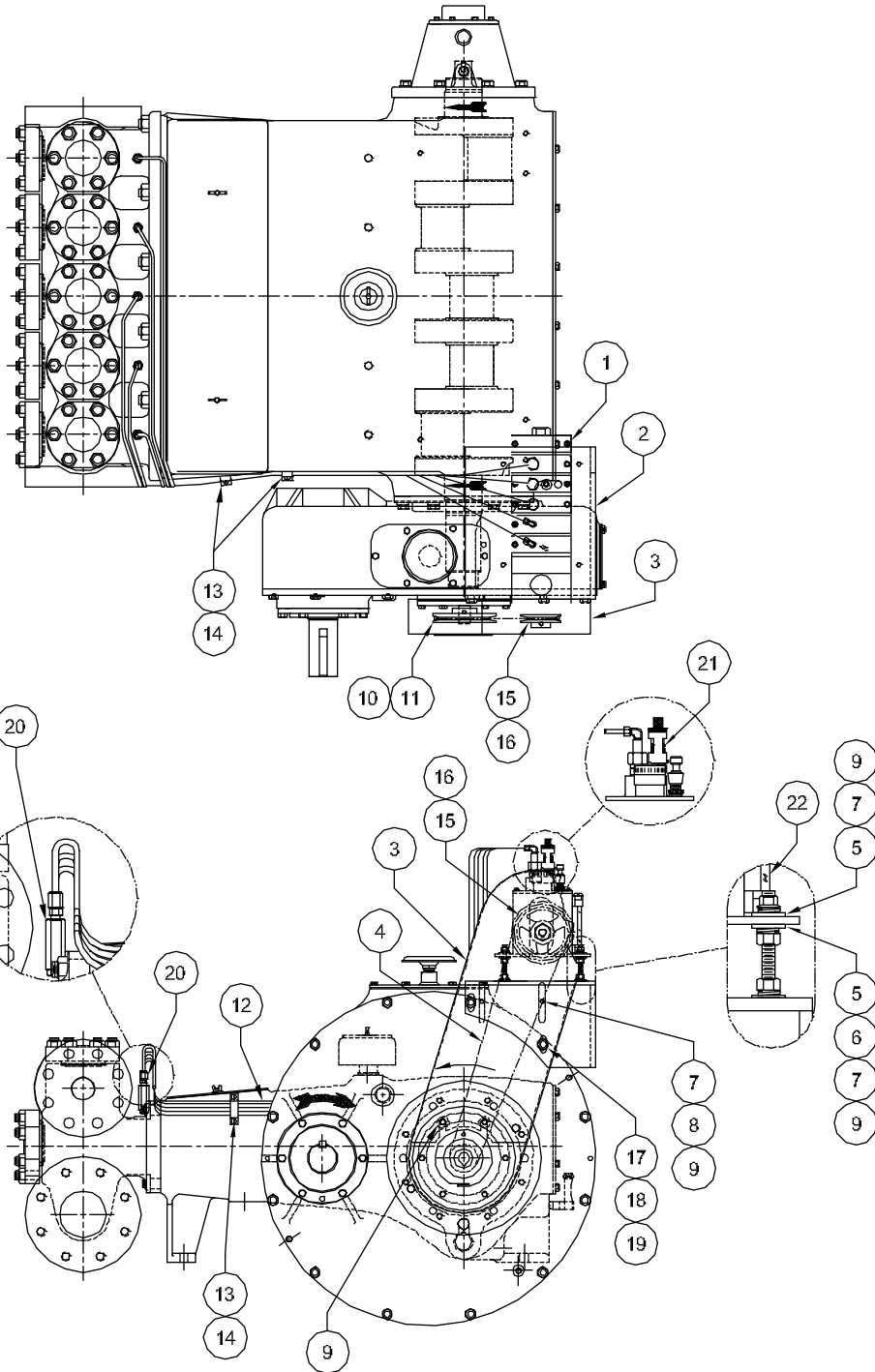
NONE

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1 of 1



SAME PLUMBING FOR CASTINGS AND BILLETS (CASTING SHOWN).

| | | | |
|--------------------------|-----------------|---------------------------|-------------|
| 1 | GAS-105265-000 | SIGHT GLASS | 22 |
| 1 | GAS-105264-000 | PUMP ASSEMBLY w/ GASKET | 21 |
| REPLACEMENT PARTS | | | |
| 5 | GAS-105240-000 | CHECK VALVE, 1/8" NPT | 20 |
| 2 | 154-012087-286 | LOCK WASHER 1/2" | 19 |
| 2 | 155-012138-286 | WASHER 1/2" | 18 |
| 2 | 100-012134-290 | CAP SCREW 1/2" x 1-3/4" | 17 |
| 1 | 420-020509-019 | HUB, DRIVEN, 5/8" BORE | 16 |
| 1 | 419-101050-999 | SHEAVE, DRIVEN, 5" DD | 15 |
| 6 | 126-006516-405 | DRIVE SCREW | 14 |
| 3 | 001-025128-405 | LINE CLAMP | 13 |
| 300" | 330-002003-365 | TUBING, 1/4" | 12 |
| 1 | 420-011000-000 | HUB, PUMP DRIVER, 1" BORE | 11 |
| 1 | 419-101032-999 | SHEAVE, DRIVER, 3.2" DD | 10 |
| 16 | 155-038100-286 | WASHER, 3/8" | 9 |
| 2 | 100-038058-290 | CAP SCREW 3/8" X 5/8" LG. | 8 |
| 14 | 154-038068-286 | LOCK WASHER 3/8" | 7 |
| 4 | 104-038400-286 | STUD, 3/8" X 4" LG | 6 |
| 12 | 133-038016-286 | NUT, ZINC PLATED 3/8" | 5 |
| 1 | 421-100420-008 | V-BELT | 4 |
| 1 | AAB-116599-C02 | BELT GUARD | 3 |
| 1 | AAB-116600-231 | LUBRICATOR BRACKET | 2 |
| 1 | 001-011154-999 | LUBRICATOR, LHD, (5) FEED | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

