

# **SKID-STEER DRUM MULCHER**

60"(1524MM) DRUM MULCHER HEAD

DOC #15-1355

SERIAL #32679+

**WARRANTY + SERVICE** 888.960.0364  
**PARTS** 888.960.0361



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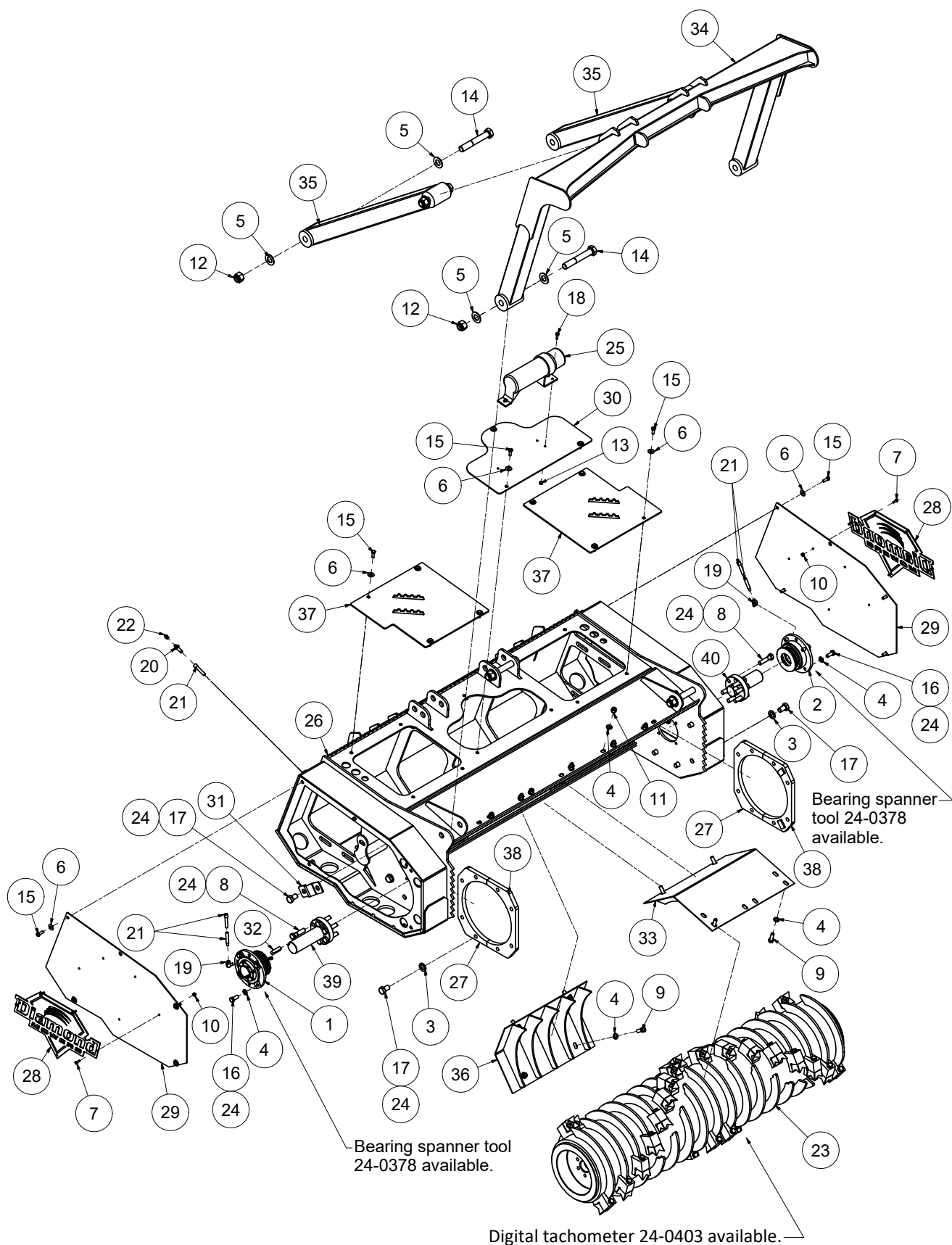
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The background of the entire page is a close-up, high-contrast image of a metal surface, likely steel, covered in numerous scratches, scuffs, and abrasions of varying lengths and directions. This texture is most prominent in the top and bottom sections of the page.

