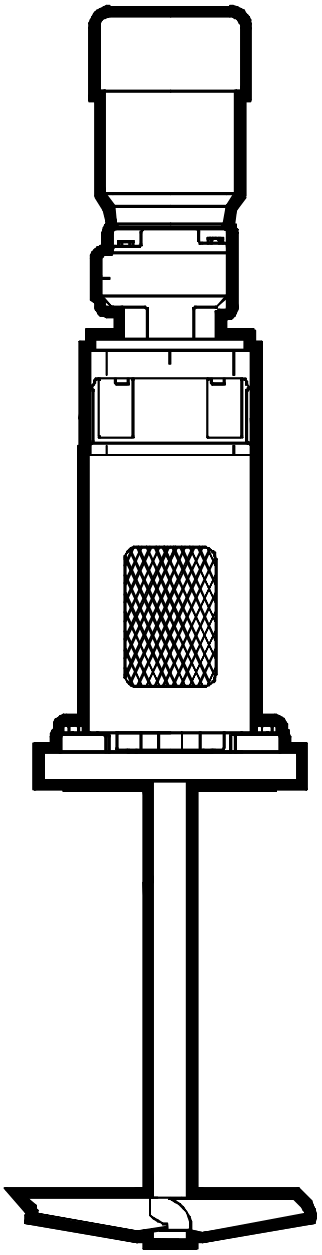
Chemineer

Manual 280

DT Small Mixers Installation, Operation, Maintenance Manual

Equipment Reference:
30DTN Style Mixer
40DTNS, 40DTNC, 40DTN Style Mixers



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INITIAL INSPECTION

Step 1: Inspect crates. Upon receipt, inspect all crates and equipment for shipping damage. Report shipping damage to your local Chemineer office or to the factory in Dayton, Ohio. A claim should be filed immediately with the carrier involved.

Step 2: Uncrate. Check the contents. Do not uncrate the unit until you have read the ***Mounting & Installation*** section of this manual and looked at the assembly drawing shipped with the unit. Be careful in uncrating and handling. Do not discard the crating without making sure that all mixer parts have been removed. Correct assembly of this unit requires referring to both the unit assembly drawing and this manual.

Step 3: Questions? Call Chemineer. If the shipment is not complete or you do not understand what you have received, please contact *your local Chemineer office* immediately.

CHEMINEER ASSISTANCE

Chemineer maintains a fully staffed Parts and Field Service Department ready to help you with any service requirement. Simply contact your local Chemineer office, or contact Parts/Field Service at the Chemineer Factory in Dayton, Ohio:

Chemineer, Inc.
P.O. Box 1123
Dayton, Ohio 45401
Phone: (937) 454-3200
FAX: (937) 454-3375

Services available are as follows:

Installation and maintenance training seminars,
Installation and start-up supervision,
Preventative maintenance planning,
Parts order service,
Special instructions.

STORAGE

Do not remove any protective packaging, coatings (generally applied to the motor or gearmotor output shafts), or any protective coverings that may be applied to the wetted parts until the mixer is to be put into service. If the equipment is to be stored, *do not stack crates*. Store in a clean dry indoor location that is free from wide variations in temperature. The storage area should be free from vibration and excessive heat.

Inspect for external rust at six-month intervals. Apply rust preventative as required. If the unit has been in storage for more than six months or subjected to adverse moisture conditions, the motor windings may have to be dried prior to operation.

CAUTION! Coated/rubber covered agitator parts require special handling to avoid damage to coatings/rubber coverings. Do not use chains or hooks on coated/covered surfaces. Special care is required to prevent damage to edges and outside corners. Contact Chemineer Field Service for instructions.

Short-Term Indoor Storage

Mixers should be stored indoors in areas with no vibration and relatively constant temperatures and humidity. The factory storage preparations should be acceptable for up to six months storage.

Rotate the drive coupling 10 to 15 revolutions at least once per month to reduce the possibility of brinelling of the bearings and to redistribute bearing grease.

VESSEL EVALUATION

Refer to the mixer assembly drawing for the required support structure design loads.

In designing the structure to accommodate bending moment, the structure should be sufficiently rigid so that the mixer extension shaft will not move more than 1/64 inch (.4mm) per foot of length due to deflection of the mounting system.

These units are supplied with a standard flange designed to mount on an ANSI or DIN nozzle or pad located on the vessel top head. Refer to the mixer assembly drawing for agitator mounting flange size and type. Special flanges, including ferrule type, are also available.

The following methodology will help determine if the designated vessel top head is sufficiently rigid to properly support a mixer or if reinforcement through gusseting is required.

1. Evaluate the designated vessel top head. Recommended head thicknesses are listed for ungusseted nozzles *(Table 1)* and ungusseted pads *(Table 2).* If the designated vessel head thickness conforms to the given dimension, refer to *page 7* for ***Sealed Tank Mixer Installation***. No further vessel head thickness evaluation is required.

TABLE 1: RECOMMENDED MINIMUM HEAD THICKNESSES, "t", inches (mm) FOR UNGUSSETED NOZZLE MOUNTING

	TANK DIAMETER, "T" FT (M)									
CASE SIZE	**2 (.61)**	**2.5 (0.76)**	**3 (0.91)**	**4 (1.22)**	**5 (1.52)**	**6 (1.83)**	**7 (2.13)**	**8 (2.44)**	**9 (2.74)**	**10 (3.05)**
30DTN	.250 (6.4)	.250 (6.4)	.375 (9.5)	.375 (9.5)	.375 (9.5)	.500 (12.7)	.500 (12.7)			
40DTNS 40DTNC 40DTN	.250 (6.4)	.375 (9.5)	.375 (9.5)	.500 (12.7)	.500 (12.7)	.500 (12.7)	.625 (15.9)	.625 (15.9)	.625 (15.9)	.625 (15.9)

Cells shaded in gray are "not recommended".

TABLE 2: RECOMMENDED MINIMUM HEAD THICKNESS, "t", inches (mm) FOR PAD MOUNTING

	TANK DIAMETER, "T" FT (M)									
CASE SIZE	**2 (.61)**	**2.5 (0.76)**	**3 (0.91)**	**4 (1.22)**	**5 (1.52)**	**6 (1.83)**	**7 (2.13)**	**8 (2.44)**	**9 (2.74)**	**10 (3.05)**
30DTN	.375 (9.5)	.375 (9.5)	.375 (9.5)	.500 (12.7)	.500 (12.7)	.625 (15.9)	.625 (15.9)			
40DTNS 40DTNC 40DTN	.188 (4.8)	.188 (4.8)	.188 (4.8)	.188 (4.8)	.250 (6.4)	.375 (9.5)	.375 (9.5)	.375 (9.5)	.375 (9.5)	.500 (12.7)

Cells shaded in gray are "not recommended".

VESSEL EVALUATION

2. If the designated vessel top head **does not** meet *Table 1 or Table 2* criteria, reinforcement support may be added to provide the equivalent rigidity of a thicker head, providing that the existing head thickness meets the minimum thicknesses as noted in *Table 3, below*, for nozzles or pads. Reference *Figure 1, page 5*.

If the vessel head still does not meet the minimum thicknesses listed below, consult Chemineer Field Service for assistance.

TABLE 3: RECOMMENDED MINIMUM HEAD THICKNESSES, "t", inches (mm) FOR REINFORCED NOZZLE OR PAD MOUNTING

	TANK DIAMETER, "T" FT (M)									
CASE SIZE	**2 (.61)**	**2.5 (0.76)**	**3 (0.91)**	**4 (1.22)**	**5 (1.52)**	**6 (1.83)**	**7 (2.13)**	**8 (2.44)**	**9 (2.74)**	**10 (3.05)**
30DTN	.188 (4.8)	.188 (4.8)	.188 (4.8)	.250 (6.4)	.250 (6.4)	.250 (6.4)	.250 (6.4)			
40DTNS 40DTNC 40DTN	.125 (3.2)	.125 (3.2)	.125 (3.2)	.125 (3.2)	.125 (3.2)	.188 (4.8)	.188 (4.8)	.188 (4.8)	.188 (4.8)	.188 (4.8)

Cells shaded in gray are "not recommended".

3. If reinforcement is applicable, refer to *Tables 4 and 5, below and Figure 2, page 6* for proper reinforcement dimensions.

TABLE 4: MOUNTING NOZZLE REINFORCEMENT DIMENSIONS, inches (mm)

A ANSI – DIN	B NOZZLE HEIGHT MINIMUM	C GUSSET DIMENSION	D BACKUP PLATE RADIUS
6 (150)	4 (102)	6.5 (165)	12 (305)

TABLE 5: MOUNTING PAD REINFORCEMENT DIMENSIONS, inches (mm)

A ANSI – DIN	D BACKUP PLATE RADIUS
6 (150)	12 (305)

VESSEL EVALUATION

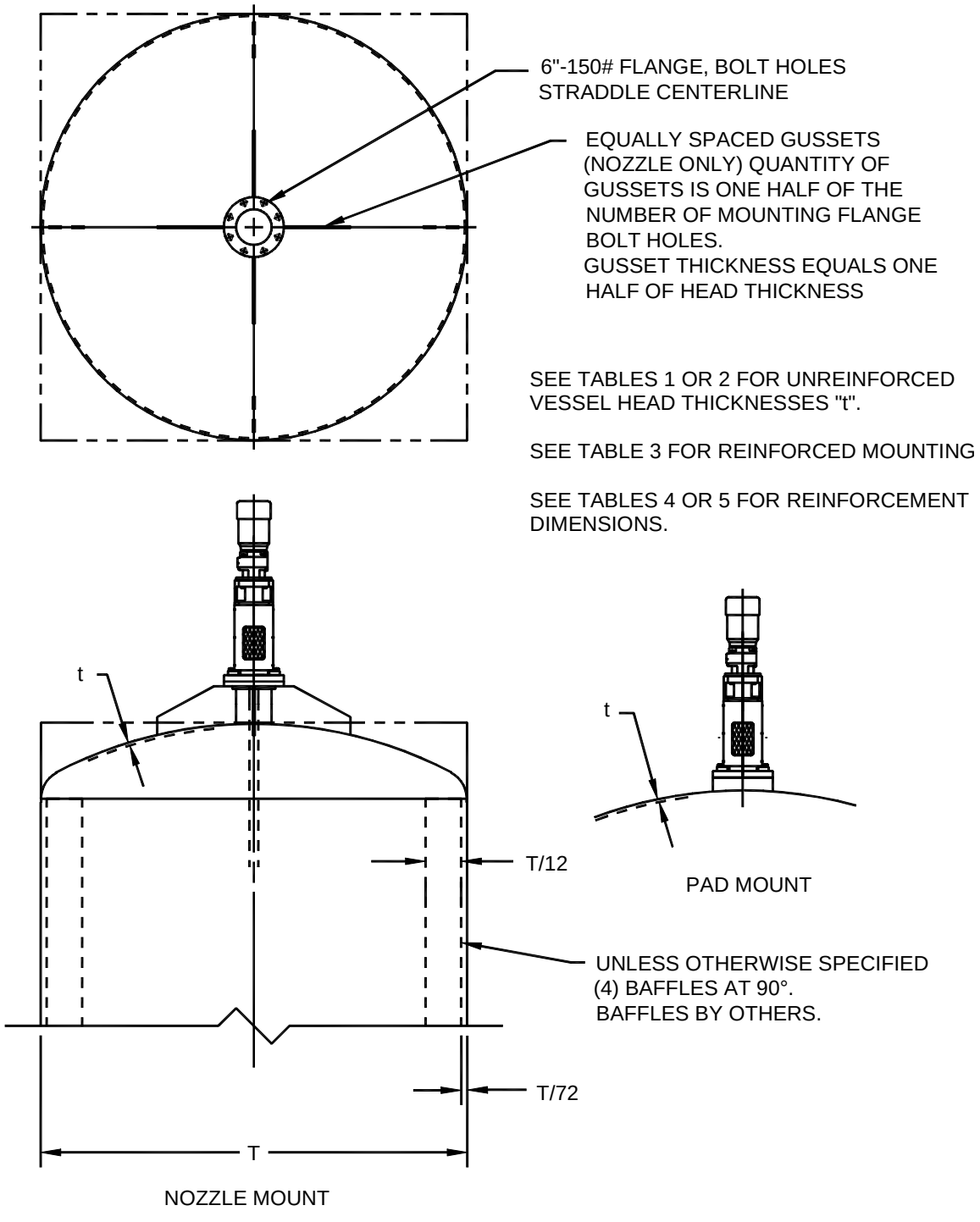


Figure 1: Models 30DTN, 40DTNS, 40DTNC, 40DTN Installation

VESSEL EVALUATION

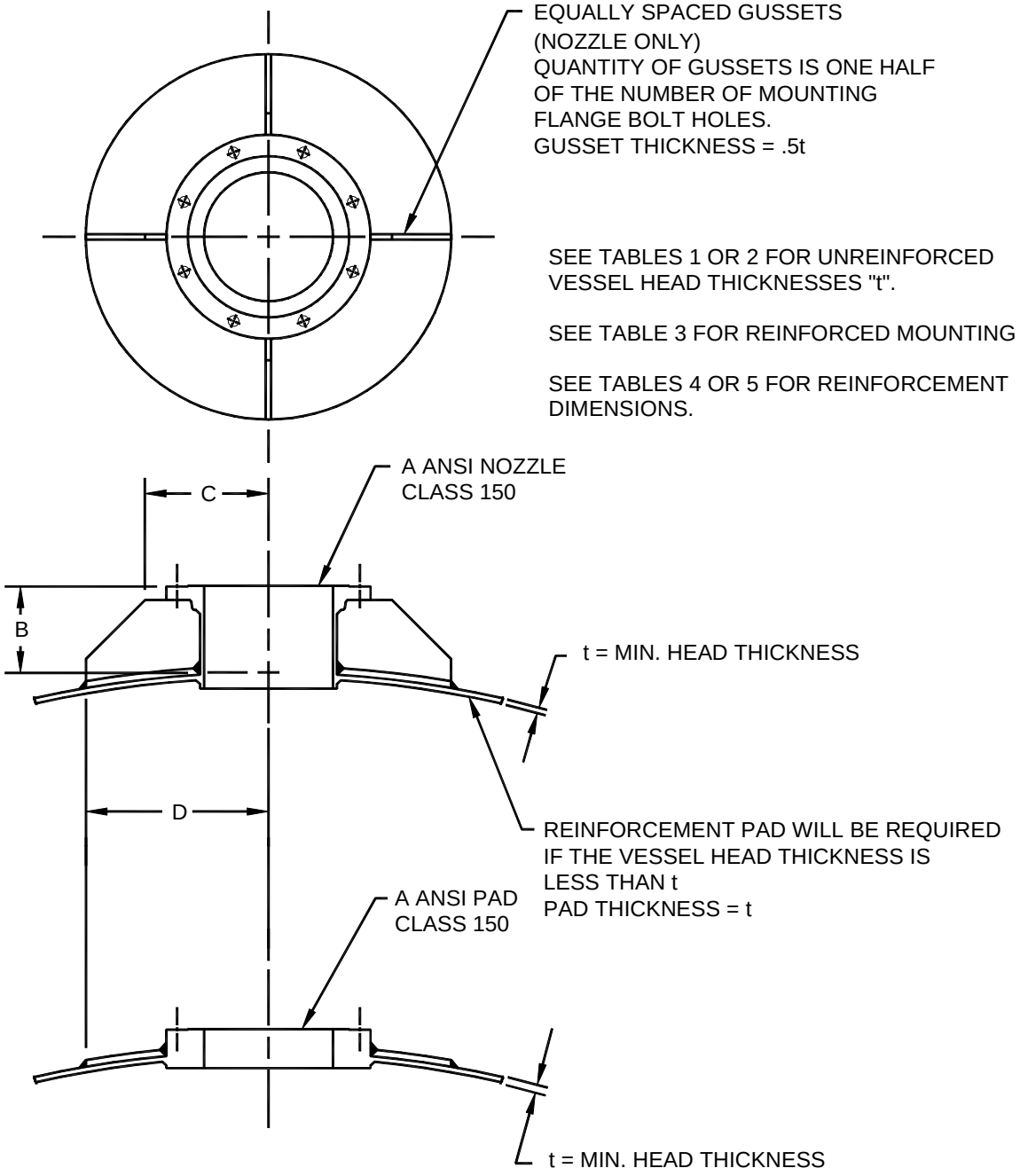


Figure 2: Models 30DTN, 40DTNS, 40DTNC, 40DTN Mounting, Nozzle/Pad

SEALED TANK MIXER INSTALLATION

Correct unit installation requires both the unit assembly drawing and this manual.