NOTE:
LEFT HAND DRIVE POWER PUMP (SHOWN) REQUIRES
RIGHT HAND DRIVE LUBRICATOR.

NOV NATIONAL OILWELL VARCO

HOUSTON, TEXAS, U.S.A.

ENGINEERING, TULSA, OKLAHOMA

TITLE:

ASSEMBLY, PACKING LUBRICATOR
W/ GEAR REDUCER (LHD)
MODEL: 217Q-4 (HP200)

DWG No.:

118625

SCALE:

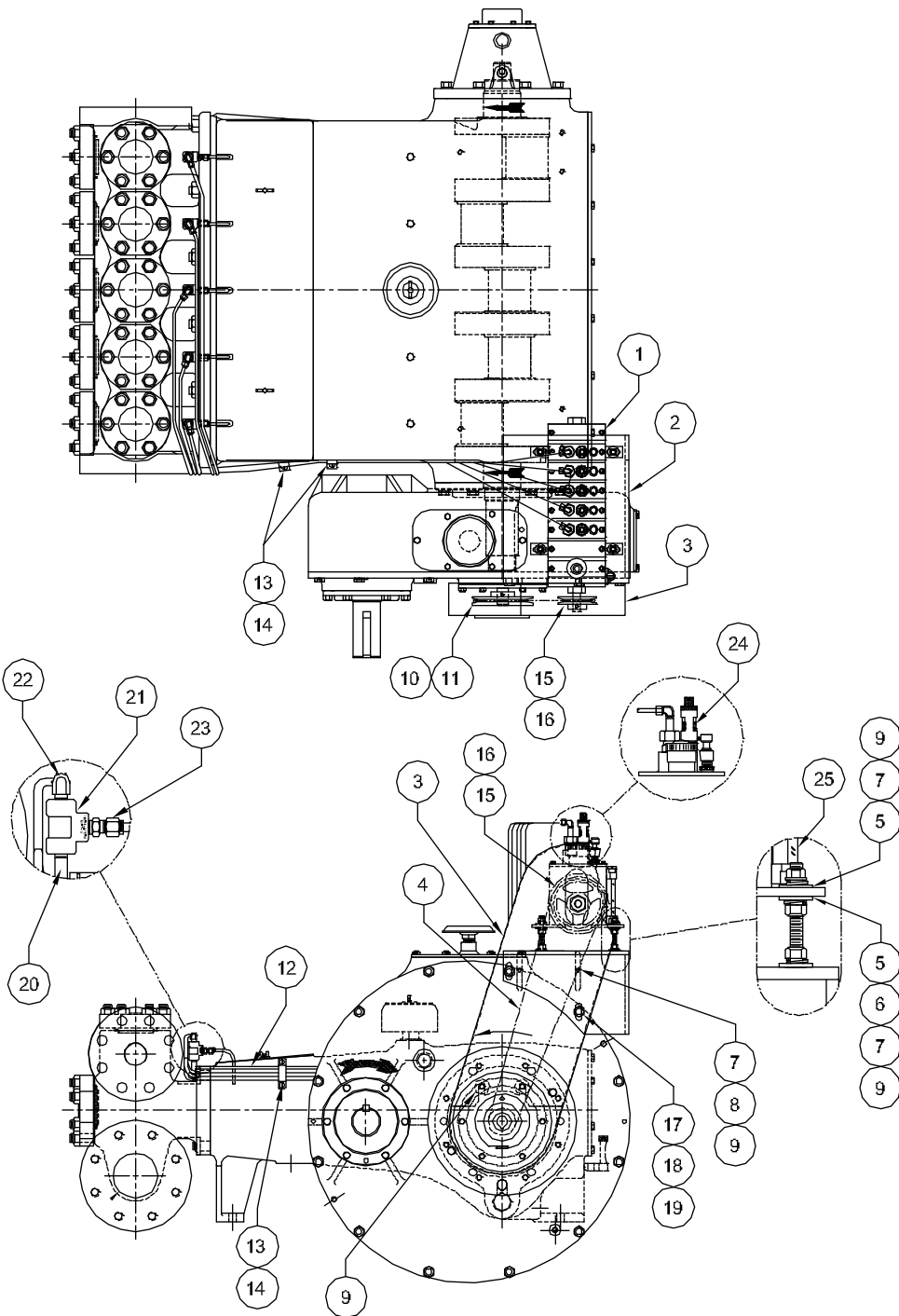
NONE

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1 OF 1



SAME PLUMBING FOR CASTINGS AND BILLETS (CASTING SHOWN).

