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INSTALLATION

OPERATING

AND

MAINTENANCE

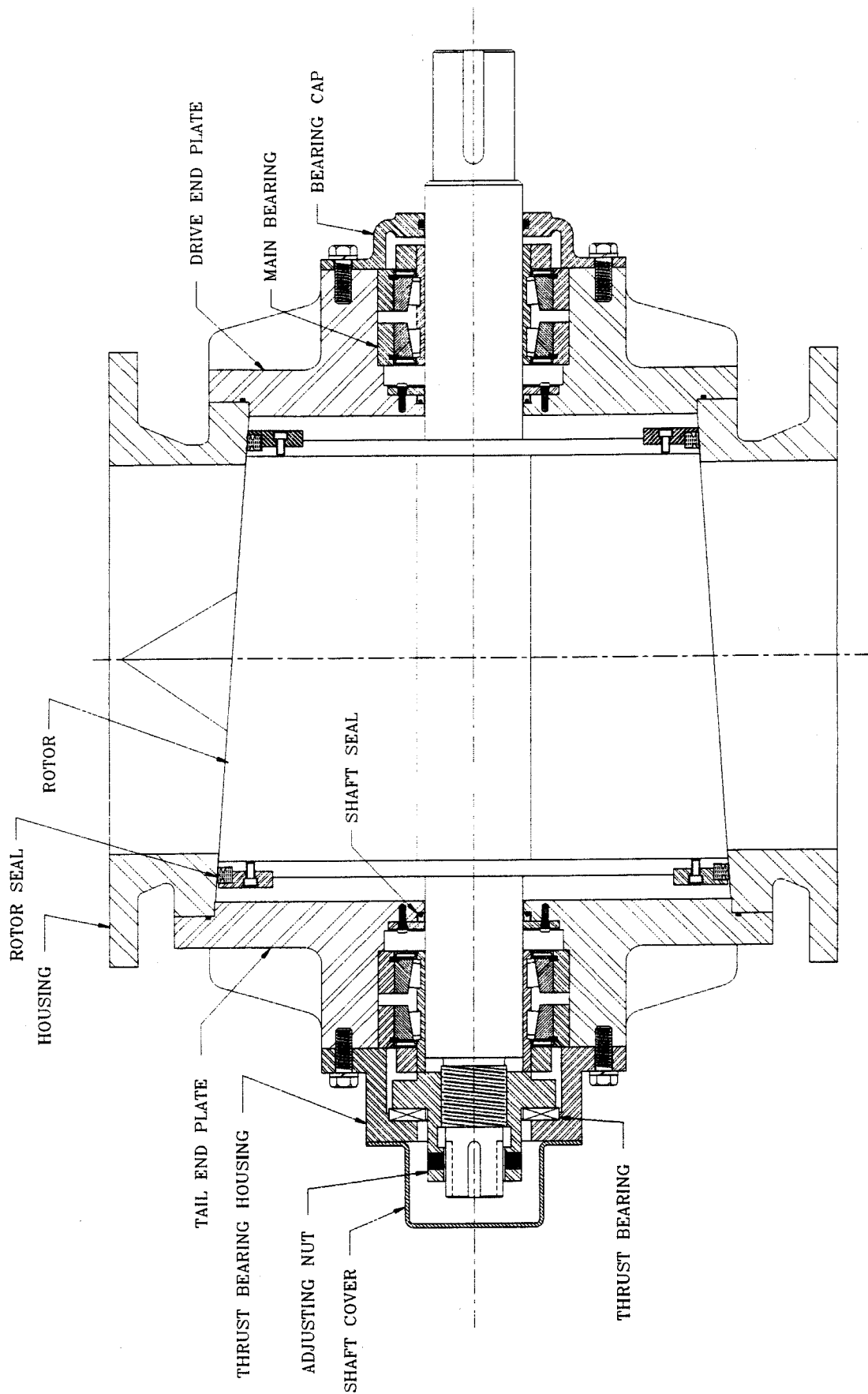
MANUAL

FOR

TAPERED

ROTARY

AIRLOCKS



SECTION THROUGH VALVE

MAJOR PARTS IDENTIFICATION

VALVE INSTALLATION

Before installing the valve use feeler gauges to check the rotor vane to housing clearance to see that they agree with the factory settings. This can be done through the product inlet and outlet openings. Next, remove the shaft cover (see Fig. 1) and check to make sure the two set screws in the adjusting nut are securely in place and then replace the shaft cover.

Disconnect the drive chain at the connecting link and rotate the rotor by hand to make sure that no foreign material is inside the valve. **CAUTION**, do not place your hands inside the valve while rotating the rotor. The vanes have sharp edges and pinch points that can cause injury.

Install the valve between its mating flanges making sure the valve is not put into a piping bind that could distort the housing as this could effect the vane to housing clearances. Rotate the rotor again after installation to make sure the rotor is turning freely and then reconnect the drive chain.

