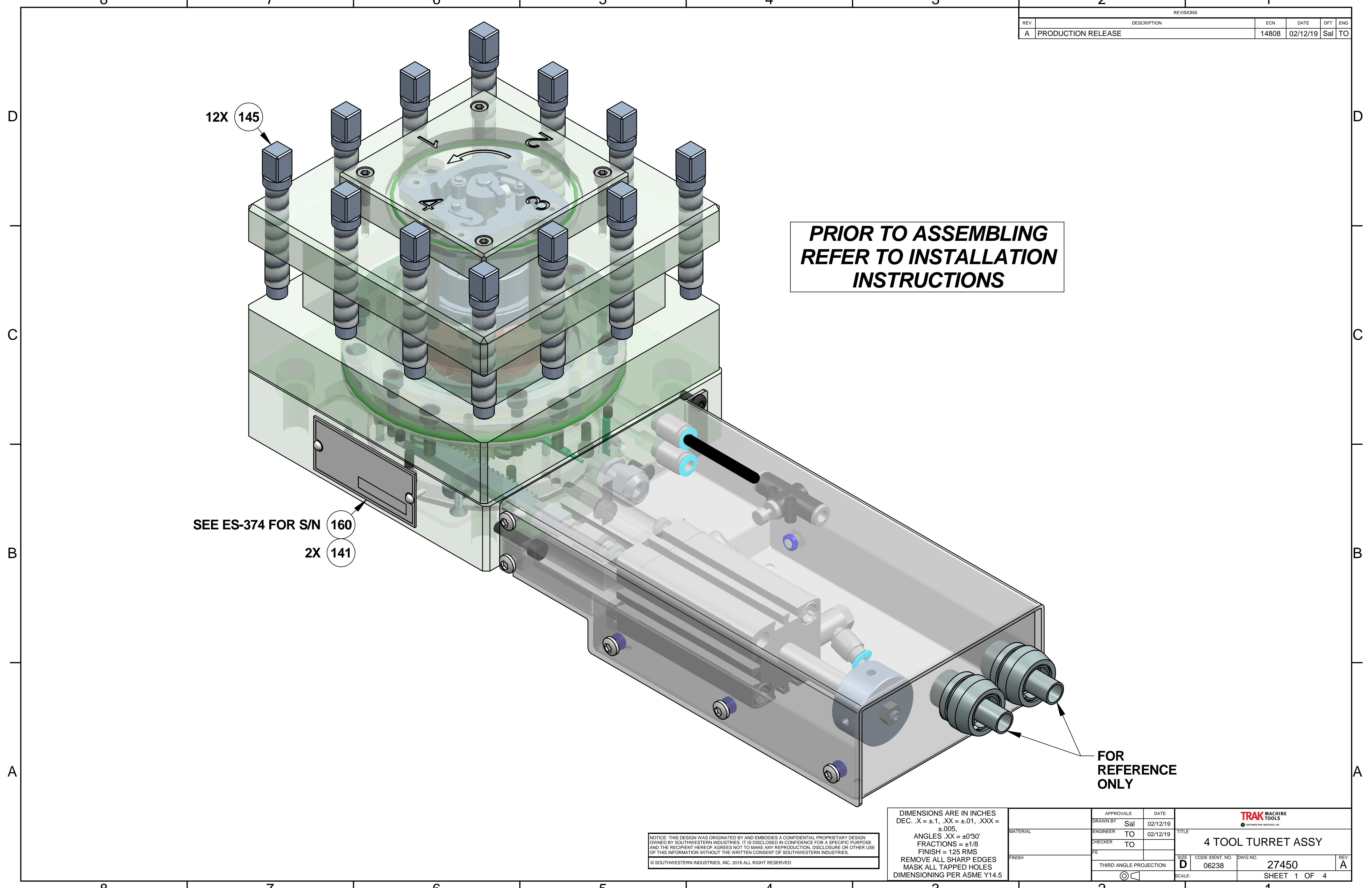


| REVISIONS | | ECN | DATE | DFT | ENG |
|-----------|--------------------|-------|----------|-----|-----|
| REV | DESCRIPTION | | | | |
| A | PRODUCTION RELEASE | 14808 | 02/12/19 | Sal | TO |