| | | | |
|--------------------------|----------------|---|------|
| 1 | GAS-105265-000 | SIGHT GLASS | 25 |
| 1 | GAS-105264-000 | PUMP ASSEMBLY w/ GASKET | 24 |
| REPLACEMENT PARTS | | | |
| 5 | 462-040012-278 | MALE CONN., STR., 1/4" TUBE x 1/8" NPT | 23 |
| 5 | 462-040022-278 | MALE CONN., 90 DEG 1/4" TUBE x 1/8" NPT | 22 |
| 5 | 469-020002-278 | PIPE TEE, 1/8" NPT | 21 |
| 5 | 157-018112-278 | PIPE NIPPLE, 1/8" NPT | 20 |
| 2 | 154-012087-286 | LOCK WASHER 1/2" | 19 |
| 2 | 155-012138-286 | WASHER 1/2" | 18 |
| 2 | 100-012134-290 | CAP SCREW 1/2" x 1-3/4" | 17 |
| 1 | 420-020509-019 | HUB, DRIVEN, 5/8" BORE | 16 |
| 1 | 419-101050-999 | SHEAVE, DRIVEN, 5" DD | 15 |
| 6 | 126-006516-405 | DRIVE SCREW | 14 |
| 3 | 001-025128-405 | LINE CLAMP | 13 |
| 300" | 330-002003-365 | TUBING, 1/4" | 12 |
| 1 | 420-011000-000 | HUB, PUMP DRIVER, 1" BORE | 11 |
| 1 | 419-010032-999 | SHEAVE, DRIVER, 3.2" DD | 10 |
| 16 | 155-038100-286 | WASHER, 3/8" | 9 |
| 2 | 100-038058-290 | CAP SCREW 3/8" X 5/8" LG. | 8 |
| 14 | 154-038068-286 | LOCK WASHER 3/8" | 7 |
| 4 | 104-038400-286 | STUD, 3/8" X 4" LG | 6 |
| 12 | 133-038016-286 | NUT, ZINC PLATED 3/8" | 5 |
| 1 | 421-100420-008 | V-BELT | 4 |
| 1 | AAB-116599-C02 | BELT GUARD | 3 |
| 1 | AAB-116600-231 | LUBRICATOR BRACKET | 2 |
| 1 | 001-011154-999 | LUBRICATOR, LHD, (5) FEED | 1 |
| REQ'D | Part No. | DESCRIPTION | ITEM |
| BILL OF MATERIAL | | | |

NOTE:
LEFT HAND DRIVE POWER PUMP (SHOWN) REQUIRES
RIGHT HAND DRIVE LUBRICATOR.

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|---|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: | | | |
| ASSEMBLY, PACKING LUBRICATOR W/ GEAR REDUCER, D.O. H. (LHD) MODEL: 217Q-4 (HP200) | | | |
| DWG No.: | SCALE: | REV: | SHT.: |
| 118626 | NONE | A | 1 OF 1 |

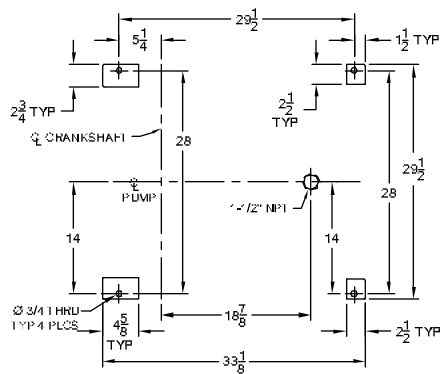
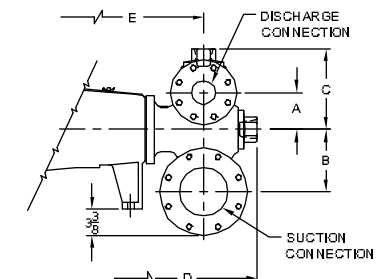
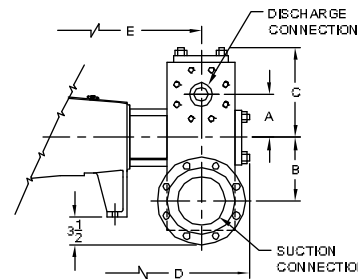
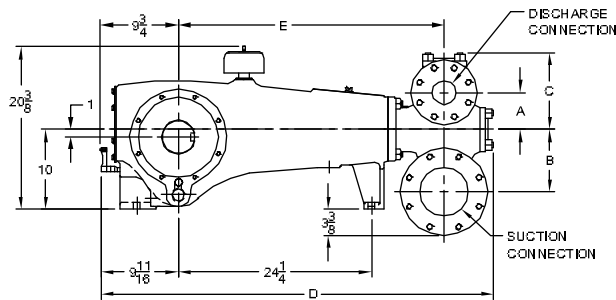
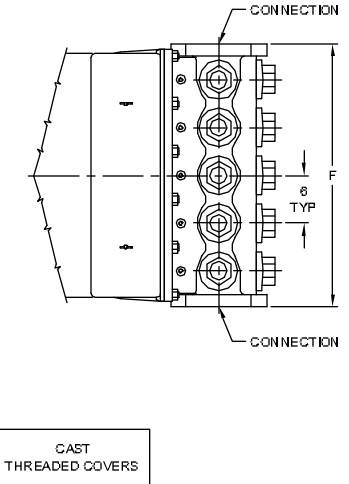
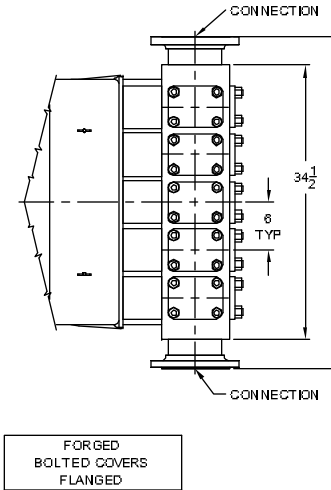
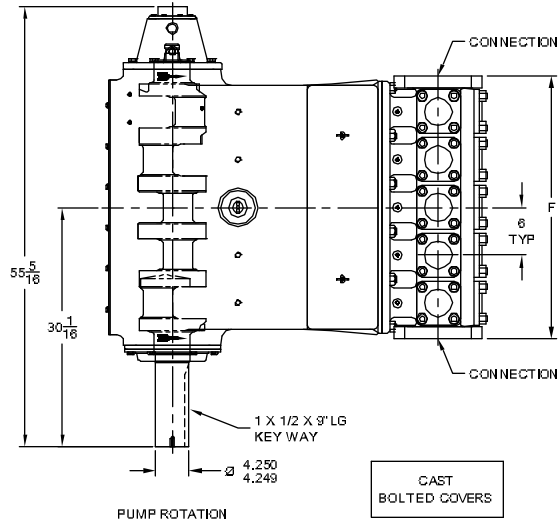
NOTES:

