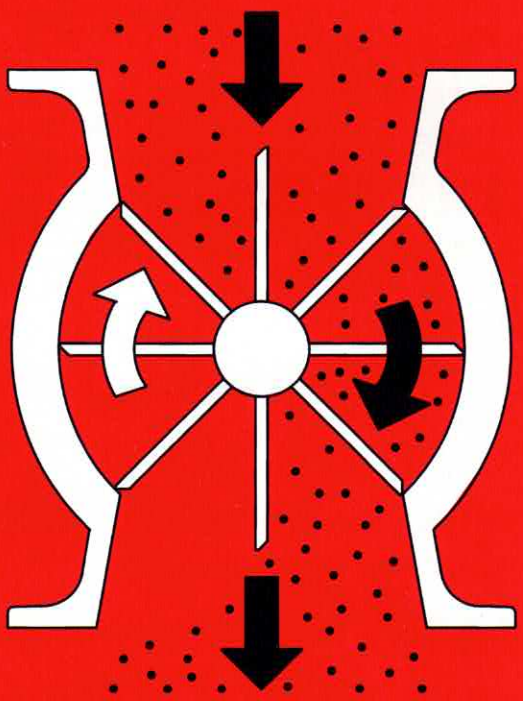
NU-CON

ROTARY VALVES & AIRLOCKS



OPERATION INSTALLATION & MAINTENANCE MANUAL

CONTENTS

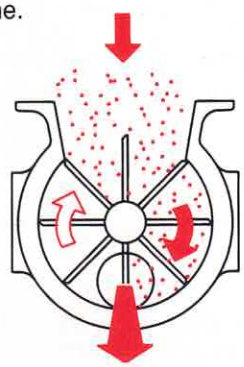
READ THIS MANUAL COMPLETELY BEFORE OPERATION

PRINCIPLE OF OPERATION

Material is fed through the rotary valve by means of a rotating cylindrical rotor. The rotor has a number of vanes (8 as standard) with accurately gauged tip and side clearances between body bore and end plates. These clearances are an important feature which relate directly to the sealing properties of the valve. Nu-Con Rotary Valves are available in two configurations:

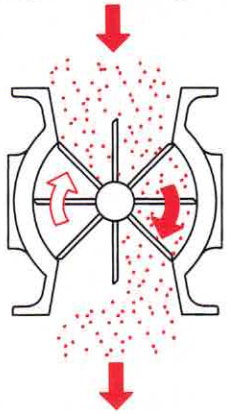
CV-Convey Through

Material enters at the top and discharges horizontally at 90° to the inlet via a pressure or vacuum pneumatic conveying line.



DT-Drop through

Material enters at the top and discharges vertically from the bottom outlet.



APPLICATION

Metering

Regulates flow of solid material at a controlled feed rate e.g. feeding, screening and milling equipment.

Airlock

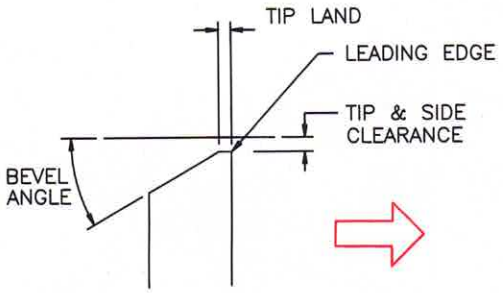
Feeds solid material between areas of differing pressure while still maintaining the pressure differential e.g. dust collector or cyclone material outlet.

Metering/Airlock

Regulates flow of solid material across a pressure differential e.g. feeding pneumatic conveying systems.

CLEARANCES AND ROTOR TIP PROFILE

Rotary valve clearances and tip profile are factory machined according to valve size, material characteristics and operating temperatures.



Standard Clearances at Ambient Temperature for Free Flowing Powder Materials

MODEL	ROTOR TIP & SIDE CLEARANCE	TIP LAND	BEVEL ANGLE
375	0.10 - 0.15mm (0.004" - 0.006")	1.0mm (0.040")	30°
500	0.10 - 0.15mm (0.004" - 0.006")	1.0mm (0.040")	30°
750	0.12 - 0.17mm (0.005" - 0.007")	1.0mm (0.040")	30°
1250	0.15 - 0.20mm (0.006" - 0.008")	1.0mm (0.040")	30°
2000	0.15 - 0.20mm (0.006" - 0.008")	1.0mm (0.040")	30°
3000	0.17 - 0.22mm (0.007" - 0.009")	1.0mm (0.040")	30°
6000	0.20 - 0.25mm (0.008" - 0.010")	1.0mm (0.040")	30°

Some materials require different clearance and rotor tip profiles. Abrasive and gritty materials such as sugar and sand with particle sizes close to standard clearances should have a minimum of land (0.5mm/0.020") large rake angle (45°) and increased clearance (0.15mm/0.04") over standard parameters. This is to prevent material packing and jamming between rotating rotor and body bore.

High Temperature Operation

Standard clearances are increased to allow for rotor expansion, amount which is dependent on rotor and body construction material and operating temperature.

Initial operation should be monitored closely as the valve approaches design operating temperature to ensure that rotor tips do not damage body or end plates in the case of a clearance problem. If possible valves should be run without material during start-up while the initial adjustments are being made.

Clearance and Tip Profile Adjustment

Rotary valve performance is dependent on accurately gauged clearances and rotor tip profiles. Any change in product or operating temperature could cause a valve to contract or expand, so altering design performance. Should rotor clearances need to be adjusted, remove rotor from valve body and machine in lathe supporting rotor between centres and clock true with a dial test indicator before machining.

If access to a lathe is unavailable, carefully draw-file each rotor vane by hand. **Under no circumstances use a disk grinder - material removed is hard to replace.** Leading vane edge must be kept sharp, do not round.

Air Leakage

Air leakage is an important consideration when applying rotary valves particularly to pneumatic conveying systems when the air loss across the valve must be compensated for in blower selection.

Approximately 30% of the total air leakage results from air being trapped in the empty rotating rotor pockets after discharging material. The other 70% from operating rotor clearances.

The following factors affect the amount of air leakage:

• Pressure differential	High pressure differential > leakage.
• Rotor speed	Higher rotor speed > leakage.
• Rotor clearance	Large rotor clearance > leakage.
• Rotor land	Small land > leakage.
• Rotor vanes	Lower number of vanes > leakage.

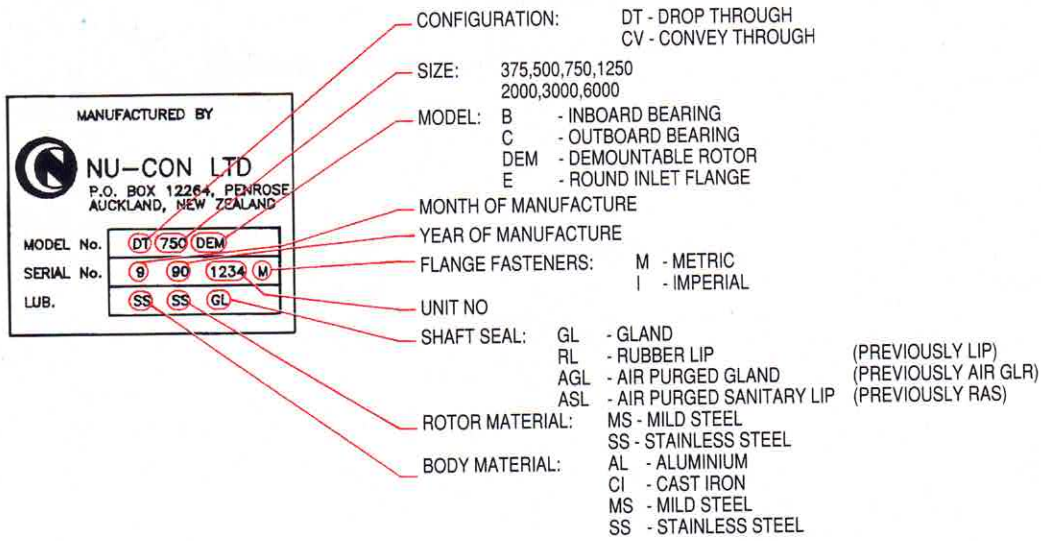
On high pressure differential applications, consideration must be given to vent the air leakage to ensure material feed to the valve is not restricted. Refer Air Venting in Installation Section.