**PRIOR TO ASSEMBLING
REFER TO INSTALLATION
INSTRUCTIONS**

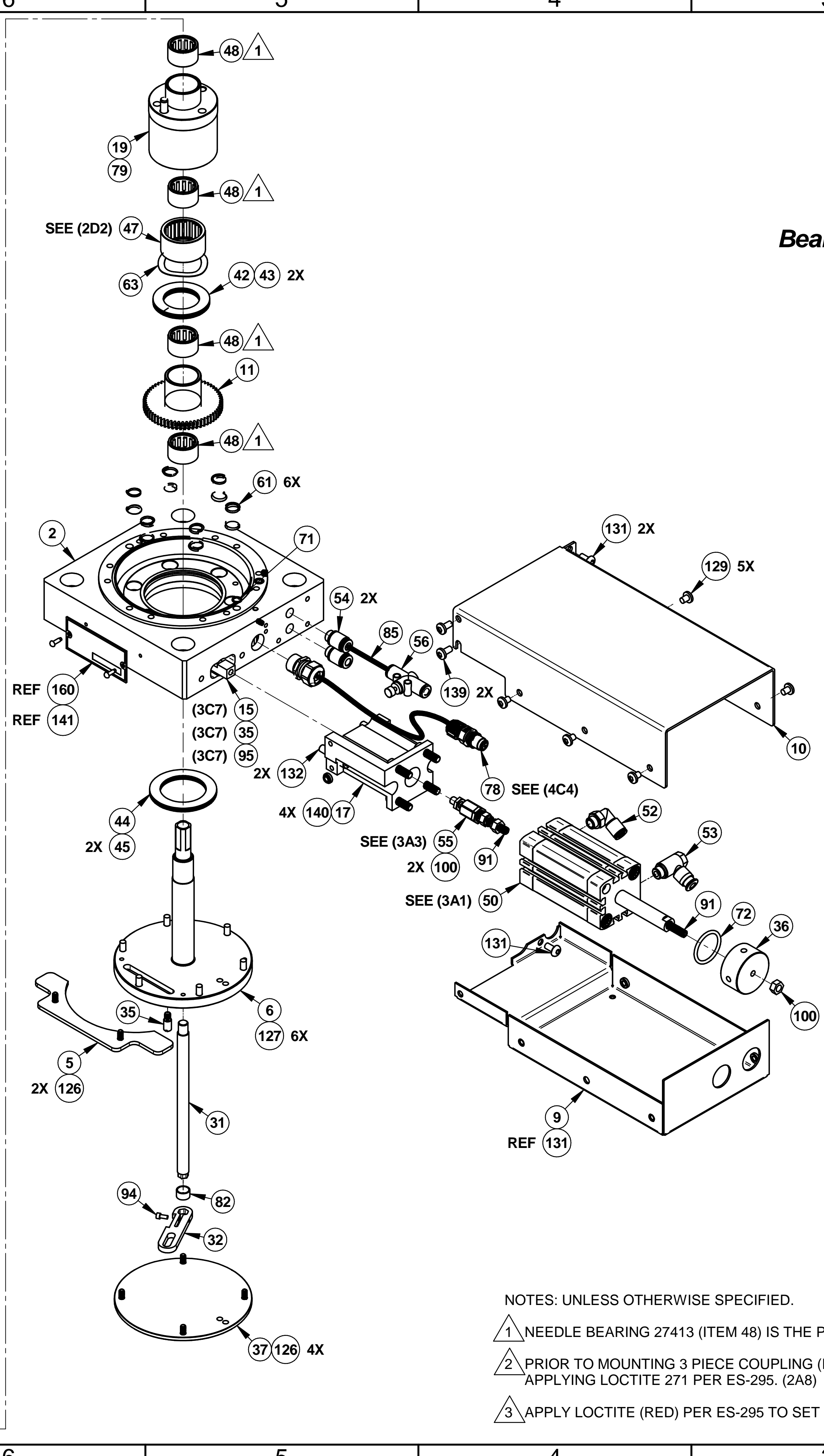
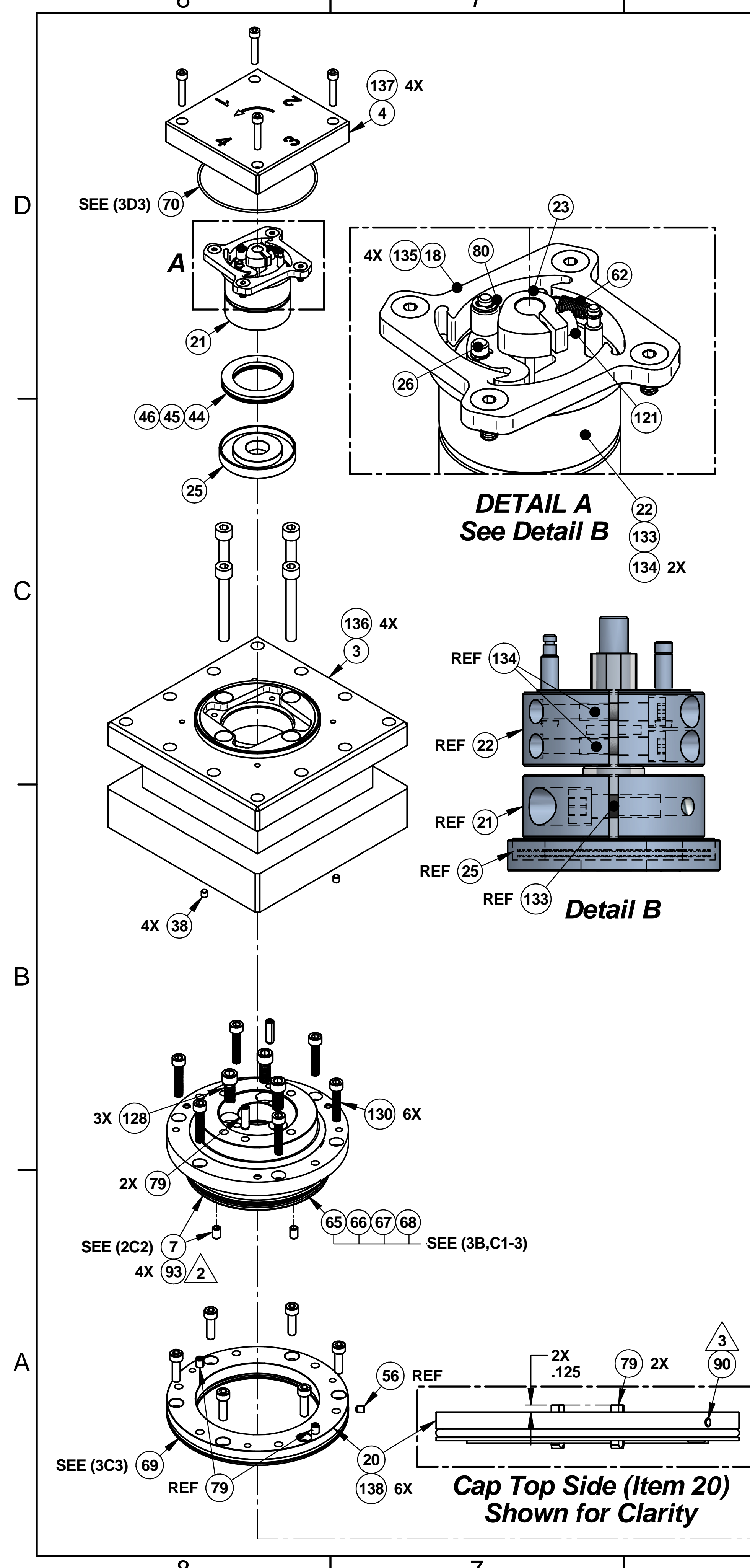
SEE ES-374 FOR S/N 160
2X 141

**FOR
REFERENCE
ONLY**

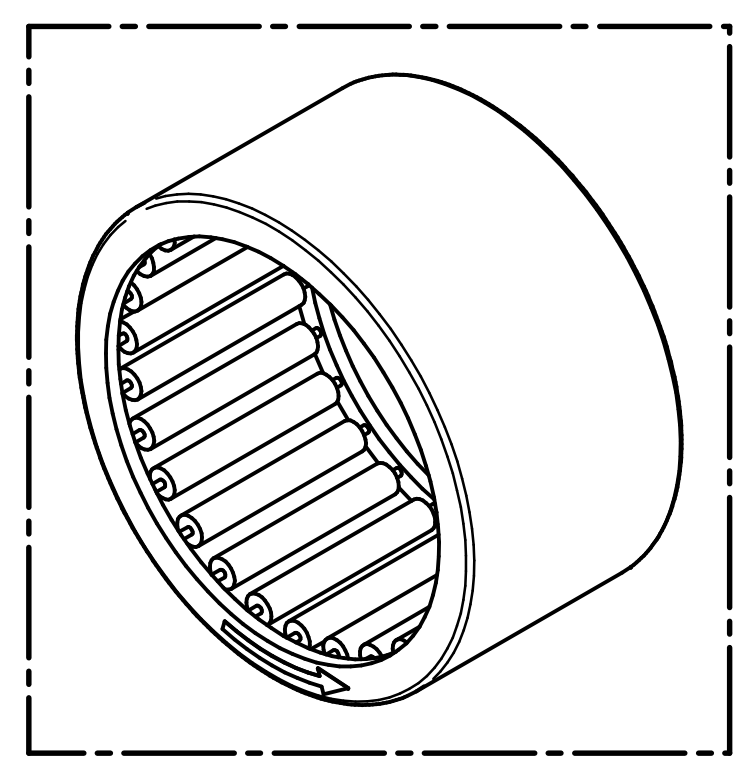
NOTICE: THIS DESIGN WAS ORIGINATED BY AND EMBODIES A CONFIDENTIAL PROPRIETARY DESIGN OWNED BY SOUTHWESTERN INDUSTRIES. IT IS DISCLOSED IN CONFIDENCE FOR A SPECIFIC PURPOSE AND THE RECIPIENT HEREOF AGREES NOT TO MAKE ANY REPRODUCTION, DISCLOSURE OR OTHER USE OF THIS INFORMATION WITHOUT THE WRITTEN CONSENT OF SOUTHWESTERN INDUSTRIES.
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DIMENSIONS ARE IN INCHES
DEC. .X = ±.1, .XX = ±.01, .XXX = ±.005
ANGLES .XX = ±0°30'
FRACTIONS = ±1/8
FINISH = 125 RMS
REMOVE ALL SHARP EDGES
MASK ALL TAPPED HOLES
DIMENSIONING PER ASME Y14.5