When the electrical connections have been made at the motor, turn on the power and run the valve momentarily to make sure the chain alignment and tension is correct and that the valve rotation is in accordance with the directional arrow. Proper valve rotation is clockwise when facing the drive end. Be careful to keep hands and loose clothing parts away from the chain drive while the guard is removed. When the installation is deemed satisfactory, turn off the power and replace the drive guard.

WARNING

BEFORE PERFORMING ANY SERVICE, MAINTENANCE OR ADJUSTMENTS BE SURE TO EXECUTE AN APPROVED ELECTRICAL LOCKOUT PROCEDURE.

ELEVATED TEMPERATURE SERVICE

If the valve is to operate in an elevated temperature environment, i.e. over one hundred degrees F., it is recommended that the clearances be opened, the system run until the valve reaches operating temperatures and then the clearances reset to the desired operating conditions. The tighter the clearances the less the leakage and the better the valve efficiency but due to differential expansion between the housing and rotor care should be taken in establishing the "cold" clearances.

ON LINE CLEARANCE ADJUSTMENT

- 1.) Remove the inspection plug (see Fig. 4).
- 2.) Remove the shaft cover (see Fig. 1)
- 3.) Remove the two dog point set screws from the adjusting nut.
- 4.) With feeler gauges, check the clearances through the inspection port.
- 5.) With a wrench on the hex part of the adjusting nut, turn the nut until the desired clearances are achieved by use of the feeler gauges. To open the clearances, turn the nut clockwise. To close the clearances turn the nut counter clockwise (see Fig. 2).
- 6.) Once the desired clearances have been reached, turn the nut until the set screw holes line up with the nearest slot in the rotor.
- 7.) Replace the two dog point set screws. **MAKE SURE THEY ARE TIGHTENED FIRMLY IN PLACE.**
- 8.) Replace the shaft cover and inspection plug.
- 9.) Turn the power back on.

ROTOR SEAL PURGE

The main purpose of the rotor seal purge is to pressurize the seal. The seal is designed so that the internal pressure in the valve will work against the inward facing lobe of the seal forcing it against the housing. To insure that the rotor seal is most efficient, there should be slightly greater pressure against the outward facing lobe. This is done by applying pressure to the piping leading into the valve end plates (see Fig. 5). This pressure must be regulated to approximately two (2) to five (5) psig above the conveying pressure.

It is recommended that an electrical cutoff valve be provided so that the seals are not under pressure when the valve is not in service. However, if there are valves in series as in the case of a bank of silos, all the valves seals should be pressurized as well as the one in service. If the cutoff valve is used, the control logic should be set up so the purge air comes on before the airlock starts and shuts off after the valve is stopped.

It is recommended that the optional flow indicators shown in Fig. 5 be installed to monitor the condition of the seals. With the seals properly installed and functioning there should be no appreciable passage of air or gas past the seals. Due to the passage of time and wear, the seals will need to be replaced. The flow indicators are helpful in determining when seal maintenance may be required. When the seals are worn, they should be replaced as soon as possible but in the interim, the higher pressure of the purge should help retard the migration of fines or powder into the void area between the rotor end bells and the valve end plates.

BEARING LUBRICATION

The bearings have been factory lubricated and are ready to run. The following table is a general guide for relubrication. However, certain conditions may require a change of lubricating periods as dictated by experience. The bearings are factory lubricated with a No. 2 consistency lithium-base grease which is suitable for normal operating conditions.

If the valve is used in elevated temperature service, it is recommended that the bearing be relubricated with Mobil Mobilith SHC 460 or equal. Also, the normal relubrication period will have to be shortened.

| LUBRICATION GUIDE | |
|-------------------|-----------------------------|
| HOURS RUN PER DAY | LUBRICATION PERIOD IN WEEKS |
| 8 | 12 |
| 16 | 12 |
| 24 | 10 |

For low speed operation it is advisable to add extra grease before putting it in operation. When relubricating, grease should be added until it shows at the seals.

BEARING LOCKING SET SCREWS

Each bearing is equipped with two (2) 3/8" X 3/4" long cup point socket set screws. Their normal purpose is to lock the bearing to the shaft. In this application, the Adjusting Nut holds the rotor shaft in position and when the clearances are changed it is important that the shaft is free to move laterally in the bearings. **DO NOT TIGHTEN THESE SET SCREWS.** As a precaution, the set screws have been turned upside down so they can't be tightened against the shaft. Their only purpose now is to hold the outer ring in place on the inner race (see Fig. 6).