CONSTRUCTION

Nu-Con Rotary Valves are manufactured in seven sizes, 375, 500, 750, 1250, 2000, 3000 and 6000, with three types of shaft bearing and seal arrangements, B, C, and DEM. All models are available in a range of rotor and body material combinations with various degrees of finish.

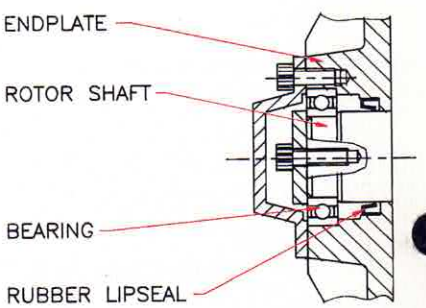
Model Identification

The Serial Plate is located on the left-hand side of the body casting, viewed from the drive end.



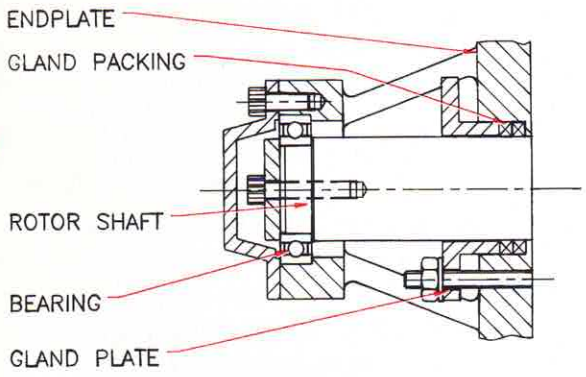
Shaft Seals

The shaft seal assembly prevents air and material leakage from inside of the valve between rotating shaft and end plate.



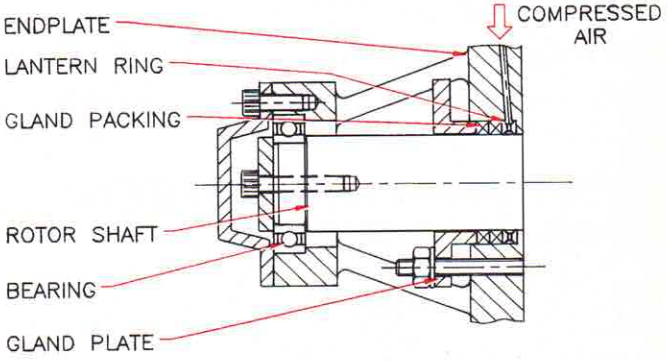
Rubber Lip Seal - B Models Inboard Bearing

Single rubber lip seal is located in end plate which also houses bearing. Sealing lip is energised by a spring to maintain contact against rotating shaft. Limited to low pressure or vacuum applications and not recommended for fine, sticky or abrasive materials.



Gland Packing - C, DEM Models Outboard Bearing

Double row Teflon gland packing is retained and compressed by an adjustable gland plate against rotating shaft. Not recommended for fine, sticky or abrasive materials. For temperatures over 260°C (500°F) high temperature, packing is used in place of teflon.



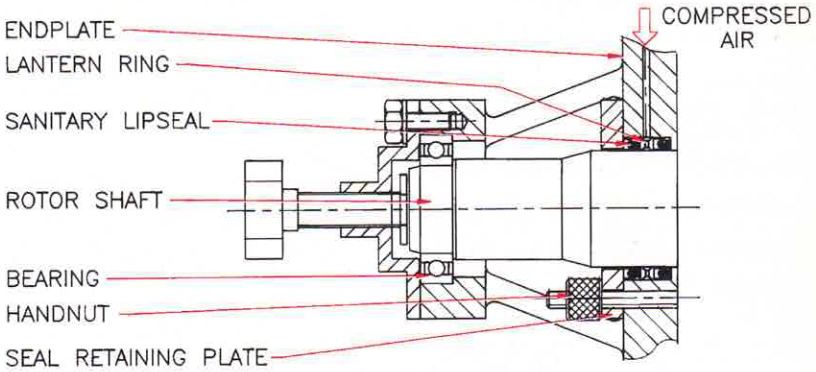
Air Purged Gland Packing - C, DEM Models Outboard Bearing

The seal cavity is pressurised at a higher pressure than valve internal operating pressure inducing an inward air flow to prevent the material from entering seal cavity. A lantern ring is used to evenly distribute air around shaft circumference. Double row Teflon gland packing prevents compressed air and material leakage from interior of valve. Gland packing is retained and compressed by an adjustable gland plate against rotating shaft. For temperatures over 260°C (500°F) high temperature, packing is used in place of teflon.

Air Purged Sanitary Lip Seals - DEM Models Outboard Bearing

The seal cavity is pressurised at a higher pressure than valve internal operating pressure inducing an inward air flow to prevent material from entering seal cavity. A lantern ring is used to evenly distribute compressed air around shaft circumference and acts as a spacer between the two seals. The Teflon lip seal has an energised lip to maintain shaft contact with the leading edge facing towards valve interior. The shaft is hard chromed to prevent damage from seal and provide resistance to wear.

For ease of servicing, the seals and lantern ring can be moved without tools from the end plate by unscrewing the hand nuts securing the seal retaining plate.



Bearings

Single row sealed deep groove ball bearings are incorporated in all models of Nu-Con Rotary Valves. Bearings have an operating temperature range of between -30°C and 110°C (-22°F to 230°F).

For operation above 110°C, metal bearing journals are used.

Rotor

Rotors are manufactured in various configurations to suit each individual material handling characteristics.

Rotors are located in valve bodies by one of the two following arrangements:

B, C Models Refer Parts Description Section For Illustration

Rotor is supported at each end by a single row deep groove ball bearing. Rotor is located axially at the non-drive end by locking bearing inner ring between shaft shoulder and shaft end washer. The outer ring of the bearing is located between end cap and end plate bearing housing shoulder.

The drive end bearing outer ring is located between end plate bearing housing shoulder and bearing retainer plate. The inner ring is an interference fit on rotor shaft and does not locate against a shoulder.

DEM Models Refer Parts Description Section For Illustration

The rotor is supported at each end by single row deep groove ball bearings and located axially at both ends. The drive end of the shaft seats against the bottom of the drive sleeve bore, and non-drive end shoulders against the inner ring of the non-drive end bearing.

The drive sleeve allows the rotor to be removed from body without the need to disassemble drive chains and sprockets. Power is transmitted from the drive sleeve to the rotor by aligning keyway in rotor with key fastened to drive sleeve by countersunk screws.

The non-drive end bearing outer ring is located between end cap and end plate bearing housing shoulder. The inner ring has a transition fit with shaft allowing end plate to be easily removed and installed. The shaft bearing locating diameter as well as the drive sleeve locating diameter is hard chromed in order to resist damage and maintain dimensional accuracy.

The drive sleeve is supported by two single row deep groove ball bearings, the shoulder axially located against bearing inner ring. The bearings inner rings have an interference fit on the drive sleeve, the outer rings secured between bearing retainer plate and drive end plate bearing housing shoulder with intermediate spacing rings between the two bearings.