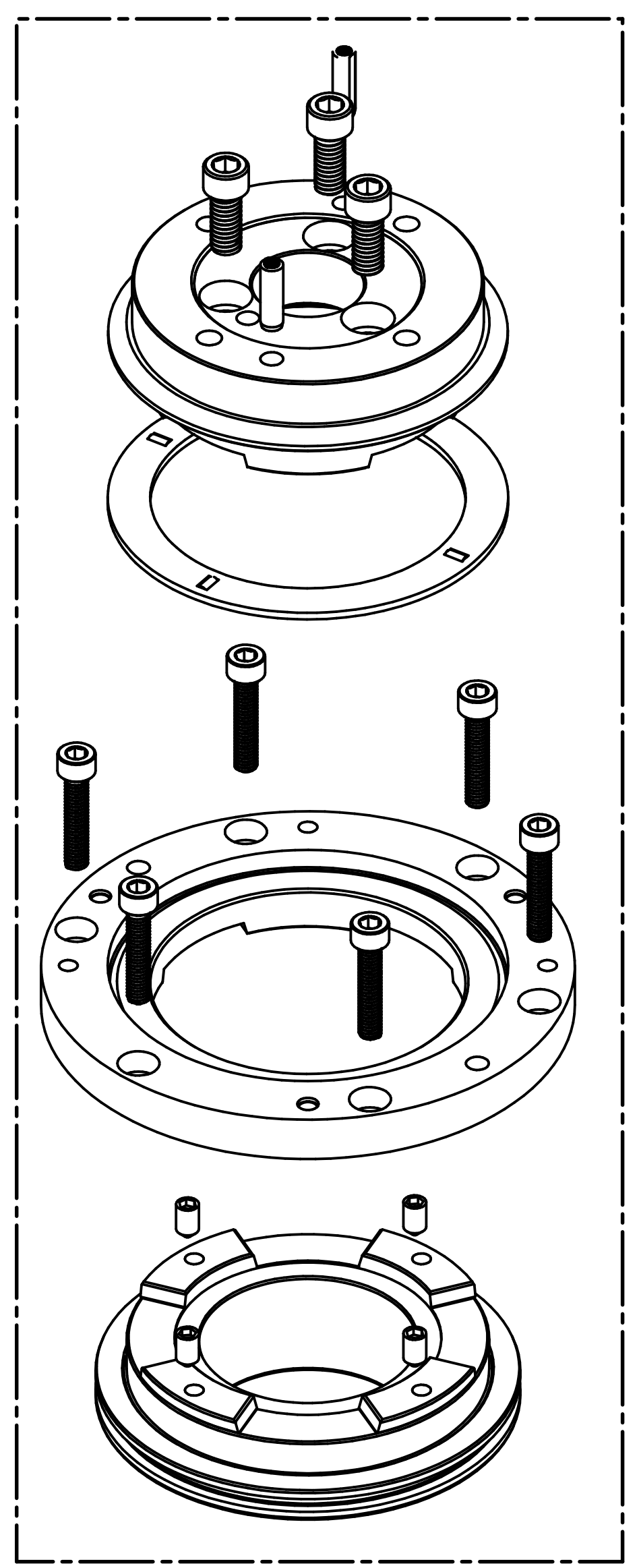
| | | | | |
|------------------------|-----|----------|--------------------|-----------------|
| APPROVALS | | DATE | | |
| DRAWN BY | Sal | 02/12/19 | TITLE | |
| ENGINEER | TO | 02/12/19 | 4 TOOL TURRET ASSY | |
| CHECKER | TO | | SIZE | CODE IDENT. NO. |
| FE | | | D | 06238 |
| THIRD ANGLE PROJECTION | | | DWG NO. | REV |
| | | | 27450 | A |
| SCALE: | | | SHEET 1 OF 4 | |



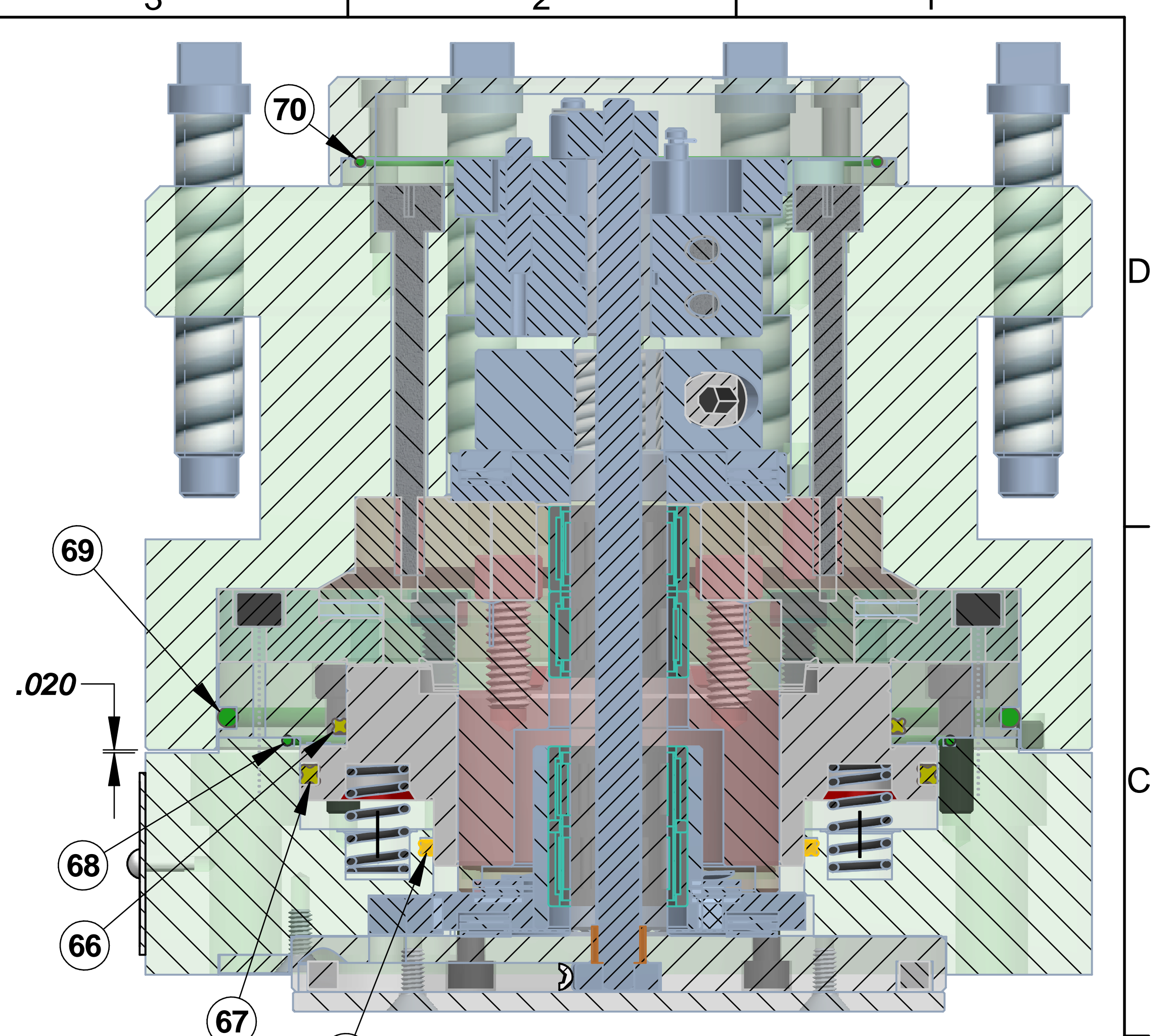
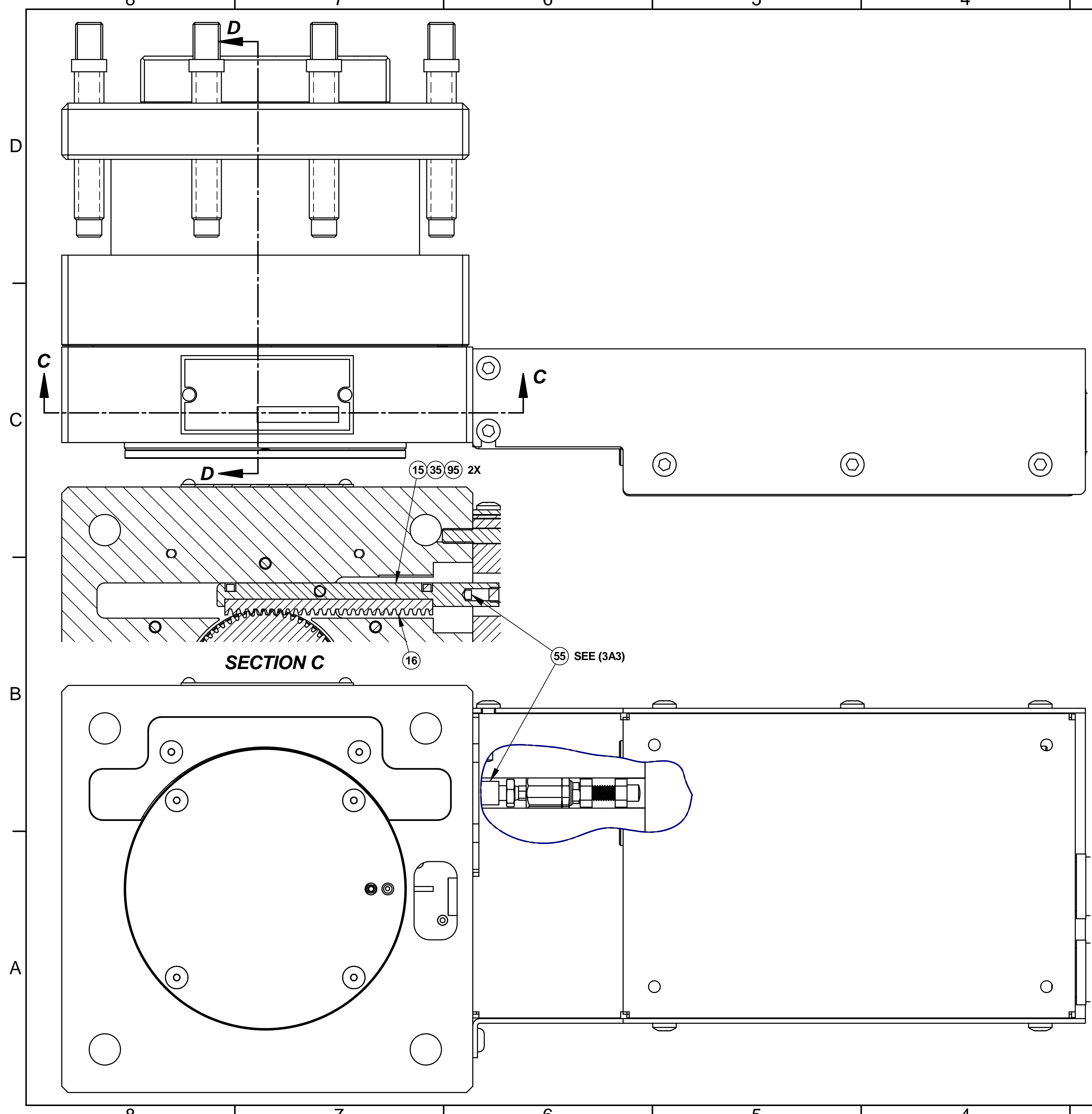
**Clutch Bearing (Item 47)
Shown from Bottom.
When pressing Clutch
Bearing Arrow must be visible**