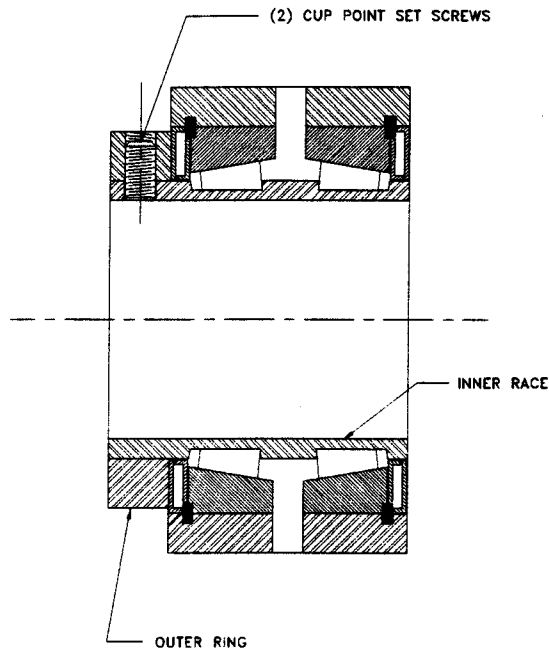


FIG. 6

GEAR REDUCER

The DODGE gear reducer is filled at the factory with Mobil SCH 634 oil to the proper level. The correct oil level is indicated by the red oil level plug for the No. 1 (level) mounting position. Changes in the mounting position will require relocation of the oil level and vent plugs.

The oil level should be checked before start-up and frequently thereafter, preferably with the gearbox warm. Check the oil level by removing the red plug. The oil level should be at the bottom edge of the threaded hole. If the level is low, add oil slowly through one of the upper plug holes until the oil starts to run out of the level hole. Replace all plugs securely.

The gearcase vent plug, located on top of the housing is provided to balance the air pressure inside the gearcase with the atmospheric pressure outside the gearcase. The vent plug must be clear at all times. Do not paint over.

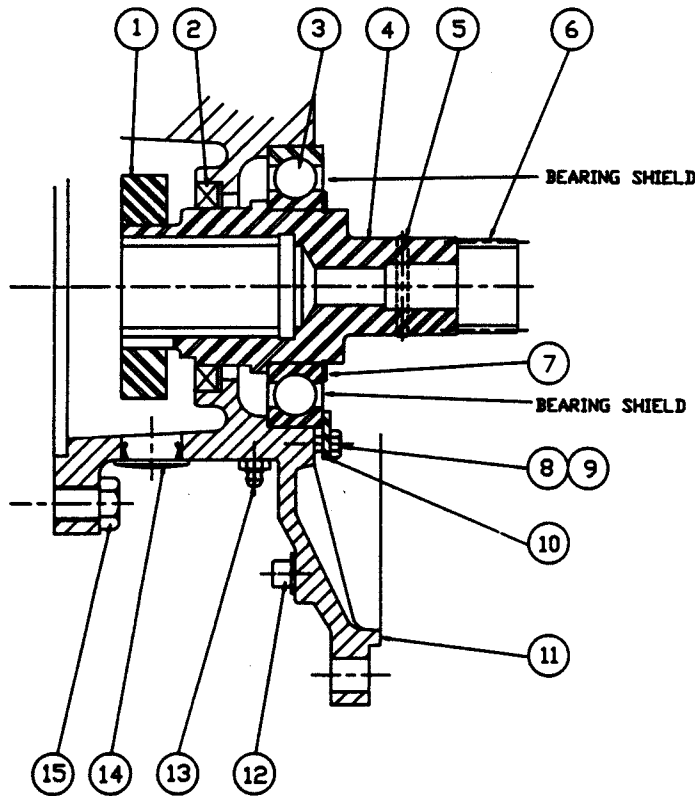
For alternate gearcase lubricants and oil change intervals, see the DODGE Installation, Service and Repair Manual the was shipped with your Rotary Valve.

NEMA C-FACE ADAPTOR LUBRICATION

The NEMA C-Face adaptor is equipped with a single ball bearing which is packed at assembly with Chevron SRI-2 grease. Units mounted in the No. 1 (level) position must have this bearing regreased with Chevron SRI-2 every 1000 hours or every six months, whichever occurs first.

A grease zerck fitting is provided and is located in the adaptor housing just off the top center and adjacent to the snap in hole plug (see Fig. 7).