1. RIGHT HAND DRIVE SHOWN, FOR LEFT HAND DRIVE MOVE SHAFT AND DIMENSIONS TO THE OPPOSITE SIDE SHOWN.
2. DIMENSIONS SHOWN ARE FOR INSTALLATION PURPOSES.

FIELD CONNECTIONS

| PUMP TYPE | DIMENSIONS IN INCHES | |
|-----------|---------------------------|-------------------------|
| | DISCHARGE CONNECTION SIZE | SUCTION CONNECTION SIZE |
| 217Q-4L | 3" - 600# ANSI | 6" - 150# ANSI |

| PUMP TYPE | DIMENSIONS IN INCHES | | | | | |
|-----------------------|----------------------|-------|--------|--------|---------|--------|
| | A | B | C | D | E | F |
| CAST, BOLTED COVERS | 4-5/8 | 7-7/8 | 9-5/8 | 49-3/8 | 33-3/8 | 33 |
| FORGED BOLTED, COVERS | 5-3/8 | 8 | 11-1/4 | 51-1/4 | 35-5/16 | 41-5/8 |
| CAST, THREADED COVERS | 4-5/8 | 7-7/8 | 10-1/8 | 49-5/8 | 33-3/8 | 33 |



NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE: **GENERAL DIMENSION, RHD
 "L" CLASS FLUID END
 217Q-4L (HP200AL)**

| | | | |
|-----------------|-------------|--------|--------------|
| DWG No.: 118604 | SCALE: NONE | REV: A | SHT.: 1 OF 1 |
|-----------------|-------------|--------|--------------|