End Plates

End plates on all Nu-Con Rotary Valve models are spigoted to body bore to maintain accurate axial alignment of rotor relative to body.

Demountable model end plates are doweled as well as spigotted to provide positive location to body during frequent re-assembly.

DRIVE POWER AND SPEED

MODEL	SWEPT VOLUME	POWER		DRIVE CHAIN	MAXIMUM ROTOR SPEED
375	.005m³ (0.16ft³)	0.37kW	(0.5 HP)	3/8" Duplex	28 RPM
500	.012m³ (0.43ft³)	0.37kW	(0.5 HP)	3/8" Duplex	28 RPM
750	.023m³ (0.80ft³)	0.75kW	(1.0 HP)	1/2" Duplex	28 RPM
1250	.035m³ (1.24ft³)	0.75kW	(1.0 HP)	1/2" Duplex	26 RPM
2000	.054m³ (1.91ft³)	1.5kW	(2.0 HP)	5/8" Duplex	26 RPM
3000	.088m³ (3.11ft³)	2.2kW	(3.0 HP)	5/8" Duplex	22 RPM
6000	.150m³ (5.65ft³)	4.0kW	(5.5 HP)	3/4" Duplex	20 RPM

Maximum rotor speed may vary dependent on material properties and pressure differential. Rotor speeds higher than those stated will not allow rotor pockets to fill efficiently and result in greater air leakage across valve.

Rotary Valve Size and Speed Selection

Two main considerations are taken into account when sizing a rotary valve:

Volumetric Capacity - Based on valve's swept volume and rotor filling efficiency for a given application.

Inlet Size - Based on material condition and feeding method prior to entering valve. For materials with a tendency to bridge, or for turbulent material flow, inlet size should be the over-riding consideration in model selection.

The rotary valve is a volumetric feeder, the rotor displacing a fixed volume per revolution termed **"Swept Volume".**

In practice, the rotor pockets will not fill 100%, so a filling efficiency factor is applied to rate calculations. Filling efficiency depends on many factors a good average being 70%.

Material Flowability
- More flowability > efficiency
  Granules and Pellets 75-90%
  Fines & Powder 60-85%

Rotor R.P.M.
- Lower speed > efficiency
  15 rpm & lower 75% +
  15 rpm & higher 80% -

Valve Application
- Low pressure differential >efficiency.
- Flow of material to valve inlet
  Bin Activator 75% +
  Dust Collector, Cyclone 50% -

Speed Calculation

MASS / BULK DENSITY	=	VOLUME
VOLUME/ MINUTE / ROTARY VALVE SWEPT VOLUME	=	ROTOR SPEED IN REVOLUTIONS/MINUTE AT 100% FILLING EFFICIENCY
EXAMPLE:	÷	0.7 FOR 70% FILLING EFFICIENCY

MOUNTING

Nu-Con Rotary Valves can be supplied bare shaft or complete with fitted drive which includes motor plate, gear head motor, drive guard and drive chain. If supplied bare shaft, refer drive assembly in this section.

Recommended mounting procedure is as follows:

1. Remove protective cover from rotary valve inlet and outlet port and check valve interior is free from foreign material.

   On CV (convey through) models, check convey line ports are not obstructed. There should be a clear path from one port to the other.

2. Check mating flange rotary valve is to be bolted to is level and flat with a straight edge. Bolting valve to an uneven or distorted flange may cause valve body to distort upsetting fine rotor clearances, causing rotor to bind.

3. Position rubber gasket between mating flange and rotary valve on assembly. Rubber gasket will take up minor variations in hopper flange providing a dust tight seal.

4. Check valve is orientated correctly for material feeding and air leakage venting in relation to rotor rotation.

   When lifting Rotary Valve in position, do not secure lifting straps around shaft. Damage to shaft, seals and rotor alignment may result.

5. Fasten rotary valve with bolts and spring washers tightening each bolt an even amount in sequence to tapped rotary valve flange.

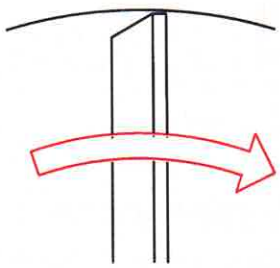
   On valves with aluminium body construction, structural support is required in addition to mating flange.

6. On CV rotary valve installation, support convey line pipework in close proximity to convey line connection. This is to avoid tension being placed on rotary valve end plates which may upset fine rotor clearances. **Do not use rotary valve convey line ports to support convey line pipework.**

ROTATION

Nu-Con Rotary Valves can only be run in one direction. Correct rotation is when the bevel edge of the rotor vane is the trailing edge.

Normally correct rotation is in a clockwise direction when viewed from the drive end as per direction arrow on the drive end plate. However as a precaution this should be visually checked.



AIR PURGED SHAFT SEALS

Set up compressed air supply to air purged tappings on end plates as follows. If rotary valve is fitted with an air service unit, a single connection only is required to the air service unit.

Shaft sealing relies on air being continually supplied to seal cavity at a higher pressure than the valve operating pressure to keep material inside valve. It must be supplied before material enters the valve. Without air purging, life of the seal is considerably reduced.

Filtered

100% oil and moisture free to prevent material accumulation in seal cavity and premature seal wear.

Line Size

Minimum 6mm ($^1/_4$") diameter nylon tube in close proximity to main (within 3 metres/ 10 feet) to avoid large pressure drop and low air flow.

Pressure

Regulated to 70 kPa (10 psig) above valve internal operating pressure.

Volume

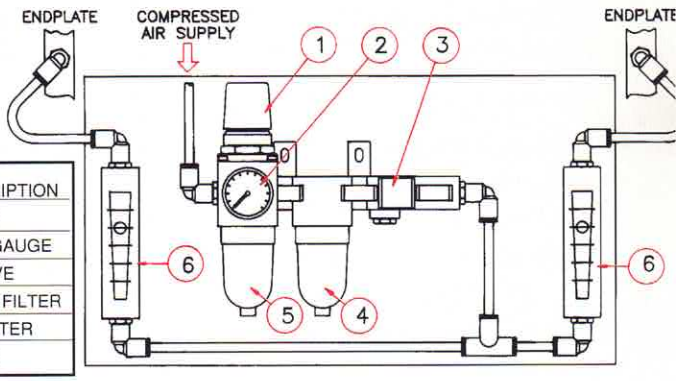
Nominal 2-3m³/hr (70-100 SCFH) per seal

Control

Supply air to seals before valve operation (rotation) and before material enters rotary valve. Maintain at all times while material is in rotary valve, to prevent material accumulation in seal cavity and premature seal wear.

Air Service Unit

As an option Nu-Con Rotary Valves can be supplied with an air service unit piped to end plate seal tappings. Compressed air supply is filtered through a primary 0.5 micron and secondary 0.03 micron coalescing filter. A check valve between seals and filter prevents back flush of material through filters. Supply air pressure is reduced by a regulator mounted on primary filter. Air pressure to seals is indicated by a pressure gauge. Air flow to seals is indicated by a flowmeter on each seal. On demountable models fitted with sanitary lip seals, air flow to seals will increase with seal wear.



ITEM	PART DESCRIPTION
1	REGULATOR
2	PRESSURE GAUGE
3	CHECK VALVE
4	SECONDARY FILTER
5	PRIMARY FILTER
6	FLOWMETER

DRIVE ASSEMBLY

In most cases the rotary valve will be supplied with a factory fitted gearhead motor and drive which is correctly aligned and pre-tensioned. When supplied bare shaft, install as follows. Care should be taken when mounting the drive so that no tension is placed on body and that the motor plate is correctly installed.