C-FACE ADAPTER PARTS IDENTIFICATION DRAWINGS FOR DODGE APG SIZES 2-8



| REF. NO. | PART DESCRIPTION | QTY. |
|----------|------------------------|--------|
| 1 | CLAMP COLLAR | 1 |
| 2 | OIL SEAL | 1 |
| 3 | BALL BEARING | 1 |
| 4 | INPUT SHAFT | 1 |
| 5 | CROSS PIN | 1 |
| 6 | PINION | 1 |
| 7 | RETAINING RING | 1 |
| 8 | HEX HEAD SCREW | 0 OR 4 |
| 9 | HEX SOCKET CAP SCREW | 0 OR 4 |
| 10 | CLAMP WASHER | 4 |
| 11 | C-FACE ADAPTER HOUSING | 1 |
| 12 | PIPE PLUG | 1 |
| 13 | GREASE FITTING | 1 |
| 14 | SNAP-IN HOLE PLUG | 1 |
| 15 | HEX HEAD SCREW | 4 OR 8 |

FIG. 7

OPTIONAL HOUSING VENT

If your valve is equipped with the option housing vent it is located at the 9:00 O'Clock position when facing the valve from the drive end. The valve rotation is clockwise so the vent is on the upswing, or empty side of the valve. The object is to vent off part of the leakage of air or gas to minimize the leakage going up through the inlet throat. Based on the type of product being conveyed and the distance from the hopper or silo to the inlet of the rotary valve, leakage can severely effect valve efficiency.

OPERATING PRINCIPLE

Housing vents must act as mini conveying systems because even though the vent is on the "empty" side, pressure and turbulence will cause some product to be carried around and go through the vent. Therefore, the velocity in the vent line must be high enough to carry the product all the way through the vent line. Housing vent lines are small in diameter in order to accomplish this. This is the opposite of what is done when venting from atop the rotary valve.

VENT LINE ROUTING

The vent line must be routed vertical and directly to the termination point; top of silo, etc. Do not route it with any horizontal runs in it or it will surly plug and be rendered useless.