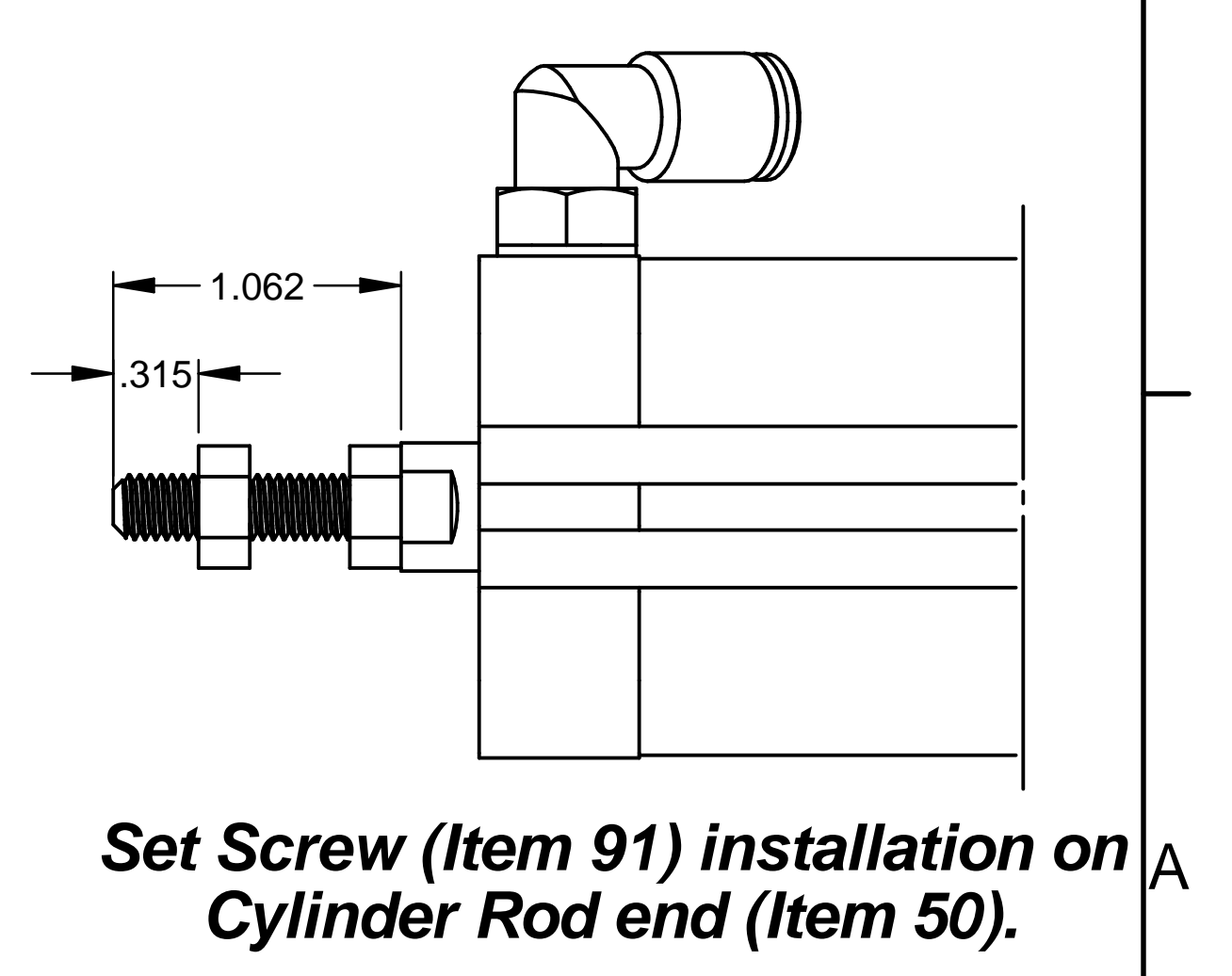
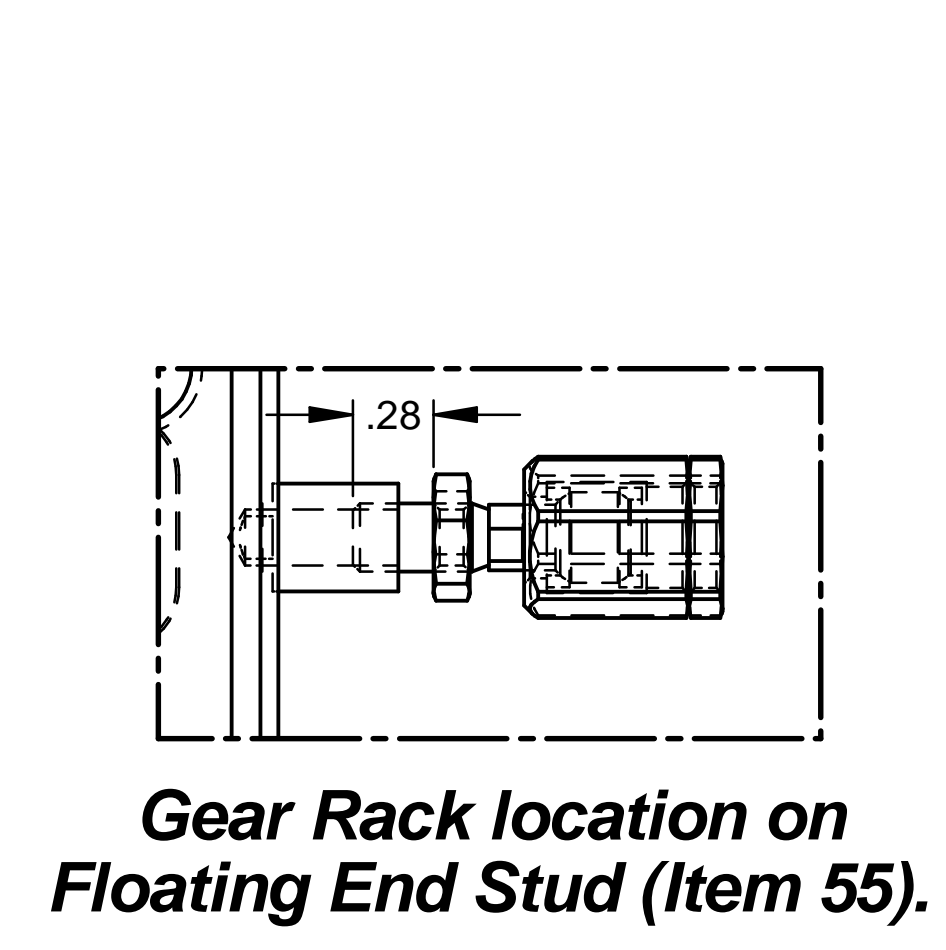
**3 Piece Set
(Item 7)
Shown Exploded
for Assembly**