The model 30DTN is a direct drive, double cartridge mechanical seal design for sealed tank applications. The drive unit is typically shipped with the motor **[100]** mounted to the cast aluminum housing **[201-06]**. A flanged drive shaft **[217]** coupling with bearing support extends from the unit housing for removable coupling/extension shaft attachment. Also in the main unit box will be a separate carton for the mechanical seal assembly **[1500 or 1650]**, seal adapter piece assembly **[1270 or 1280]**, handhole cover **[1716-02]**, removable coupling assembly **[300]**, mounting flange **[1251]**, impellers **[500]** and all other required accessories. Shafting **[400]** is shipped separately.

The models 40DTNS, 40DTNC and 40DTN are gear reduced, heavy duty, single component mechanical seal (40DTNS), single cartridge mechanical seal (40DTNC), or double cartridge mechanical seal (40DTN) designs for sealed tank applications. The drive unit is typically shipped with the gearmotor (integral motor/gear reducer) **[105]** mounted to the cast aluminum housing **[201-06]**. A flanged drive shaft **[217]** coupling with bearing support extends from the unit housing for removable coupling/extension shaft attachment. Also in the main unit box will be a separate carton for the mechanical seal assembly **[1400, 1450, 1500, 1550, 1600, or 1650]**, seal adapter plate assembly **[1260, 1270, 1280, or 1290]**, handhole cover **[1107-02 or 1716-02]**, removable coupling assembly **[300]**, mounting flange **[1251]**, impellers **[500]** and all other required accessories. Shafting **[400]** is shipped separately.

Be certain to locate all contents before discarding packaging materials.

1. Remove all shipping constraints. A nylon strap, or similar, should be secured around the mixer housing **[201-06]** to lift and move the mixer. Please note the approximate net weight of the unit as shown on the assembly drawing and use caution when moving or lifting these items. *At no point during installation or maintenance of the mixer, should the extension shaft ever be used as a lifting point!*

WARNING: DO NOT connect the mixer to the power source until the unit is fully assembled and properly positioned in the vessel.

2. Install the mounting flange **[1251]**, onto the vessel nozzle using a customer supplied gasket and fastener set.

SEALED TANK MIXER INSTALLATION

3. Refer to the seal assembly drawing provided with the unit for shaft support collar "set" dimension. Set shaft collar **[1253]** to proper dimension from upper shaft end and clamp into place by tightening bolts **[1254]** provided with the collar. Lift the mixer shaft **[400]** and lower it into the vessel until the collar rests on the shaft support shelf inside the mounting flange. All welded shaft assemblies should be lowered into the vessel and then raised through the mounting flange, prior to attaching the shaft support collar. Shaft support collar may then be attached and the shaft lowered onto the support shelf in the mounting flange.

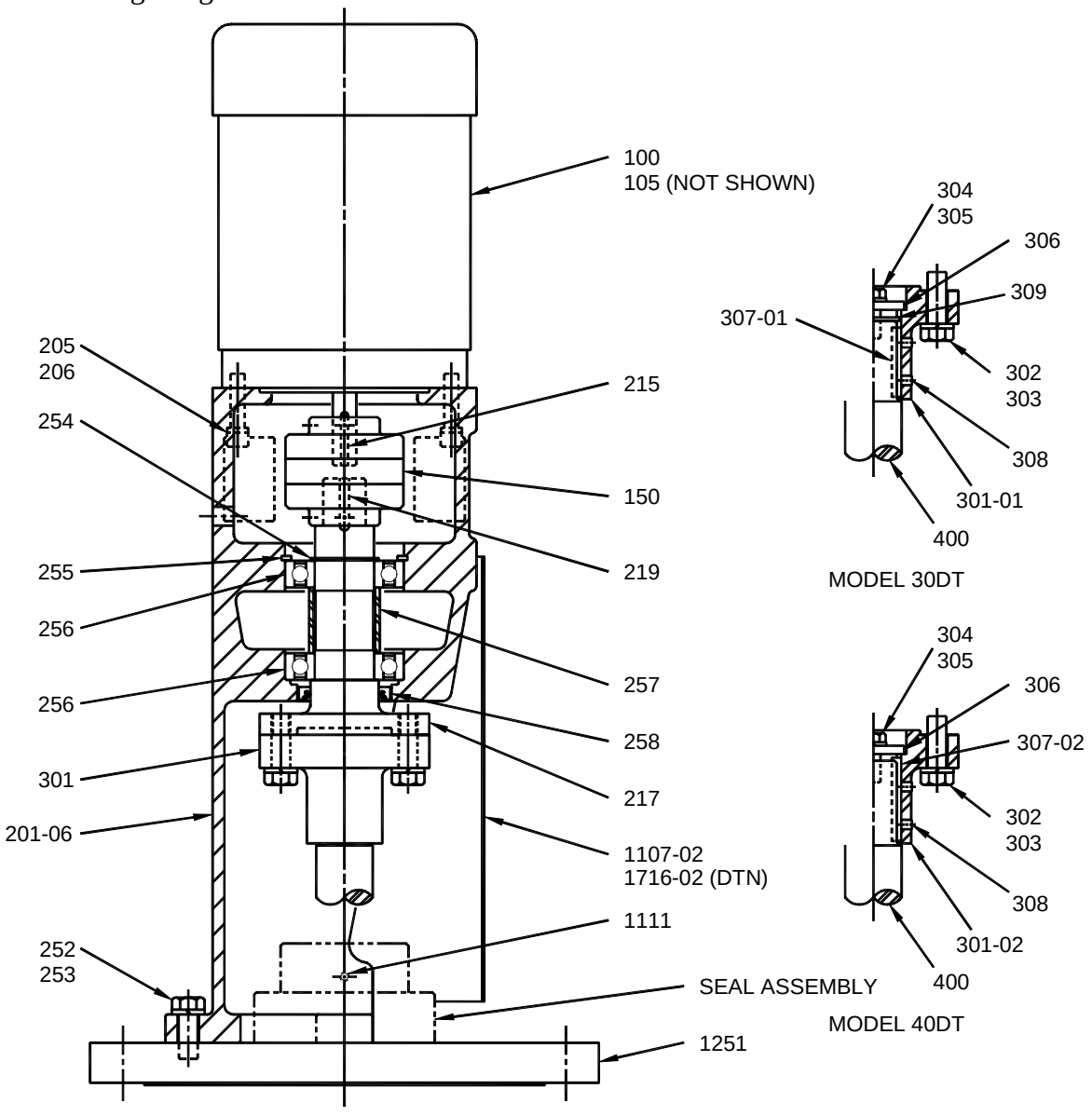


Figure 3: Model 30DTN, 40DTNS, 40DTNC, 40DTN Drive Assembly

SEALED TANK MIXER INSTALLATION

Seal Cartridge Installation

Model 40DTNS, Flowserve MCRO Seal:

1. Place o-ring **[1252]** into groove in mounting flange **[1251]**.

2. Install seal adapter plate **[1261]** onto flange. Install bolts, lockwashers, and flatwashers **[1262, 1263, 1264]** loosely. *Do not tighten bolts at this time.*

3. Install stationary seal ring **[1456]** and o-ring **[1457]** into the adapter plate **[1261]**.

4. Remove o-ring **[1455]** from rotary seal ring **[1454]**. Lubricate and re-install o-ring **[1455]** into rotary seal ring **[1454]**. Lubricate shaft **[400]**. Compress seal spring **[1453]** into rotary seal ring and slide entire seal ring, o-ring, and spring assembly down shaft to rest on the stationary seal insert **[1456]**. O-ring **[1455]** should be fully seated in rotary seal ring **[1454]**. *CAUTION: Do not get lubricant on the sealing faces.*

5. Install collar **[1451]** with setscrews **[1452]**. *Do not tighten setscrews at this time.*

6. Clean the removable shaft coupling **[301-02]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307-02]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37*. Engage the two coupling setscrews **[308]** onto the shaft key **[307-02]**.

7. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7*. Install two coupling bolts and lockwashers **[302, 303]** at 180^{o}. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

SEALED TANK MIXER INSTALLATION

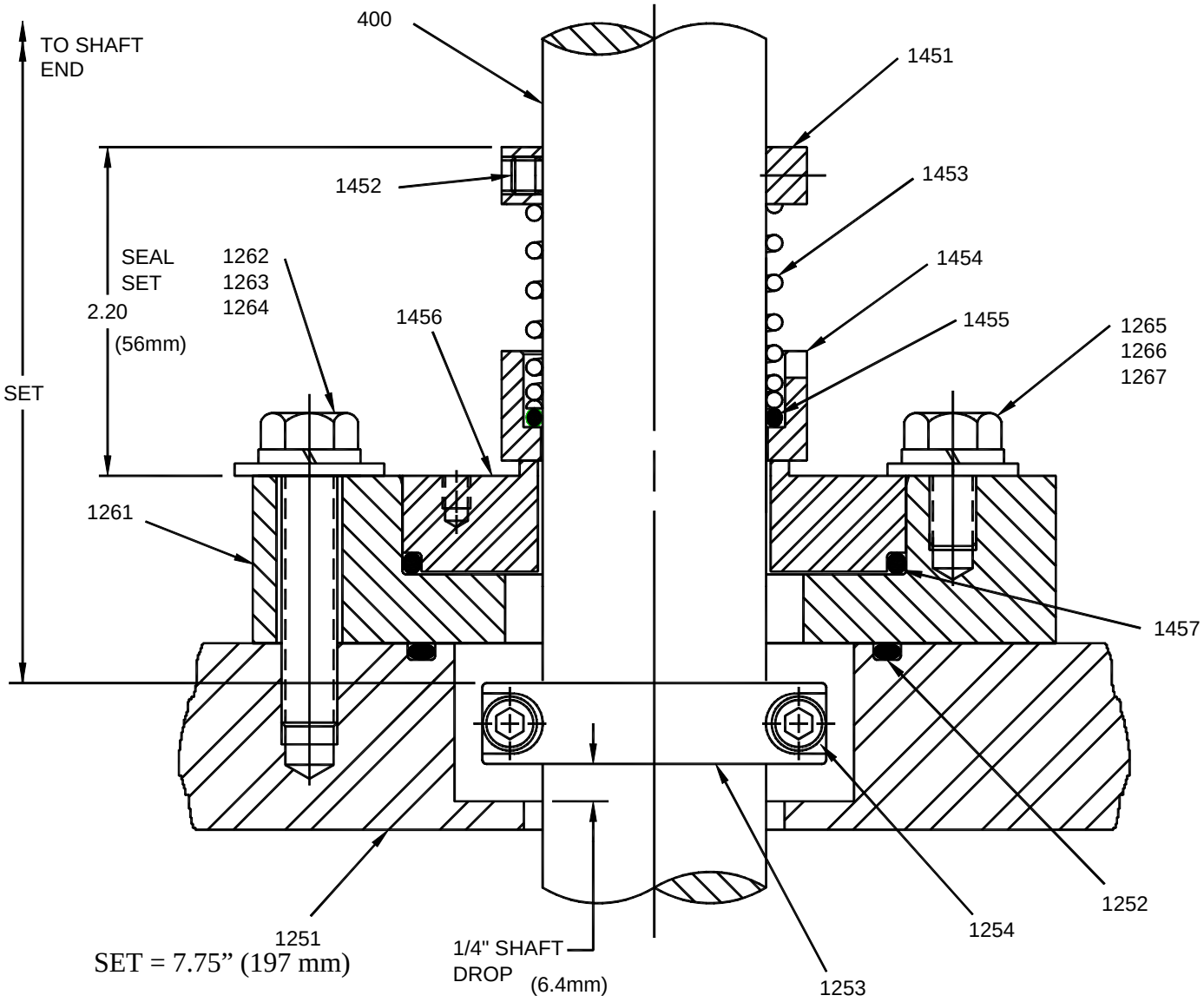


Figure 4: Model 40DTNS Seal, Flowserve MCRO

SEALED TANK MIXER INSTALLATION

8. Slide the rotary seal ring **[1454]** up the extension shaft **[400]**. Center the mechanical seal adapter plate/stationary seal ring **[1261/1456]** on the extension shaft. Torque bolts **[1262]** to the value shown in *Table 7, page 37*.

9. Install bolts, lockwashers, and flatwashers **[1265, 1266, 1267]**. Torque bolts to the value shown in *Table 7*.

10. Set collar **[1451]** at 2.20" (55.9mm) above the adapter plate face per *Figure 4, page 10*. Evenly tighten all cup point setscrews **[1452]**.

11. Install the handhole cover **[1107-02]** onto the housing **[201-06]** using bolts **[1111]**.

12. For single impeller assemblies, install the impeller with the lower hub face even with the shaft end. Impeller orientation should allow the driving edge of the impeller to pump toward the bottom of the mixing vessel. Tighten the impeller setscrews (typically quantity two).

    For dual impeller assemblies, space the upper impeller at a recommended minimum of two impeller diameters and maximum of three impeller diameters above the lower impeller. The lower impeller should be a minimum of one impeller diameter below the liquid surface at all times during mixer operation.

SEALED TANK MIXER INSTALLATION

Seal Cartridge Installation

Model 40DTNS, Crane 8B2 Seal:

1. Place o-ring **[1252]** into groove in mounting flange **[1251]**.

2. Install pin **[1561]** into seal adapter plate **[1261]**. Place seal adapter plate onto flange. Install bolts, lockwashers, and flatwashers **[1262, 1263, 1264]** loosely. *Do not tighten bolts at this time.*

3. Mating ring adapter **[1559]**, stationary mating ring **[1554]**, o-ring **[1558]**, anti-rotation pin **[1557]**, and snap ring **[1562]** are pre-assembled. Install mating ring adapter **[1559]** assembly into adapter plate **[1261]**. Make sure slot engages pin **[1561]**. Do not install bolts **[1265]** at this time.

4. Lubricate shaft **[400]**. Slide rotary seal ring **[1553]** assembly down shaft to rest on stationary mating ring **[1554]**.