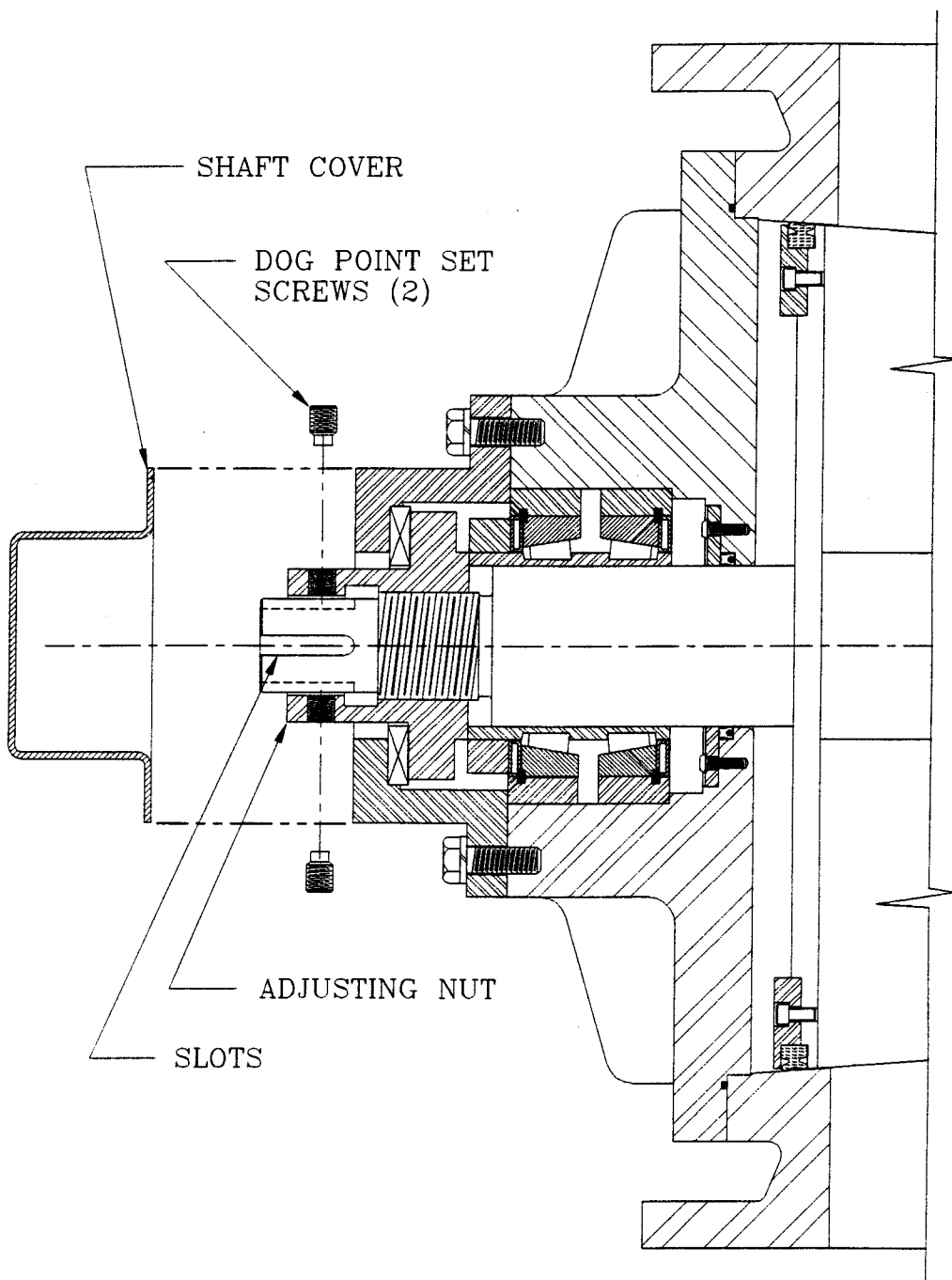


FIG. 1

SETTING THE TIP CLEARANCE

- 1.) Remove the shaft cover.
- 2.) Remove the two dog point set screws from the adjusting nut.
- 3.) With feeler gauges, check the existing clearances.
- 4.) With a wrench on the hex part of the adjusting nut, turn the nut until the desired clearances are achieved by the use of feeler gauges. To open the clearances, turn the nut clockwise. To close the clearances, turn the nut counter clockwise.
- 5.) Now turn the nut in either direction so the set screw holes line up with the nearest slots on the rotor.
- 6.) Tighten the set screws, replace the shaft cover and turn the power back on.

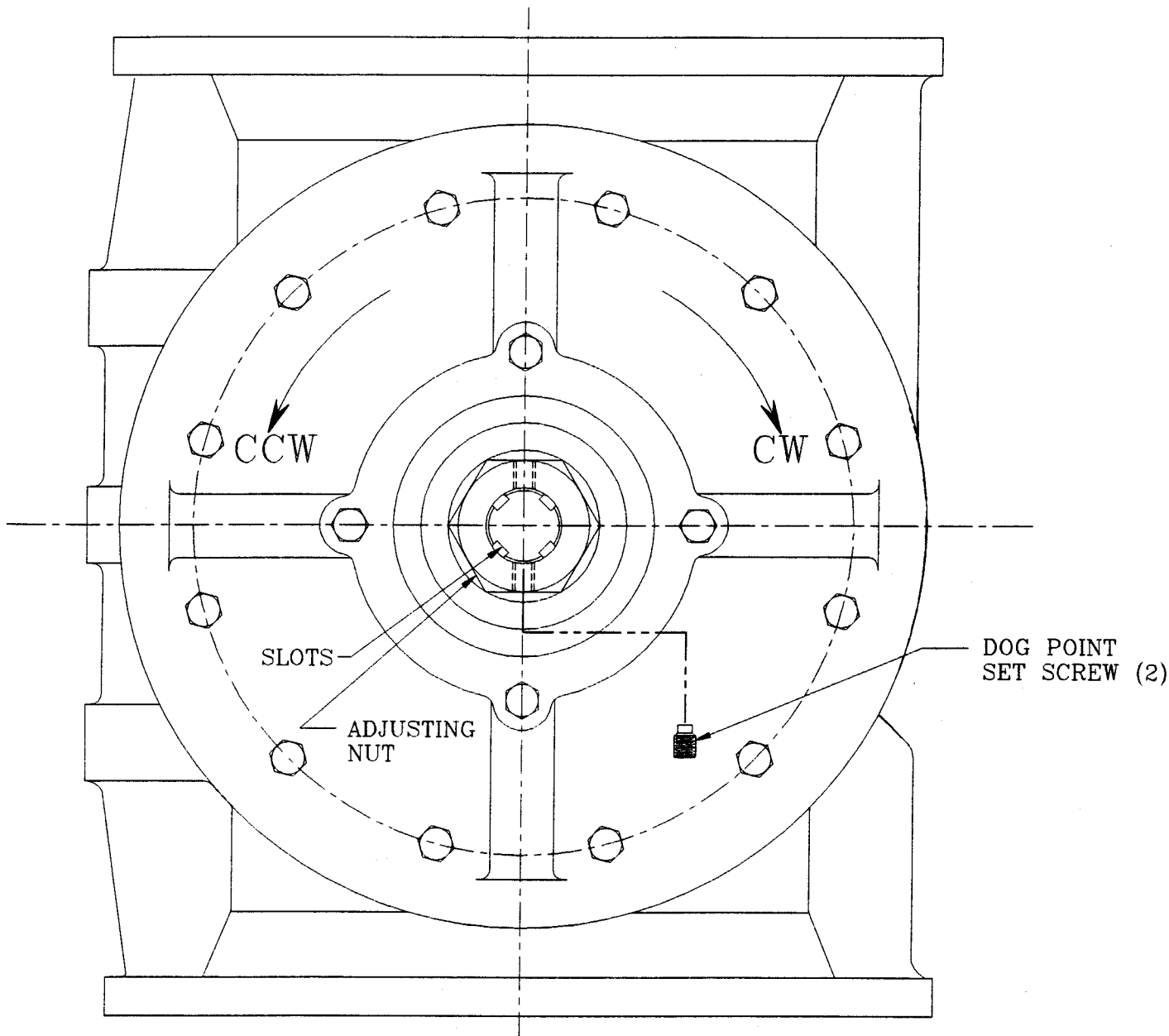


FIG. 2

ADJUSTING NUT ROTATION FOR CLEARANCE SETTINGS

Facing the rear end of the valve (end opposite drive), turn the adjusting nut clockwise to open the clearances and counter clockwise to close the clearances.