1. Fasten motor plate to rotary valve body and drive end plate. Position bolts to align with tapped mounting bosses provided on body and drive end plate.

   Motor plates should be designed of sufficient strength to withstand torque of gearhead motor.

2. Select sprocket sizes under full torque rating of motor to prevent damage to rotor shaft. Refer Nu-Con Drive and Power Recommendations in Operation Section.

3. Assemble sprockets to rotary valve and gearhead motor shaft with teeth as close as possible to bearings to keep overhung loads to a minimum. Align sprockets with a straight edge and check that valve and gearhead motor shafts are parallel. Good alignment is important to prevent rotor mis-alignment in body.

4. Tension chain increasing centre distance between valve and gearhead motor shafts by extending gearhead motor base plate or motor plate on studs and lock in correct position with nuts. A correctly tensioned chain should deflect 6mm ($^1/_4$") when depressed firmly in mid span. Care should be taken not to over-tension chain which may result in drive bearing failure or rotor mis-alignment in body.

5. Enclose sprockets and drive chain assembly in guard for personnel safety.

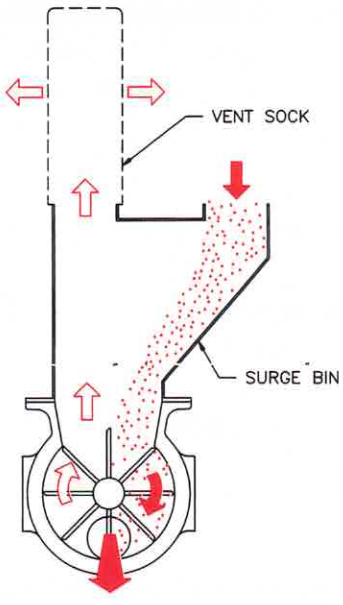
AIR VENTING

In high pressure differential applications such as feeding a pneumatic conveying system it is necessary to relieve air pressure between inlet and outlet sides of rotary valve. This prevents high pressure air contained in rotor pockets and leaking through clearances escaping at inlet as rotor rotates, restricting material flowing into valve

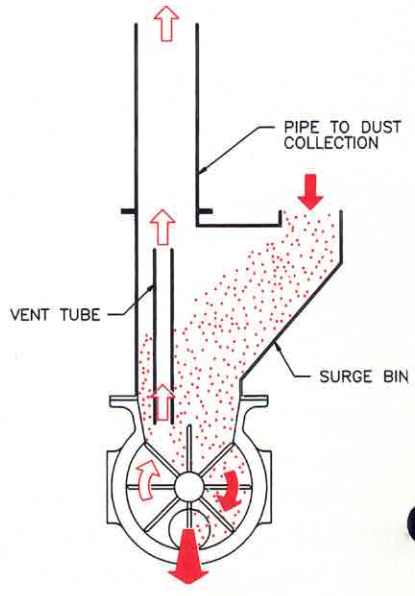
Venting high pressure air away from incoming material flow is commonly carried out by one of the two following methods.

Surge Hopper

The surge hopper is mounted on the inlet flange of the rotary valve and is designed to feed material at the leading edge of rotor allowing high pressure air to pass at the opposite side of valve inlet uninterrupting material flow. Air can be vented to the atmosphere via a vent sock to contain dust or to a negative pressure dust collection system piped to surge hopper. Ideally material flow to the surge hopper should be metered to avoid material flooding over valve inlet blocking air path to vent. This can be overcome by fitting a tube or baffle to separate material from air flow allowing air to vent.



METERED FEED



FLOOD FEED

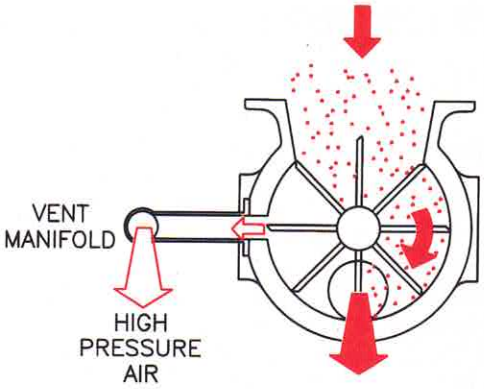
Body Vent Manifold

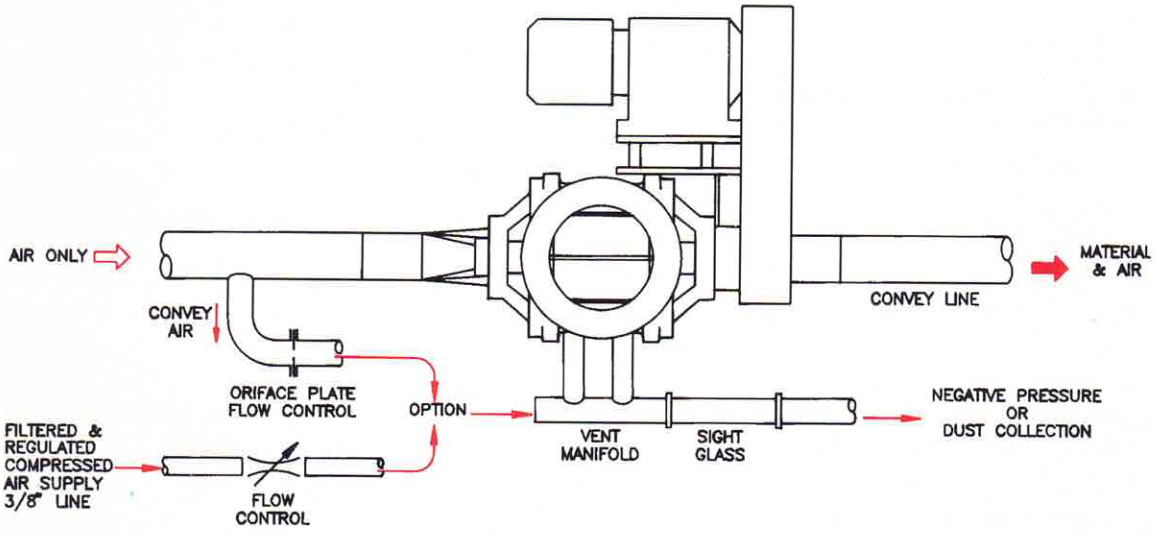
The vent manifold is mounted horizontally on the valve body opposite to the material feeding side. High pressure air is vented from the empty rotor pocket prior to being filled at the valve inlet.

A low volume low pressure air supply is connected to one side of the vent to assist flow of material and air through the vent pipe. This air supply can be taken from the air only side of the convey line or from a regulated compressed air supply.

The vent pipework should be connected to a negative pressure system such as a dust collection duct or nearby silo which is in turn vented to a dust collection system.

Ideally a sight glass should be installed in the vent line so that the air supply can be easily and correctly regulated to ensure material flow is maintained in the vent line.





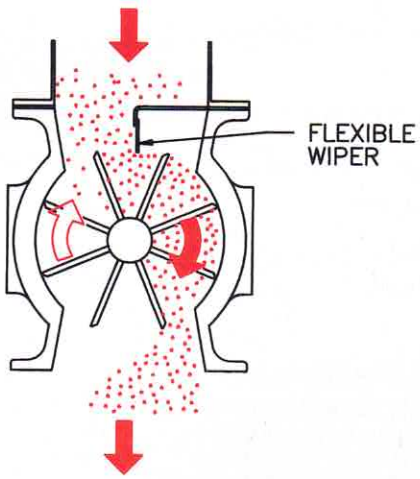
FEEDING PELLET MATERIALS

In applications feeding free flowing pellets, it is necessary to restrict the level of material in each rotor pocket to prevent material shearing between rotating rotor and inlet port of body. Material shearing can cause erratic valve operation and severe rotor damage.