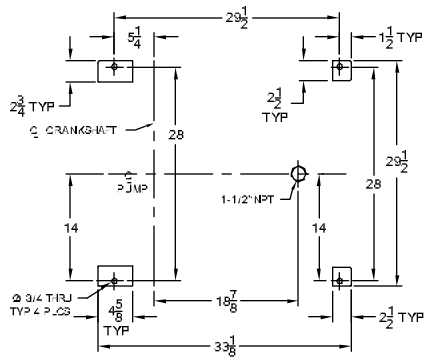
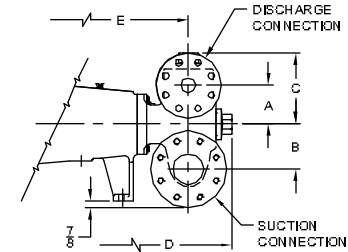
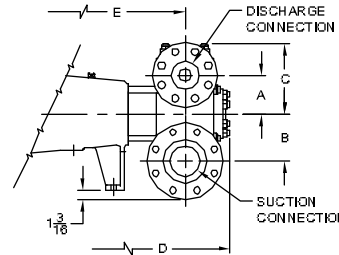
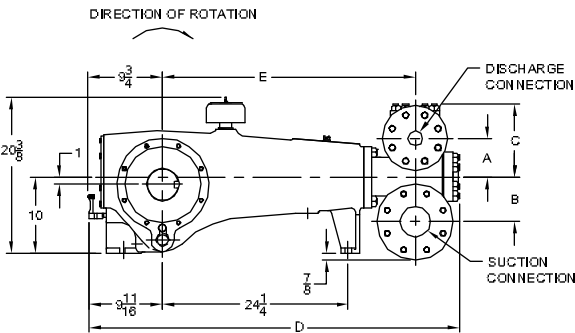
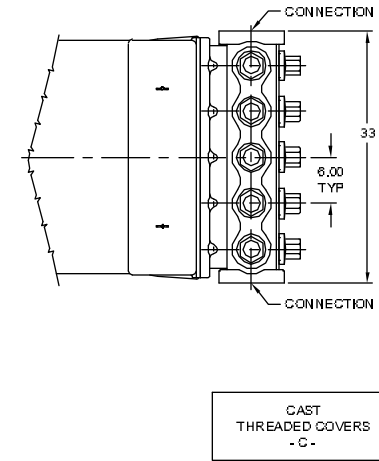
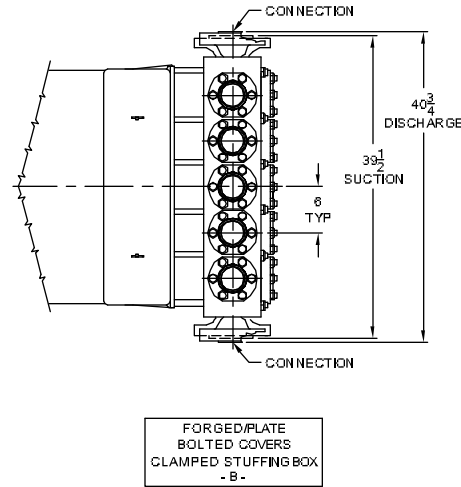
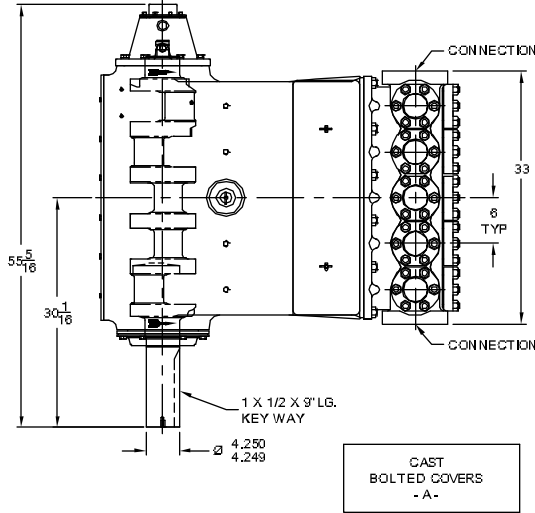
NOTES:

1. RIGHT HAND DRIVE SHOWN, FOR LEFT HAND DRIVE MOVE SHAFT AND DIMENSIONS TO THE OPPOSITE SIDE SHOWN.
2. DIMENSIONS SHOWN ARE FOR INSTALLATION PURPOSES.

FIELD CONNECTIONS

| PUMP TYPE | DIMENSIONS IN INCHES | | |
|-----------|---------------------------|-------------------------|----------------|
| | DISCHARGE CONNECTION SIZE | SUCTION CONNECTION SIZE | |
| 217Q-4M | - A - | 2" - 1500# ANSI | 4" - 300# ANSI |
| | - B - | 2" - 1500# ANSI | 4" - 300# ANSI |
| | - C - | 2" - 1500# ANSI | 4" - 300# ANSI |

| PUMP TYPE | DIMENSIONS IN INCHES | | | | |
|---------------------------------|----------------------|--------|--------|----------|--------|
| | A | B | C | D | E |
| CAST, BOLTED COVERS (-A-) | 5-1/16 | 5-7/8 | 9-1/2 | 48-11/16 | 33 |
| FORGED/PLATE, CLAMPED BOX (-B-) | 5-1/16 | 6-3/16 | 9-1/4 | 49-3/8 | 33-5/8 |
| CAST, THREADED COVERS (-C-) | 5-1/16 | 5-7/8 | 9-5/16 | 47-7/8 | 33 |



MOUNTING FEET DETAIL

NOV NATIONAL OILWELL VARCO
 HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE: **GENERAL DIMENSION, RHD
 "M" CLASS FLUID END
 217Q-4M (HP200AM)**

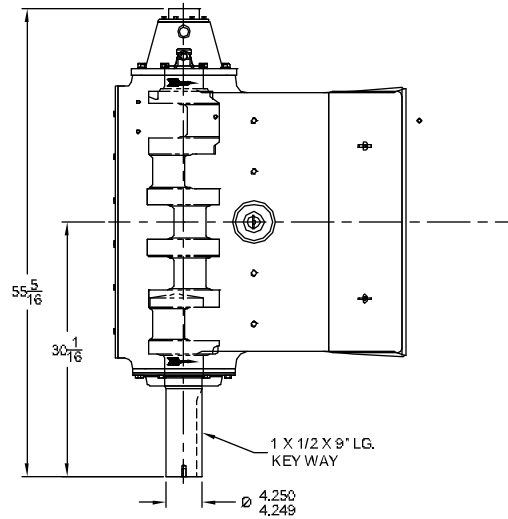
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| DWG No.: 118605 | SCALE: NONE | REV A | SHT.: 1 OF 1 |
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NOTES:

