

LUBRICATION OF PLUG VALVES ON GAS TRANSMISSION AND DISTRIBUTION SYSTEMS

GENERAL

This standard is to establish a procedure for lubricating and maintaining plug valves on gas transmission and distribution systems. Satisfactory performance of lubricated plug valves for gas service depends on proper selection and insertion of lubricants together with proper adjustments of valves.

LUBRICATION

Valves equipped with button-head fittings are to be lubricated with a grease gun, equipped with pressure gage. Valves equipped with lubricant screw are to be lubricated with stick lubricants. Use only clean lubricant of the type specified.

To insure proper distribution of lubricant throughout lubricant grooves and sealing surface, it is mandatory that the plug be seated firmly in the body. When the plug is properly seated, it is possible to 'jack' the plug from its seat when the lubricant grooves and lubricant reservoir are filled. This facilitates free turning of the plug and speeds up distribution of lubricant film over sealing surface, in addition to providing a positive leak seal.

If excessive clearance exists between the plug and the body, due to adjustment gland or adjustment screw being backed off, the lubricant 'short circuits' into the pipeline.

The practice of loosening adjustments to obtain a temporarily free turning plug will invariably result in the secondary results outlined below.

Secondary effects of improper plug adjustment are as follows:

- 1 Leakage
- 2 Entrance of foreign or abrasive materials between plug and seat, resulting in a damaged sealing surface
- 3 Higher torque characteristics as damage occurs
- 4 Possible gear and operator damage as torque becomes excessive
- 5 Ultimate valve replacement

Proper lubricating procedure is being followed when the pressure gage shows increasing pressure on each stroke of the lubricant gun following which the pressure drops back towards zero. As the system fills the pressure will drop back more slowly and when full, the pressure will hold at the maximum.

Lubricant pressure on the gage should read a minimum of 2000 psi for any valve, with pressure not to exceed 5000 psi when lubricating semi-steel valves, and 12,000 psi when lubricating steel valves. Generally speaking, small valves can be expected to require higher pressures for lubrication than larger valves. Very low pressure or no static pressure indicates one of the following troubles:

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SUPV BY	GAS STANDARD								DRAWING LIST	
DSGN	VALVE LUBRICATION REQUIREMENTS								SUPERSEDES	
DR	PACIFIC GAS AND ELECTRIC COMPANY								SUPERSEDED BY	
CH	SAN FRANCISCO CALIFORNIA								SHEET NO 1 OF 4 SHEETS	
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- 1 The gun is empty
- 2 The valve plug is loose
- 3 The gun is malfunctioning and should be checked. No repairs are to be made to the hydraulic system. If the gun is unsatisfactory, an order shall be issued for its reconditioning.

If an especially high pressure is immediately built up, it may indicate a defective lubricant fitting, which would prevent lubricant from getting into the valve.

Valves should be lubricated in the fully open position. In this position, all four grease grooves are connected with the two circular grooves at the top and bottom of the plug and, also, the walls of the plug are mated to the walls of the body. This assures a full and even spread of lubricant over all surfaces so that it can act as a bearing interface as well as a sealant.

This procedure, as applied to lubrication of regulating plug valves, will necessitate that control valves be taken out of service by switching the control function to the monitor valve.

This will allow the regulating valve to be fully opened, lubricated, and stroked in the closing direction back to its control position. The operating division should provide personnel for this lubricating procedure and have authorization to complete the changeover of control and perform the required valve lubrication.

If the above procedure is not possible, fully closed is the second best position. If the valve is stuck, lubricant should be injected to free it if possible. After lubrication, the valve should be operated until it turns freely.

During construction, inspection and lubrication should be performed on all plug valves and plastic stem packing added when necessary. This is necessary to assure proper flow and distribution of lubricant throughout the valve body (and lube extension pipe if used) before installation. This should be done by Gas Construction personnel in cooperation with the operating division personnel responsible for the station after construction. All valves should be lubricated above ground, visually checking for excretion of lube around the plug port and valve body. If a valve is found to be operating improperly, a request shall be made to the Gas System Design Department for instructions.

For hyperseal valves that are in operation and have become inoperable and it is necessary to adjust the plug in order to operate, the necessity shall be reported to the Gas Distribution Department.

PERIOD OF LUBRICATION

A frequency program for valve lubrication shall be established by each division, which will include lubrication of

- 1 Main line valves at least once a year
- 2 Station valves at least twice a year
- 3 Motor operated valves on standby or overpressure protection operated once a month and serviced if required, with lubrication at least twice a year
- 4 Continually regulated ball and plug valves at least once a week
- 5 Other valves prior to use

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In addition, regulating plug valves should be observed very closely during the first days of operation to determine the frequency of movement and subsequent lubrication needed. If the valve is cycling often or if a new pipeline is feeding the station full-position lubrication should be performed as frequently as every other day.

ADJUSTMENTS

Adjustments of valve gland nuts on standard valves are generally not required and are not to be made except as specified.

When the valve plug is not properly seated or when lubrication is not effective in loosening a tight valve, the gland adjustment nuts should be tightened. This tightening will seal off lubricant leakage and will help develop the proper hydraulic pressure in the system during lubrication. Never loosen the packing gland prior to lubrication.

Valves of the hyperseal-type have an adjustment screw in the bottom cover. This screw is adjusted at the factory to strict specifications. To prevent tampering, a cover is welded over this screw. It should not be necessary to adjust the screw position in the field.

Lubrication screw is not to be screwed into the plug stem beyond complete engagement of threads, otherwise water will collect in plug stem and make lubricant screw difficult to remove.

When adjustments to adjustable valves, as specified, are unsuccessful and proper lubrication cannot be obtained, the difficulty is to be referred to the manufacturer's representative or to the Gas Distribution Department.

HYPRESPHERE

To obtain proper lubrication of the Hypresphere valve, it is necessary to have a differential pressure across the valve. Lubrication is most effective in the closed position. If this is not possible, the full open is the next best position. Three lubricant fittings will be found on certain models, one for each seat and one neck fitting. All fittings should be kept lubricated for satisfactory operation, with attention given to thoroughly lubricating the seat on the low pressure side of the valve. (Caution: When a valve is closed and a line blown down on what is normally the upstream side of the valve, seat reversal occurs. Before the line is returned to service, lubrication should be given to both seats of the valve before an attempt is made to pack the line against this normal direction of flow.)

GROVE BALL VALVE

Routine lubrication of the Grove ball valve is not necessary. When leakage occurs in the closed position of the valve and lubrication is necessary for shut off, use Rockwell No. 555 or equal.

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TYPE OF LUBRICANT

a Rockwell No 555, No 555 W G , or approved equivalent is to be used for a general purpose lubricant on all plug valves in the following service

- 1 Natural and manufactured gases with water or organic condensates
- 2 LPG systems
- 3 Hydrocarbon liquids
- 4 Glycols
- 5 Water

b Standard sizes and packages are

<u>Size</u>	<u>Valve Size</u>	<u>Fitting Size</u>	<u>Sticks per Box</u>	<u>Code</u>
A	1/2	None	24	50-3078
B	3/4 - 1-1/4 - 2	1/4	24	50-3067
D	3 - 4 - 6	1/2	24	50-3069
J	For handgun use on valves fitted with button head fitting		6	50-3071

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