

PLAINTIFF'S
EXHIBIT
USX-298

INSTALLATION AND OPERATION

DUST VALVES

USHC 701730

OPERATING INSTRUCTIONS
FOR
TYPE R-1 MOTOR DRIVEN TIPPING VALVE

WESTERN PRECIPITATION DIVISION
JOY MANUFACTURING COMPANY
1000 WEST NINTH STREET
LOS ANGELES 54, CALIFORNIA

TYPE R-1 MOTOR DRIVEN TIPPING VALVE

DESCRIPTION

The Type R-1 Motor Driven Tipping Valve is a tight, two-part, quick-closing, counter-weighted valve, equipped with motor operated mechanism for positive alternate opening of the valve flap in the upper part of the valve, followed by the valve flap in the lower part of the valve, each flap opening and closing approximately two times per minute.

INSTALLATION

The complete valve, together with motor and levers, is shop assembled and tested before shipment and is ready for installation.

The procedure is as follows:

1. Bolt the valve to the hopper or other source of supply flange, using a gasket and No. 2 Permatex or any other gasket sealing compound, to insure a tight joint.

IMPORTANT: Bolt holes in companion flanges connecting to the valve (both ends) must match properly to avoid strain and insure a good connection.

2. Connect the motor leads to the power supply. Wiring instructions are attached to the motor. Check the connections to be certain the rotation is clockwise when facing the motor, or counterclockwise when facing the drive shaft end.
3. Before starting the valve, it is important that the recommended oil, described under the heading APPROVED LUBRICANTS, is in the reducer, the oil level checked and the spring clip or cap removed from the vent plug. The purpose of the spring clip or cap is to keep the plunger in the vent plug closed to prevent leakage of oil from the gear case during handling and shipping. To check the oil level, remove the brass or red painted plug located to the right of and 2-1/2 in. above the centerline of the drive shaft. If oil starts flowing, replace the plug and the unit is ready to start. If the oil does not flow, the necessary amount must be added through the vent plug opening.

NOTE: The green tag attached to the motor by Master Electric Company showing oil level and vent plug locations for position 1, is general for their regular line of gear head motors and does not apply directly to the special gear head motor on this installation.

Occasionally a gear motor may be turned upside-down during shipment or handling, and the vent plug may become covered with a film of oil. If this happens, a bubbling of oil may be observed as the motor is warming up. To correct this condition, remove the plug and wash thoroughly with naphtha (or a similar solvent), dry thoroughly and replace.

CAUTION: Do not obstruct the operation of the vent by painting or otherwise.

OPERATION

Before putting the valve in service, make sure it was not damaged during shipment. Operate both flaps and levers by hand to see that they operate freely and seat properly and also check the contacting surfaces of seats and flaps for tightness. Start the motor and if all parts run smoothly and freely it is in good condition.

The setting of the weights depends on the plant operation and amount of dust or material being passed through the valve. Should the valve operate under positive pressure, the weights must be placed and secured on weight lever arms a greater distance from the valve shafts than when the valve is operating under negative pressure.

1. The valve operates on pressures of not more than 30 in. v. w. c. negative, or 5 in. v. w. c. positive.
2. It is not recommended for use with gases exceeding 750° F.
3. It operates best on dry or any free flowing material.
4. Although the valve operates best when the material is free-flowing, the type R-1 valve will also perform better than other types of valves when difficult operating conditions are encountered.
5. The valve is operated by the motor to open and close the upper and lower flaps.
6. The adjustable counterweights insure tight seating and control of quantity flow of material.
7. The material will gravity-flush through the valve flaps in cases of overloading, until normalcy is restored, regardless of the position of the operating levers.

Flushing will not permit the valve to leak when it is operating under negative pressure, since it will close immediately when flushing stops and normal operation is restored.

8. Valve flaps and/or operating linkage will not be damaged should flaps become wedged in open position. The function of the drive motor is to open the valve flaps only and has no effect on closing them. The closing of flaps is by counterweight. -

MOTOR OPERATING TEMPERATURES

Heating is natural characteristic of Master parallel shaft gear motors and a maximum temperature of 150° F. is not uncommon. However, lubrication and design have fully taken into consideration these conditions and there is no danger of damage from this cause, when recommended lubricants are used and motor is not carrying excessive load.

MAINTENANCE

A valve in operation should be inspected at least once each month, depending on plant conditions.