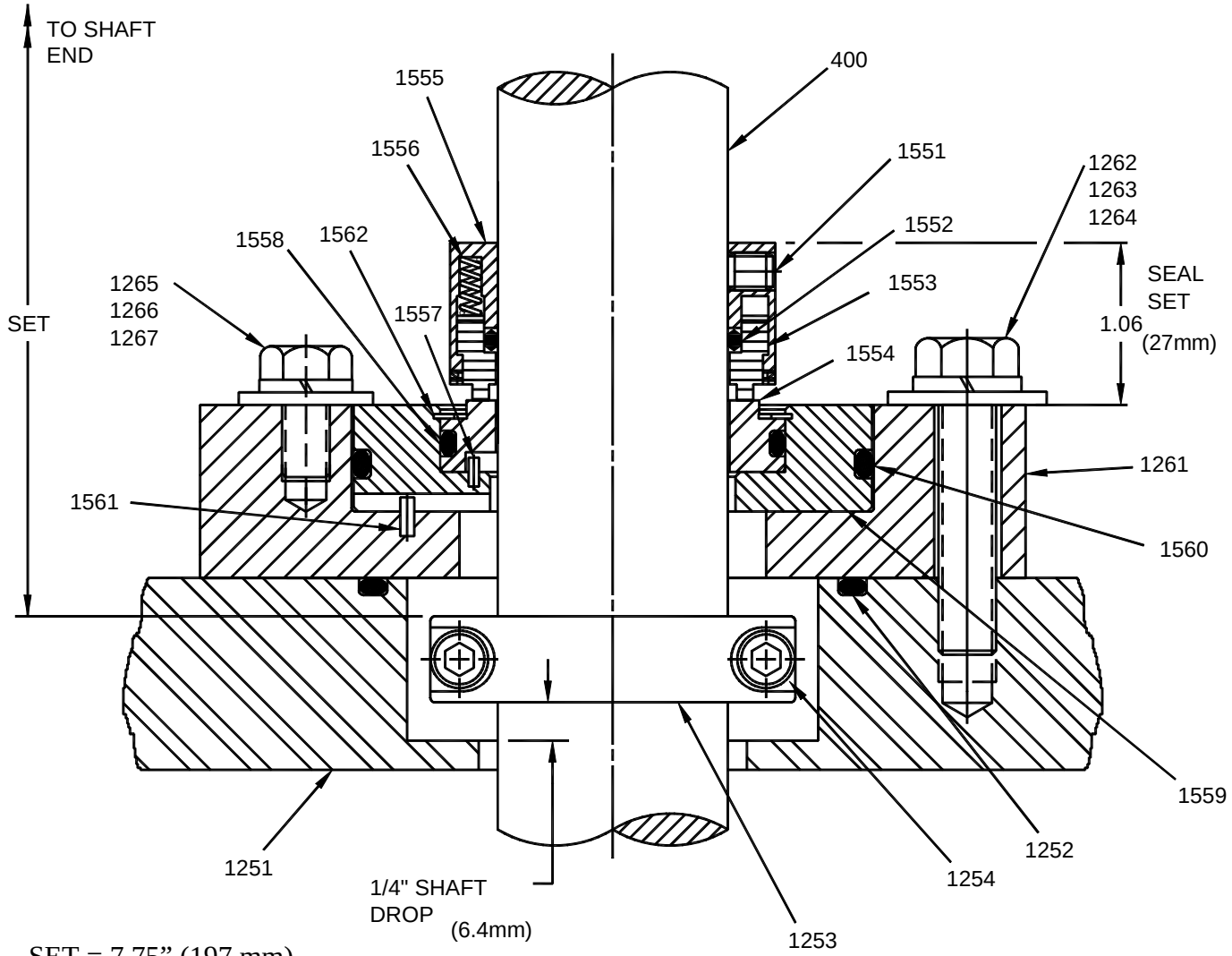
5. Clean the removable shaft coupling **[301-02]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307-02]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37.* Engage the two coupling setscrews **[308]** onto the shaft key **[307-02]**.

6. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7*. Install two coupling bolts and lockwashers **[302, 303]** at 180^{o}. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

7. Slide the rotary seal ring **[1553]** assembly up the extension shaft. Center the mechanical seal adapter plate/stationary mating ring **[1261/1554]** on the extension shaft. Torque bolts **[1262]** to the value shown in *Table 7*.

8. Install bolts, lockwashers, and flatwashers **[1265, 1266, 1267]**. Torque bolts to the value shown in *Table 7*.

SEALED TANK MIXER INSTALLATION



SET = 7.75” (197 mm)

Figure 5: Model 40DTNS Seal, Crane 8B2

SEALED TANK MIXER INSTALLATION

9. Set rotary seal ring **[1555]** retainer at 1.06" (26.9mm) above the adapter plate face per *Figure 5, page 13*. Evenly tighten all cup point setscrews **[1551]**.

10. Install the handhole cover **[1107-02]** onto the housing **[201-06]** using bolts **[1111]**.

11. For single impeller assemblies, install the impeller with the lower hub face even with the shaft end. Impeller orientation should allow the driving edge of the impeller to pump toward the bottom of the mixing vessel. Tighten the impeller setscrews (typically quantity two).

    For dual impeller assemblies, space the upper impeller at a recommended minimum of two impeller diameters and maximum of three impeller diameters above the lower impeller. The upper impeller should be a minimum of one impeller diameter below the liquid surface at all times during mixer operation.

SEALED TANK MIXER INSTALLATION

Seal Cartridge Installation

Model 40DTNC, Chesterton 155 Seal:

1. Place o-ring **[1252]** into groove in mounting flange **[1251]**.

2. Install seal adapter plate **[1291]** onto flange. Install bolts, lockwashers, and flatwashers **[1295, 1296, 1297]** loosely. *Do not tighten bolts at this time.*

3. Lubricate shaft **[400]**. Slide seal cartridge **[1400]** assembly with gasket **[1412]** down shaft to rest on adapter plate **[1291]**.

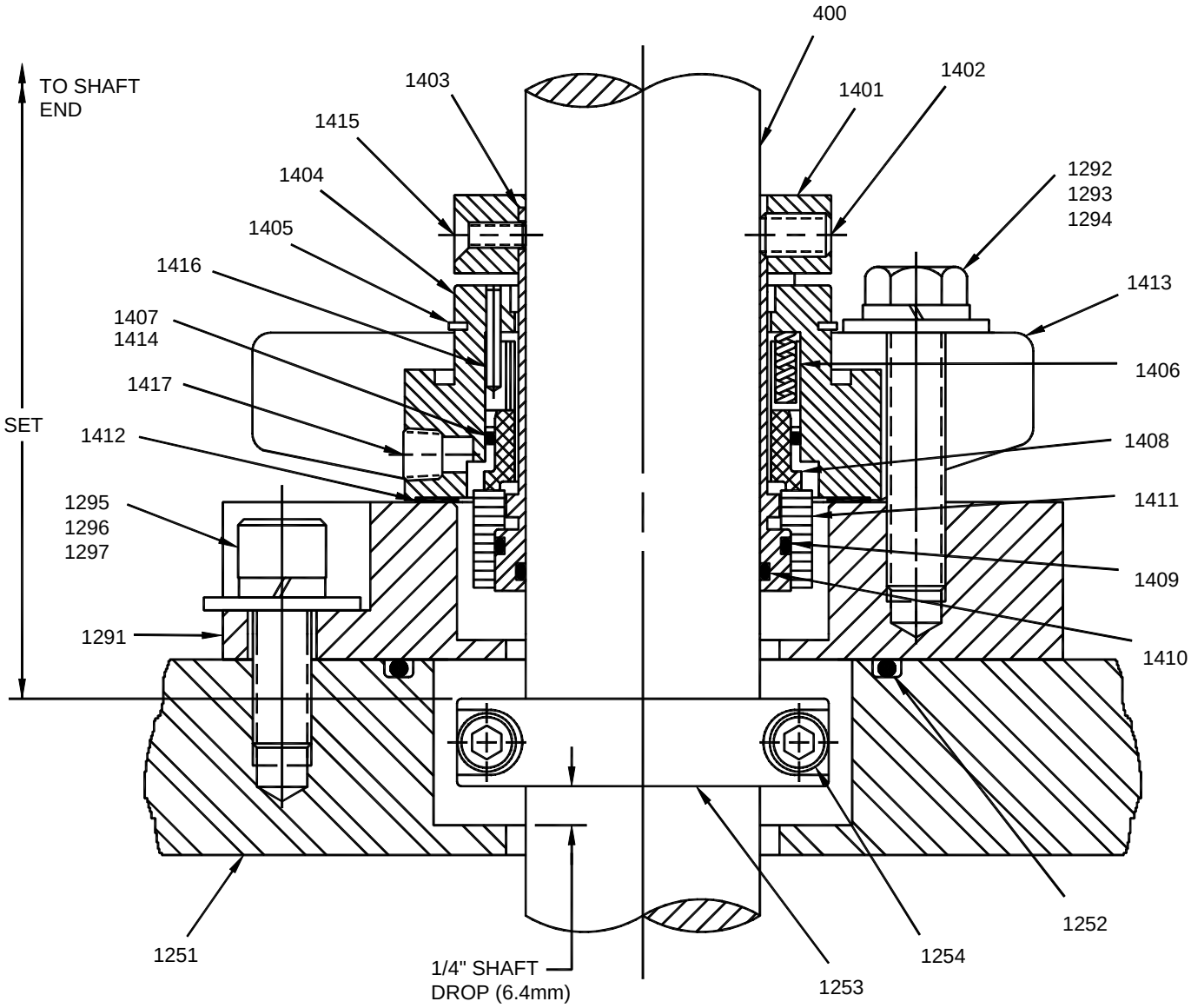
4. Clean the removable shaft coupling **[301-02]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307-02]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37.* Engage the two coupling setscrews **[308]** onto the shaft key **[307-02]**.

5. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7*. Install two coupling bolts and lockwashers **[302, 303]** at 180^{o}. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

6. Slide the mechanical seal cartridge **[1400]** up the extension shaft. Center the mechanical seal adapter plate **[1291]** on the extension shaft. Torque bolts **[1295]** to the value shown in *Table 7*.

7. Slide mechanical seal cartridge down shaft and install bolts, lockwashers, and flatwashers **[1292, 1293, 1294]**. Tighten bolts evenly. Do not overtighten. Reference *Figure 6, page 16*.

SEALED TANK MIXER INSTALLATION



SET = 7.75” (197 mm)

Figure 6: Model 40DTNC Seal, Chesterton 155

SEALED TANK MIXER INSTALLATION

8. Evenly tighten lock ring setscrews **[1402]**, securing seal cartridge to shaft. Remove centering strap and save for later use during seal changeout. *NOTE: It may be easier to tighten three setscrews at 120^{o}, and then remove centering strap. Remaining setscrews may be better accessed for tightening by rotating the shaft.*

9. Install the handhole cover **[1107-02]** onto the housing **[201-06]** using bolts **[1111]**.

10. For single impeller assemblies, install the impeller with the lower hub face even with the shaft end. Impeller orientation should allow the driving edge of the impeller to pump toward the bottom of the mixing vessel. Tighten the impeller setscrews (typically quantity two).

    For dual impeller assemblies, space the upper impeller at a recommended minimum of two impeller diameters and maximum of three impeller diameters above the lower impeller. The upper impeller should be a minimum of one impeller diameter below the liquid surface at all times during mixer operation.

SEALED TANK MIXER INSTALLATION

Seal Cartridge Installation

Model 40DTNC, Flowserve VRA Seal

1. Place o-ring **[1252]** into groove in mounting flange **[1251]**.

2. Install gland ring **[1605]** assembly with stationary seal ring **[1608]** and o-rings **[1609]** onto flange. Install bolts and lockwashers **[1298, 1299]** loosely. *Do not tighten bolts at this time.*

3. Lubricate shaft **[400]**. Slide drive collar rotary seal ring **[1603]** assembly down shaft to stationary seal ring **[1608]**.

4. Clean the removable shaft coupling **[301-02]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307-02]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37*. Engage the two coupling setscrews **[308]** onto the shaft key **[307-02]**.

5. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7*. Install two coupling bolts and lockwashers **[302, 303]** at 180^{o}. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

6. Slide drive collar rotary seal ring **[1603]** assembly up the extension shaft. Center the gland ring **[1605]** assembly on the extension shaft. Torque bolts **[1298]** to the value shown in *Table 7*.

7. Slide drive collar rotary seal ring **[1603]** assembly down shaft, and set seal spring gap dimension at 1.875” (47.6 mm). Refer to *Figure 7, page 19*. Evenly tighten all cup point setscrews **[1604]**.

SEALED TANK MIXER INSTALLATION

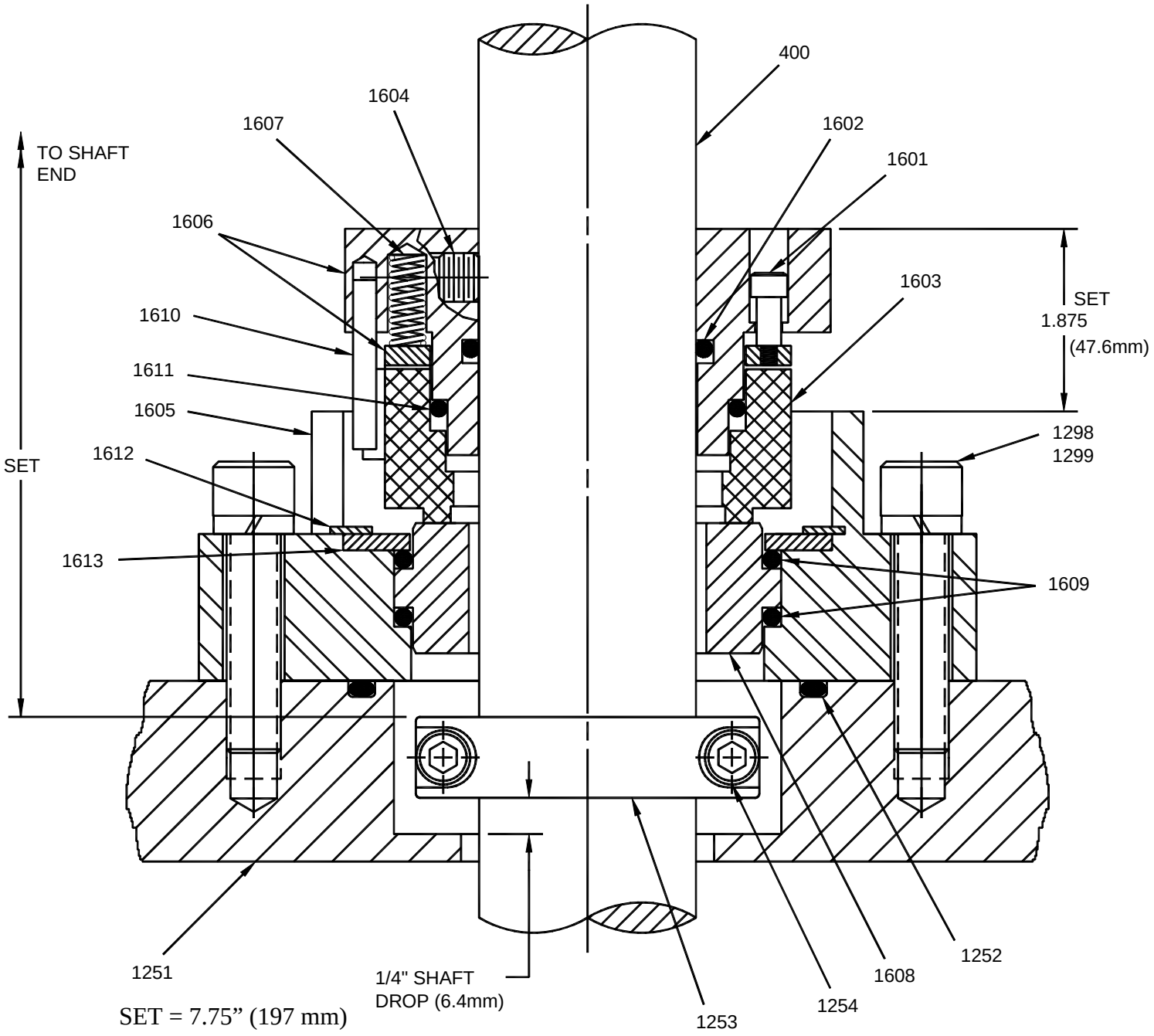


Figure 7: Model 40DTNC Seal, Flowserve VRA

SEALED TANK MIXER INSTALLATION

8. Install the handhole cover **[1107-02]** onto the housing **[201-06]** using bolts **[1111]**.

9. For single impeller assemblies, install the impeller with the lower hub face even with the shaft end. Impeller orientation should allow the driving edge of the impeller to pump toward the bottom of the mixing vessel. Tighten the impeller setscrews (typically quantity two).