# DRUM MULCHER HEAD

# DRUM MULCHER HEAD

## DECK ASSEMBLY



25-1856-1 Rev D

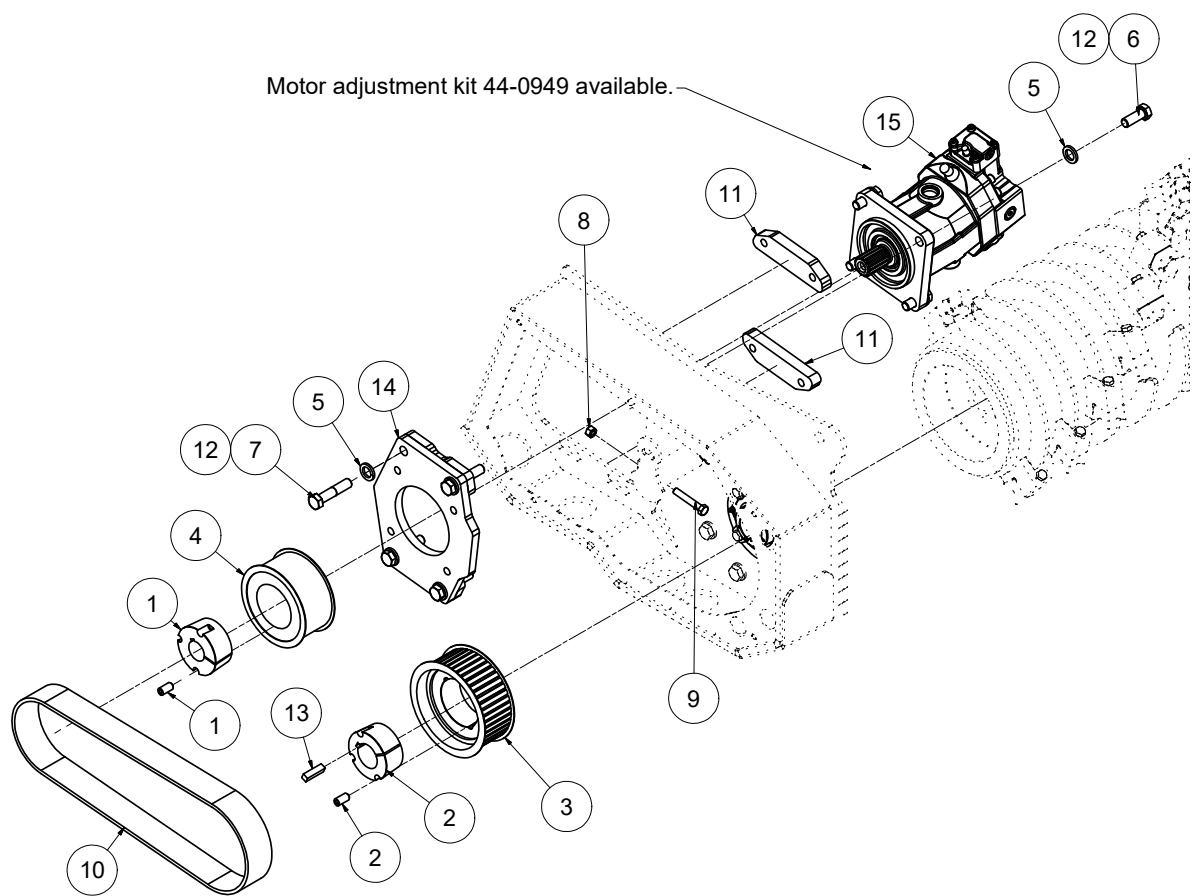
# DRUM MULCHER HEAD

## DECK ASSEMBLY

| REF# | PARTS DESCRIPTION                                 | REQ | PART#   | TORQUE<br>(ft-lbs) |
|------|---------------------------------------------------|-----|---------|--------------------|
| 1    | FDS BEARING ASSEMBLY WITH 10-0104, DRIVE SIDE     | 1   | 10-1068 |                    |
| 2    | FDS BEARING ASSEMBLY WITH 10-0105, NON DRIVE SIDE | 1   | 10-1069 |                    |
| 3    | 3/4 SAE GR 8 FLAT WASHER, YELLOW                  | 16  | 11-0039 |                    |
| 4    | 1/2 X 1.062 GR 8 SAE FLAT WASHER, YELLOW ZINC     | 38  | 11-0042 |                    |
| 5    | 1 SAE FLAT WASHER GR 8                            | 12  | 11-0056 |                    |
| 6    | 3/8 THRU-HARDENED FLAT WASHER, YELLOW ZINC        | 21  | 11-0092 |                    |
| 7    | 1/4-20 X 3/4 GR 5 HEX CAP, ZINC                   | 10  | 11-0588 | 8.4                |
| 8    | 5/8-11 X 2-1/2 GR 8 HEX CAP, YELLOW ZINC          | 12  | 11-0971 | 212                |
| 9    | 1/2-13 X 1-1/2 GR 8 HEX CAP SCREW, YELLOW ZINC    | 24  | 11-0972 | 106                |
| 10   | 1/4-20 GR 2 NYLOCK NUT, ZINC                      | 10  | 11-1022 |                    |
| 11   | 1/2-13 GR 8 NYLOCK NUT, ZINC                      | 6   | 11-1072 |                    |
| 12   | 1 NC NYLOCK NUT, GR 8                             | 6   | 11-1082 |                    |
| 13   | 1/4-20 GR 5 NYLOCK FLANGE NUT, ZINC               | 3   | 11-1090 |                    |
| 14   | 1-8 X 6-1/2 GR 8 HEX CAP, YELLOW ZINC             | 6   | 11-1622 | 909                |
| 15   | 3/8-16 X 1 GR 8 HEX CAP, YELLOW ZINC              | 19  | 11-1624 | 44                 |
| 16   | 1/2-13 X 1-1/4 GR 8 HEX CAP, YELLOW ZINC          | 8   | 11-2203 | 106                |
| 17   | 3/4-10 X 1-1/4 GR 8 HEX CAP, YELLOW ZINC          | 16  | 11-2204 | 376                |
| 18   | 1/4-20 X 1 GR 5 HEX FLANGE BOLT, ZINC             | 3   | 11-2210 | 8.5                |
| 19   | ELBOW 1/8" X 90                                   | 2   | 21-1104 |                    |
| 20   | BULKHEAD, 1/8 MP X 1/4 MJIC                       | 2   | 21-1687 |                    |
| 21   | GREASE HOSE, 1/8" X 24" (1/8MP X 1/4 FJIC)        | 2   | 21-4840 |                    |
| 22   | GREASE ZERK 1/8" FEM. NPT                         | 2   | 23-0008 |                    |
| 23   | 60 DRUM ASSEMBLY                                  | 1   | 24-0377 |                    |
| 24   | LOCTITE 262, .017 OZ (RED)                        | 1   | 24-0382 |                    |
| 25   | LARGE MANUAL CANISTER, 12" X 3.25"                | 1   | 24-0397 |                    |
| 26   | FDS 060 SHELL WELDMENT                            | 1   | 25-0248 |                    |
| 27   | ANTI-WRAP BLOCK, DRUM MULCHER                     | 2   | 31-0659 |                    |
| 28   | DIAMOND LOGO CUTOUT                               | 2   | 31-0670 |                    |
| 29   | BELT COVER MOUNT, FDS060                          | 2   | 31-0849 |                    |
| 30   | ACCESS PLATE, FDS060                              | 1   | 31-0850 |                    |
| 31   | GREASE LINE BRACKET                               | 1   | 31-1069 |                    |
| 32   | KEY 1/2 X 1/2 X 2                                 | 1   | 37-0026 |                    |
| 33   | UPPER LINER FDS060                                | 3   | 41-1870 |                    |
| 34   | PUSH BAR FDS 060                                  | 1   | 41-1871 |                    |
| 35   | PUSH BAR BRACE TUBE, DRUM MULCHER                 | 2   | 41-1873 |                    |
| 36   | LOWER LINER, FDS060                               | 3   | 41-1886 |                    |
| 37   | TOP COVER PLATE, FDS060                           | 2   | 41-1887 |                    |
| 38   | FDS ANTI-WRAP, SHEAR PLATE                        | 2   | 41-1957 |                    |
| 39   | DRIVE SHAFT, DRUM MULCHER                         | 1   | 90-7058 |                    |
| 40   | IDLER SHAFT, DRUM MULCHER                         | 1   | 90-7059 |                    |

# DRUM MULCHER HEAD

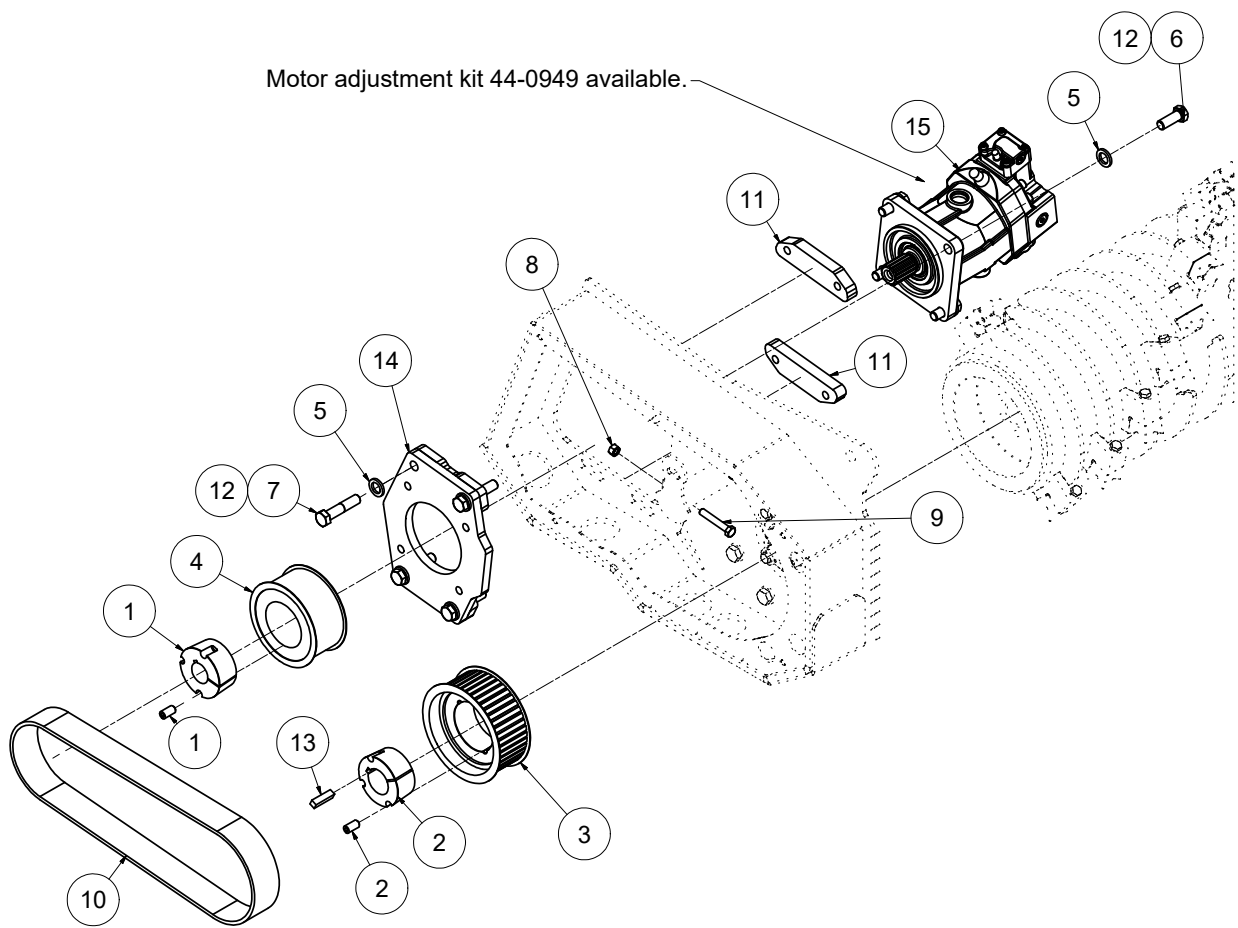
## DRIVE ASSEMBLY - 32-45GPM (119-171LPM)