The dust seals may become worn and leak. This can easily be checked by a lighted match or candle held against shaft where it passes through lower body.

The valve seat and flaps will also wear, the severity being dependent on the type of dust passing through the valve.

This wear will also cause the valve to leak which can be readily detected by holding a sheet of paper to cover the lower valve body opening.

At the time of plant shut-down, it is desirable to take the valve down for a thorough inspection and repair.

Should the gear motor item need repairing, it can be easily removed by dismantling the lever system and unbolting from motor bracket. The electrician should properly tag the connections before disconnecting the motor from the power circuit.

When re-assembling the valve, be sure that the flaps seat properly, weights are properly and securely located and all moving parts operate freely before placing the valve in service.

APPROVED LUBRICANTS

Parallel Shaft Gear Motors:

Proper lubrication is extremely important for satisfactory operation of parallel shaft gear motors. The proper oil level must be maintained at all times and the correct grade of lubricant used.

All parallel type reduction gear head motors are lubricated at the factory with SAE 40 unless otherwise specified.

Since it is impossible to obtain one lubricant which will have the necessary qualities over a wide range of ambient (surrounding air) temperatures, it may be necessary to use one of the lubricants listed below as the ambient conditions indicate. Gear motors for outdoor service may require seasonal oil changes to prevent damage due to lubrication failure.

Frequent inspections of the oil level should be made with the motor stopped but preferably when the oil is warm. After each 1500 hours of operation, under normal operating conditions of 8 hours per day, in ambient temperatures of 60° F. to 110° F., drain and flush the gear case. If operating conditions are more severe or operation is 24 hours per day, drain and flush more frequently. Refill with one of the approved lubricants, using the grade indicated for the ambient temperature in which the gear motor operates.

Use only a straight mineral oil (except when otherwise recommended), preferably a Pennsylvania base oil such as is recommended for the best automotive service.

Ambient temperature 110° F. to 165° F.	Use SAE 50
Ambient temperature 60° F. to 110° F.	Use SAE 40
Ambient temperature 35° F. to 70° F.	Use SAE 30
Ambient temperature 10° F. to 40° F.	Use 20 W
Ambient temperature -10° F. to +20° F.	Use 10 W
Ambient temperature -30° F. to +10° F.	Use Gulf Mech. A.
Ambient temperature -65° F. to +20° F.	Use Gulf Mech. A 50% Kerosene 50%

Use automotive heavy duty detergent oil (SAE 50) with oxidation inhibitor.

NOTE: Gulf Mechanism A is a napthenic base oil with a low pour point and viscosities of 53 SSU at 100° F. or 33 SSU at 210° F. Any other oil meeting these specifications would be suitable as a substitute.

For those concerns which prefer to use an industrial instead of automotive oil, the following 4 oils have been tested and approved for use. They may be used with countershaft speeds below 500 RPM and in an ambient temperature range of 60° F. to 110° F.