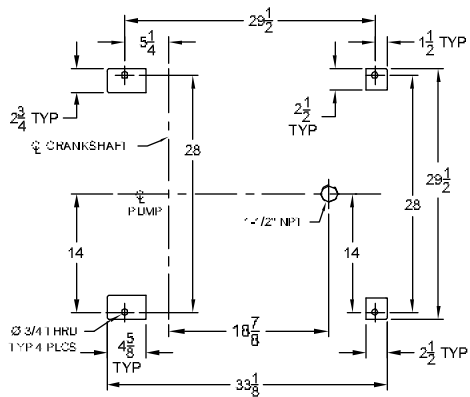
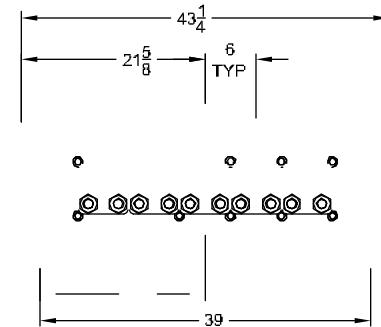
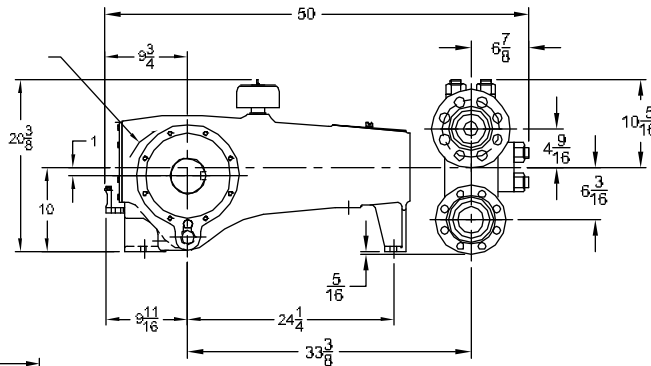
1. RIGHT HAND DRIVE SHOWN, FOR LEFT HAND DRIVE
MOVE SHAFT AND DIMENSIONS TO THE OPPOSITE SIDE SHOWN.
2. DIMENSIONS SHOWN ARE FOR INSTALLATION PURPOSES.

FIELD CONNECTIONS

| PUMP TYPE | DIMENSIONS IN INCHES | |
|-----------|---------------------------|-------------------------|
| | DISCHARGE CONNECTION SIZE | SUCTION CONNECTION SIZE |
| 217Q-4H | 2" - 2500# ANSI | 3" - 300# ANSI |