| REF# | PARTS DESCRIPTION                                | REQ | PART#   | TORQUE (ft-lbs) |
|------|--------------------------------------------------|-----|---------|-----------------|
| 1    | BUSHING, 1-3/4 13T, DRUM MULCHER                 | 1   | 10-1060 | 60              |
| 2    | BUSHING, 2-3/16 KEYED, DRUM MULCHER              | 1   | 10-1061 | 60              |
| 3    | PULLEY, 201MM X 85MM, DRUM MULCHER               | 1   | 10-1063 |                 |
| 4    | PULLEY, 165MM X 85MM, DRUM MULCHER               | 1   | 10-1064 |                 |
| 5    | 3/4 SAE GR 8 FLAT WASHER, YELLOW                 | 8   | 11-0039 |                 |
| 6    | 3/4-10 X 2 GR 8 HEX CAP, YELLOW ZINC             | 4   | 11-0751 | 376             |
| 7    | 3/4-10 X 3-1/2 GR 8 HEX CAP, YELLOW ZINC         | 4   | 11-0792 | 376             |
| 8    | 1/2-13 GR 5 HEX NUT, ZINC                        | 1   | 11-1016 |                 |
| 9    | 1/2-13 X 3 GR 8 HEX CAP, YELLOW ZINC FULL THREAD | 1   | 11-2206 | 106             |
| 10   | BELT, HT500, 68MM X 1568MM, DRUM MULCHER         | 1   | 12-0082 |                 |
| 11   | MOTOR MOUNT CLAMP PLATE, DRUM MULCHER            | 2   | 24-0368 |                 |
| 12   | LOCTITE 262, .017 OZ (RED)                       | 1   | 24-0382 |                 |
| 13   | KEY 1/2 X 1/2 X 2                                | 1   | 37-0026 |                 |
| 14   | MOTOR MOUNT, DRUM MULCHER                        | 1   | 41-1606 |                 |
| 15   | VARIABLE DISPLACENT BENT AXIS PISTON MOTOR       | 1   |         |                 |
|      | 3000 PSI CARRIER SETTING                         |     | 30-0586 |                 |
|      | 3300 PSI CARRIER SETTING                         |     | 30-0585 |                 |
|      | 3500 PSI CARRIER SETTING                         |     | 30-0584 |                 |
|      | 4000 PSI CARRIER SETTING                         |     | 30-0545 |                 |

# DRUM MULCHER HEAD

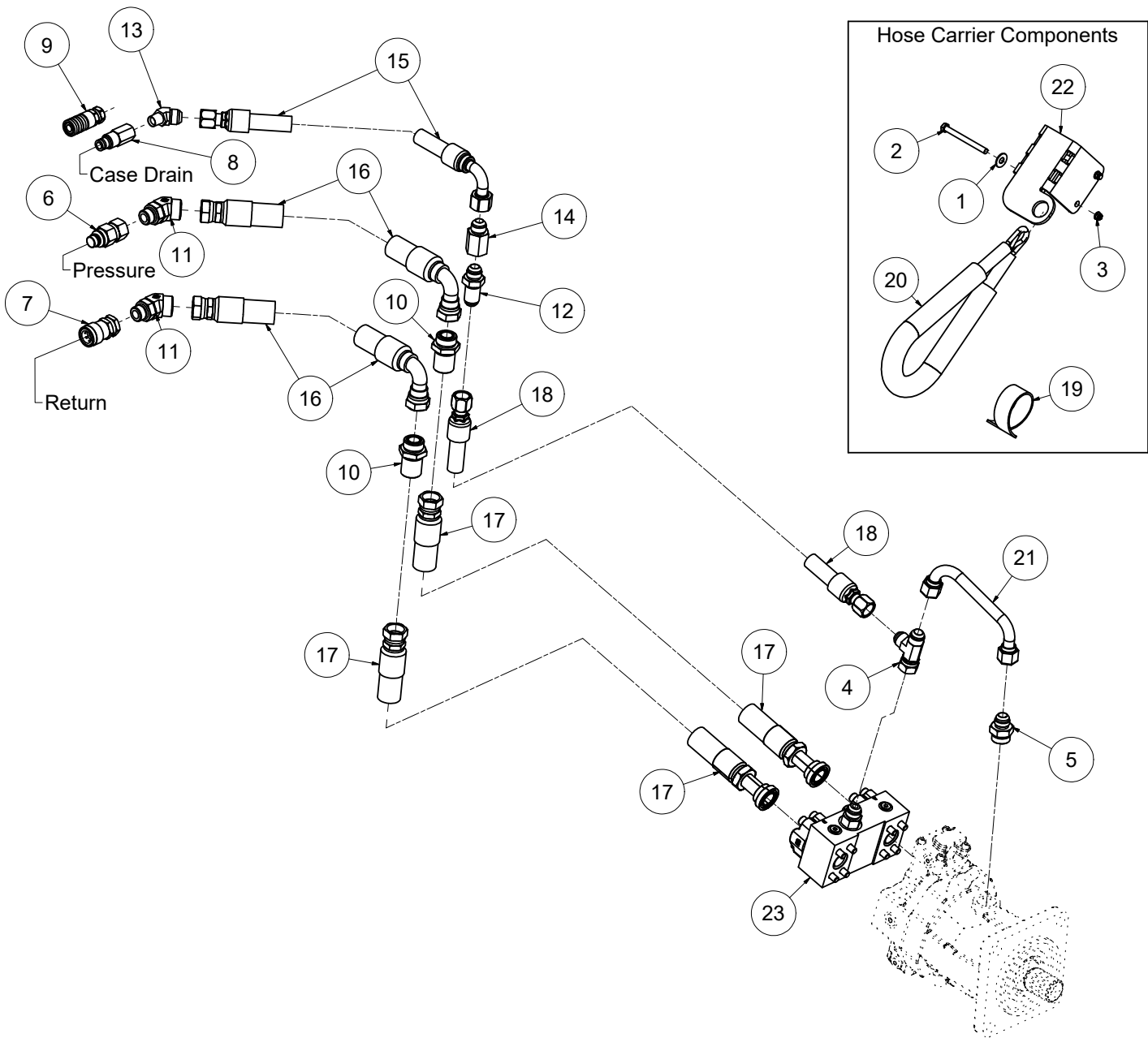
## DRIVE ASSEMBLY - 23-31GPM (88-118LPM)



| REF# | PARTS DESCRIPTION                                | REQ | PART#   | TORQUE (ft-lbs) |
|------|--------------------------------------------------|-----|---------|-----------------|
| 1    | BUSHING, 1-3/4 13T, DRUM MULCHER                 | 1   | 10-1060 | 60              |
| 2    | BUSHING, 2-3/16 KEYED, DRUM MULCHER              | 1   | 10-1061 | 60              |
| 3    | PULLEY, 201MM X 85MM, DRUM MULCHER               | 1   | 10-1063 |                 |
| 4    | PULLEY, 165MM X 85MM, DRUM MULCHER               | 1   | 10-1064 |                 |
| 5    | 3/4 SAE GR 8 FLAT WASHER, YELLOW                 | 8   | 11-0039 |                 |
| 6    | 3/4-10 X 2 GR 8 HEX CAP, YELLOW ZINC             | 4   | 11-0751 | 376             |
| 7    | 3/4-10 X 3-1/2 GR 8 HEX CAP, YELLOW ZINC         | 4   | 11-0792 | 376             |
| 8    | 1/2-13 GR 5 HEX NUT, ZINC                        | 1   | 11-1016 |                 |
| 9    | 1/2-13 X 3 GR 8 HEX CAP, YELLOW ZINC FULL THREAD | 1   | 11-2206 | 106             |
| 10   | BELT, HT500, 68MM X 1568MM, DRUM MULCHER         | 1   | 12-0082 |                 |
| 11   | MOTOR MOUNT CLAMP PLATE, DRUM MULCHER            | 2   | 24-0368 |                 |
| 12   | LOCTITE 262, .017 OZ (RED)                       | 1   | 24-0382 |                 |
| 13   | KEY 1/2 X 1/2 X 2                                | 1   | 37-0026 |                 |
| 14   | MOTOR MOUNT, DRUM MULCHER                        | 1   | 41-1606 |                 |
| 15   | VARIABLE DISPLACENT BENT AXIS PISTON MOTOR       |     |         |                 |
|      | 3000 PSI CARRIER SETTING                         | 1   | 30-0580 |                 |
|      | 3300 PSI CARRIER SETTING                         | 1   | 30-0581 |                 |
|      | 3500 PSI CARRIER SETTING                         | 1   | 30-0582 |                 |
|      | 4000 PSI CARRIER SETTING                         | 1   | 30-0583 |                 |