Material level of rotor pockets can be regulated by one of the following methods.

Flexible Wiper

The wiper is inserted into the inlet port and is mounted between inlet and mating flange. The wiper is positioned below rotor tip and material level screeded in rotor pocket below leading edge.



Hi-Con Inlet Throat Baffle Plate

The baffle plate is inserted into the inlet port and is mounted between inlet and mating flange. A specially designed internal baffle arrangement creates a void in each pocket due to the materials angle of repose keeping it below leading edge of rotor.

RECOMMENDED SCHEDULE

Weekly

Check shaft seals for wear and adjust gland plate on gland seal models.

Monthly

Check drive chain tension.

LUBRICATION

Bearings

Bearings incorporate two rubber seals and are supplied lubricated with the correct quantity of lithium based grease. Relubrication and service is not required.

Replace bearing units when worn. Axial and radial rotor movement indicates excessive bearing wear.

Gearbox

Follow Manufacturer's recommendation attached to gearhead motor.

SHAFT SEALS

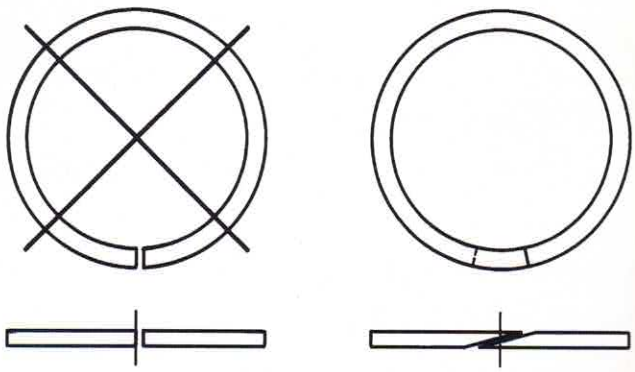
Rubber Lip Seals - B Models

The rubber lip seal requires no routine maintenance. When leakage occurs after wear from service, replace with new seal. In B Series model, bearing failure is usually a result of seal failure, so bearing should be renewed at the same time as seals.

To replace seals, end plates and bearings need to be removed from rotary valve.

Gland Packing and Air Purged Gland Packing - C & DEM Models

Occasionally gland packing will require replacement. It is important to ensure that gland cavity and shaft are completely free from damage or foreign materials. Special care should be taken to clear any burnt material which appears as a black mark on the shaft but which will very quickly spoil newly inserted packing. Packing rings should be loop jointed and not butt jointed as per illustration.



Run in new packing as follows:

1. Operate rotary valve without material for at least 5 minutes.
2. Tighten gland plate evenly. Gland plate should be square to end plate.
3. Operate rotary valve for another 5 minutes and re-tighten gland plate.
4. Introduce material and adjust gland plate periodically over the first 24 hours of operation.
5. For optimum performance, gland must be bedded in gradually and care not to be taken too far too quickly as drive motor may be overloaded.

Air Purged Sanitary Lip Seals - DEM Models

Occasionally the lip seals will require replacement when leakage occurs after wear from service or when there can be no risk of contamination when handling different materials.

Seals and Lantern Rings are easily removed from end plate after first removing rotor, by unscrewing the two hand nuts securing seal retainer plate and disconnecting the compressed air supply to end plates. Ease seals and lantern rings from seal housing by hand taking care not to damage sealing lip of the seal. Install seals on each side of lantern ring with leading edge of lip facing interior of valve.

ROTOR & BEARING REMOVAL & ASSEMBLY

B & C Models

Removal

Remove bolts and cap screws securing non-drive end plate, end cap and shaft end washer.

Remove non-drive end plate from rotor using a gear puller attaching arms to end plate bearing housing. Repeat procedure for drive end plate.

Bearings can be driven out with a hammer and drive punch once end plates are removed. The driving instrument should have approximately the same diameter as the outside diameter of the bearings. **Carefully record shim size and location if used in end plate housing.**

Remove packing and lantern ring on air purge models by unscrewing nuts retaining gland plate.

Assembly

Place rotor in body checking orientation is correct relative to end plates.

On C Models, assemble gland packing in end plates, checking that lantern ring on air purged models aligns with air purge port and that port is unobstructed. Do **not** tighten gland plate until final assembly.

Bolt end plates to body matching identification marks. **Position shims if used in end plate bearing housings.**

Drive bearing on to non-drive end of shaft until outer ring bottoms out in end plate housing. Replace shaft end washer and tighten cap screw until shaft shoulder is hard up against bearing inner ring. This locates rotor axially in body. Replace end cap.

Drive drive bearing on to shaft until outer ring bottoms out in end plate housing. Replace bearing retainer plate.

Check rotor turns without contacting body or end plates.

Check side and end rotor clearances are to specification with feeler gauges.

DEM Models

Removal

Remove non-drive end plate, rotor and seals as instructed under Demountable Rotary Valves in this Section.

Remove end cap with hand bolt from non-drive end plate and drive bearing out with a hammer and drive punch as per B & C models.

Remove drive end plate and bearing retainer plate. Drive drive sleeve complete with bearing and spacer assembly from end plate housing with a drive punch inserted through the seal housing. The drive instrument should be slightly smaller than the seal housing but larger than the drive sleeve bore.

Remove bearings from drive sleeve using a gear puller attaching arms to bearing outer ring.

Assembly

Drive bearings and spacer on to drive sleeve using a punch until inner ring of bearing bottoms out on drive sleeve shoulder using a drive instrument with an inside and outside diameter similar to bearing. Assemble into drive end plate bearing housing until bearing outer ring bottoms out on end plate housing. Replace bearing retainer plate.

Place end plate sealing ring in bore groove (USDA Models only) and assemble drive end plate to body aligning dowel pins with holes in body.

Rotor, seals and non-drive end plate can now be re-assembled to valve without tools as per instruction in the Demountable Rotary Valves Section.

On completion of assembly after replacing bearings check rotor turns without contacting body and end plates.

Check side and end rotor clearances are to specification with feeler gauges.

DEMOUNTABLE ROTARY VALVES

This model of rotary valve is designed to be fully dis-assembled without the use of tools or removal of drive chain and sprockets. Rotor, non-drive end plate and shaft seals can be removed from valve body for access to all product contact surfaces.

Special Precautions

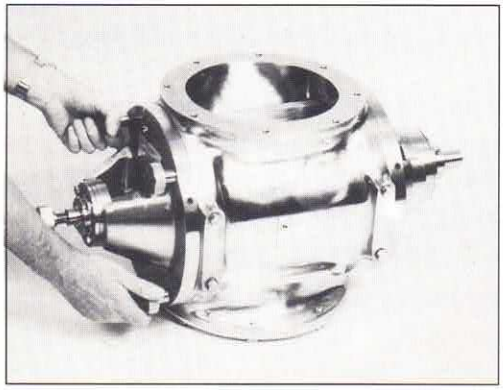
The rotary valve is a precision machined piece of equipment which relies on accurately gauged clearances for optimum operational performance.