FORGED
BOLTED COVERS
FLANGED



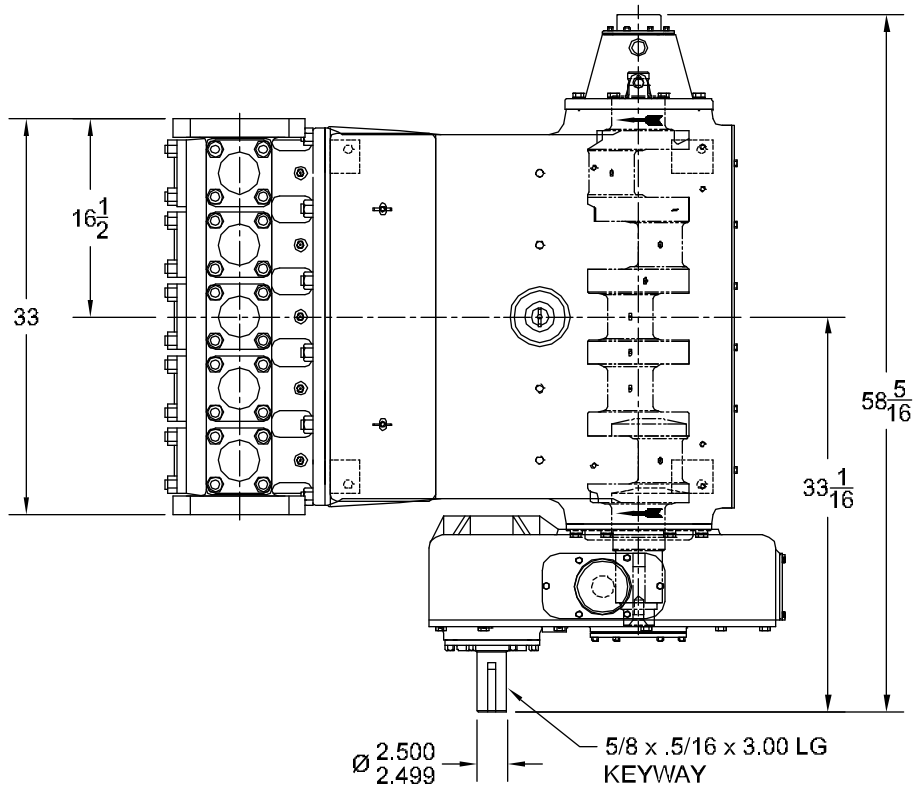
MOUNTING FEET DETAIL

NATIONAL OILWELL VARCO

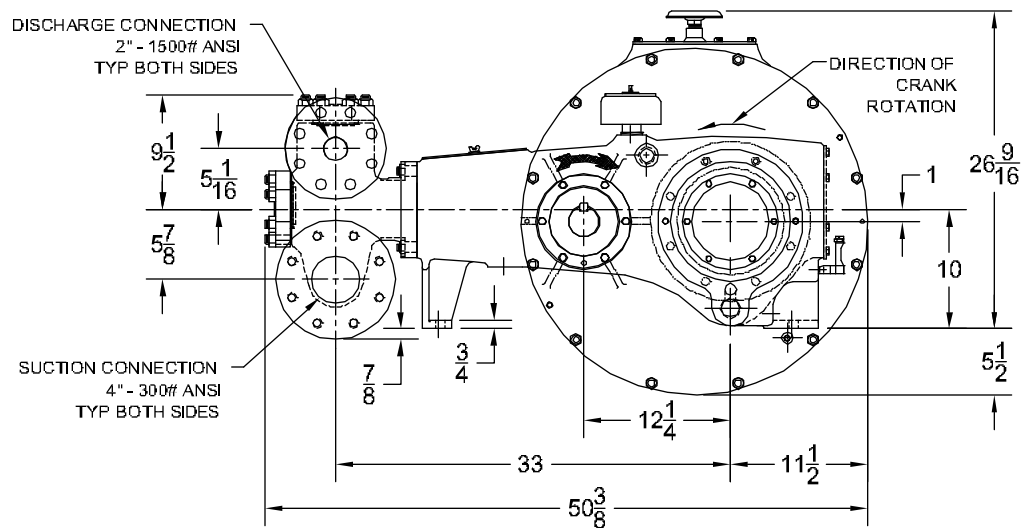
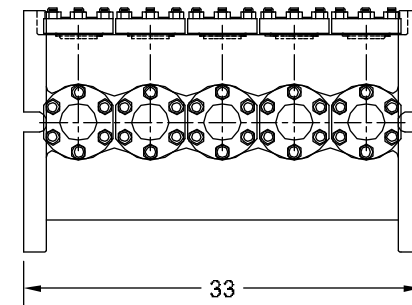
HOUSTON, TEXAS, U.S.A. ENGINEERING, TULSA, OKLAHOMA

TITLE: GENERAL DIMENSION, RHD
"H" CLASS FLUID END
217Q-4H

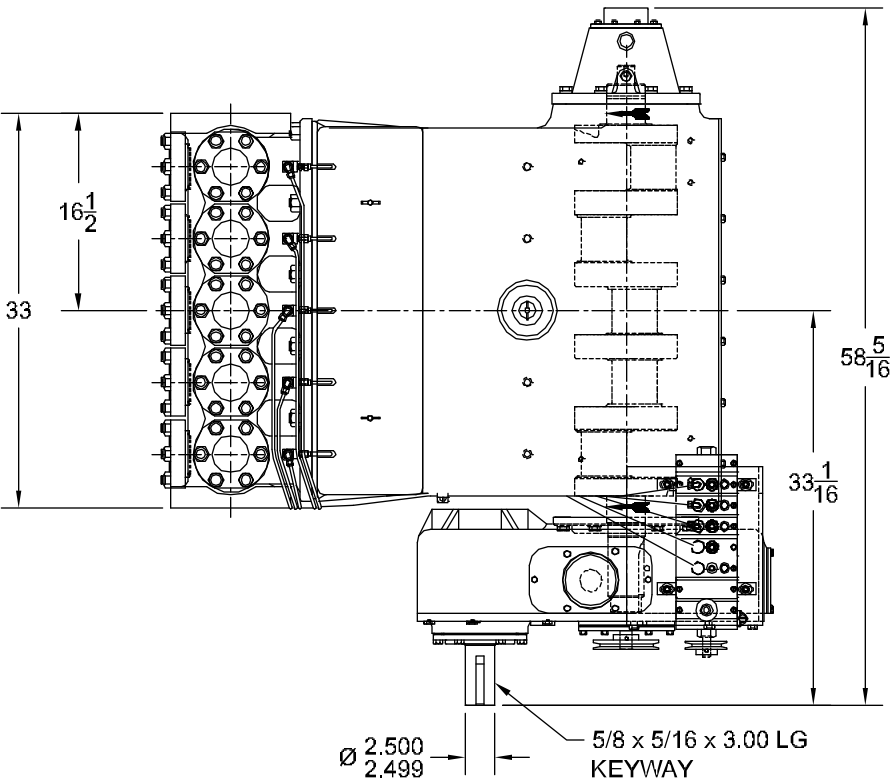
| | | | |
|----------|--------|-----|--------|
| DWG No.: | SCALE: | REV | SH1.: |
| 118606 | NONE | A | 1 OF 1 |



1. ALL GEAR REDUCER DRIVEN PUMPS ARE LEFT HAND DRIVE ONLY.
2. "M" CLASS CAST FLUID END SHOWN. FOR OTHER CLASS FLUID ENDS AND OTHER DIMENSIONS SEE DRAWINGS 118604, 118605, AND 118606.