# DRUM MULCHER HEAD

## DECK FEED ASSEMBLY



# DRUM MULCHER HEAD

## DECK FEED ASSEMBLY

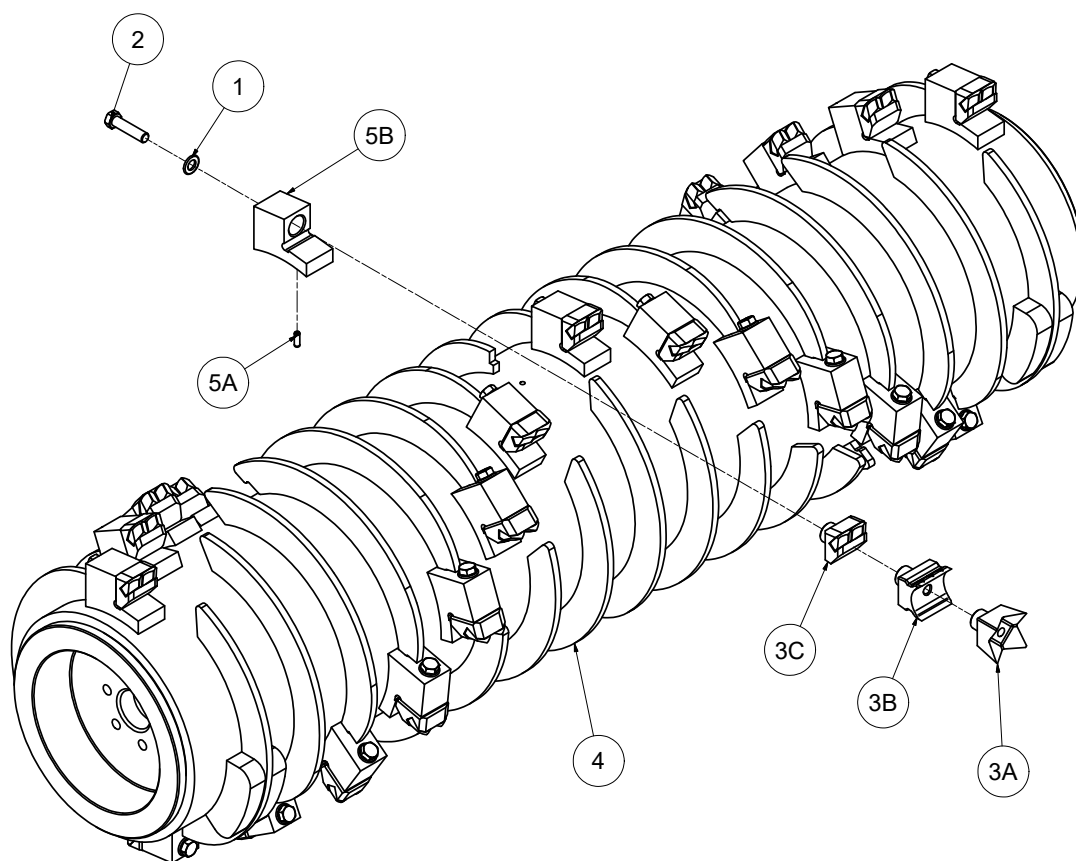
| REF# | PARTS DESCRIPTION                                             | REQ | PART#   | TORQUE<br>(ft-lbs) |
|------|---------------------------------------------------------------|-----|---------|--------------------|
| 1    | 3/8 THRU-HARDENED FLAT WASHER, YELLOW ZINC                    | 2   | 11-0092 |                    |
| 2    | 3/8-16 X 4 GR 5 HEX CAP, ZINC                                 | 2   | 11-0581 | 31                 |
| 3    | 3/8-16 GR 5 NYLOCK FLANGE NUT, ZINC                           | 2   | 11-1091 |                    |
| 4    | TEE, 3/4MJIC X 3/4MJIC X 3/4FJIC                              | 1   | 21-1130 |                    |
| 5    | 1M-OR X 3/4MJIC, ADAPTER                                      | 1   | 21-1536 |                    |
| 6    | 1/2 MALE QUICK COUPLER X 3/4 SAE, FLAT FACE, NO SPILL         | 1   | 21-1559 |                    |
| 7    | 1/2 FEMALE QUICK COUPLER X 3/4 SAE, FLAT FACE, NO SPILL       | 1   | 21-1560 |                    |
| 8    | 3/8 MALE QUICK COUPLER, FLAT FACE, NO SPILL                   | 1   | 21-1561 |                    |
| 9    | 3/8 FEMALE QUICK COUPLER, FLAT FACE, NO SPILL                 | 1   | 21-1562 |                    |
| 10   | BULKHEAD, 1FS X 1FS                                           | 2   | 21-1645 |                    |
| 11   | ELBOW, -12 ADJ MOR X -16 MFS, 45 DEG                          | 2   | 21-1689 |                    |
| 12   | BULKHEAD, -12MJIC X -12MJIC                                   | 1   | 21-1709 |                    |
| 13   | ADAPTER 3/4MJIC x 1/2MP -45DEG                                | 1   | 21-1731 |                    |
| 14   | CHECK VALVE, 3/4 MJIC X 3/4 FJIC, CHECKED FROM MALE TO FEMALE | 1   | 21-1774 |                    |
| 15   | HOSE 3/4 x 88, 3000 PSI (3/4FJIC-90DEG x 3/4FJIC)             | 1   | 21-4831 |                    |
| 16   | HOSE, 1 X 88, 4000 PSI (-16 FFS X -16 FFS 90 DEG) KEVLAR      | 2   | 21-4832 |                    |
| 17   | HOSE, 1 X 57, 4000 PSI (-16 CODE 62 FLANGE X -16 FFS)         | 2   | 21-4905 |                    |
| 18   | HOSE, 3/4 X 58, 300 PSI (-12FJIC X -12FJIC)                   | 1   | 21-4930 |                    |
| 19   | HOSEGUARD 3" SPIRAL / 54"                                     | 1   | 24-0390 |                    |
| 20   | ELASTIC STRAP WITH CLIPS, 24", 47lb at 60"                    | 1   | 24-0391 |                    |
| 21   | PREFORMED TUBE, CASE DRAIN, FDS                               | 1   | 28-0093 |                    |
| 22   | BRACKET HOSE SUPPORT                                          | 1   | 31-1063 |                    |
| 23   | MOTOR MOUNTED ANTI CAVITATION MANIFOLD, A6VM                  | 1   | 39-0134 |                    |
|      | OPTIONAL QUICK COUPLERS                                       |     |         |                    |
|      | 5/8" MALE QUICK COUPLER X 3/4 SAE, FLAT FACE                  | 1   | 21-1574 |                    |
|      | 5/8" FEMALE QUICK COUPLER X 3/4 SAE, FLAT FACE                | 1   | 21-1575 |                    |
|      | 3/4" MALE QUICK COUPLER X 3/4 SAE, FLAT FACE                  | 1   | 21-1576 |                    |
|      | 3/4" FEMALE QUICK COUPLER X 3/4 SAE, FLAT FACE                | 1   | 21-1577 |                    |