   For dual impeller assemblies, space the upper impeller at a recommended minimum of two impeller diameters and maximum of three impeller diameters above the lower impeller. The upper impeller should be a minimum of one impeller diameter below the liquid surface at all times during mixer operation.

SEALED TANK MIXER INSTALLATION

Seal Cartridge Installation

Model 30DTN/40DTN, Crane 5620 Seal

1. Place gasket **[1255]** around bore of mounting flange **[1251]**.

2. Install seal adapter piece **[1281]** into flange bore (tenon fit).

3. Lubricate shaft **[400]**. Slide seal cartridge **[1650]** assembly with gasket **[1659]** down shaft until just above adapter piece.

4. Clean the removable shaft coupling **[301]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. For model 30DTN units, install snap ring **[309]** into coupling **[301-01]**. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37*. Engage the two coupling setscrews **[308]** onto the shaft key **[307]**.

5. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7*. Install two coupling bolts and lockwashers **[302, 303]** at 180^{o}. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

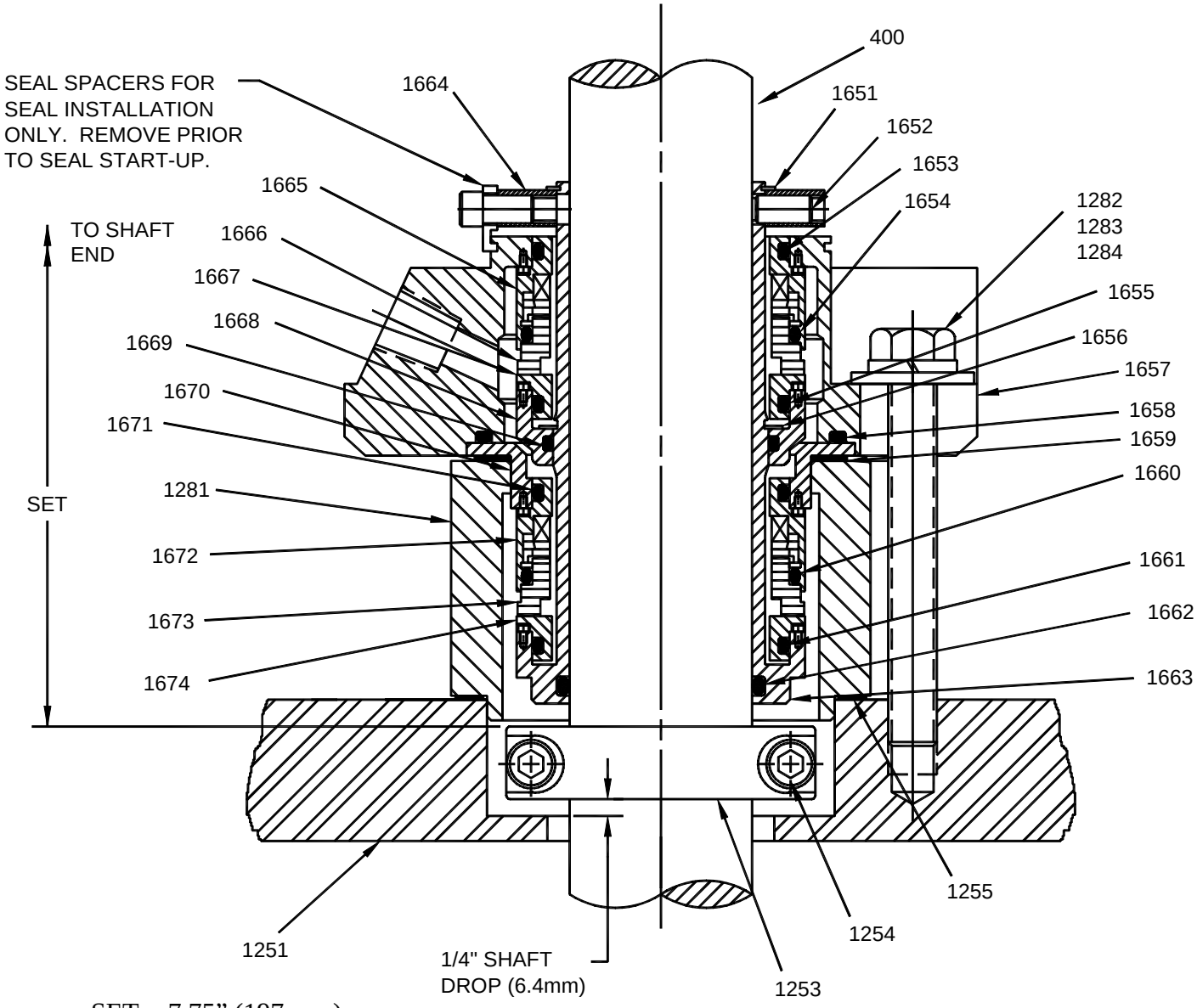
6. Slide mechanical seal **[1650]** assembly into adapter piece **[1281]** (tenon fit). Orient fluid ports per mechanical seal assembly drawing included with unit. Install bolts, lockwashers, and flatwashers **[1282, 1283, 1284]**. Tighten bolts evenly. Do not overtighten. Refer to *Figure 8, page 22*.

7. Tighten collar setscrews **[1652]** evenly, securing seal to shaft.

8. Remove seal spacers and save for future seal changeout.

9. Attach seal lubrication lines. See ***Options: Mechanical Seal Lubricator*** for installation instructions.

SEALED TANK MIXER INSTALLATION



SET = 7.75” (197 mm)

Figure 8: Model 30DTN/40DTN Seal, Crane 5620

SEALED TANK MIXER INSTALLATION

10. Install the handhole cover **[1716-02]** onto the housing **[201-06]** using bolts **[1111]**.

11. For single impeller assemblies, install the impeller with the lower hub face even with the shaft end. Impeller orientation should allow the driving edge of the impeller to pump toward the bottom of the mixing vessel. Tighten the impeller setscrews (typically quantity two).

    For dual impeller assemblies, space the upper impeller at a recommended minimum of two impeller diameters and maximum of three impeller diameters above the lower impeller. The upper impeller should be a minimum of one impeller diameter below the liquid surface at all times during mixer operation.

SEALED TANK MIXER INSTALLATION

Seal Cartridge Installation

Model 30DTN/40DTN, Chesterton 255 Seal

1. Place gasket **[1255]** around bore of mounting flange **[1251]**.

2. Install seal adapter piece **[1271]** into flange bore (tenon fit).

3. Lubricate shaft **[400]**. Slide seal cartridge **[1500]** assembly with gasket **[1507]** down shaft until just above adapter piece.

4. Clean the removable shaft coupling **[301]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. For model 30DTN units, install snap ring **[309]** into coupling **[301-01]**. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37*. Engage the two coupling setscrews **[308]** onto the shaft key **[307]**.

5. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7*. Install two coupling bolts and lockwashers **[302, 303]** at 180^{o}. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

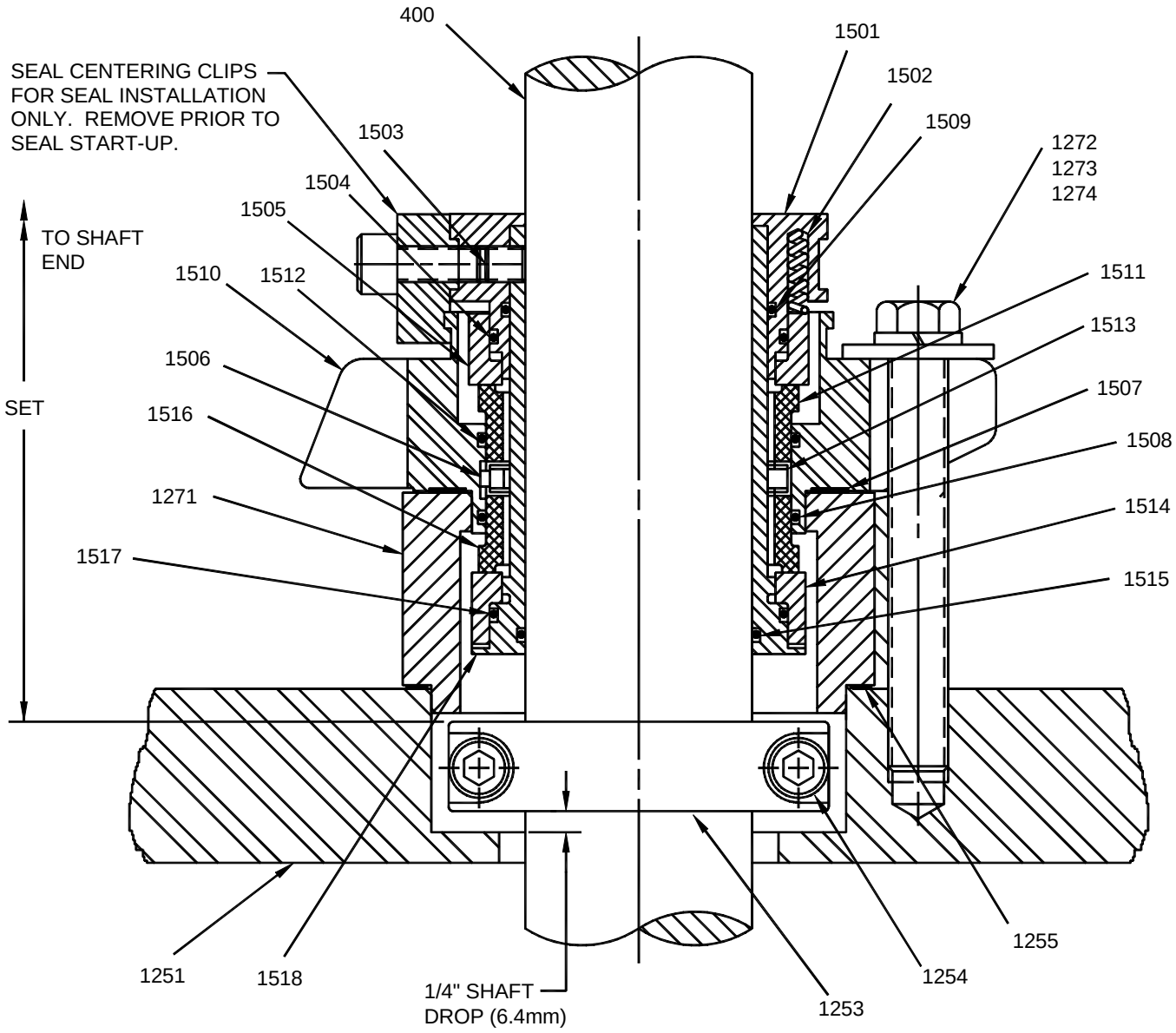
6. Slide mechanical seal **[1500]** assembly into adapter piece **[1271]** (tenon fit). Orient fluid ports per mechanical seal assembly drawing included with unit. Install bolts, lockwashers, and flatwashers **[1272, 1273, 1274]**. Tighten bolts evenly. Do not overtighten. Refer to *Figure 9, page 25*.

7. Tighten collar setscrews **[1503]** evenly, securing seal to shaft.

8. Remove centering clips and save for future seal changeout.

9. Attach seal lubrication lines. See ***Options: Mechanical Seal Lubricator*** for installation instructions.

SEALED TANK MIXER INSTALLATION



SET = 7.75” (197 mm)

Figure 9: Model 30DTN/40DTN Seal, Chesterton 255

SEALED TANK MIXER INSTALLATION

10. Install the handhole cover **[1716-02]** onto the housing **[201-06]** using bolts **[1111]**.

11. For single impeller assemblies, install the impeller with the lower hub face even with the shaft end. Impeller orientation should allow the driving edge of the impeller to pump toward the bottom of the mixing vessel. Tighten the impeller setscrews (typically quantity two).

    For dual impeller assemblies, space the upper impeller at a recommended minimum of two impeller diameters and maximum of three impeller diameters above the lower impeller. The upper impeller should be a minimum of one impeller diameter below the liquid surface at all times during mixer operation.

OPTIONS: MECHANICAL SEAL LUBRICATOR

Model DTN double cartridge mechanical seals are designed to be operated "wet" with a pressurized liquid barrier fluid. The Chesterton 255 Seal ***ONLY*** *on gear reduced units* has the capability to run dry, with Nitrogen purge. Refer to the unit seal assembly drawing for the specific requirements of the seal type purchased.

NOTE: The barrier fluid port connections are dependent upon the mixer extension shaft rotation. The standard mixer extension shaft rotation is clockwise, when looking into the tank. Refer to Figure 10, page 29.

For Crane 5620 Mechanical Seals: The barrier fluid supply enters through Port #2, and the barrier fluid return exits through Port #1.

For Chesterton 255 Mechanical Seals: The barrier fluid supply enters through the left port, and the barrier fluid return exits through the right port (as viewed when facing the seal ports).

For ***counter-clockwise*** (non-standard) extension shaft rotation, the port connections are as follows:

For Crane 5620 Mechanical Seals: The barrier fluid supply enters through Port #4, and the barrier fluid return exits through Port #1.

For Chesterton 255 Mechanical Seals: The barrier fluid supply enters through the right port, and the barrier fluid return exits through the left port (as viewed when facing the seal ports).

Lubricator Assembly Instructions

1. Assemble the lubricator mounting bracket **[1711]** to the mechanical seal lubricator **[1701]** using bolts and lockwashers **[1714, 1715]**. Torque bolts to the value shown in *Table 7, page 37*.

2. Install sight glass **[1703]** and drain plug **[1704]**. Install pipe nipple **[1709]**. Install metal hose **[1710]** female union end onto the pipe nipple.