Special care should be taken with demountable rotary valves during dis-assembly and re-assembly of accurately toleranced components such as end plates, rotor and body bore. Damage to critical surfaces can result in rotor to body pick-up. When dis-assembling, place components on a soft surface such as a rubber mat. **Do not place or drop on hard surfaces such as floors or access platforms.**

Dis-assembly Procedure

1. Isolate electrical supply to gearhead motor.
2. Clean outside of the valve to prevent the ingress of foreign material when the end plate is removed.
3. Isolate and remove compressed air supply to seals from end plate.
4. Loosen and remove the 4 hand bolts securing the non-drive end plate. (1.)
5.) crew in the centre extractor handbolt (clockwise) to withdraw the non-drive end plate from body. (2) Support end plate with both hands and remove from rotor shaft. (3.) After removing end plate, screw the extractor hand bolt out (counter-clockwise) until tight.
6. Remove rotor by pulling from non-drive end of shaft. When rotor vanes are part of the way out from body, rotor can be easily guided and supported by holding a rotor vane each side of rotor. (4.)
   Should difficulty be experienced pulling rotor from drive sleeve, remove drive guard and screw a length of M12 threaded rod in end of drive sleeve. Turn in clockwise direction to ease rotor shaft from base of drive sleeve bore.
7. The shaft seals and lantern rings can be removed from each end plate by unscrewing the hand nuts securing the seal retainer plate. Seals should be eased from the end plate housing by hand taking care not to damage the sealing lip.

1.



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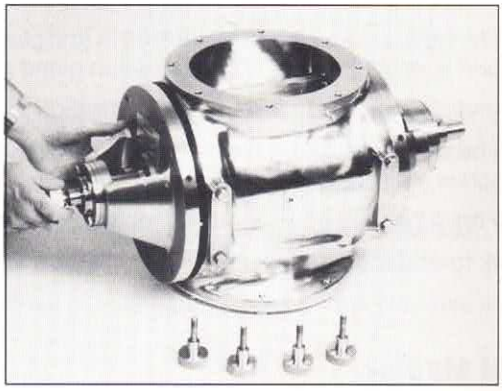

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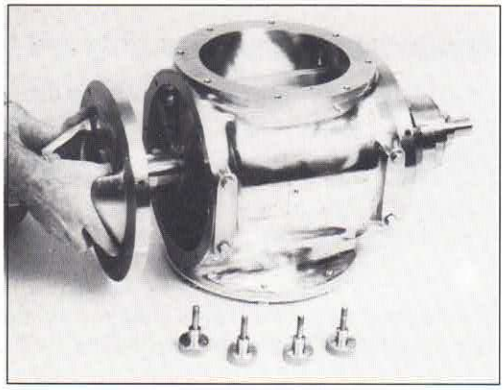


4.

Cleaning

Avoid directing jets of water or cleaning solution in the area of end plate bearing housings to prevent possible penetration of bearing seals.

Before assembly check that no foreign materials has deposited in drive sleeve bore as this will affect rotor end plate clearances if trapped in end of drive sleeve bore.

Assembly Procedure

1. Check air seal ports in each end plate are unobstructed.
2. Fit seals and lantern ring to each end plate taking care to orientate correctly. Leading edge of sealing lip should be facing interior of valve. Secure with seal retainer plate and tighten hand nuts.
3. Smear petroleum jelly or food approved grease to drive end of rotor. Carefully place rotor in body bore supporting rotor each side by holding vanes. Revolve rotor to align keyway with key in drive sleeve, and push rotor into sleeve until no further movement is possible.
4. Replace non-drive end plate over shaft checking first that extractor hand bolt is in unscrewed position and that bore locating spigot is clean. Align dowel pins in end plate with holes in body.
5. Secure non-drive end plate with the 4 hand bolts tightening each in turn evenly. Check rotor is seated securely and removable end plate is tight against body flange. This will prevent the possibility of rotor picking up on the bore and end plates and ensure rotor is located with correct end clearances minimising air leakage.
6. Re-connect compressed air supply to seals and end plate.
7. Connect electrical supply to gearhead motor.

No matter how well equipment is designed and manufactured, there may be times when servicing will be required due to normal wear, the need for re-adjustment or various external causes. Whenever equipment needs attention, the operator or repairman should be able to locate the cause and correct the trouble quickly.

The following Trouble Shooting Chart will assist the mechanic in those respects.

PROBLEM	POSSIBLE CAUSES	SOLUTION
Material not feeding into valve or low throughput.	Rotor speed too high.	Check rotor speed is below recommended Maximum reduce rotorspeed.
	Excessive air leakage across valve	Vent air leakage with surge bin or body vent manifold. Refer Installation Section. If possible, reduce rotor speed & pressure differential. Check rotor clearances are to specification.
	Material bridging valve inlet. Turbulent material flow at valve inlet, e.g. cyclone discharge	Rotary valve inlet too small. Replace with larger rotary valve
	Rotor not turning	Check drive chain, sprockets & gearhead motor. Replace if necessary.
	Material bulk density not to specification	Check actual bulk density & re-calculate valve speed.
Material stuck to rotor.	Material not to specification. High temperature, high moisture or high fat.	Apply non-stick coating to rotor, e.g. Silver-stone or Teflon. Consult factory.
	Natural characteristics of material.	Install scallop rotor which has large pocket corner radii (DT valves only). Consult factory.
		Install compressed air jets to direct air at underside of rotor. Install below shaft seals on models without disc end rotors. Install in outlet. Transition with disc end rotors.
		Non-sanitary applications. Install chains in rotor pockets.
Excessive valve wear.	Material handled is abrasive in nature.	Line valve bore with Lurethene, hard chrome or ceramic. Consult factory.
		Install adjustable tips on rotor. Consult factory.
Excessive Rotor Tip Wear	Excessive Air leakage across Valve	Check rotor clearances. Re-build rotor tips. Consult factory.
Excessive End Plate Wear	Excessive compressed air pressure on airseals	Check and reduce to recommended pressure
Excessive Seal Leakage & Wear	Worn seals.	Replace seals.
	No air purging.	Connect air supply.
	Insufficient air supply indicated by burnt material in seal cavity.	Check and set-up as per instructions in Installation Section. Check air purge port is clean and free from obstruction and aligned with lantern ring.
	Rough shaft contact surface.	Re-machine. On hard chrome models, grind existing hard chrome and re-apply chrome. Consult factory.
Erratic chain operation **Chain Jumping** **Chain Breaking** **Rotor Jamming**	Shearing of material between rotor and body	Pellet materials - Restrict level of material in rotor pockets by wiper or baffle. Refer Installation Section.
		Shearing materials e.g. wood slithers. Install knife blade in body. Consult factory.

PROBLEM	POSSIBLE CAUSES	SOLUTION
Erratic chain operation Chain Jumping Chain Breaking Rotor Jamming	Rotor clearances too tight, e.g. rotor expansion due to temperature	Check valve operating temperature & clearances at ambient temperature. Increase rotor clearances. Consult factory
	Material particles similar size to rotor clearance. Material build-up on rotor tips and or bore.	Increase rotor tip and side clearance. Reduce rotor land. Refer Operations Section.
	Drive Chain undersized,	Check and replace if required. Refer Operation Section.
	Drive Chain under-tensioned.	Correctly tension.
	Rotor rotating wrong direction.	Re-wire motor for correct rotation.
Excessive air leakage on a vented rotary valve.	Increased rotor clearances due to wear.	Check clearances and restore to specification if necessary. Consult Factory.
	Air path blocked.	Surge bin - clean vent sock. If flooded material feed, install baffle or vent tube. Refer Installation Section.
		Body vent manifold. Check vent line is unblocked. View flow through sight glass. Increase air supply to vent manifold if blocked. Refer Installation Section.
Valve Squealing	Rotor clearances too tight, e.g. rotor expansion due to temperature. Checkvalve body& end plates for scouring.	Check valve operating temperature & clearances at ambient temperature. Increase rotor clearances Consult Factory.
	Gland seals over tightened.	Reduce pressure on gland plate.
	Material in seal cavity. Check if valve squeals without material.	Clean and replace seals. Check air is supplied t seals on air purged models before material enter valves.
Rotor Pick-up on body & end plates.	Rotor clearances too tight. Valve bolted to distorted mating flange in turn distorting valve bore.	Check clearances at ambient temperature are to specification. Remove valve completely from installed position & check for binding. Straighten mating flange and assemble with gasket
	Drive chain tensioned too tight. Pick-up typically occurs diagonally opposite sides of bore and end plate.	Correctly tension drive chain. Check rotary valve and gearhead motor shafts are parallel.
	Rotor pickups bore and end plate at elevated temperature.	Check operating temperature is to specification. Increase rotor clearance. Consult Factory.
	Worn bearings. Excessive radial and axial play of rotor in body.	Replace with new bearings.
	Valve body distorted in mounted position.	Check support structure is placing no tension on Valve.
		CV Models - support mating pipework close to valve convey transition. Do not use convey transition as a pipe support.
Demountable Models	Foreign material in drive sleeve. Pick-up on non-drive end plate.	Clean drive sleeve & re-assemble. Ensure non-drive end plate seats tight against body before operation.
Drive Motor Overloading.	Motor under size.	Check and replace if required. Consult Factory.
	Gland seals over-tightened.	Reduce pressure on gland plate.
	Demountable model extractor hand bolt screwed against rotor shaft.	Unscrew.