\* NOT SHOWN

25-1856-3 Rev D

# DRUM MULCHER HEAD

## DRUM ASSEMBLY

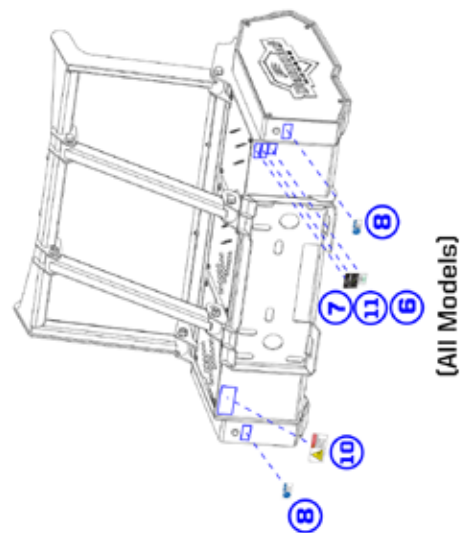
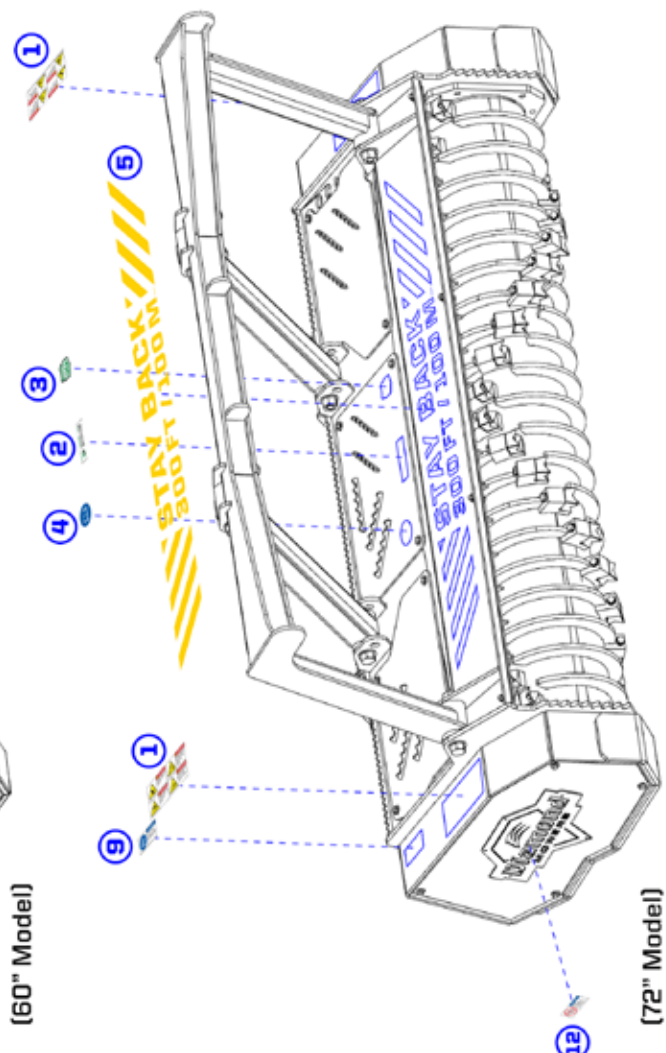
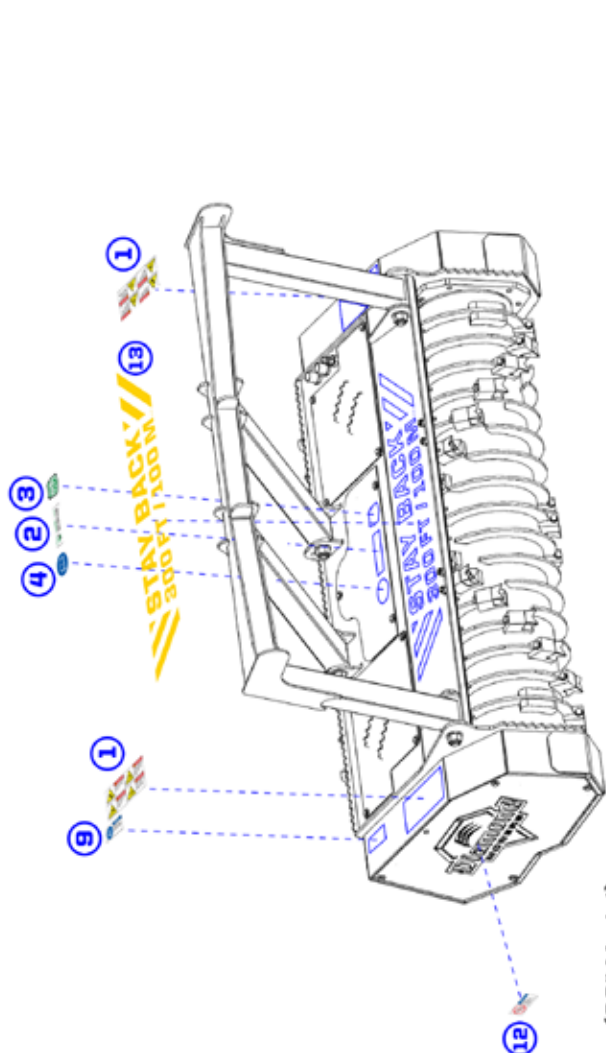


| REF# | PARTS DESCRIPTION                             | REQ | PART#   | TORQUE<br>(ft-lbs) |
|------|-----------------------------------------------|-----|---------|--------------------|
| 1    | 1/2 X 1.062 GR 8 SAE FLAT WASHER, YELLOW ZINC | 33  | 11-0042 |                    |
| 2    | 1/2-20 X 2 GR 8 HEX CAP, YELLOW ZINC          | 33  | 11-0633 | 120                |
| 3A   | FOUR-POINT HARDENED STEEL TOOTH               | 33  | 22-0019 |                    |
| 3B   | TWIN CHISEL™ PLANER TOOTH                     | 33  | 22-0041 |                    |
| 3C   | TWIN MAUL™ CARBIDE TOOTH                      | 33  | 22-0044 |                    |
| 4    | FDS060 DRUM WELDMENT                          | 1   | 41-1868 |                    |
| 5    | ASSEMBLY, TOOTH HOLDER, DRUM MULCHER          | 33  | 90-7104 |                    |
| 5A   | SPRING PIN, .25 X .75                         | 33  | 11-2148 |                    |
| 5B   | TOOTH HOLDER, DRUM MULCHER                    | 33  | 90-7062 |                    |
|      | TOOTH KIT - FOUR-POINT FDS060                 | 1   | 44-0937 |                    |
|      | 1/2 X 1.062 GR 8 SAE FLAT WASHER, YELLOW ZINC | 33  | 11-0042 |                    |
|      | 1/2-20 X 2 GR 8 HEX CAP, YELLOW ZINC          | 33  | 11-0633 | 120                |
|      | FOUR-POINT HARDENED STEEL TOOTH               | 33  | 22-0019 |                    |
|      | TOOTH KIT - TWIN MAUL™ FDS060                 | 1   | 44-0942 |                    |
|      | 1/2 X 1.062 GR 8 SAE FLAT WASHER, YELLOW ZINC | 33  | 11-0042 |                    |
|      | 1/2-20 X 2 GR 8 HEX CAP, YELLOW ZINC          | 33  | 11-0633 | 120                |
|      | TWIN MAUL™ CARBIDE TOOTH                      | 33  | 22-0044 |                    |
|      | TOOTH KIT - TWIN CHISEL™ FDS060               | 1   | 44-0958 |                    |
|      | 1/2 X 1.062 GR 8 SAE FLAT WASHER, YELLOW ZINC | 33  | 11-0042 |                    |
|      | 1/2-20 X 2 GR 8 HEX CAP, YELLOW ZINC          | 33  | 11-0633 | 120                |
|      | TWIN CHISEL™ PLANER TOOTH                     | 33  | 22-0041 |                    |