The clearances will change approximately 0.005" to 0.006" per full turn of the nut.

See previous instructions on preparing to change the clearances.

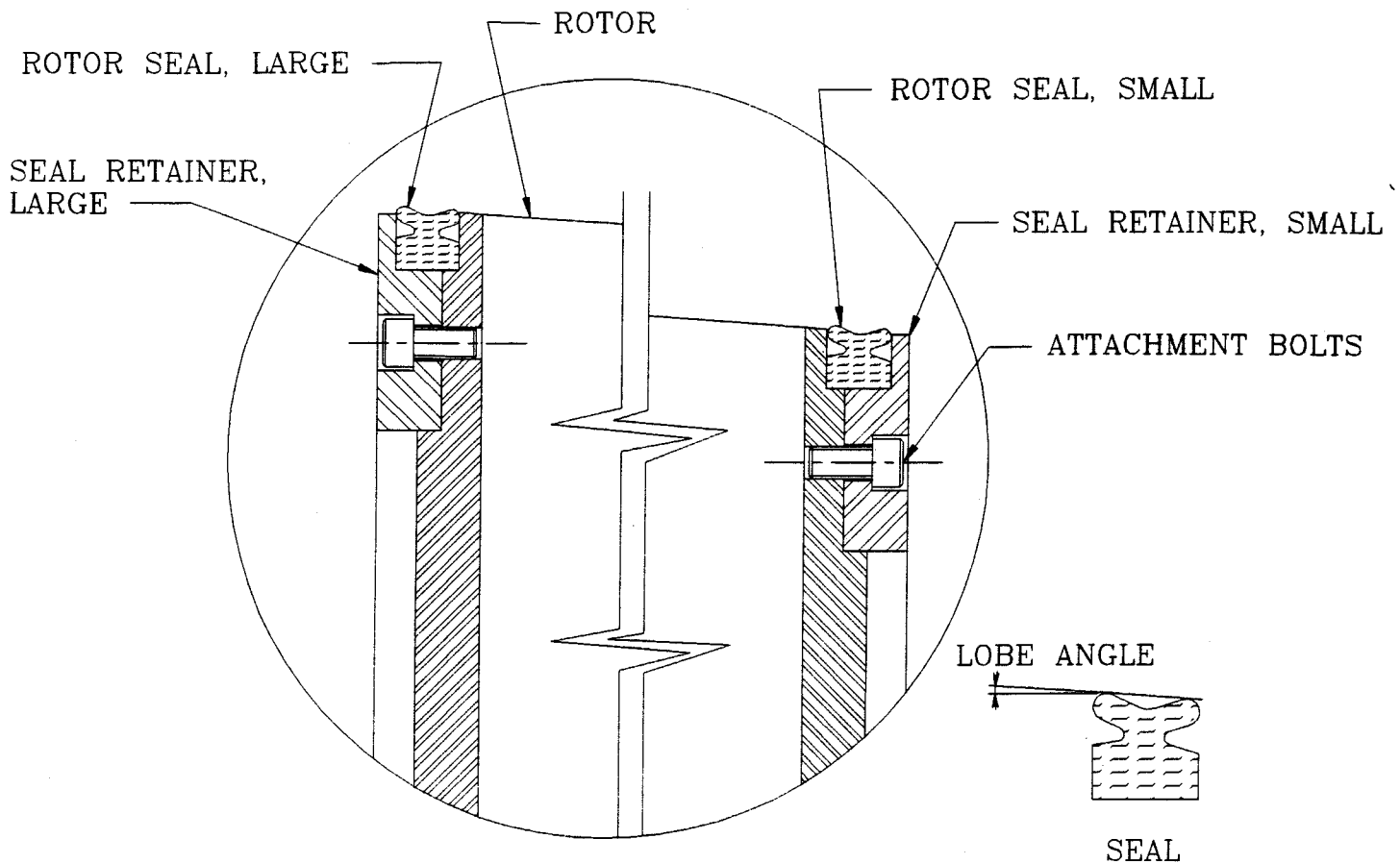


FIG. 3

REPLACING ROTOR SEALS

Depending on which seal is to be replaced, large end (tail end), small end (drive end) or both, remove all parts external to the valve end plates. This includes the thrust bearing housing and adjusting nut on the tail end and the driven sprocket on the drive end and then proceed along the following steps;

- 1.) Remove both end plates. Pull the rotor out through the tail end, taking care not to let it drag on the bottom of the housing.
- 2.) Support the rotor in a cradle of some type and remove the seal retainers. Discard the old seals.
- 3.) Install the new seals on the seal retainers, making sure that the angle on the seal lobes matches the angle on the rotor.
- 4.) Bring the seal retainers up to the rotor end bells lining up with the attachment bolt holes. Make sure the leading edge is up on the step of the end plate end bell.
- 5.) Replace and tighten the attachment bolts.
- 6.) Replace the rotor in the housing taking care not to damage the seals.
- 7.) Replace the end plates and then the balance of the parts.