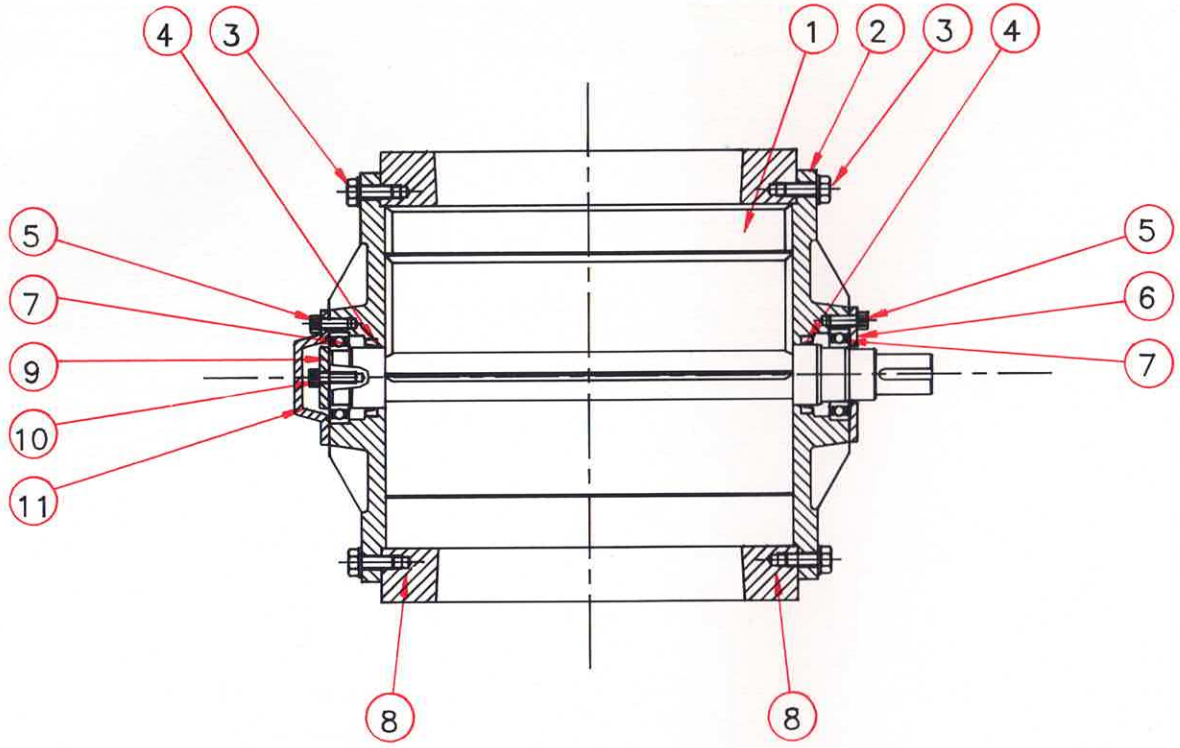
This start-up procedure should be followed during initial installation, and after any shutdown period or after the rotary valve has been worked on or moved to a new location.

READ THIS MANUAL COMPLETELY BEFORE OPERATION

1. Check the rotary valve inside and out to remove any foreign material that may have accumulated during transport and installation.
2. Check rotor direction is correct relative to material feeding, air venting, and rotor tip profile.
3. Check drive chain alignment and tension.
4. Check gearhead drive motor has correct lubrication and filled to required level.
5. Check compressed air supply and set up on models fitted with air purged seals.
6. Check that no tension is placed on valve body.
7. Start the unit and operate with no material in valve. On models fitted with gland seals, tighten adjustable gland plate periodically to take up clearance.
8. In high temperature applications, closely monitor valve as it approaches operating temperature.
9. Introduce material into the inlet of rotary valve while the unit is in operation. Check frequently during first day of operation.
10. If malfunctions occur, **DO NOT CONTINUE TO OPERATE.** Refer Trouble Shooting Section for possible cause and remedy.

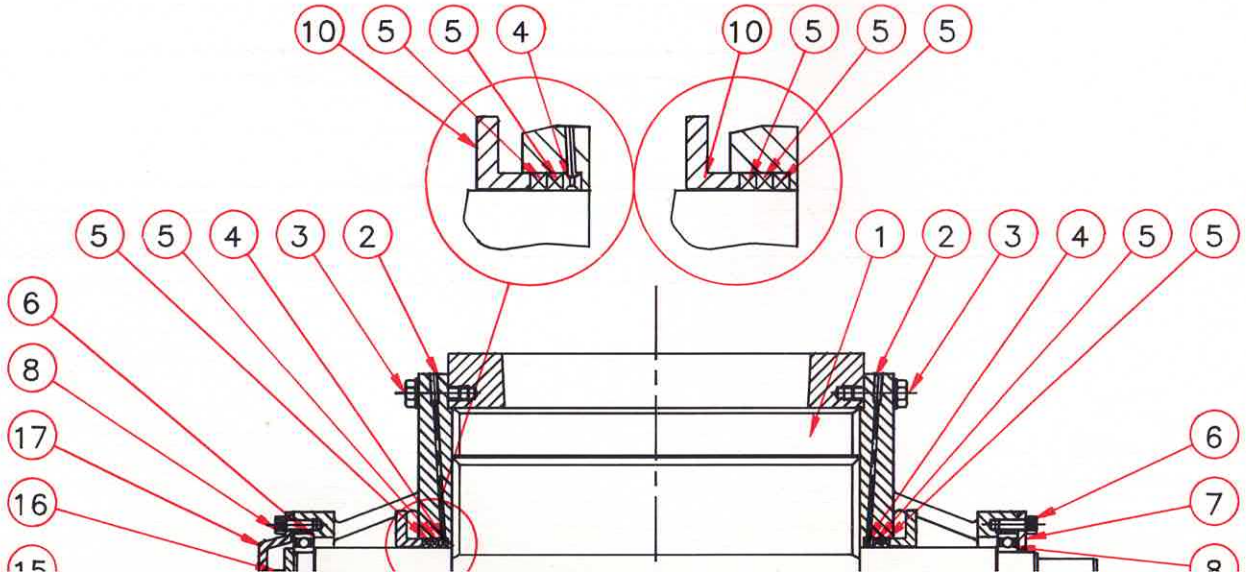
IF IN DOUBT CONSULT FACTORY

matter how well equipment is designed and manufactured, there may be times when servicing will be required due to normal wear,