# DRUM MULCHER HEAD

## DECAL ASSEMBLY

- ① PART #15-0057 - Decal Group (horizontal) - QTY 2
- ② PART #15-1018 - Warranty and Service - QTY 1
- ③ PART #15-0055 - Made in the USA - QTY 1
- ④ PART #15-0058 - Read Manual - QTY 1
- ⑤ PART #15-0076 - Stay Back 300ft / 100m (72") - QTY 1
- ⑥ PART #15-0068 - Patent Denis Cimaf - QTY 1
- ⑦ SERIAL NUMBER LABEL - (not included in kit) - QTY 1
- ⑧ PART #15-0126 - #2 Lithium Grease Only - QTY 2
- ⑨ PART #15-0077 - Variable Displacement Motor Notice - QTY 1
- ⑩ PART #15-0105 - Safety Polycarbonate Tag - QTY 1
- ⑪ PART #15-0124 - FDS GPM/PSI Tag (not included in kit) - QTY 1
- ⑫ PART #15-0114 - Belt Tension Notice (machine interior) - QTY 1
- ⑬ PART #15-0115 - Stay Back 300ft / 100m (60") - QTY 1



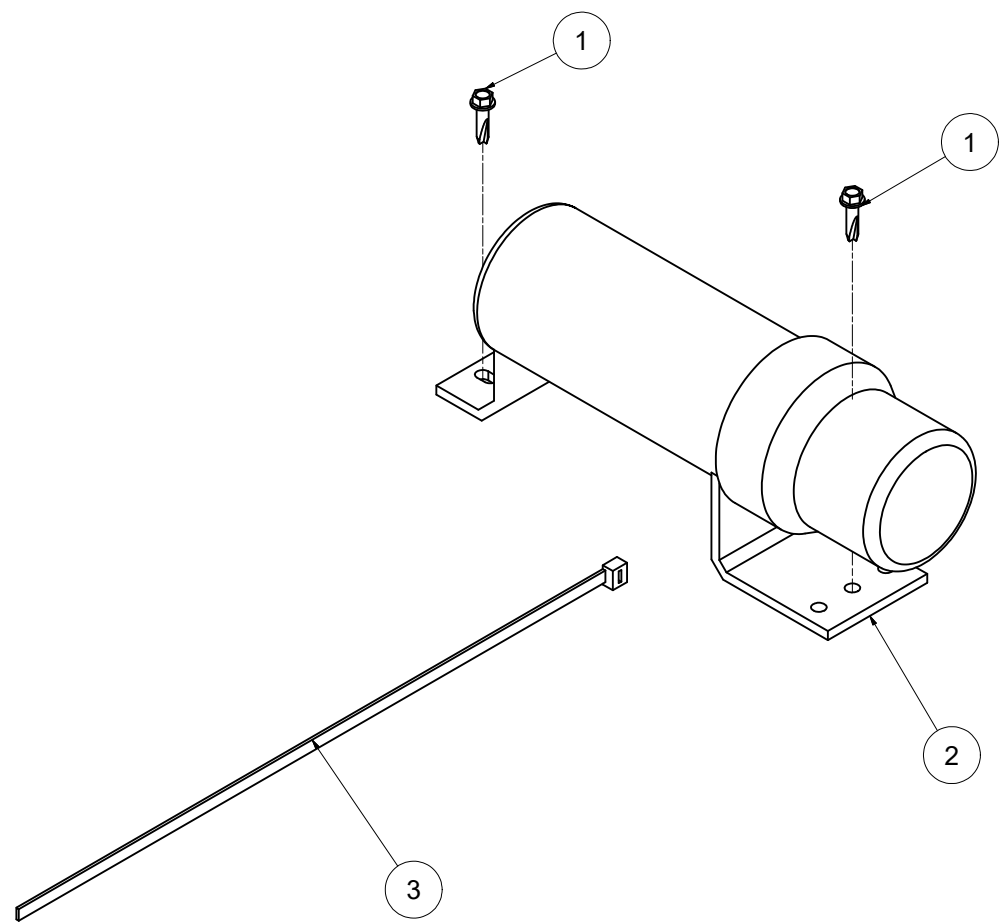
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# MISCELLANEOUS ASSEMBLIES

# MISCELLANEOUS ASSEMBLIES

## MANUAL CANISTER ASSEMBLY



| REF# | PARTS DESCRIPTION                       | REQ | PART#   | TORQUE (ft-lbs) |
|------|-----------------------------------------|-----|---------|-----------------|
| 1    | 1/4-14 X 1" TEKS SCREW, HEX WASHER HEAD | 2   | 11-1173 |                 |
| 2    | LARGE MANUAL CANISTER, 12" X 3.25"      | 1   | 24-0397 |                 |
| 3    | 17" ZIP TIE, UV RESISTANT               | 1   | 24-0396 |                 |



# APPENDIX

## O-RINGS - S.A.E.

### ORING (AS568) BOSS FITTINGS [KIT PART# 33-0122] SAE SIZES

| STANDARD<br>ORING<br>PART # | HYDRAULIC<br>SIZE | ORING ID<br>SAE<br>(IN) | ORING WIDTH<br>SAE<br>(IN) | ORING MATERIAL       |
|-----------------------------|-------------------|-------------------------|----------------------------|----------------------|
| 902                         | -2                | 0.24                    | 0.06                       | 90-durometer Nitrile |
| 903                         | -3                | 0.30                    | 0.06                       | 90-durometer Nitrile |
| 904                         | -4                | 0.35                    | 0.07                       | 90-durometer Nitrile |
| 905                         | -5                | 0.41                    | 0.07                       | 90-durometer Nitrile |
| 906                         | -6                | 0.47                    | 0.08                       | 90-durometer Nitrile |
| 908                         | -8                | 0.64                    | 0.09                       | 90-durometer Nitrile |
| 910                         | -10               | 0.76                    | 0.1                        | 90-durometer Nitrile |
| 912                         | -12               | 0.92                    | 0.12                       | 90-durometer Nitrile |
| 914                         | -14               | 1.05                    | 0.12                       | 90-durometer Nitrile |
| 916                         | -16               | 1.17                    | 0.12                       | 90-durometer Nitrile |
| 920                         | -20               | 1.48                    | 0.12                       | 90-durometer Nitrile |
| 924                         | -24               | 1.72                    | 0.12                       | 90-durometer Nitrile |
| 932                         | -32               | 2.34                    | 0.12                       | 90-durometer Nitrile |

### ORING (AS568) FLAT SEAL FITTINGS [KIT PART# 33-0123] SAE SIZES & METRIC SIZES

| STANDARD<br>ORING<br>PART # | HYDRAULIC<br>SIZE | END SIZE    |                | ORING ID    |                | ORING WIDTH |                | ORING MATERIAL       |
|-----------------------------|-------------------|-------------|----------------|-------------|----------------|-------------|----------------|----------------------|
|                             |                   | SAE<br>(IN) | METRIC<br>(MM) | SAE<br>(IN) | METRIC<br>(MM) | SAE<br>(IN) | METRIC<br>(MM) |                      |
| 011                         | -4                | 1/4         | 6              | 0.30        | 7.70           | 0.07        | 1.78           | 90-durometer Nitrile |
| 012                         | -6                | 3/8         | 8, 10          | 0.36        | 9.30           | 0.07        | 1.78           | 90-durometer Nitrile |
| 014                         | -8                | 1/2         | 12             | 0.49        | 12.40          | 0.07        | 1.78           | 90-durometer Nitrile |
| 016                         | -10               | 5/8         | 14, 15, 16     | 0.61        | 15.60          | 0.07        | 1.78           | 90-durometer Nitrile |
| 018                         | -12               | 3/4         | 18, 20         | 0.74        | 18.80          | 0.07        | 1.78           | 90-durometer Nitrile |
| 020                         | -14               | 7/8         | 22             | 0.86        | 21.80          | 0.07        | 1.78           | 90-durometer Nitrile |
| 021                         | -16               | 1           | 25             | 0.93        | 23.50          | 0.07        | 1.78           | 90-durometer Nitrile |
| 025                         | -20               | 1 1/4       | 28, 30, 32     | 1.18        | 29.90          | 0.07        | 1.78           | 90-durometer Nitrile |
| 029                         | -24               | 1 1/2       | 35, 38         | 1.49        | 37.80          | 0.07        | 1.78           | 90-durometer Nitrile |
| 135                         | -32               | 2           | 50             | 1.93        | 49.00          | 0.10        | 2.54           | 90-durometer Nitrile |