3. Install pipe nipple **[1705]**, elbow **[1706]**, and pipe nipple **[1707]**. Install metal hose **[1708]** female union end onto pipe nipple **[1707]**.

4. Install the lubricator/mounting bracket assembly onto the housing **[201]** using bolts and lockwashers **[1712, 1713]**. Torque bolts to the value shown in *Table 7*.

5. Install the flexible metal hose **[1708, 1710]** NPT male ends into the mechanical seal ports.

OPTIONS: MECHANICAL SEAL LUBRICATOR

6. Connect the flexible metal hose **[1708, 1710]** union ends.

7. Fill the mechanical seal lubricator to the center of the sight glass. The approximate capacity is .30 gallons U.S. (1.14 liters). Install the 3/8" NPT fill plug **[1702]**.

8. Connect a pressure line to the mechanical seal lubricator 1/4" NPT inlet port. Pressurize using a gas bottle or other means to 25-50 psi (172-344 kPa) above the maximum vessel operating pressure. Check all fittings for leaks.

*CAUTION: Never pressurize the vessel without having the mechanical seal fully pressurized. See the **Lubrication** section for additional information.*

Install handhole cover and resume assembly instructions shown in ***Sealed Tank Mixer Installation***.

OPTIONS: MECHANICAL SEAL LUBRICATOR

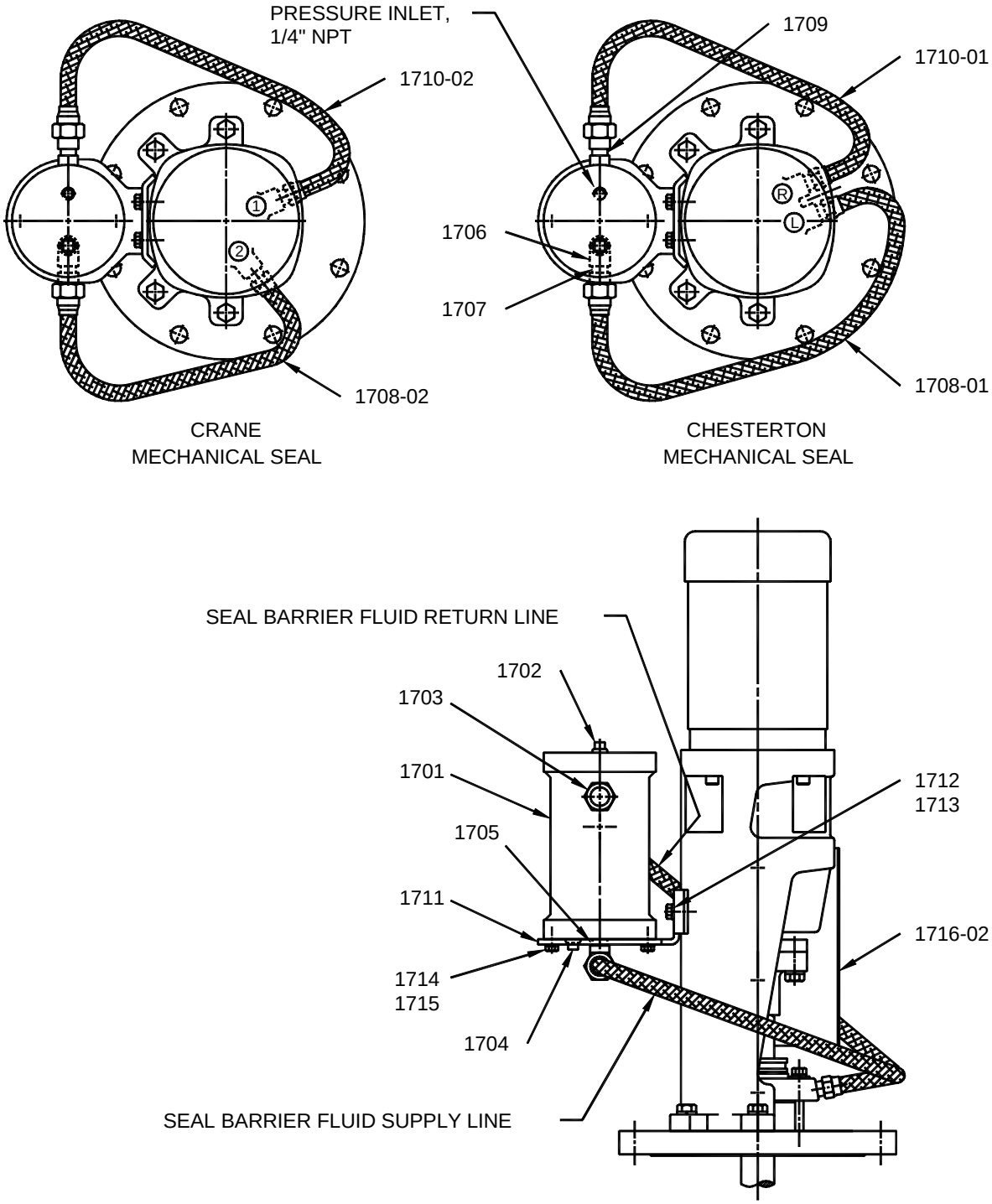


Figure 10: Seal Lubrication System

SEALED TANK MIXER INSTALLATION
OPTIONAL ANGLE MOUNTED DRIVE

The 30DTN, 40DTNS, 40DTNC, and 40DTN mixers may be angle mounted. However, these units must be mounted to a solid structure in a vertical position prior to proceeding with the standard extension shaft and seal assembly and disassembly instructions, listed previously in this section of the manual.

See *Figure 12, page 31* for mixer nozzle location. See *Figure 1, page 5* for structural requirements.

The drive unit may be angle mounted in any orientation. Unit will attach to vessel nozzle using customer supplied fastener set.

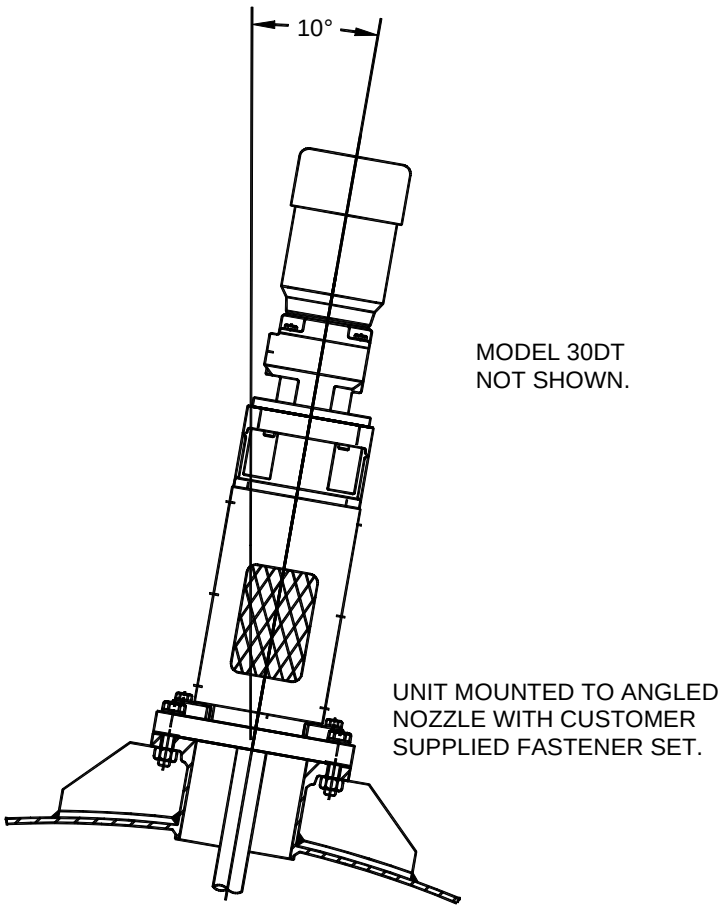


Figure 11: Angle Mounted Drive

SEALED TANK MIXER INSTALLATION
OPTIONAL ANGLE MOUNTED DRIVE

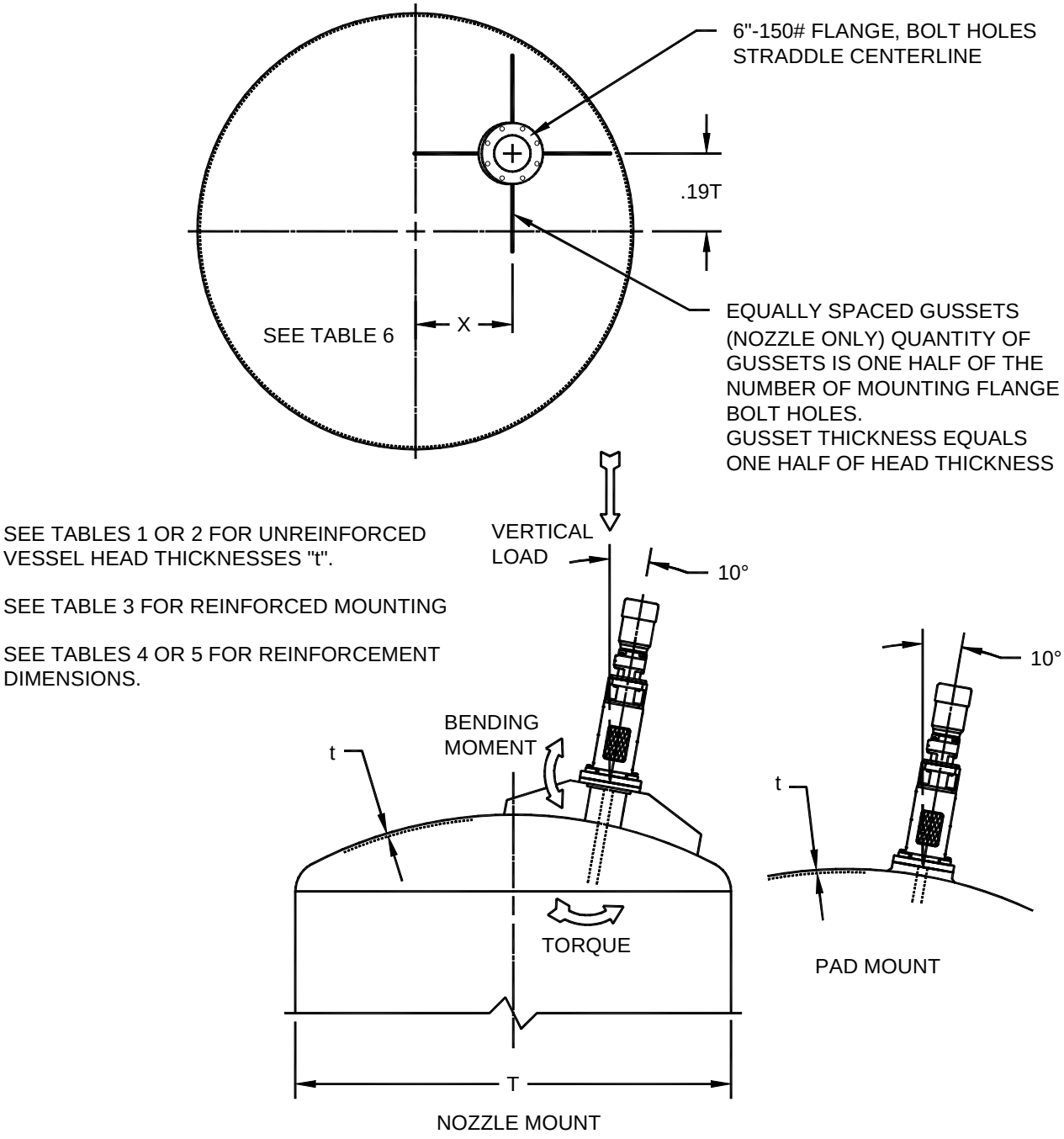


Figure 12: Angle Mount Installation

SEALED TANK MIXER INSTALLATION
OPTIONAL ANGLE MOUNTED DRIVE

TABLE 6: OFF-CENTER POSITIONING

SHAFT EXTENSION RANGE IN (MM)	"X" DIMENSION IN (MM)	MINIMUM TANK DIAMETER "T" IN (MM)
20" – 37" (508 – 940)	5" (127)	18" (457)
38" – 53" (965 – 1346)	7.5" (191)	22" (559)
54" – 76" (1372 – 1930)	10.75" (273)	32" (813)
77" – 110" (1956 – 2794)	15.5" (394)	46" (1168)
111" – 135" (2819 – 3429)	21.25" (540)	64" (1626)

MIXER INSTALLATION
ELECTRIC MOTORS, GEARMOTORS

1. Check the nameplate data on the motor/gearmotor to assure that the available power supply agrees with the motor requirements. Protective devices should be of the proper size and rating to safely carry the load and interrupt the circuit on overloads.

2. If the motor/gearmotor has been stored in a damp location, the windings may require drying.

NOTE: Do not obstruct the normal flow of ventilating air through or over the motor/gearmotor.

3. Many of the motors supplied with this product are dual voltage. The motor cord supplied with a single phase motor is applicable for use on 125VAC systems only. Customer is responsible for supplying all necessary motor connections and for properly wiring the motors. Refer to wiring diagrams *Figures 13 and 14, pages 34 and 35*, for normal gearmotor connections and *Figure 15, page 36* for normal motor connections. Consult *Chemineer Field Service* if there are any questions pertaining to the installation or operation of the motor or mixer unit.

4. Connect the motor/gearmotor in accordance with the National Electric Code and local requirements, but do not make the connections permanent until the motor/gearmotor rotation has been checked. Jog the motor/gearmotor to check for correct rotation prior to securing wiring. Refer to unit assembly drawing for unit rotation direction. If any additional motor/gearmotor auxiliary devices such as space heaters or temperature sensors are used, connect them in proper circuits and insulate them from motor/gearmotor power cables.

AIR MOTORS

1. Air motors are designed to be driven by compressed air. Under no circumstances should they be driven with any other type of gas, fluids, particles, solids, or any substance mixed with air.

2. The muffler is shipped uninstalled on the air motor. Always install a moisture trap and filter in the air line ahead of the motor.

3. “Reversible” type air motors will work equally in both directions. A 4-way valve may be connected to both air ports to allow reversible operation. For efficiency of output and control of speed, use air lines of the same size or the next larger pipe size than the intake port of the motor.

Lubrication of the air motor is required. Refer to ***Lubrication*** section of this manual for more information.