- NOTES: UNLESS OTHERWISE SPECIFIED.
- 1 NEEDLE BEARING 27413 (ITEM 48) IS THE PREFERRED TYPE, IF UNAVAILABLE 27413-1 (ITEM 49) IS A SUITABLE REPLACEMENT. (2C5), (2D5)
 - 2 PRIOR TO MOUNTING 3 PIECE COUPLING (ITEM 7) INSERT SOCKET SET SCREWS (ITEM 93) INTO LOCK RING (27403) APPLYING LOCTITE 271 PER ES-295. (2A8)
 - 3 APPLY LOCTITE (RED) PER ES-295 TO SET SCREW (ITEM 90). (2A6)



**SECTION D-D
O Ring Locations View**



8 7 6 5 4 3 2 1

D

C

B

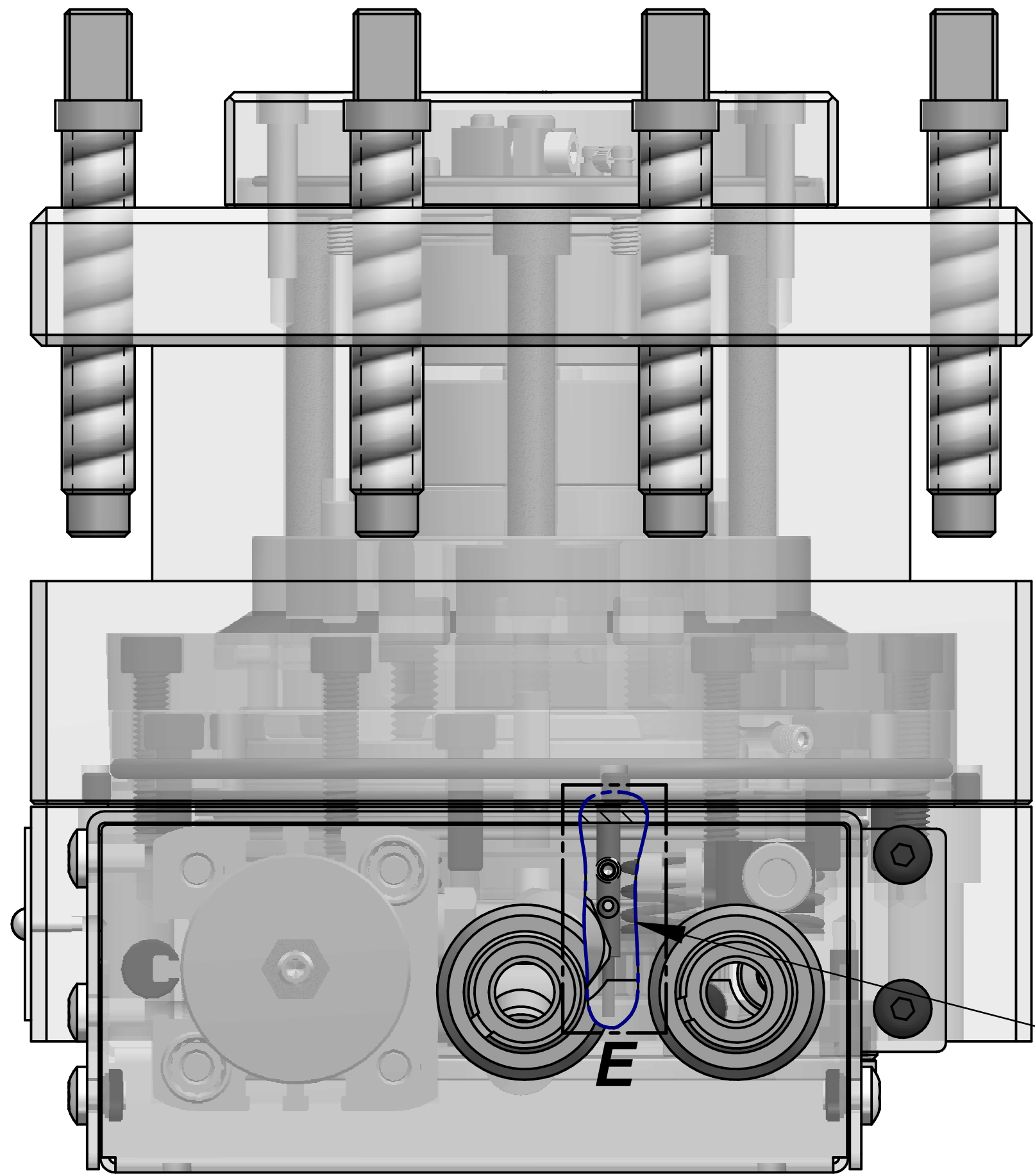
A

D

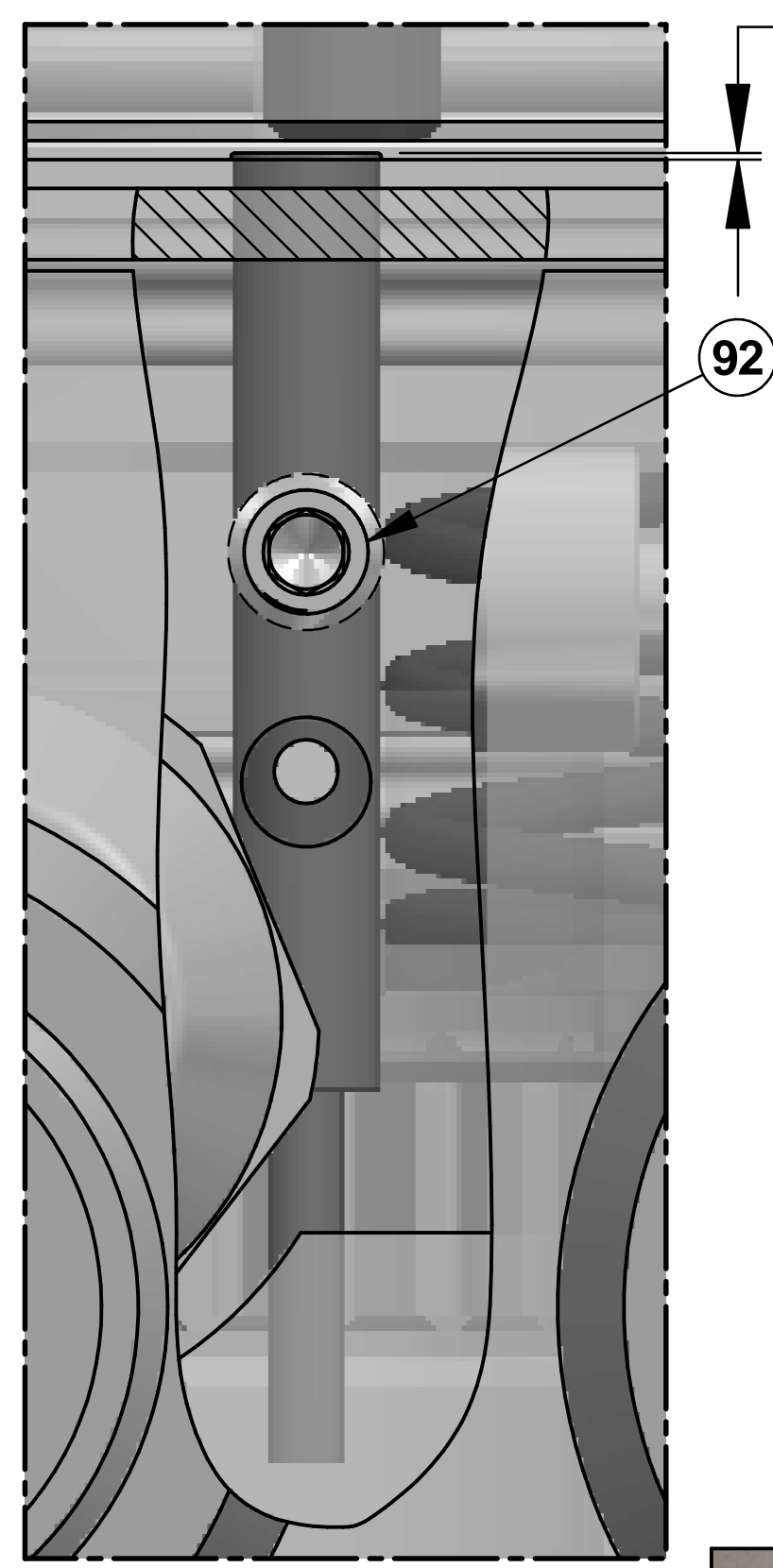
C

B

A

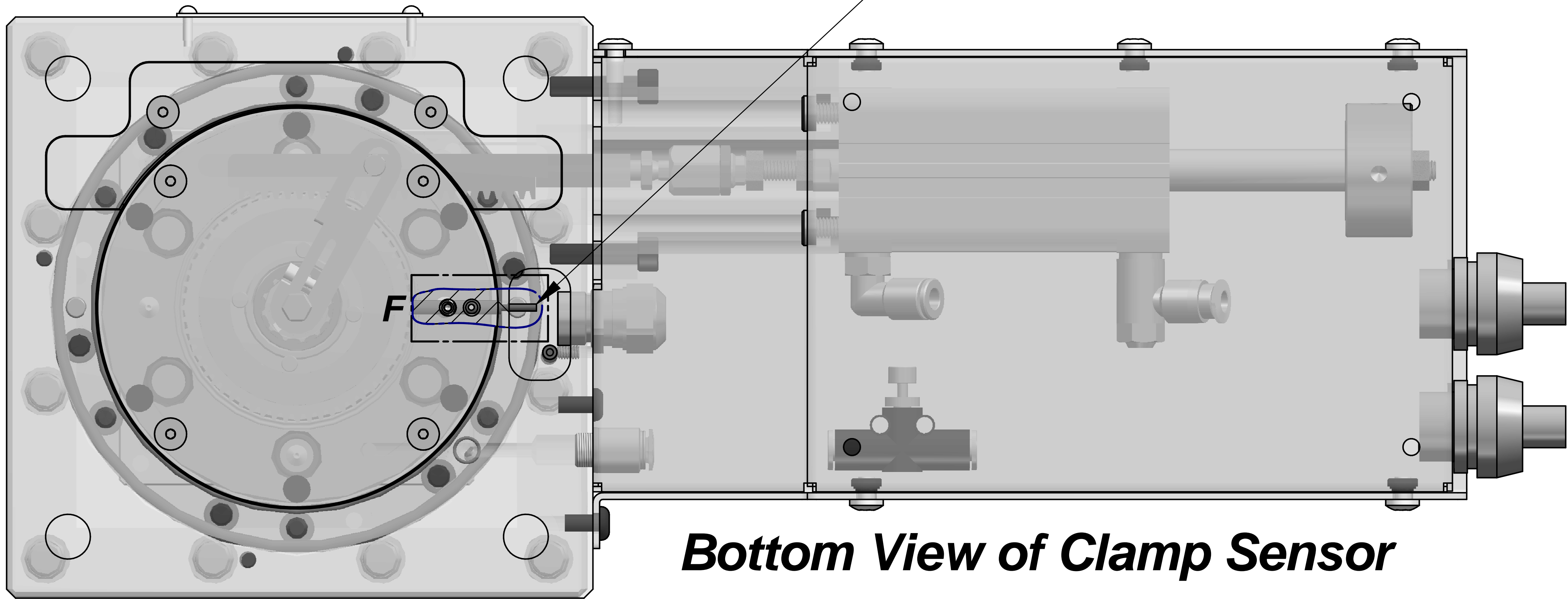


**Right View
of In-Position Sensor**

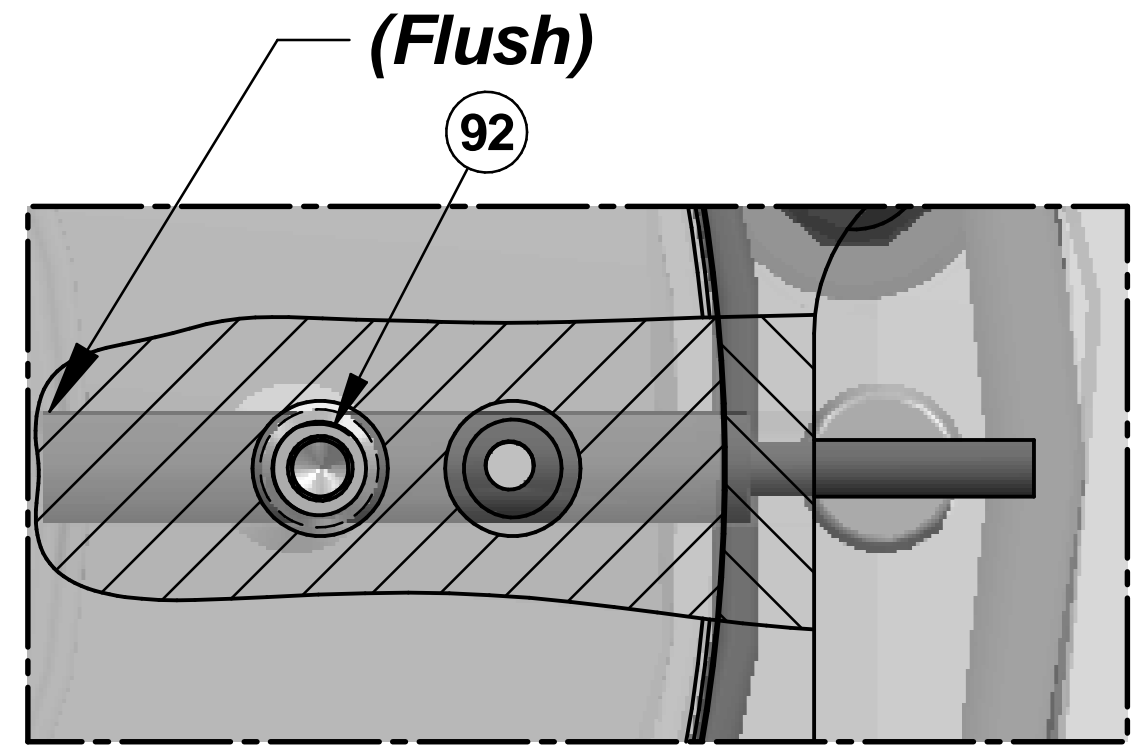


Detail E
**In-Position Sensor to be
installed using a .007
Feeler Gauge measuring
from bottom of
Tool Holder Post (27406)
to top of Sensor**

IN TURRET SENSORS ASSY (ITEM 78)



Bottom View of Clamp Sensor



Detail F
**Clamp Sensor to be
mounted flush
with LED positioned
as shown**

8 7 6 5 4 3 2 1

Parts List for Assembly P/N: 27450

Printed 2/12/2019

27450
4 TOOL TURRET ASSY

| | | | |
|----------|----------|--------------|----|
| Type | PL | Dwg Size | D |
| Revision | A | Product | |
| Status | R | Engineer | TO |
| Date | 4/6/2015 | Planner Code | |
| By | Sal | Comm Code | |

| Item | P/N | Title | Detail | Qty | UseA | Rev | Stat | Type | Mfr | Mfr P/N |
|------|-------|--|--------|-----|------|-----|------|------|-----|---------|
| 2 | 27405 | HOUSING-BASE-4 TOOL TURRET | | 1 | EA | A | R | PL | | |
| 3 | 27406 | POST-TOOL HOLDER-3/4 & 1"-4 TOOL TURRET | | 1 | EA | A | R | PL | | |
| 4 | 27407 | COVER-TOP-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 5 | 27408 | COVER-BOTTOM-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 6 | 27409 | PIN-CENTER-4 TOOL TURRET | | 1 | EA | A | R | PL | | |
| 7 | 27400 | COUPLING-3 PIECE SET-HIRTH W/ 27803 THRUST BEARING | | 1 | EA | A | R | PL | | |