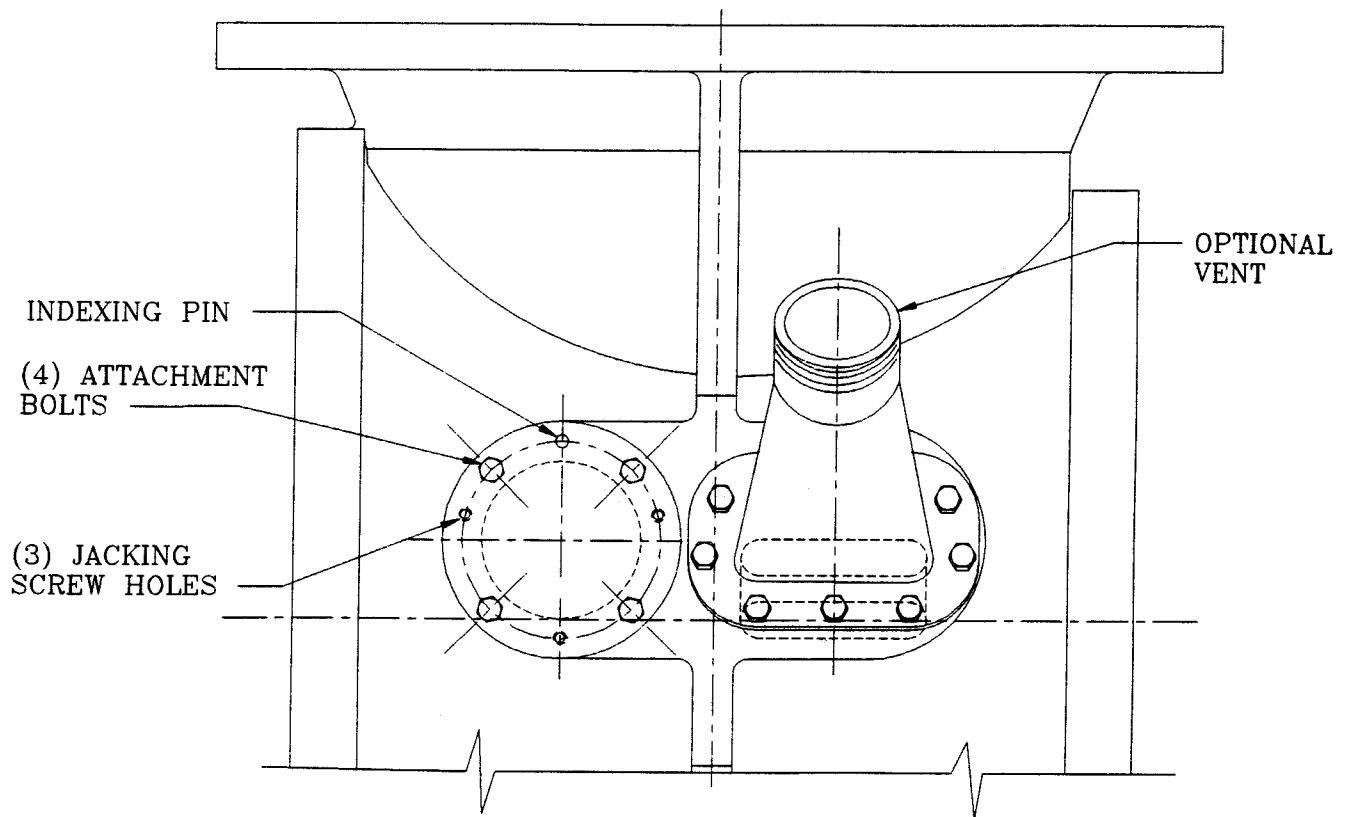


FIG. 4

REMOVAL OF INSPECTION PLUG

The inspection plug is match machined to the housing and therefore must always be replaced in the same position. That is the purpose of the indexing pin.

TO REMOVE THE PLUG

- 1.) Remove the four (4) attachment bolts.
- 2.) Screw three (3) of the attachment bolts into the jacking screw holes until they bottom out.
- 3.) With a wrench, screw the bolts in evenly by alternating between them a turn or two at a time. This will extract the plug without putting it in a bind.