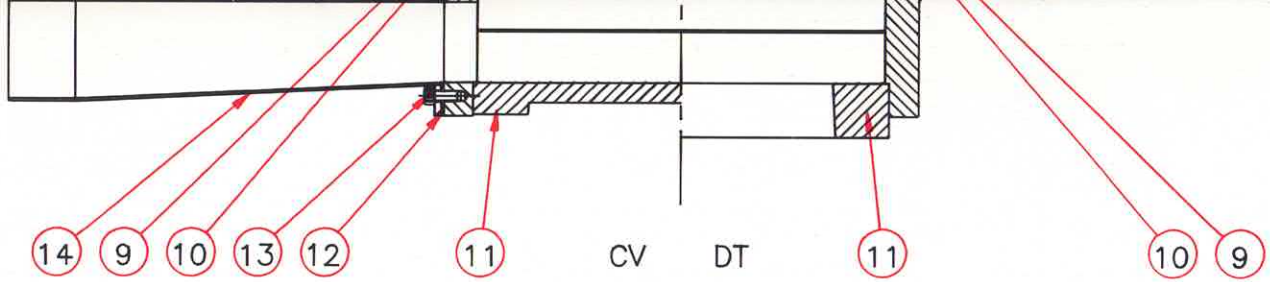
B MODELS

ITEM	PART DESCRIPTION	QTY
1	ROTOR	1
2	ENDPLATE	2
3	HEX BOLT & SPRING WASHER	8
4	RUBBER LIP SEAL	2
5	CAPSCREW –ENDPLATE	8
6	BEARING RETAINER PLATE	1
7	BEARING	2
8	BODY	1
9	SHAFT END WASHER	1
10	CAPSCREW –SHAFT	1
11	ENDCAP	1



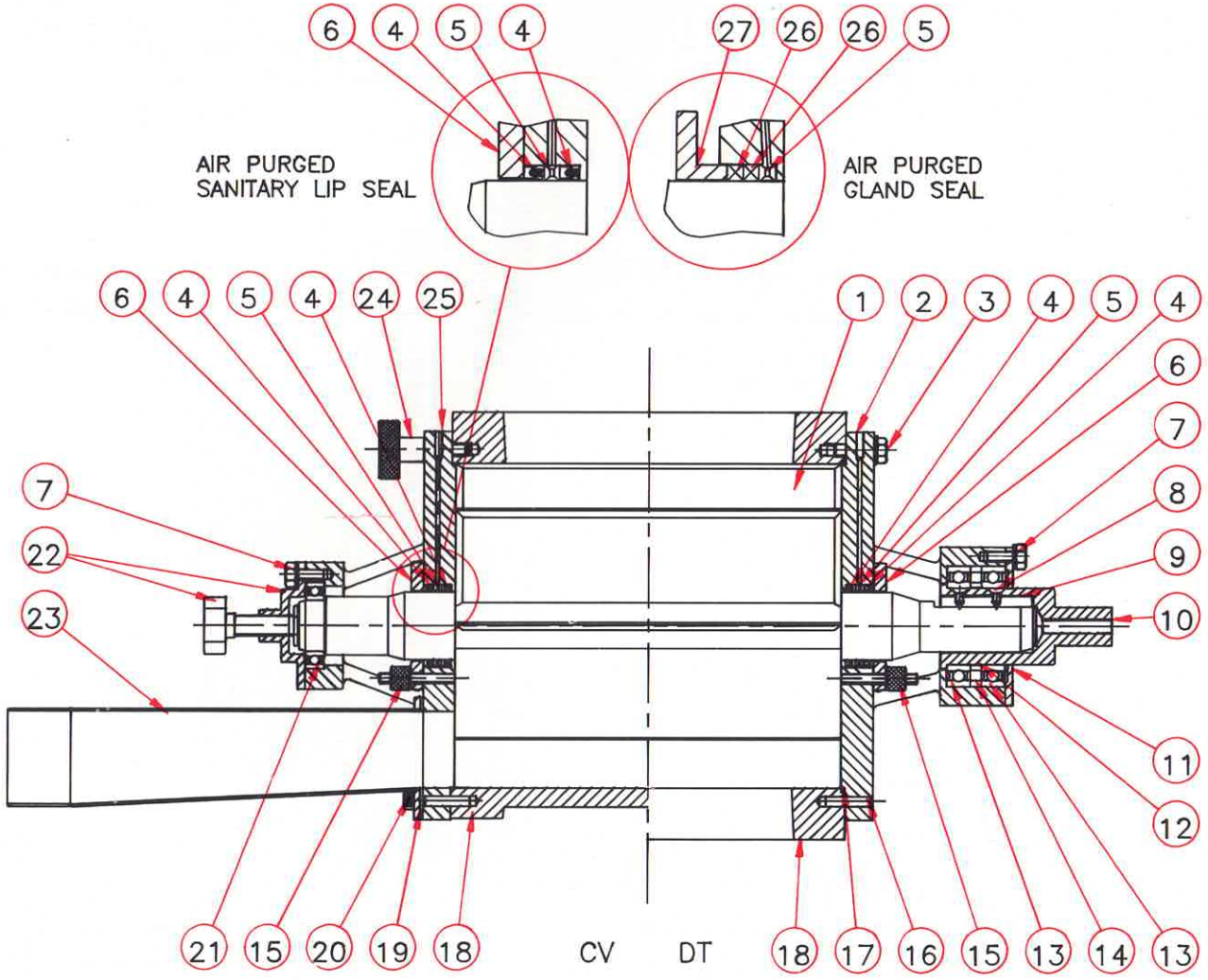
C MODELS

ITEM	PART DESCRIPTION	QTY
1	ROTOR	1
2	ENDPLATE	2
3	HEX BOLT & SPRING WASHER	8
4	LANTERN RING	2
5	GLAND PACKING	4
6	CAPSCREW –ENDPLATE	8
7	BEARING RETAINER PLATE	1
8	BEARING	2
9	HEX NUT –GLAND	4
10	GLAND PLATE	2
11	BODY	1



14	CONVEY TUBE TRANSITION	2
15	SHAFT END WASHER	1
16	CAPSCREW –SHAFT	1
17	ENDCAP	1

DEMOUNTABLE



ITEM	PART DESCRIPTION	QTY
1	ROTOR	1
2	DRIVE ENDPLATE	1
3	HEX BOLT & SPRING WASHER	4
4	USDA SANITARY LIPSEAL	4
5	LANTERN RING	2
6	SEAL RETAINER PLATE	2
7	HEX BOLT –ENDCAP	8
8	COUNTERSUNK SCREW	2
9	DRIVE KEY	1
10	DRIVE SLEEVE	1
11	BEARING RETAINER PLATE	1
12	INNER SPACER RING	1
13	BEARING –DRIVE END	2
14	OUTER SPACER RING	1
15	HANDNUT	4
16	DOWEL PIN	4
17	SEAL RING –DRIVE ENDPLATE	1
18	BODY	1
19	GASKET –CONVEY TRANSITION	2
20	HEX BOLT –CONVEY TRANSITION	8
21	BEARING –NON DRIVE END	1
22	ENDCAP WITH HAND BOLT	1
23	CONVEY TUBE TRANSITION	2
24	HANDBOLT	4
25	NON DRIVE ENDPLATE	1
26	GLAND PACKING	4
27	GLAND PLATE	2

SPECIFY: MODEL No, ITEM No, PART DESCRIPTION, QUANTITY AND SERIAL No WHEN ORDERING SPARE OR REPLACEMENT PARTS.

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