| 9 | 27440 | SHEET METAL-CYLINDER-COVER-BOTTOM | | 1 | EA | A | R | PL | | |
| 10 | 27441 | SHEET METAL-CYLINDER COVER-TOP | | 1 | EA | A | R | DWG | | |
| 11 | 27410 | GEAR INDEX ASSY-4 TOOL TURRET | | 1 | EA | A | R | PL | | |
| 15 | 27416 | BRACKET-GEAR RACK-INDEX-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 16 | 27417 | MODIFIED-GEAR RACK-INDEX | | 1 | EA | A | R | PL | | |
| 17 | 27418 | BLOCK-CYLINDER MT-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 18 | 27419 | RATCHET-TURRET INDEX-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 19 | 27421 | POST-MAIN-COUPLING-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 20 | 27422 | CAP-TOP SIDE-CYLINDER-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 21 | 27423 | LOCKNUT-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 22 | 27452 | RATCHET PAWL MOUNT ASSY | | 1 | EA | A | R | PL | | |
| 23 | 27420 | CAM-RATCHET PAWL-INDEX-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 25 | 27425 | WASHER-TOP THRUST BRG-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 26 | 27426 | PAWL ASSY-4 TOOL TURRET | | 1 | EA | A | R | PL | | |
| 31 | 27430 | SHAFT-RATCHET CAM-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |

Parts List for Assembly P/N: 27450
4 TOOL TURRET ASSY

27450

Rev A

Printed 2/12/2019

| Item | P/N | Title | Detail | Qty | UseA | Rev | Stat | Type | Mfr | Mfr P/N |
|------|---------|---|-----------------------------|-----|------|-----|------|------|-----------------|----------|
| 32 | 27431 | LINK-PAWL CAM-RATCHET-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 35 | 27434 | PIN-LINK DRIVE-RATCHET-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 36 | 27435 | KNOB-STROKE ADJUSTMENT-INDEX CYLINDER | | 1 | EA | A | R | DWG | | |
| 37 | 27436 | COVER-CENTER PIN-BOTTOM-4 TOOL TURRET | | 1 | EA | A | R | DWG | | |
| 38 | 27437 | PLUG-PLASTIC-SENSOR-4 TOOL TURRET | | 4 | EA | A | R | DWG | | |