## S.A.E. TORQUE SPECIFICATIONS

| Nominal Dia.                 | threads per inch | Tensile Stress Area |  | ASTM A307 Grade A |           |           |  | SAE J429 Grade 5  |           |            |  | SAE J429 Grade 8  |            |            |  | FNL Grade 9       |            |            |
|------------------------------|------------------|---------------------|-----------------------------------------------------------------------------------|-------------------|-----------|-----------|-----------------------------------------------------------------------------------|-------------------|-----------|------------|-----------------------------------------------------------------------------------|-------------------|------------|------------|-------------------------------------------------------------------------------------|-------------------|------------|------------|
|                              |                  |                     | Clamp Load                                                                        | Tightening Torque |           |           | Clamp Load                                                                        | Tightening Torque |           |            | Clamp Load                                                                        | Tightening Torque |            |            | Clamp Load                                                                          | Tightening Torque |            |            |
|                              |                  |                     | (Lbs.)                                                                            | K = 0.15          | K = 0.17  | K = 0.20  | (Lbs.)                                                                            | K = 0.15          | K = 0.17  | K = 0.20   | (Lbs.)                                                                            | K = 0.15          | K = 0.17   | K = 0.20   | (Lbs.)                                                                              | K = 0.15          | K = 0.17   | K = 0.20   |
| (in.)                        |                  | (sq. in.)           |                                                                                   |                   |           |           |                                                                                   |                   |           |            |                                                                                   |                   |            |            |                                                                                     |                   |            |            |
| Unified Coarse Thread Series |                  |                     |                                                                                   |                   |           |           |                                                                                   |                   |           |            |                                                                                   |                   |            |            |                                                                                     |                   |            |            |
| 1/4                          | 20               | 0.0318              | 859                                                                               | 32 in-lbs         | 37 in-lbs | 43 in-lbs | 2029                                                                              | 76 in-lbs         | 86 in-lbs | 101 in-lbs | 2864                                                                              | 107 in-lbs        | 122 in-lbs | 143 in-lbs | 3357                                                                                | 126 in-lbs        | 143 in-lbs | 168 in-lbs |
| 5/16                         | 18               | 0.0524              | 1416                                                                              | 66                | 75        | 88        | 3342                                                                              | 157               | 178       | 209        | 4719                                                                              | 221               | 251        | 295        | 5531                                                                                | 259               | 294        | 346        |
| 3/8                          | 16               | 0.0775              | 2092                                                                              | 10 ft-lbs         | 11 ft-lbs | 13 ft-lbs | 4940                                                                              | 23 ft-lbs         | 26 ft-lbs | 31 ft-lbs  | 6974                                                                              | 33 ft-lbs         | 37 ft-lbs  | 44 ft-lbs  | 8174                                                                                | 38 ft-lbs         | 43 ft-lbs  | 51 ft-lbs  |
| 7/16                         | 14               | 0.1063              | 2870                                                                              | 16                | 18        | 21        | 6777                                                                              | 37                | 42        | 49         | 9568                                                                              | 52                | 59         | 70         | 11214                                                                               | 61                | 70         | 82         |
| 1/2                          | 13               | 0.1419              | 3831                                                                              | 24                | 27        | 32        | 9046                                                                              | 57                | 64        | 75         | 12771                                                                             | 80                | 90         | 106        | 14969                                                                               | 94                | 106        | 125        |
| 9/16                         | 12               | 0.1819              | 4912                                                                              | 35                | 39        | 46        | 11599                                                                             | 82                | 92        | 109        | 16375                                                                             | 115               | 130        | 154        | 19193                                                                               | 135               | 153        | 180        |
| 5/8                          | 11               | 0.2260              | 6102                                                                              | 48                | 54        | 64        | 14408                                                                             | 113               | 128       | 150        | 20340                                                                             | 159               | 180        | 212        | 23840                                                                               | 186               | 211        | 248        |
| 3/4                          | 10               | 0.3345              | 9030                                                                              | 85                | 96        | 113       | 21322                                                                             | 200               | 227       | 267        | 30101                                                                             | 282               | 320        | 376        | 35281                                                                               | 331               | 375        | 441        |
| 7/8                          | 9                | 0.4617              | 12467                                                                             | 136               | 155       | 182       | 29436                                                                             | 322               | 365       | 429        | 41556                                                                             | 455               | 515        | 606        | 48707                                                                               | 533               | 604        | 710        |
| 1                            | 8                | 0.6057              | 16355                                                                             | 204               | 232       | 273       | 38616                                                                             | 483               | 547       | 644        | 54517                                                                             | 681               | 772        | 909        | 63899                                                                               | 799               | 905        | 1065       |
| 1 1/4                        | 7                | 0.9691              | 26166                                                                             | 409               | 463       | 545       | 53786                                                                             | 840               | 952       | 1121       | 87220                                                                             | 1363              | 1545       | 1817       | 102229                                                                              | 1597              | 1810       | 2130       |
| 1 1/2                        | 6                | 1.4053              | 37942                                                                             | 711               | 806       | 949       | 77991                                                                             | 1462              | 1657      | 1950       | 126473                                                                            | 2371              | 2688       | 3162       | 148237                                                                              | 2779              | 3150       | 3706       |
| Fine Thread Series           |                  |                     |                                                                                   |                   |           |           |                                                                                   |                   |           |            |                                                                                   |                   |            |            |                                                                                     |                   |            |            |
| 1/4                          | 28               | 0.0364              | 982                                                                               | 37 in-lbs         | 42 in-lbs | 49 in-lbs | 2319                                                                              | 87 in-lbs         | 99 in-lbs | 116 in-lbs | 3274                                                                              | 123 in-lbs        | 139 in-lbs | 164 in-lbs | 3837                                                                                | 144 in-lbs        | 163 in-lbs | 192 in-lbs |
| 5/16                         | 24               | 0.0581              | 1568                                                                              | 73                | 83        | 98        | 3702                                                                              | 174               | 197       | 231        | 5226                                                                              | 245               | 278        | 327        | 6125                                                                                | 287               | 325        | 383        |
| 3/8                          | 24               | 0.0878              | 2371                                                                              | 11 ft-lbs         | 13 ft-lbs | 15 ft-lbs | 5599                                                                              | 26 ft-lbs         | 30 ft-lbs | 35 ft-lbs  | 7905                                                                              | 37 ft-lbs         | 42 ft-lbs  | 49 ft-lbs  | 9265                                                                                | 43 ft-lbs         | 49 ft-lbs  | 58 ft-lbs  |
| 7/16                         | 20               | 0.1187              | 3205                                                                              | 18                | 20        | 23        | 7568                                                                              | 41                | 47        | 55         | 10684                                                                             | 58                | 66         | 78         | 12523                                                                               | 68                | 78         | 91         |
| 1/2                          | 20               | 0.1600              | 4319                                                                              | 27                | 31        | 36        | 10197                                                                             | 64                | 72        | 85         | 14396                                                                             | 90                | 102        | 120        | 16873                                                                               | 105               | 120        | 141        |
| 9/16                         | 18               | 0.2030              | 5480                                                                              | 39                | 44        | 51        | 12940                                                                             | 91                | 103       | 121        | 18268                                                                             | 128               | 146        | 171        | 21412                                                                               | 151               | 171        | 201        |
| 5/8                          | 18               | 0.2560              | 6911                                                                              | 54                | 61        | 72        | 16317                                                                             | 127               | 144       | 170        | 23036                                                                             | 180               | 204        | 240        | 27000                                                                               | 211               | 239        | 281        |
| 3/4                          | 16               | 0.3730              | 10070                                                                             | 94                | 107       | 126       | 23776                                                                             | 223               | 253       | 297        | 33566                                                                             | 315               | 357        | 420        | 39343                                                                               | 369               | 418        | 492        |
| 7/8                          | 14               | 0.5095              | 13756                                                                             | 150               | 171       | 201       | 32479                                                                             | 355               | 403       | 474        | 45853                                                                             | 502               | 568        | 669        | 53743                                                                               | 588               | 666        | 784        |
| 1                            | 14               | 0.6799              | 18357                                                                             | 229               | 260       | 306       | 43343                                                                             | 542               | 614       | 722        | 61190                                                                             | 765               | 867        | 1020       | 71720                                                                               | 896               | 1016       | 1195       |
| 1 1/4                        | 12               | 1.0729              | 28970                                                                             | 453               | 513       | 604       | 59548                                                                             | 930               | 1055      | 1241       | 96565                                                                             | 1509              | 1710       | 2012       | 113182                                                                              | 1768              | 2004       | 2358       |
| 1 1/2                        | 12               | 1.5810              | 42688                                                                             | 800               | 907       | 1067      | 87747                                                                             | 1645              | 1865      | 2194       | 142292                                                                            | 2668              | 3024       | 3557       | 166778                                                                              | 3127              | 3544       | 4169       |