MIXER INSTALLATION

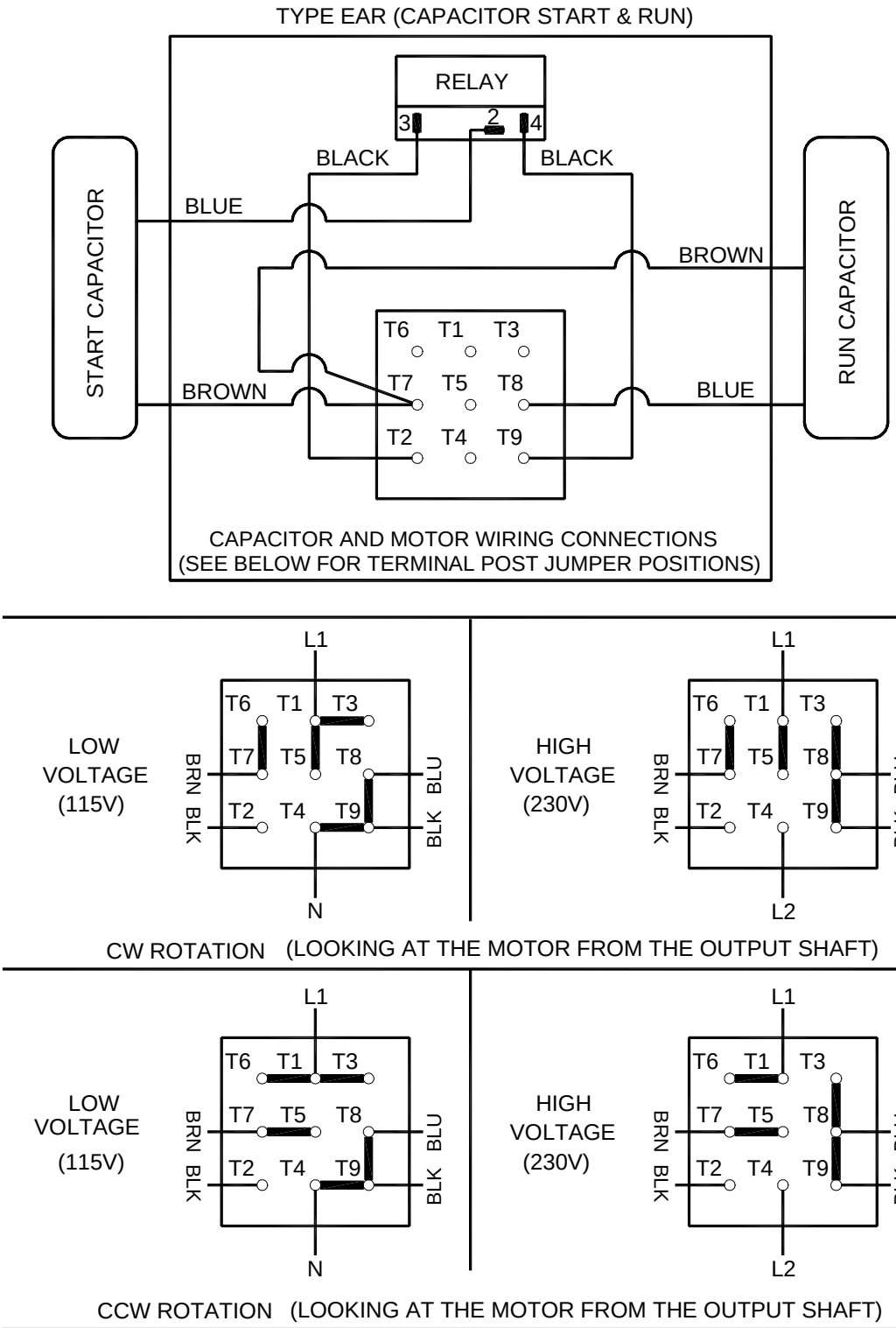
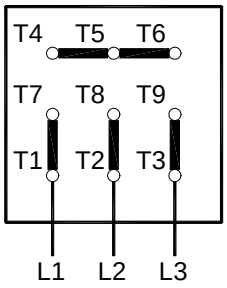


Figure 13: Wiring Diagram, 1ph Gearmotor

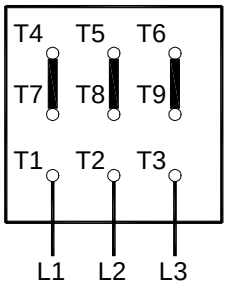
MIXER INSTALLATION

MOTOR WIRING CONNECTIONS AND
TERMINAL POST JUMPER POSITIONS

LOW
VOLTAGE
(230V)



HIGH
VOLTAGE
(460V)



NOTE: TO REVERSE GEARMOTOR SHAFT ROTATION,
INTERCHANGE ANY TWO LINE LEADS

CHECK MOTOR LEADS WITH CONNECTION DIAGRAMS ON MOTOR NAMEPLATE OR CONDUIT BOX FOR PROPER WIRING

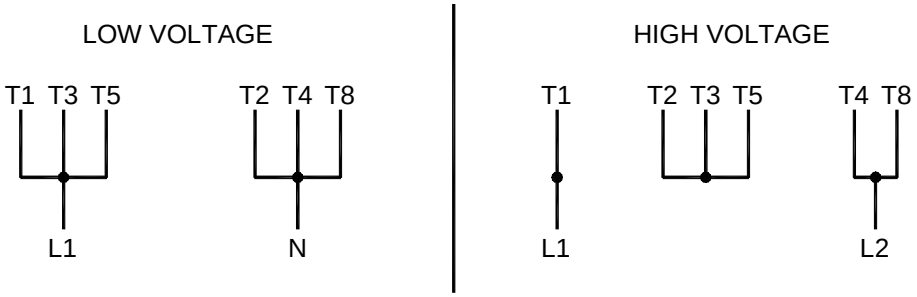
CHECK THE MIXER SHAFT ROTATION AGAINST THE PROPER ROTATION INDICATED ON THE ASSEMBLY DRAWING

NOTE:
THE NORMAL GEARMOTOR OUTPUT SHAFT ROTATION SHOULD BE CCW WHEN LOOKING AT THE GEARMOTOR FROM THE OUTPUT SHAFT END. THE NORMAL MIXER SHAFT ROTATION IS CW WHEN LOOKING INTO THE TANK FOR STANDARD ROTATION IMPELLERS.

Figure 14: Wiring Diagram, 3ph Gearmotor

MIXER INSTALLATION

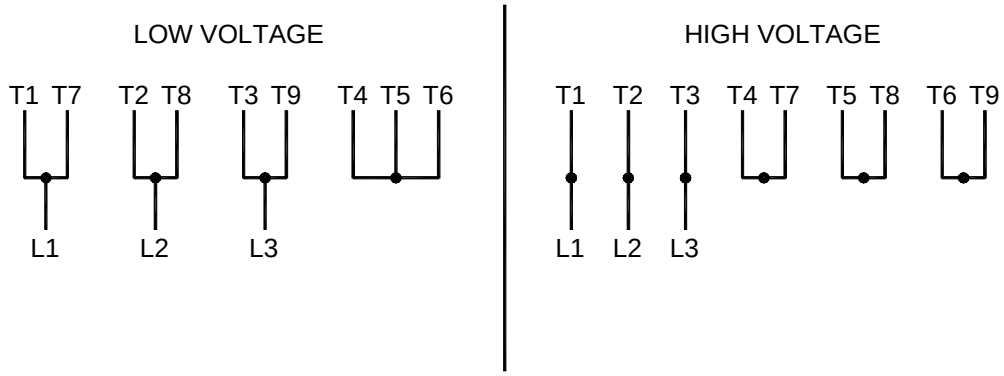
SINGLE-PHASE MOTOR
(WITHOUT THERMAL PROTECTOR)



CCW ROTATION (LOOKING AT THE MOTOR FROM THE SHAFT END)

NOTE: TO REVERSE MOTOR SHAFT ROTATION,
INTERCHANGE MOTOR LEADS T5 AND T8

THREE-PHASE MOTOR
(WITHOUT THERMAL PROTECTOR)



NOTE: TO REVERSE MOTOR SHAFT ROTATION,
INTERCHANGE ANY TWO LINE LEADS

CHECK MOTOR LEADS WITH CONNECTION DIAGRAMS ON MOTOR NAMEPLATE OR CONDUIT BOX FOR PROPER WIRING

CHECK THE MIXER SHAFT ROTATION AGAINST THE PROPER ROTATION INDICATED ON THE ASSEMBLY DRAWING

NOTE:
THE NORMAL MOTOR SHAFT ROTATION SHOULD BE CCW WHEN LOOKING AT THE MOTOR FROM THE SHAFT END.
THE NORMAL MIXER SHAFT ROTATION IS CW WHEN LOOKING INTO THE TANK FOR STANDARD ROTATION IMPELLERS.

Figure 15: Wiring Diagram, Motors

MIXER INSTALLATION

TABLE 7: BOLT TIGHTENING TORQUE

BOLT SIZE	CARBON STEEL [1]				300 SERIES STAINLESS [2]	
	GRADE 2		GRADE 5			
	Ft-lb	Nm	Ft-lb	Nm	Ft-lb	Nm
1/4-20	4.1	5.6	6	8.1	4.1	5.6
5/16-18	8.3	11	13	17	8.3	11
3/8-16	15	20	23	31	15	20
1/2-13	38	51	56	76	38	51
5/8-11	68	92	113	153	68	92
3/4-10	120	163	200	271	120	163

Tighten all fasteners to values shown unless specifically instructed to do otherwise. Lubricate all fasteners at assembly with grease, oil or an anti-seize material. Bolt threads and contact surfaces of bolt heads and nuts should be lubricated.

[1]If fasteners cannot be lubricated, multiply table values by 1.33.

[2]If fasteners cannot be lubricated, multiply table values by 1.25.

LUBRICATION

This section defines the proper oils and greases that must be used with this equipment.

ELECTRIC MOTOR – MODEL 30DT

The motor bearings have been properly greased by the manufacturer. Motor bearings should be regreased at 12-month intervals when installed in clean, dry environments, or every six months for heavy duty and dusty locations. Any good quality general purpose grease consisting of a refined base oil stock and a lithium or calcium-complex based soap, with an NLGI No. 2 classification, will work satisfactorily. Most major oil companies offer such products, usually with extreme pressure (EP) additives for additional protection. *Table 9, page 39* lists some commonly available greases.

When regreasing, stop the motor, remove the outlet plug and add grease according to *Table 8* with a hand lever gun only. Run the motor for about ten minutes before replacing the outlet plug. Certain TEFC motors have a spring relief outlet fitting on the fan end. If the outlet plug is not accessible at the surface of the hood, it is the spring relief type and need not be removed when regreasing.

CAUTION! Overgreasing is a major cause of bearing and motor failure.

TABLE 8: MOTOR BEARING GREASE ADDITION

MOTOR FRAME SIZE	RELIANCE		LEESON		BALDOR	
	in^3	cm^3	in^3	cm^3	in^3	cm^3
56C	sealed for life		sealed for life		sealed for life	
140TC	sealed for life		sealed for life		0.6	9.8

ELECTRIC MOTOR – MODEL 30DT

TABLE 9: TYPICAL NLGI NO. 2 GREASES

For Ambient Temperature Range of 0^o to 104^o F (-18^o to 40^o C)		
MANUFACTURER	**GENERAL PURPOSE**	**EP**
Amoco Oil Co.	Amolith grease: Grade 2	Amolith grease: Grade 2EP
Ashland Oil Co.		Multi-lube Lithium EP grease: Grade 2
		EP Lithium #2
Chevron U.S.A.Inc.	Industrial grease: Grade medium	Dura-Lith greases EP: Grade 2
CITGO Petroleum Corp.		Premium Lithium EP grease: Grade 2
Conoco Inc.		EP Conolith grease: Grade 2
Exxon Co. U.S.A.	Unirex N: Grade 2	Nebula EP: Grade 2
		Ronex MP: Grade 2
Mobil Oil Corp.		Mobilux EP 2
Pennzoil Products Co.		Pennlith EP grease 712
Phillips 66 Co.	Philube L Multi-purpose grease L-2	Philube EP grease: EP-2
Shell Oil Co.	Alvania grease 2	Alvania grease EP 2
		Alvania grease EP LF 2
Texaco Lubricants Co.	Premium RB grease	Multifak EP 2
Unocal 76		Unoba EP grease: Grade 2
		Multiplex EP: Grade 2

ELECTRIC MOTOR – MODEL 30DT

The following table may be used as a guide in determining frequency of lubrication. The periods listed assume a clean, dry environment with an ambient temperature not exceeding 104°F (40°C). If conditions are less desirable than this, adjust the frequency accordingly. (*Table 10* is for motor speeds 1800 RPM or slower).

TABLE 10: LUBRICATION FREQUENCY

DUTY	LUBRICATION INTERVAL (Months)
Intermittent	36
8-16 Hours/Day	30
Continuous	24

AIR MOTOR – MODEL 30DT

Lubrication of the air motor is required. An automatic air line lubricator must be installed in the air line just ahead of the air motor. The lubricator should be adjusted to feed one drop of oil for every 50-75 CFM of air going through the motor. Detergent SAE #10 automotive engine oil or equivalent is the recommended air motor lubricant.

GEARMOTOR – MODELS 20DT, 40DT

The gearmotor (gear reducer) has been permanently lubricated with mineral oil, ISO 220 grade, acceptable for operation in ambient temperatures not exceeding 104°F (40°C). The gearmotor can be operated at up to a 10 degree off vertical mounting angle, any orientation.

MECHANICAL SEALS

Model DTN double cartridge mechanical seals are designed to be operated "wet" with a pressurized liquid barrier fluid. The Chesterton 255 Seal ***ONLY*** on gear reduced units, has the capability to run dry, with Nitrogen purge. *Refer to the unit seal assembly drawing for the specific requirements of the seal type purchased.* Common liquid barrier fluids include glycerine, ethylene glycol, mineral oil, and water. Models DTNS and DTNC are furnished with single mechanical seals. These seals are designed to run "dry". *Do not lubricate the sealing faces.*

The seal barrier fluid is to be pressurized 25-50psi (172-344kPa) above maximum vessel operating pressure. The seal should always be pressurized before pressurizing the vessel or operating the mixer. The mechanical seal lubrication system should be checked regularly for proper lubrication level (*see* ***Operation***).

MIXER

Proper operating procedures will allow maximum performance of your Chemineer DT Mixer. The following list will aid in the safe operation of your unit.

- **Do not** operate the unit before reading and following the instructions on all tags and nameplates attached to the unit.

- **Do not** operate the unit with less than one impeller's diameter liquid coverage above the lowest impeller. Increased side loading caused by operations at liquid level will decrease unit life.

- **Do not** operate the unit in a fluid with a specific gravity or viscosity higher than that for which the unit was designed.

- **Do not** attempt to start the unit with the mixing impeller buried in solids or a "set up" fluid.

- **Do not** locate tank internals or other rotating equipment close to the mixer impellers or extension shaft.

- **Do not** make any modifications to the mixer unit in the field (i.e. motor horsepower, mixer speed, shaft length, impeller diameter, etc.) without reviewing the change with *your local Chemineer office* or *Chemineer Field Service*.

CAUTION: There may be a speed range where the unit cannot be operated because of shaft resonant frequency. This range must be avoided or passed through quickly or destructive forces can be generated. Refer to main unit assembly drawing for speed range information or consult *your local Chemineer office*.

Should there be problems operating the unit, confirm that the installation is correct. If you are unable to resolve the problem, contact *your local Chemineer office*.

FLEXIBLE MOTOR COUPLING

The flexible motor coupling will provide years of operation with little maintenance or repair. If the motor/gearmotor is removed for service, the flexible coupling should be inspected for wear.

ELECTRIC MOTORS

Air circulation is very important to get full performance and long life from an electric motor. Do not block the suction inlets on fan-cooled motors. Motor life will be decreased if its temperature exceeds its thermal rating. The allowable temperature is stamped on the motor nameplate.