| 42 | 27357 | BEARING-NEEDLE-ROLLER THRUST-30mm ID x 47mm OD x 2mm THK | Used with 27357-1 | 1 | EA | A | R | DWG | MCMaster | 5909K17 |
| 43 | 27357-1 | WASHER-NEEDLE-ROLLER THRUST-30mm ID x 47mm OD x 1mm THK | Used with 27357 | 2 | EA | A | R | DWG | MCMaster | 5909K77 |
| 44 | 27364 | BEARING-NEEDLE-ROLLER THRUST-1.5 ID x 2.188 OD x .078 THK | Use with 27364-2 | 2 | EA | A | R | DWG | MCMaster | 5909K41 |
| 45 | 27364-1 | WASHER-NEEDLE-ROLLER THRUST-1.5 ID x 2.188 OD x .032 THK | Use with 27364 | 3 | EA | A | R | DWG | MCMaster | 5909K54 |
| 46 | 27364-2 | WASHER-NEEDLE-ROLLER THRUST-1.5 ID x 2.188 OD x .126 THK | Use with 27364 | 1 | EA | A | R | DWG | MCMaster | 5909K67 |
| 47 | 27358 | CLUTCH-ROLLER BEARING-ONE WAY-30mm ID | | 1 | EA | A | R | DWG | MCMaster | 6392K51 |
| 48 | 27413 | BEARING-NEEDLE-ROLLER-18mm ID | SEE NOTES | 4 | EA | A | R | DWG | IKO | TA1815Z |
| 49 | 27413-1 | BEARING-NEEDLE-ROLLER-18mm ID | | (4) | EA | A | R | DWG | IKO | TA1813Z |
| 50 | 27583-9 | CYLINDER-32mm BORE-50mm STROKE | ADN-32-50-I-PPS-A-S2-536267 | 1 | EA | A | R | DWG | FESTO | 536267 |
| 52 | 27016-7 | FITTING-G1/8 to 4mm TUBE 90°-PLASTIC | QSL-G1/8-4 | 1 | EA | A | R | DWG | FESTO | 186116 |
| 53 | 28531-1 | VALVE-ONE-WAY CONTROL | GRLA-1/8-QS-4-D | 1 | EA | A | R | DWG | FESTO | 193143 |
| 54 | 28562 | ADAPTOR-AIR-QUICK DISCONNECT | QS-G1/8-6-I | 2 | EA | A | R | PS | FESTO | 186107 |
| 55 | 27361 | ROD COUPLER-SELF ALIGNING-M6 | FK-M6 | 1 | EA | A | R | DWG | FESTO | 2061 |
| 56 | 28071-3 | VALVE-FLOW CONTROL-INLINE-AIR | Ø6mm PUSH TO CONNECT | 1 | EA | A | R | PS | KING RICH | A-91-099 |
| 61 | 27798-2 | SPRING-.281 ID x .50 OD-FL | | 5 | EA | A | R | DWG | CENTURY SPRINGS | D-1107 |
| 62 | 27362 | SPRING-EXTENSION-ULTRA-PRECISION-302 SS | | 1 | EA | A | R | DWG | MCMaster | 9065K11 |
| 63 | 25014-2 | WASHER-WAVE DISC SPRING-1.613 OD x 1.209 ID x .018 THK | | 1 | EA | A | R | DWG | MCMaster | 9714K68 |