The torque values can only be achieved if nut (or tapped hole) has a proof load greater than or equal to the bolt's minimum ultimate tensile strength.

Clamp load calculated as 75% of the proof load when specified by the standard. ASTM A307 utilized 75% of 36,000 PSI.

Torque values for 1/4 and 5/16-in series are in inch-pounds. All other torque values are in foot-pounds.

Torque values calculated from formula  $T = KDF$ , where

$K = 0.15$  for "lubricated" conditions

$K = 0.17$  for zinc plated and dry conditions; we have also found various forms of customer applied thread lockers to have a similar K value.

$K = 0.20$  for plain and dry conditions

$D$  = Nominal Diameter

$F$  = Clamp Load

**Note: When using Zinc Plated (lubricated with wax) Top Lock Nuts, the K value can vary between 0.12-0.16**

## METRIC TORQUE SPECIFICATIONS

| Nominal Dia.<br>(mm) | Pitch | 4.6 Class 4.6     |                     |                      |                    | 8.8 Class 8.8     |                     |                      |                    | 10.9 Class 10.9   |                     |                      |                    | 12.9 Class 12.9   |                     |                      |                    |
|----------------------|-------|-------------------|---------------------|----------------------|--------------------|-------------------|---------------------|----------------------|--------------------|-------------------|---------------------|----------------------|--------------------|-------------------|---------------------|----------------------|--------------------|
|                      |       | Tightening Torque |                     |                      |                    | Tightening Torque |                     |                      |                    | Tightening Torque |                     |                      |                    | Tightening Torque |                     |                      |                    |
|                      |       | Clamp Load (lbs)  | Lubricated (ft-lbs) | Zinc Plated (ft-lbs) | Plain&Dry (ft-lbs) | Clamp Load (lbs)  | Lubricated (ft-lbs) | Zinc Plated (ft-lbs) | Plain&Dry (ft-lbs) | Clamp Load (lbs)  | Lubricated (ft-lbs) | Zinc Plated (ft-lbs) | Plain&Dry (ft-lbs) | Clamp Load (lbs)  | Lubricated (ft-lbs) | As-Received (ft-lbs) | Plain&Dry (ft-lbs) |
| 4                    | 0.7   | 333               | 0.7                 | 0.7                  | 0.9                | 858               | 1.7                 | 1.9                  | 2.3                | 1228              | 2.4                 | 2.7                  | 3.2                | 1436              | 2.8                 | 3.2                  | 3.8                |
| 5                    | 0.8   | 538               | 1.3                 | 1.5                  | 1.8                | 1387              | 3.4                 | 3.9                  | 4.5                | 1985              | 4.9                 | 5.5                  | 6.5                | 2319              | 5.7                 | 6.5                  | 7.6                |
| 6                    | 1     | 763               | 2.3                 | 2.6                  | 3.0                | 1968              | 5.8                 | 6.6                  | 7.7                | 2816              | 8.3                 | 9.4                  | 11.1               | 3291              | 9.7                 | 11.0                 | 13.0               |
| 7                    | 1     | 1095              | 3.8                 | 4.3                  | 5.0                | 2822              | 9.7                 | 11.0                 | 13.0               | 4039              | 13.9                | 15.8                 | 18.5               | 4720              | 16.3                | 18.4                 | 21.7               |
| 8                    | 1.25  | 1389              | 5.5                 | 6.2                  | 7.3                | 3580              | 14.1                | 16.0                 | 18.8               | 5123              | 20.2                | 22.9                 | 26.9               | 5987              | 23.6                | 26.7                 | 31.4               |
| 10                   | 1.5   | 2200              | 10.8                | 12.3                 | 14.4               | 5671              | 27.9                | 31.6                 | 37.2               | 8115              | 39.9                | 45.2                 | 53.2               | 9484              | 46.7                | 52.9                 | 62.2               |
| 12                   | 1.75  | 3197              | 18.9                | 21.4                 | 25.2               | 8240              | 48.7                | 55.1                 | 64.9               | 11792             | 69.6                | 78.9                 | 92.8               | 13781             | 81.4                | 92.2                 | 108.5              |
| 14                   | 2     | 4379              | 30.2                | 34.2                 | 40.2               | 11289             | 77.8                | 88.1                 | 103.7              | 16154             | 111.3               | 126.1                | 148.4              | 18879             | 130.0               | 147.4                | 173.4              |
| 16                   | 2     | 5943              | 47                  | 53                   | 62                 | 15320             | 121                 | 137                  | 161                | 21924             | 173                 | 196                  | 230                | 25622             | 202                 | 229                  | 269                |
| 18                   | 2.5   | 7301              | 65                  | 73                   | 86                 | 18822             | 167                 | 189                  | 222                | 26934             | 239                 | 270                  | 318                | 31477             | 279                 | 316                  | 372                |
| 20                   | 2.5   | 9286              | 91                  | 104                  | 122                | 23938             | 236                 | 267                  | 314                | 34256             | 337                 | 382                  | 449                | 40034             | 394                 | 446                  | 525                |
| 22                   | 2.5   | 11509             | 125                 | 141                  | 166                | 29669             | 321                 | 364                  | 428                | 42457             | 460                 | 521                  | 613                | 49619             | 537                 | 609                  | 716                |
| 24                   | 3     | 13372             | 158                 | 179                  | 211                | 34471             | 407                 | 461                  | 543                | 49329             | 582                 | 660                  | 777                | 57649             | 681                 | 771                  | 908                |
| 27                   | 3     | 17428             | 232                 | 262                  | 309                | 44924             | 597                 | 676                  | 796                | 64288             | 854                 | 968                  | 1139               | 75132             | 998                 | 1131                 | 1331               |
| 30                   | 3.5   | 21266             | 314                 | 356                  | 419                | 54819             | 809                 | 917                  | 1079               | 78448             | 1158                | 1312                 | 1544               | 91680             | 1353                | 1534                 | 1804               |
| 33                   | 3.5   | 26310             | 427                 | 484                  | 570                | 67821             | 1101                | 1248                 | 1468               | 97055             | 1576                | 1786                 | 2101               | 113425            | 1842                | 2087                 | 2455               |
| 36                   | 4     | 30982             | 549                 | 622                  | 732                | 79866             | 1415                | 1603                 | 1886               | 114291            | 2024                | 2294                 | 2699               | 133569            | 2366                | 2681                 | 3154               |

The torque values can only be achieved if nut (or tapped hole) has a proof load greater than or equal to the bolt's minimum ultimate tensile strength.

Clamp loads estimated as 75% of proof load for specified bolts.

Torque values listed in foot-pounds.

Torque values calculated from formula  $T = KDF$  where;  $K = 0.15$  for "lubricated" condition,  $K = 0.17$  for zinc plated and dry condition (or as-received for the 12.9),  $K = 0.20$  for plain and dry condition

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**DEMAND  
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