Prior to permanently wiring the electric motor:

- Check nameplate data on motor to assure that the available power supply agrees with the motor requirements. Protective devices should be the proper size and rating to safely carry the load and to interrupt the circuit on overloads.

- Check motor leads with connection diagrams on motor nameplate and/or conduit box so that the proper connections are made. All motors should be installed in accordance with the National Electric Code and local requirements.

- Check the output shaft rotation against the proper rotation indicated on the assembly drawing. For standard three-phase electric motors, the rotation is reversed by switching any two power leads.

- Check operating motor amperage against nameplate amperage.

The motor should start quickly and run smoothly. If the motor should fail to start or make abnormal noise, immediately shut motor off, disconnect it from the power supply, and investigate the cause. If the problem cannot be corrected, contact *your local Chemineer office* for assistance.

AIR MOTORS

Air motors are designed to be driven by compressed air. Under no circumstances should they be driven with any other type of gas, fluids, particles, solids, or any substance mixed with air.

Operating pressures should not exceed 100psi (689 kPa). The speed and torque can be regulated by using a pressure regulator or shut-off valve to obtain the desired power and to conserve air.

MECHANICAL SEALS

Model DTN double cartridge mechanical seals must be pressurized to operate properly. Before operation, the seal cavity should be pressurized to 25-50 psi (172-344 kPa) above the maximum vessel operating pressure.

Refer to the unit assembly drawing for specific seal operating limits.

CAUTION! Never pressurize the vessel without first pressurizing the mechanical seal cavity (mechanical seal lubricator).

If the lubrication system is of Chemineer design, fill the lubricator pot by removing fill plug **[1702]** and slowly pouring in the barrier fluid. The lubricator is self-venting while being filled. As the seal lubricator is being filled, gravity flow will fill and purge the seal cavity. After filling, replace and tighten the fill plug. Pressurize the lubricator using a constant pressure source, such as a gas bottle, to the recommended seal cavity pressure. This is a thermosiphon system for use with model DTN mechanical seals only. Refer to *Figure 10, page 29*.

For lubrication system supplied by others, read and understand the installation and operation instructions supplied with that lubrication system.

During normal operation it is common for mechanical seals to leak a few drops of fluid per minute across the seal faces. The mechanical seal lubricator lubricant level should be checked regularly and refilled as required.

Models DTNS and DTNC are furnished with single mechanical seals. These seals are designed to run “dry”. *Do not lubricate the sealing faces*.

Refer to the unit assembly drawing for specific seal operating limits.

MIXER MAINTENANCE

Refer to *Figure 3, page 8*.

Mixer Drive Removal & Disassembly

CAUTION: Prior to removing mixer, review the installation to assure that all safety issues are resolved.

1. Lock out and disconnect all power to the mixer motor and any optional devices.

2. Depressurize and ventilate vessel.

3. Remove the bolts **[1111]** and remove handhole cover **[1107-02 or 1716-02]**.

4. Clean the portion of the agitator shaft between the removable coupling and the mechanical seal.

5. *For 40DTNS units, Flowserve MCRO*: Loosen cup point setscrews **[1452]** in collar **[1451]** one turn. Slide collar up shaft at least 1/2" (13mm). Reference *Figure 4, page 10*.

   For 40DTNS units, Crane 8B2: Loosen setscrews **[1551]** in rotary seal ring **[1553]** assembly one turn. Slide rotary seal ring assembly up shaft at least 1/2" (13mm). Reference *Figure 5, page 13*.

   For 40DTNC units, Chesterton 155: Insert seal centering strap. Loosen collar setscrews **[1402]** one turn. Reference *Figure 6, page 16*.

   For 40DTNC units, Flowserve VRA: Loosen collar setscrews **[1604]** one turn. Reference *Figure 7, page 19*.

   For 30DTN/40DTN units, Crane 5620 or Chesterton 255: Depressurize the mechanical seal barrier fluid lines, and disconnect from seal ports. Plug seal ports. Install centering clips, and loosen collar setscrews **[1652 or 1503]** one turn. Reference *Figure 8, page 22 or Figure 9, page 25*.

6. Lower the mixer shaft by loosening the coupling bolts **[302]**. Lower evenly until the shaft is supported by the shaft collar **[1253]**. The shaft should drop approximately 1/4" (6mm). Remove coupling bolts **[302]**.

7. Remove the mixer motor/housing assembly mounting bolts and lockwashers **[252, 253]**. Lift the drive assembly from the flange **[1251]** and move to a suitable service area. The mounting flange and mechanical seal assembly should remain on the vessel with the extension shaft and removable coupling extending above the seal.

MIXER MAINTENANCE

8. Remove the motor or gearmotor mounting bolts **[205]**. Remove the motor **[100]** or gearmotor **[105]** from the housing **[201-06]**. The motor coupling half **[151]** will be attached to the motor or gearmotor output shaft. If motor servicing is required, loosen the coupling setscrews, and remove the coupling half **[151]** from the motor output shaft. Remove the motor key **[215]**.

9. Rotate the flanged drive shaft **[217]** until the drive shaft flexible coupling half **[153]** setscrew is aligned with the setscrew access hole located in the housing **[201-06]**. Insert a 5/32" hex key wrench into the access hole and engage the setscrew. Loosen the setscrew. Rotate the drive shaft and loosen the other setscrew.

10. Remove the drive shaft coupling half **[153]**. Remove the drive shaft key **[219]**.

11. Remove the snap ring **[254]** from the drive shaft.

12. Mount the housing, motor mounting end up, in an arbor press. Press the drive shaft out of the housing.

13. Remove the snap ring **[255]** from the housing.

14. Turn the housing over, motor mounting end down, and remove the lip seal **[258]**.

15. Press the lower bearing **[256]** out of the housing. The bearing spacer **[257]** and upper bearing **[256]** will also be pressed out from the housing.

The mixer drive is now fully disassembled. Clean parts and inspect for wear. Replace worn parts as required.

MIXER MAINTENANCE

Mixer Drive Re-Assembly

Refer to *Figure 3, page 8*.

1. Mount the housing **[201-06]**, motor mounting end up, in an arbor press. Place bearing **[256]** into upper bearing bore and press into housing. Apply press to outer race of the bearing to avoid damaging the bearing. The bearing will press through the upper bore and drop into lower bearing bore. Continue to apply press to outer race of bearing until bearing rests against lower housing shoulder.

2. Install bearing spacer **[257]** into the housing so that it rests on the inner race of the lower bearing **[256]**. Spacer should be centered with bearing bore.

3. Place another bearing **[256]** into upper bearing bore and press into housing. Apply press to outer race of the bearing to avoid damaging the bearing. Continue to press bearing into bore until bearing rests on spacer.

4. Install the snap ring **[255]** into groove in upper bearing bore.

5. Turn the housing over, motor mounting end down. Install the lip seal **[258]** into the housing (seal lip facing the bearing, flush with the bottom of the housing).

6. Support the housing, motor mounting end down, by resting the inner race of the upper bearing **[256]** on a suitable pipe or tube fixture. *NOTE: The bearing inner race must be supported while installing the drive shaft to avoid damaging the bearing.*

7. Apply grease to the lip of the lip seal **[258]**. Press the flanged drive shaft **[217]** into the lower bearing **[256]**, through the spacer and upper bearing, to the shoulder of the shaft.

8. Install snap ring **[254]** onto the drive shaft.

9. Install the drive shaft key **[219]**. Install the drive shaft flexible coupling half **[153]** onto the drive shaft until it rests on the shaft shoulder. Rotate the drive shaft until one of the flexible coupling setscrews is aligned with the access hole located in the housing. Insert a 5/32" hex key wrench into the housing access hole and engage the setscrew. Tighten the setscrew securely. Rotate the drive shaft and tighten the other flexible coupling half setscrew securely.

10. Install the motor or gearmotor key **[215]** onto the motor shaft using Loctite Adhesive. Install the motor shaft coupling half **[151]** so that the face of the coupling (not the teeth) is flush with the end of the motor output shaft. Tighten both flexible coupling half setscrews securely.

MIXER MAINTENANCE

11. Insert the flexible coupling rubber sleeve **[152]** into the drive shaft flexible coupling half.

12. Position the motor or gearmotor onto the housing, being careful to align the teeth of the motor coupling half with those in the rubber sleeve. Install the motor or gearmotor to the housing using bolts **[205]** and lockwashers **[206]**. Tighten bolts securely.

Refer to the ***Mounting & Installation*** section of the manual for mixer drive installation instructions.

MIXER MAINTENANCE

Refer to main unit assembly *Figure 3, page 8* and seal assembly *Figure 4, page 10.*

Seal Cartridge Removal - Model 40DTNS, Flowserve MCRO Seal:

1. Remove internal coupling bolt, lockwasher, and washer **[304, 305, 306]**. Loosen setscrews **[308]**. Remove coupling **[301-02]** and key **[307]**. Clean extension shaft above seal.

2. Remove collar **[1451]**, spring **[1453]**, rotary seal ring **[1454]**, and o-ring **[1455]**. Remove bolts, lockwashers, and flatwashers **[1265, 1266, 1267]**.

3. Remove bolts, lockwashers, and flatwashers **[1262, 1263, 1264]**. Remove mechanical seal adapter plate and o-ring **[1261, 1252]**. Remove stationary seal ring and o-ring **[1456, 1457]** from seal adapter plate.

4. Inspect parts for wear. Replace worn or damaged parts as required.

Seal Cartridge Installation - Model 40DTNS, Flowserve MCRO Seal:

1. Place o-ring **[1252]** into groove in mounting flange **[1251]**.

2. Install seal adapter plate **[1261]** onto flange. Install bolts, lockwashers, and flatwashers **[1262, 1263, 1264]** loosely. *Do not tighten bolts at this time.*

3. Install stationary seal ring **[1456]** and o-ring **[1457]** into the adapter plate **[1261]**.

4. Remove o-ring **[1455]** from rotary seal ring **[1454]**. Lubricate and re-install o-ring **[1455]** into rotary seal ring **[1454]**. Lubricate shaft **[400]**. Compress seal spring **[1453]** into rotary seal ring and slide entire seal ring, o-ring, and spring assembly down shaft to rest on the stationary seal insert **[1456]**. O-ring **[1455]** should be fully seated in rotary seal ring **[1454].** *CAUTION: Do not get lubricant on the sealing faces.*

5. Install collar **[1451]** with setscrews **[1452]**. *Do not tighten setscrews at this time.*

6. Clean the removable shaft coupling **[301-02]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307-02]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37.* Engage the two coupling setscrews **[308]** onto the shaft key **[307-02]**.

MIXER MAINTENANCE

7. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7, page 37*. Install two coupling bolts and lockwashers at 180°. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

8. Slide the rotary seal ring **[1454]** up the extension shaft **[400]**. Center the mechanical seal adapter plate/stationary seal ring **[1261/1456]** on the extension shaft. Torque bolts **[1262]** to the value shown in *Table 7*.

9. Install bolts, lockwashers, and flatwashers **[1265, 1266, 1267]**. Torque bolts to the value shown in *Table 7*.

10. Set collar **[1451]** at 2.20" (55.9mm) above the adapter plate face. Evenly tighten all cup point setscrews **[1452]**.

11. Install the handhole cover **[1107-02]** onto the housing **[201-06]** using bolts **[1111]**.

MIXER MAINTENANCE

Refer to main unit assembly *Figure 3, page 8* and seal assembly *Figure 5, page 13.*

Seal Cartridge Removal - Model 40DTNS, Crane 8B2 Seal:

1. Remove internal coupling bolt, lockwasher, and washer **[304, 305, 306]**. Loosen setscrews **[308]**. Remove coupling **[301-02]** and key **[307]**. Clean extension shaft above seal.

2. Remove rotary seal ring **[1553]** assembly. Remove bolts, lockwashers, and flatwashers **[1265, 1266, 1267]**.

3. Remove bolts, lockwashers, and flatwashers **[1262, 1263, 1264]**. Remove mechanical seal adapter plate and o-ring **[1261, 1252]**. Remove stationary mating ring adapter **[1559]** assembly and o-ring **[1560]** from seal adapter plate.

4. Remove stationary mating ring **[1554]** and anti-rotation pin **[1557]** from mating ring adapter. Remove pin **[1561]** from seal adapter plate.

5. Inspect parts for wear. Replace worn or damaged parts as required.

Seal Cartridge Installation - Model 40DTNS, Crane 8B2 Seal:

1. Place o-ring **[1252]** into groove in mounting flange **[1251]**. Install pin **[1561]** into seal adapter plate **[1261]**. Place seal adapter plate onto flange. Install bolts, lockwashers, and flatwashers **[1262, 1263, 1264]** loosely. *Do not tighten bolts at this time.*

2. Mating ring adapter **[1559]**, stationary mating ring **[1554]**, o-ring **[1558]**, anti-rotation pin **[1557]**, and snap ring **[1562]** are pre-assembled. Install mating ring adapter **[1559]** assembly into adapter plate **[1261]**. Make sure slot engages pin **[1561]**. Do not install bolts **[1265]** at this time.

3. Lubricate shaft **[400]**. Slide rotary seal ring **[1553]** assembly down shaft to rest on stationary mating ring **[1554]**.

4. Clean the removable shaft coupling **[301-02]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307-02]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37.* Engage the two coupling setscrews **[308]** onto the shaft key **[307-02]**.

MIXER MAINTENANCE

5. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7, page 37*. Install two coupling bolts and lockwashers **[302, 303]** at 180°. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

6. Slide the rotary seal ring **[1553]** assembly up the extension shaft. Center the mechanical seal adapter plate/stationary mating ring **[1261/1554]** on the extension shaft. Torque bolts **[1262]** to the value shown in *Table 7*.

7. Install bolts, lockwashers, and flatwashers **[1265, 1266, 1267]**. Torque bolts to the value shown in *Table 7*.

8. Set rotary seal ring **[1555]** retainer at 1.06" (26.9mm) above the adapter plate face. Evenly tighten all cup point setscrews **[1551]**.

9. Install the handhole cover **[1107-02]** onto the housing **[201-06]** using bolts **[1111]**.

MIXER MAINTENANCE

Refer to main unit assembly *Figure 3, page 8* and seal assembly *Figure 6, page 16.*

Seal Cartridge Removal - Model 40DTNC, Chesterton 155:

1. Remove internal coupling bolt, lockwasher, and washer **[304, 305, 306]**. Loosen setscrews **[308]**. Remove coupling **[301-02]** and key **[307]**. Clean extension shaft above seal.

2. Remove bolts, lockwashers, and flatwashers **[1292, 1293, 1294]**. Slide seal cartridge up and off of shaft.

3. Remove bolts **[1295]** and seal adapter plate. Remove o-ring **[1252]**.

4. Inspect parts for wear. Replace worn or damaged parts as required.

Seal Cartridge Installation - Model 40DTNC, Chesterton 155:

1. Place o-ring **[1252]** into groove in mounting flange **[1251]**. Install seal adapter plate **[1291]** onto flange. Install bolts, lockwashers, and flatwashers **[1295, 1296, 1297]** loosely. *Do not tighten bolts at this time.*

2. Lubricate shaft **[400]**. Slide seal cartridge **[1400]** assembly with gasket **[1412]** down shaft to rest on adapter plate **[1291]**.

3. Clean the removable shaft coupling **[301-02]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307-02]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37.* Engage the two coupling setscrews **[308]** onto the shaft key **[307-02]**.

4. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7*. Install two coupling bolts and lockwashers **[302, 303]** at 180^{o}. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

5. Slide the mechanical seal cartridge **[1400]** up the extension shaft. Center the mechanical seal adapter plate **[1291]** on the extension shaft. Torque bolts **[1295]** to the value shown in *Table 7*.

MIXER MAINTENANCE

6. Slide mechanical seal cartridge down shaft and install bolts, lockwashers, and flatwashers **[1292, 1293, 1294].** Tighten bolts evenly. Do not overtighten.

7. Evenly tighten lock ring setscrews **[1402]**, securing seal cartridge to shaft. Remove centering strap and save for later use during seal changeout. *NOTE: It may be easier to tighten three setscrews at 120^{o}, and then remove centering strap. Remaining setscrews may be better accessed for tightening by rotating the shaft.*

8. Install the handhole cover **[1107-02]** onto the housing **[201-06]** using bolts **[1111]**.

MIXER MAINTENANCE

Refer to main unit assembly *Figure 3, page 8* and seal assembly *Figure 7, page 19.*

Seal Cartridge Removal - Model 40DTNC, Flowserve VRA:

1. Remove internal coupling bolt, lockwasher, and washer **[304, 305, 306]**. Loosen setscrews **[308]**. Remove coupling **[301-02]** and key **[307]**. Clean extension shaft above seal.

2. Remove rotary seal ring **[1603]** assembly.

3. Remove bolts and lockwashers **[1298, 1299]**. Remove gland ring **[1605]** assembly and o-ring **[1252]**.

4. Inspect parts for wear. Replace worn or damaged parts as required.

Seal Cartridge Installation - Model 40DTNC, Flowserve VRA:

1. Place o-ring **[1252]** into groove in mounting flange **[1251]**. Install gland ring **[1605]** assembly with stationary seal ring **[1608]** and o-rings **[1609]** onto flange. Install bolts and lockwashers **[1298, 1299]** loosely. *Do not tighten bolts at this time.*

2. Lubricate shaft **[400]**. Slide drive collar rotary seal ring **[1603]** assembly down shaft to stationary seal ring **[1608]**.

3. Clean the removable shaft coupling **[301-02]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307-02]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37.* Engage the two coupling setscrews **[308]** onto the shaft key **[307-02]**.

4. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7*. Install two coupling bolts and lockwashers **[302, 303]** at 180^{o}. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

5. Slide drive collar rotary seal ring **[1603]** assembly up the extension shaft. Center the gland ring **[1605]** assembly on the extension shaft. Torque bolts **[1298]** to the value shown in *Table 7*.

MIXER MAINTENANCE

6. Slide drive collar rotary seal ring **[1603]** assembly down shaft, and set seal spring gap dimension at 1.875” (47.6 mm). Evenly tighten all cup point setscrews **[1604]**.

7. Install the handhole cover **[1107-02]** onto the housing **[201-06]** using bolts **[1111]**.

MIXER MAINTENANCE

Refer to main unit assembly *Figure 3, page 8* and seal assembly *Figure 8, page 22.*

Seal Cartridge Removal - Model 30DTN/40DTN, Crane 5620:

1. Remove internal coupling bolt, lockwasher, and washer **[304, 305, 306]**. Loosen setscrews **[308]**. Remove coupling **[301-02]** and key **[307]**. Clean extension shaft above seal.

2. Remove bolts, lockwashers, and flatwashers **[1282, 1283, 1284]**. Slide seal cartridge up and off of shaft.

3. Remove adapter piece **[1281]**. Remove gasket **[1255]**.

4. Inspect parts for wear. Replace worn or damaged parts as required.

Seal Cartridge Installation - Model 30DTN/40DTN, Crane 5620:

1. Place gasket **[1255]** around bore of mounting flange **[1251]**.

2. Install seal adapter piece **[1281]** into flange bore (tenon fit).

3. Lubricate shaft **[400]**. Slide seal cartridge **[1650]** assembly with gasket **[1659]** down shaft until just above adapter piece.

4. Clean the removable shaft coupling **[301]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. For model 30DTN units, install snap ring **[309]** into coupling **[301-01]**. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37*. Engage the two coupling setscrews **[308]** onto the shaft key **[307]**.

5. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7*. Install two coupling bolts and lockwashers **[302, 303]** at 180^{o}. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

6. Slide mechanical seal **[1650]** assembly into adapter piece **[1281]** (tenon fit). Orient fluid ports per mechanical seal assembly drawing included with unit. Install bolts, lockwashers, and flatwashers **[1282, 1283, 1284]**. Tighten bolts evenly. Do not overtighten.

MIXER MAINTENANCE

7. Tighten collar setscrews **[1652]** evenly, securing seal to shaft.

8. Remove seal spacers and save for future seal changeout.

9. Attach seal lubrication lines. See ***Options: Mechanical Seal Lubricator*** for installation instructions.

10. Install the handhole cover **[1716-02]** onto the housing **[201-06]** using bolts **[1111]**.

MIXER MAINTENANCE

Refer to main unit assembly *Figure 3, page 8* and seal assembly *Figure 9, page 25.*

Seal Cartridge Removal - Model 30DTN/40DTN, Chesterton 255:

1. Remove internal coupling bolt, lockwasher, and washer **[304, 305, 306]**. Loosen setscrews **[308]**. Remove coupling **[301-02]** and key **[307]**. Clean extension shaft above seal.

2. Remove bolts, lockwashers, and flatwashers **[1272, 1273, 1274]**. Slide seal cartridge up and off of shaft.

3. Remove adapter piece **[1271]**. Remove gasket **[1255]**.

4. Inspect parts for wear. Replace worn or damaged parts as required.

Seal Cartridge Installation - Model 30DTN/40DTN, Chesterton 255:

1. Place gasket **[1255]** around bore of mounting flange **[1251]**. Install seal adapter piece **[1271]** into flange bore (tenon fit).

2. Lubricate shaft **[400]**. Slide seal cartridge **[1500]** assembly with gasket **[1507]** down shaft until just above adapter piece.

3. Clean the removable shaft coupling **[301]**. Make sure both the extension shaft and coupling bore surfaces are completely dry and free from any burrs or nicks. Install the shaft key **[307]** into the extension shaft keyway, making sure it is fully bottomed into the keyway. For model 30DTN units, install snap ring **[309]** into coupling **[301-01]**. Install the coupling over the shaft end. Install the shaft bolt, lockwasher, and flatwasher **[304, 305, 306]** and torque to the value shown in *Table 7, page 37*. Engage the two coupling setscrews **[308]** onto the shaft key **[307]**.

4. Lower the mixer housing assembly onto the flange **[1251]** and removable coupling half **[301-02],** and attach with bolts and lockwashers **[252, 253]**. Torque bolts to the value shown in *Table 7*. Install two coupling bolts and lockwashers **[302, 303]** at 180^{o}. Tighten the bolts to engage the tenon and pull the removable coupling **[301]** and flanged drive shaft coupling **[217]** faces together. Install and tighten the remaining coupling bolts and lockwashers **[302, 303]**.

5. Slide mechanical seal **[1500]** assembly into adapter piece **[1271]** (tenon fit). Orient fluid ports per mechanical seal assembly drawing included with unit. Install bolts, lockwashers, and flatwashers **[1272, 1273, 1274]**. Tighten bolts evenly. Do not overtighten.

MIXER MAINTENANCE

6. Tighten collar setscrews **[1503]** evenly, securing seal to shaft.

7. Remove centering clips and save for future seal changeout.

8. Attach seal lubrication lines. See ***Options: Mechanical Seal Lubricator*** for installation instructions.

9. Install the handhole cover **[1716-02]** onto the housing **[201-06]** using bolts **[1111]**.

MIXER PART NUMBERS

Part #	Description	Qty.
100	Motor	1
105	Gearmotor	1
150	Flexible Motor Coupling Assembly	
151-01	Motor Coupling Half, 56C	1
151-02	Motor Coupling Half, 140TC	1
152	Coupling Sleeve	1
153	Drive Shaft Coupling Half	1
200	Housing Assembly	
201-06	Housing, Models 30DTN, 40DTNS, 40DTNC, 40DTN	1
205	Socket Head Bolt	4
206	Hi-Collar Lockwasher	4
215-01	Motor Key, 56C Motor	1
215-02	Motor Key, 140TC Motor/Gearmotor	1
217	Flanged Drive Shaft Coupling, Mate 56C/140TC	1
219	Drive Shaft Key	1
252	Hex Bolt	4
253	Spring Lockwasher	4
254	Snap Ring	1
255	Snap Ring	1
256	Bearing	2
257	Bearing Spacer	1
258	Lip Seal	1
300	Removable Coupling Assembly	
301-01	Removable Flanged Shaft Coupling, 1” Shaft	1
301-02	Removable Flanged Shaft Coupling, 1-1/2” Shaft	1
302	Hex Bolt	4
303	Spring Lockwasher	4
304	Hex Bolt	1
305	Spring Lockwasher	1
306	Flatwasher	1
307-01	Key, 1” Shaft	1
307-02	Key, 1-1/2” Shaft	1
308	Setscrew	2
309	Snap Ring, 1” Shaft	1

MIXER PART NUMBERS

Part #	Description	Qty.
400	Extension Shaft	1
500	Propellers/Impellers Marine Propeller, Type JP-3 High Efficiency Impeller, Type SC-3	
1100	Handhole Cover Assembly	
1107-02	Handhole Cover, Models DTNS/DTNC Units	1
1111	Bolt	6
1251	Mounting Flange	1
1252	O-Ring	1
1253	Shaft Collar	1
1254	Clamp Bolt	2
1255	Gasket	1
1260	Crane 8B2/Flowserve MCRO Seal Adapter Plate Assembly	
1261	Seal Adapter Plate	1
1262	Hex Bolt	4
1263	Spring Lockwasher	4
1264	Flatwasher	4
1265	Hex Bolt	4
1266	Spring Lockwasher	4
1267	Flatwasher	4
1270	Chesterton 255 Seal Adapter Piece Assembly	
1271	Seal Adapter Piece	1
1272	Hex Bolt	4
1273	Spring Lockwasher	4
1274	Flatwasher	4
1280	Crane 5620 Seal Adapter Piece Assembly	
1281	Seal Adapter Piece	1
1282	Hex Bolt	4
1283	Spring Lockwasher	4
1284	Flatwasher	4

MIXER PART NUMBERS

Part #	Description	Qty.
1290	Chesterton 155 Seal Adapter Plate Assembly	
1291	Seal Adapter Plate	1
1292	Hex Bolt	4
1293	Spring Lockwasher	4
1294	Flatwasher	4
1295	Socket Bolt	4
1296	Hi-Collar Lockwasher	4
1297	Flatwasher	4
1298	Socket Bolt	4
1299	Hi-Collar Lockwasher	4
1400	Chesterton 155 Seal Assembly	
1401	Lock Ring	1
1402	Setscrew, Cup Point	6
1403	Sleeve	1
1404	Gland Assembly	1
1405	Snap Ring	1
1406	Springs	
1407	Back-up Washer	1
1408	Stationary Seal Ring	1
1409	O-Ring	1
1410	O-Ring	1
1411	Rotary Seal Ring	1
1412	Gasket	1
1413	Gland Tab with Spring	8
1414	O-Ring	1
1415	Flat Head Socket Screw	3
1416	Stationary Drive Assembly	1
1417	Pipe Plug	1
1450	Flowserve MCRO Seal Assembly	
1451	Collar	1
1452	Setscrew, Cup Point	2
1453	Spring	1
1454	Rotary Seal Ring	1
1455	O-Ring	1
1456	Stationary Seal Ring	1
1457	O-Ring	1

MIXER PART NUMBERS

Part #	Description	Qty.
1500	Chesterton 255 Seal Assembly	
1501	Lock Ring	1
1502-01	Springs, 1.00” Shaft	
1502-02	Springs, 1.50” Shaft	
1503	Setscrew, Cup Point/Quarter Dog Point	3,3
1504	O-Ring	1
1505	Upper Rotary Seal Ring	1
1506	Lug	1
1507	Gasket	1
1508	O-Ring	1
1509	O-Ring	1
1510	Gland	1
1511	Upper Stationary Seal Ring	1
1512	O-Ring	1
1513	Drive Clip/Drive Channel	2,1
1514	Lower Rotary Seal Ring	1
1515	O-Ring	1
1516	Lower Stationary Seal Ring	1
1517	O-Ring	1
1518	Sleeve	1
1550	Crane 8B2 Seal Assembly	
1551	Setscrew	4
1552	O-Ring	1
1553	Rotary Seal Ring	1
1554	Stationary Mating Ring	1
1555	Retainer	1
1556	Spring	3
1557	Anti-Rotation Pin	1
1558	O-Ring	1
1559	Mating Ring Adapter	1
1560	O-Ring	1
1561	Pin	1
1562	Snap Ring	1

MIXER PART NUMBERS

Part #	Description	Qty.
1600	Flowserve VRA Seal Assembly	
1601	Shoulder Screw	3
1602	O-Ring	1
1603	Rotary Seal Ring	1
1604	Setscrew	4
1605	Gland Ring	1
1606	Drive Collar Assembly	1
1607	Spring	3
1608	Stationary Seal Ring	1
1609	O-Ring	2
1610	Drive Pin	4
1611	O-Ring	1
1612	Retaining Ring	1
1613	Retaining Plate	1
1650	Crane 5620 Seal Assembly	
1651	Snap Ring	1
1652	Setscrew	4
1653	O-Ring	1
1654	O-Ring with Anti-Extrusion Ring	1
1655	O-Ring	1
1656	Snap Ring	1
1657	Gland Plate	1
1658	O-Ring	1
1659	Gasket	1
1660	O-Ring with Anti-Extrusion Ring	1
1661	O-Ring	1
1662	O-Ring	1
1663	Sleeve	1
1664	Collar	1
1665	Upper Retainer with Drive Ring and Spring	1
1666	Upper Rotary Seal Ring	1
1667	Upper Stationary Ring	1
1668	Sleeve Adapter	1
1669	O-Ring	1
1670	Gland Adapter	1
1671	O-Ring	1
1672	Lower Retainer with Drive Ring and Spring	1
1673	Lower Rotary Seal Ring	1
1674	Lower Stationary Ring	1

MIXER PART NUMBERS

Part #	Description	Qty.
1700	Lubrication Assembly	
1701	Mechanical Seal Lubricator	1
1702	Plug, NPT	1
1703	Sight Glass, NPT	1
1704	Plug, NPT	1
1705	Pipe Nipple, NPT	1
1706	Pipe Elbow, NPT	1
1707	Pipe Nipple, NPT	1
1708-01	Flexible Metal Hose (Chesterton 255) [30” Overall Length]	1
1708-02	Flexible Metal Hose (Crane 5620) [24” Overall Length]	1
1709	Pipe Nipple, NPT	1
1710-01	Flexible Metal Hose (Chesterton 255) [30” Overall Length]	1
1710-02	Flexible Metal Hose (Crane 5620) [30” Overall Length]	1
1711	Mounting Bracket	1
1712	Hex Bolt	2
1713	Spring Lockwasher	2
1714	Hex Bolt	2
1715	Spring Lockwasher	2
1716	Handhole Cover, Special	1