Parts List for Assembly P/N: 27450
4 TOOL TURRET ASSY

27450

Rev A

Printed 2/12/2019

| Item | P/N | Title | Detail | Qty | UseA | Rev | Stat | Type | Mfr | Mfr P/N |
|------|-----------------|--|--------------------------------|-----|------|-----|------|------|----------|---------------|
| 65 | 27802-4 | X RING-145-.103 ± .003 C/S-2.55 ID x 2.756 OD | INTERNALLY LUBED | 1 | EA | A | R | DWG | PAI | 4444-145 3757 |
| 66 | 27802-5 | X RING-154-.103 ± .003 C/S-3.7378 ID x 3.943 OD | INTERNALLY LUBED | 1 | EA | A | R | DWG | PAI | 4444-154 3757 |
| 67 | 27802-6 | X RING-243-.139 4.109 ID x 4.387 OD | | 1 | EA | A | R | DWG | MCMaster | 90025K525 |
| 68 | 27805-24 | O RING-047-4.489 ID x 4.629 OD x .07 W | | 1 | EA | A | R | DWG | MCMaster | 9452K312 |
| 69 | 27805-26 | O RING-252-.139 ± .003 C/S-5.25 ID x 5.5 OD | INTERNALLY LUBED | 1 | EA | A | R | DWG | PAI | 1-252 3757 |
| 70 | 27805-23 | O RING-043-3.489 ID x 3.629 OD x .07 W | | 1 | EA | A | R | DWG | MCMaster | 9452K132 |
| 71 | 27805-15 | O-RING-6mm ID X 1mm W-BUNA N-70A | | 1 | EA | A | R | DWG | MCMaster | 9262K103 |
| 72 | 27805-25 | O RING-120-.987 ID x 1.193 OD x .103 W | | 1 | EA | A | R | DWG | MCMaster | 9452K84 |
| 78 | 27457 | CABLE ASSY-IN TURRET SENSORS-4 TOOL-1630, 1845, 2470 | | 1 | EA | A | R | PL | | |
| 79 | 28525 | DOWEL PIN-M6 x 20L- W/M4 THD-PULL OUT | M4 THD | 5 | EA | A | R | DWG | | |
| 80 | 27363 | RETAINING RING-EXT-LOW CL-.188 SHAFT DIA | | 1 | EA | A | R | DWG | MCMaster | 97414A620 |
| 82 | 27453 | BEARING-SLEEVE-OIL EMBEDDED-.3755 ID x .439 OD x .25L | | 1 | EA | A | R | DWG | MCMaster | 6391K624 |
| 85 | 28575 | TUBING-POLYURETHANES-6mm-BLACK | PUN-6x1-SW | 2in | FT | A | R | DWG | FESTO | 159665 |
| 90 | 10-32X3/16 43B | SCREW-SOC SET-STL-BO-KNURLED | | 1 | EA | - | R | PS | | |
| 91 | M6-1.0X35 40B | SCREW-SOCKET SET-STL-BO-CUP | | 2 | EA | | R | PS | | |
| 92 | 8-32X1/4 41B | SCREW-SOCKET SET-STL-FLAT PT | NONMARRING DRIVE SIZE 5/64" | 2 | EA | A | R | PS | MCMaster | 94105A190 |
| 93 | M6-1.0X10 40B | SCREW-SOCKET SET-STL-BO-CUP | | 4 | EA | | R | PS | | |
| 94 | 4-40X1/2 25B | SCREW-SOCKET HEAD CAP-STL-BO | | 1 | EA | A | R | PS | | |
| 95 | 4-40X1/4 25B | SCREW-SOCKET HEAD CAP-STL-BO | | 2 | EA | A | R | PS | | |
| 100 | M6-1.0 50B | NUT-HEX-STL-BO | | 2 | EA | | R | PS | | |
| 121 | 8-32X1/2 25B | SCREW-SHCS-STL-BO | | 1 | EA | | R | PS | | |
| 126 | 8-32X7/16 26B | SCREW-FHCS-STL-BO | | 6 | EA | A | R | PS | | |
| 127 | 10-32X1/2 25B | SCREW-SHCS-STL-BO | | 6 | EA | - | R | PS | | |
| 128 | 5/16-18X3/4 25B | SCREW-SHCS-STL-BO | | 3 | EA | | R | PS | | |

| Item | P/N | Title | Detail | Qty | UseA | Rev | Stat | Type | Mfr | Mfr P/N |
|------|----------------|-----------------------------|--|-----|------|-----|------|------|-----|---------|
| 129 | 10-32X1/4 27B | SCREW-BHCS-STL-BO | | 5 | EA | | R | PS | | |
| 130 | M6-1.0X30 25B | SCREW-SHCS-STL-BO | | 6 | EA | A | R | PS | | |
| 131 | M5-0.8X10 27B | SCREW-BHCS-STL-BO | | 3 | EA | - | R | PS | | |
| 132 | M6-1.0X25 25B | SCREW-SHCS-STL-BO | | 2 | EA | A | R | PS | | |
| 133 | 1/4-20X3/4 25B | SCREW-SHCS-STL-BO | | 1 | EA | A | R | PS | | |
| 134 | 10-32X3/4 25B | SCREW-SHCS-STL-BO | | 2 | EA | | R | PS | | |
| 135 | 10-32X1/2 26B | SCREW-FHCS-STL-BO | | 4 | EA | | R | PS | | |
| 136 | M8-1.25X60 25B | SCREW-SHCS-STL-BO | | 4 | EA | | R | PS | | |
| 137 | 10-32X1 25B | SCREW-SHCS-STL-BO | | 4 | EA | | R | PS | | |
| 138 | M6-1.0X20 25B | SCREW-SHCS-STL-BO | | 6 | EA | - | R | PS | | |
| 139 | 10-32X3/8 27B | SCREW-BHCS-STL-BO | | 2 | EA | A | R | PS | | |
| 140 | 27372 | SCREW-M6-1.0 x 20mm-SHCS-BO | 4mm H x Ø 10mm-LOW PROFILE-CLASS 8.8 | 4 | EA | A | R | DWG | | |
| 141 | 4X3/8 34J | SCREW-DRIVE-4-SS | | 2 | EA | A | R | PS | | |
| 145 | 23873 | SQUARE HEAD SCREW M12-1" | | 12 | EA | - | R | PS | | |
| 160 | 21934-1 | NAMEPLATE-SERIAL NUMBER | | 1 | EA | A | R | DWG | | |