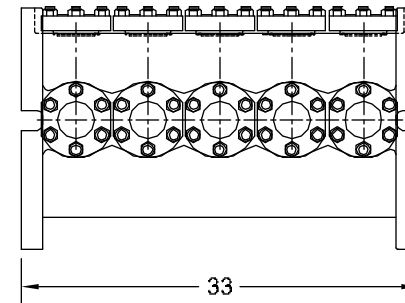
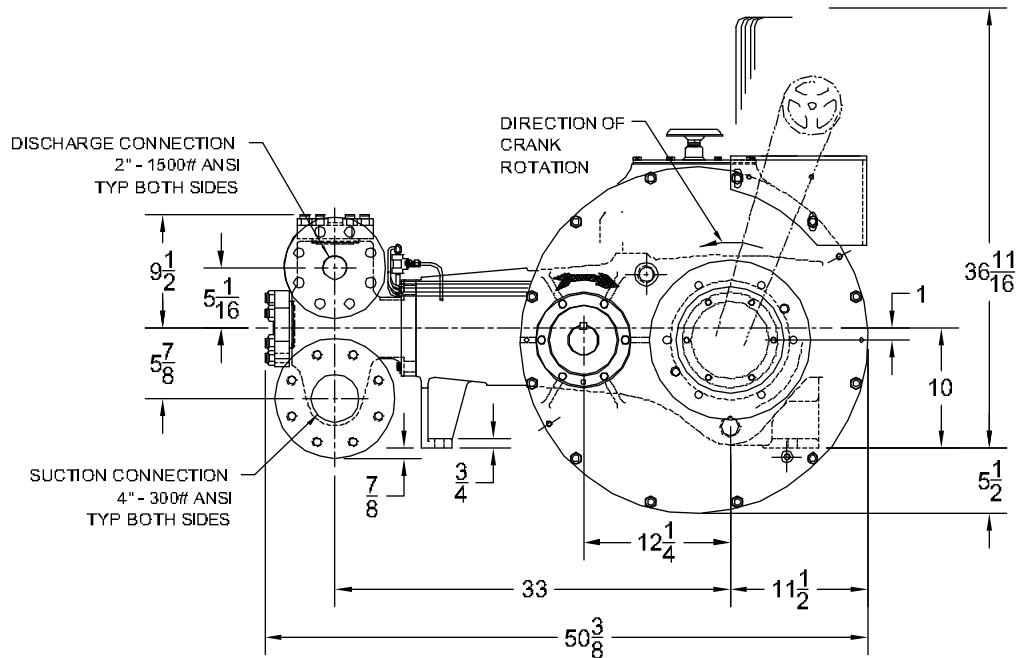


| | | | |
|--|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: GENERAL DIMENSION, HELICAL GEAR REDUCER MODEL: 217Q-4 (HP200) | | | |
| DWG No.: | 118610 | SCALE: | NONE |
| REV: | A | SHT.: | 1 of 1 |



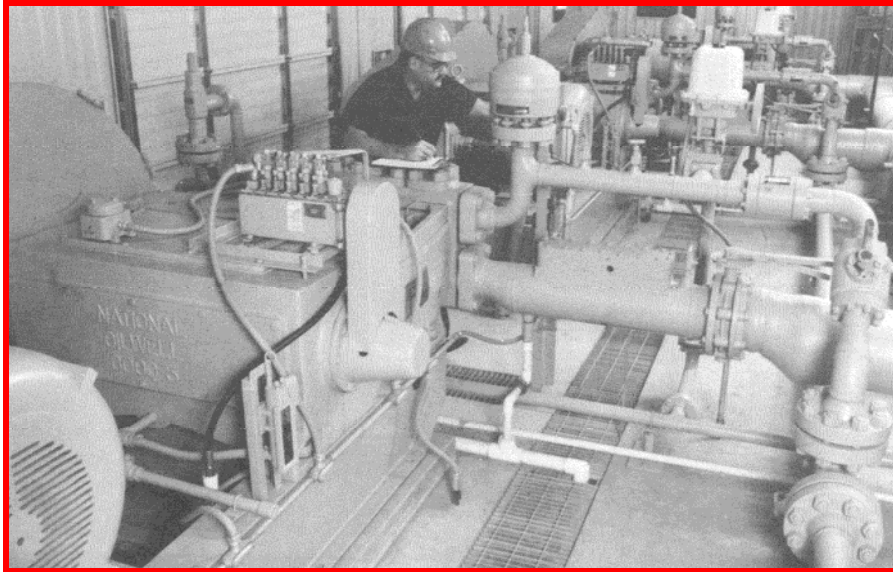
NOTE:

1. LEFT HAND DRIVE POWER PUMP (SHOWN) REQUIRES LEFT HAND DRIVE LUBRICATOR.
2. ALL GEAR REDUCER DRIVEN PUMPS ARE LEFT HAND DRIVE ONLY.
3. "M" CLASS CAST FLUID END SHOWN. FOR OTHER CLASS FLUID ENDS AND OTHER DIMENSIONS SEE DRAWINGS 118604, 118605, AND 118606.



| | | | |
|--|--------|------------------------------|--------|
| NOV NATIONAL OILWELL VARCO | | | |
| HOUSTON, TEXAS, U.S.A. | | ENGINEERING, TULSA, OKLAHOMA | |
| TITLE: GENERAL DIMENSION, HELICAL GEAR REDUCER, w/ LUBRICATOR (LHD) MODEL: 217Q-4 (HP200) | | | |
| DWG No.: | SCALE: | REV | SHT.: |
| 118609 | NONE | A | 1 OF 1 |

NATIONAL OILWELL VARCO



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