TO REPLACE THE PLUG

- 1.) Line the plug up so the indexing pin is over its hole.
- 2.) Gently tap the plug evenly on top with a mallet to get it started into the hole, making sure that the indexing pin alignment is correct.
- 3.) Replace the four (4) attachment bolts in their holes and with a wrench, alternate around the bolts to evenly and firmly seat the plug into the housing.

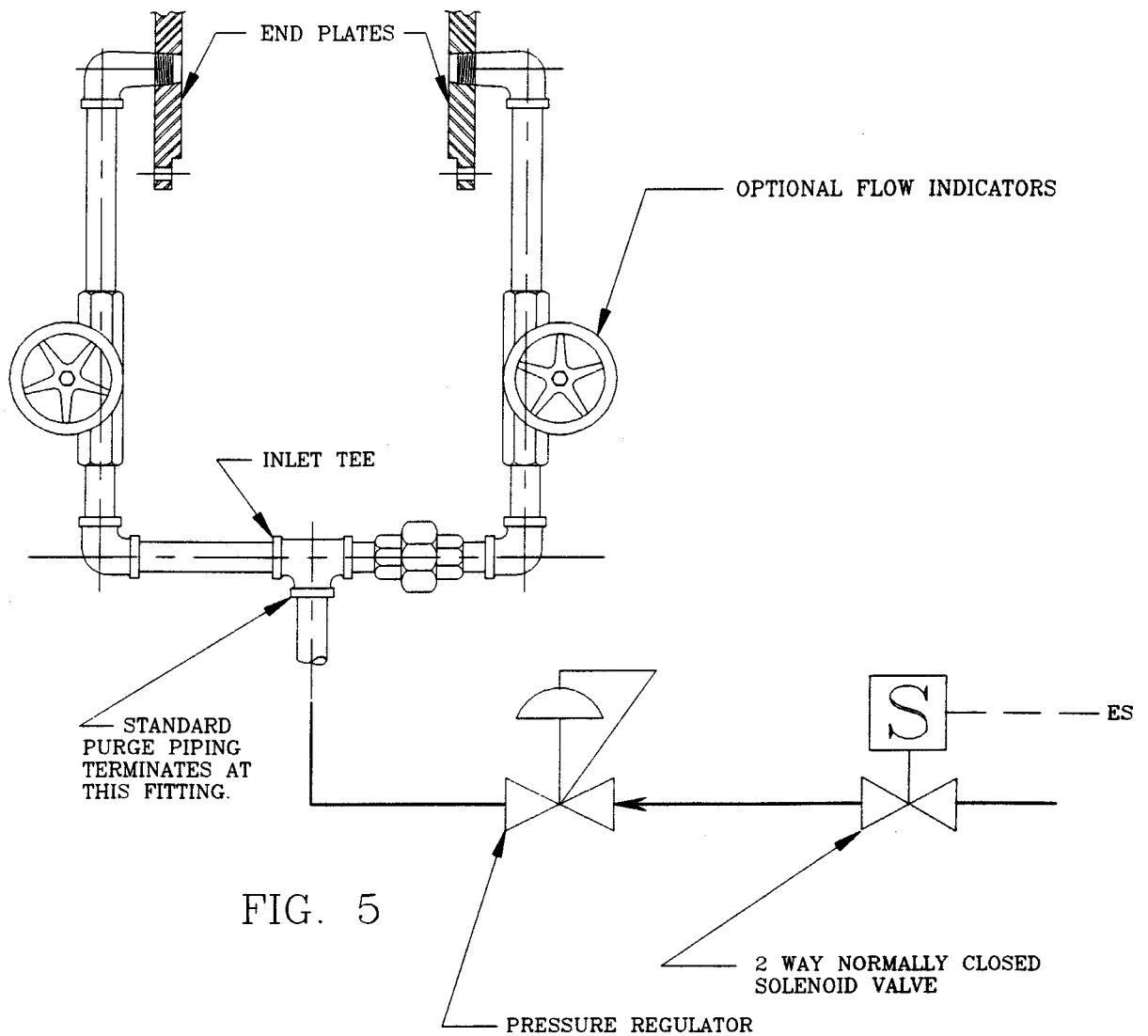


FIG. 5

ROTOR SEAL PURGE

The purpose of the purge piping is to pressurize the rotor seal and is basically non-consumable in that the purge medium does not pass the seals. From the inlet Tee, pipe in the same medium used for conveying, (air or gas). A pressure regulator must be provided to keep the pressure at two (2) to five (5) psig over the conveying pressure. A cut off valve should be provided so the seals are not under pressure when the valve is out of service. The optional flow indicators are a good way of determining when seal maintenance may be required. Rotation of one or both of the indicators shows that air or gas is passing the seals. See Fig. 3 for seal replacement instructions.