Parvis Oil H
DDTE, extra Heavy
Solnus Extra Heavy
Auriga Oil

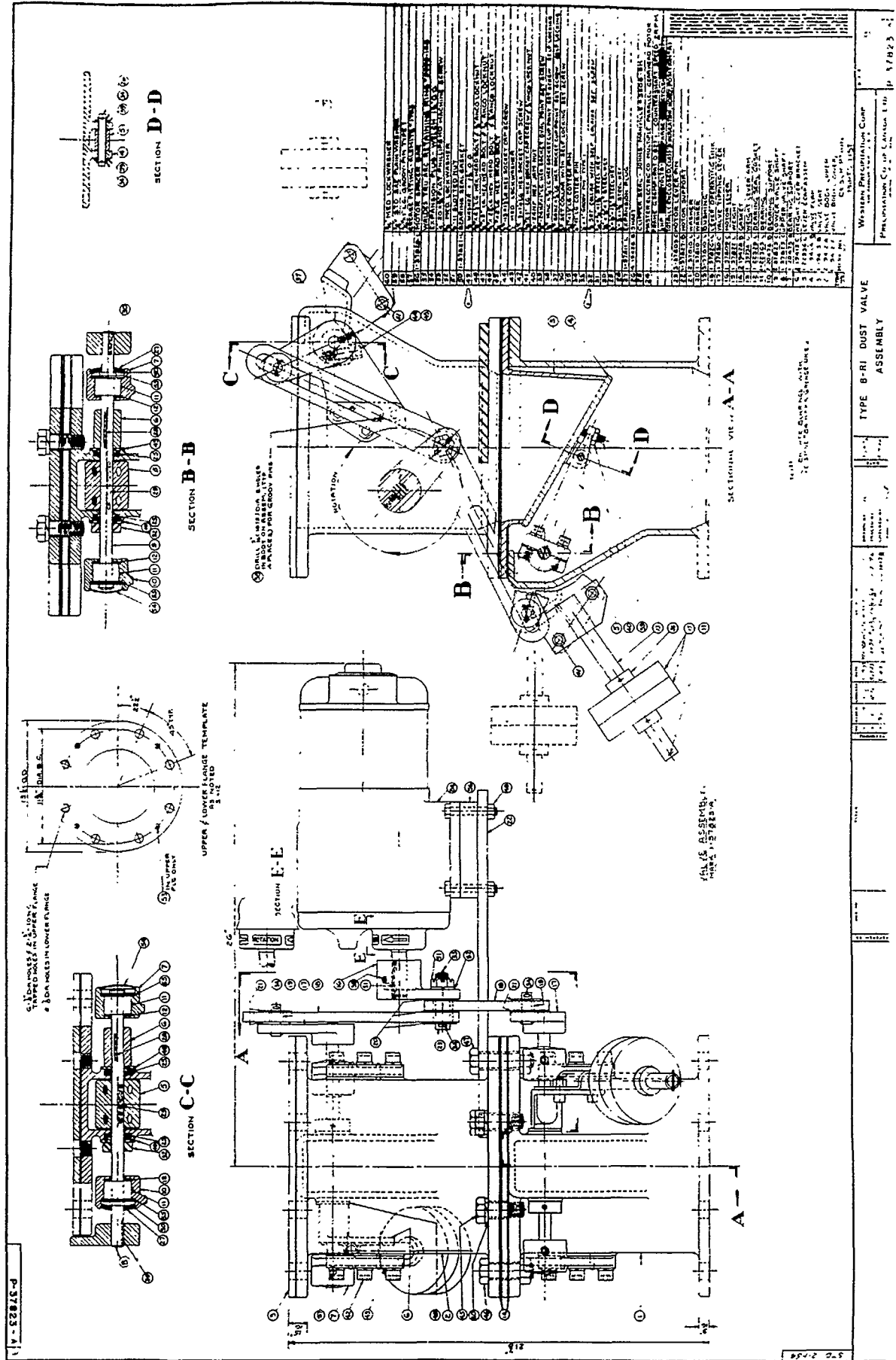
Gulf Refining Company
Socony-Vacuum Oil Company
Sun Oil Company
The Texas Company

Flap Shaft Bearings:

There are 4 bearings on the valve which are supplied with Alemite fittings where lubrication is necessary. These bearings require very little care but should be lubricated periodically. The lubricant should be forced into each bearing slowly until a slight oozing of lubricant from the seal is noted. Either of the following lubricants are recommended:

Keystone 84 H XXX obtained from any Keystone distributor
PD 908A made by Socony Vacuum Oil Company

USHO 001738



WESTERN PRECIPITATION DIVISION JOY MANUFACTURING COMPANY

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SPARE PARTS LIST NO. SP-86678-L

JOB NO. STANDARD

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DATE _____

8" - TYPE R-1 DUST VALVE

DRAWING P-37823-A

ITEM	NO. OF PARTS	DESCRIPTION	MARK	PRICE EACH	AMOUNT
3	2	Valve Seats	1-19413-B		
4	2	Valve Flaps	1-19414-B		
11	4	Heim Company Bearings	1-22365-L		
12	4	Bearing Seal Gaskets	1-22329-L		
14	4	Gaskets	2-19428-B		
19	4	Bushings	3-37810-L		
25	4	Clipper Seals J. M. #5506-SH			
50	4	Bearing Seal Gaskets	1-37821-L		
55	4	#5000-168 Waldes Truarc Retaining Rings			
<u>NOTE:</u> Depending upon the number of valves to be serviced, multiple sets of the above spare parts list should be stocked as follows: 1 set - 1 - 10 valves 2 sets - 11 - 20 valves 3 sets - 21 - 30 valves 4 sets - 31 - 100 valves					
USHO 001739					