

2.1.3.2 The twice each calendar year schedule may be modified by the responsible supervisor under the following conditions:

- a) Where valves are operated frequently, additional servicing and lubrication should be scheduled.
- b) For valves meeting all of the criteria outlined below the scheduled inspections may be extended to once a year;
 - i) The valve is known to be and is maintained in good condition.
 - ii) The valve is used infrequently.
 - iii) The valve is not critical to the emergency operation or reliability of the facility.
 - iv) It has been determined locally that no special operating conditions exist which require more frequent maintenance.

Should any of the above conditions change, the maintenance frequency shall be increased to twice each calendar year.

- *2.1.4 When operating a valve as required in 2.1.1, 2.1.2, or 2.1.3 above, the valve should be turned through its complete range where operating conditions permit. Where operating conditions do not permit full operation of the valve, it should be turned through at least half of its range (45° plug rotation).
- 2.1.5 Power actuated valves on standby or used for overpressure protection, should be partially operated and inspected once a month, and lubricated (where required) at least twice each calendar year as specified in Section 2.2.
- 2.1.6 Power actuated ball and plug valves used as regulators should be lubricated and inspected at least once a week.
- 2.1.7 All valves shall be inspected and lubricated (where required) prior to use.
- 2.1.8 Any problem experienced with the operation of any of the above valves, either during scheduled maintenance or at any other time, shall be reported on a Material Failure Report (S.P. 460.21-7).

*Paragraph Revised

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2.2 Scheduling of Maintenance

- 2.2.1 An annual "anniversary month" shall be established for the inspection and maintenance of each valve covered by Section 2.1. The "anniversary month" is the calendar month in which the inspection and maintenance required in Section 2.1 is scheduled. Except as permitted by Paragraph 2.2.4, the "anniversary month" shall be based on the month in which the last inspection and maintenance was performed in 1983 and shall be the same month each subsequent year.
- 2.2.2 Where Section 2.1 requires maintenance twice each calendar a second anniversary month shall be established, as the sixth month after the annual anniversary month established in Paragraph 2.2.1.
- 2.2.3 The inspection and maintenance required by Section 2.1 shall be scheduled for the anniversary month(s). If circumstances do not permit performance of the work during the month in which it is scheduled, it may be performed in the month prior to or following the scheduled month, provided the annual or semi-annual requirements of Section 2.1 are met.
- 2.2.4 A new anniversary month(s) for scheduled maintenance may be established by performing the required inspection and maintenance during a month which is earlier than the anniversary month. A new anniversary month may not be established by performing the scheduled maintenance during a month following the established anniversary month. Performing the work during the month prior to or the month following the anniversary month, as permitted by Paragraph 2.2.3, will not change the anniversary month.

3. GENERAL

- 3.1 Valves equipped with button head lubricating fittings are to be lubricated with a high-pressure grease gun equipped with the appropriate pressure gage. Valves equipped with lubricant screws are to be lubricated with stick type lubricants. Only clean lubricants of the type specified by this standard or as approved by the Gas System Design Department should be used. Each valve requiring lubrication as a normal maintenance requirement should be lubricated at intervals not exceeding one year. Service conditions may require more frequent lubrication of some valves.
- 3.2 A tag may be attached to the valve to indicate if lubrication is needed. If the valve requires lubrication, the tag shall state the type of lubricant and the frequency of application of this lubricant.

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- 3.3 When block and bleed type valves are exposed to water, condensates, or other foreign matter, the valve body should be drained to prevent damage to the valve.
- 3.4 If a valve is difficult to operate, then flushing out the old grease may be necessary. Refer to the manufacturers instructions for proper use of a valve flushing product.
- 3.5 As part of the maintenance program on valve-operator combinations, a continuing record should be maintained of the torque required to close the valve (or equivalent data) or the time required for the operator to close the valve. Plotting this information over a period of time will show changes which can indicate wear in the operator or problems with the valve.

4. LUBRICATION AND MAINTENANCE REQUIREMENTS

4.1 Plug Valves

4.1.1 Plug valves should be lubricated in the fully open or fully closed position. In either of these positions, all four grease grooves in the body are connected with the two circular grooves at the top and bottom of the plug, and 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. However, the plug valve can be lubricated in any position without injecting lubricant directly through the grease grooves into the gas stream.

Plug valves used as regulators should be lubricated in the fully open or fully closed position whenever possible. (Do not close the valve fully if there is no alternate source of supply.) Plug valve regulators, which are backed up by monitor valves, should be put in the fully open position for lubrication, permitting the monitor valve to take over the control function. Monitor valves requiring lubrication should be lubricated in their normal fully open position.

- 4.1.2 During the first days of operation, a regulating plug valve should be observed very closely. If the valve is cycling often or if a new pipeline is feeding the station, lubrication should be performed as frequently as every other day.
- 4.1.3 If a plug valve is stuck, lubricant should be injected to free it if possible. After lubrication, the valve should be operated until it turns freely.

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- 4.1.4 Proper lubrication is indicated when the pressure gage shows increasing pressure with each stroke of the lubricant gun and decreasing pressure after each stroke. As the system fills the pressure will drop back more slowly and when full, the pressure will hold at the maximum.
- 4.1.5 Lubricant pressure on the gage should read a minimum of 2,000 psi for any plug valve, with pressure not to exceed 5,000 psi when lubricating semisteel 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:
- a. The gun is empty.
 - b. The valve plug is loose.
 - c. 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.
- 4.1.6 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.
- 4.1.7 If excessive clearance exists between the plug and the body due to the adjustment gland or adjustment screw being backed off, the lubricant "short circuits" into the pipeline, and the lubricant pressure will not build up properly.
- 4.1.8 The practice of loosening adjustments to obtain a temporarily free turning plug will invariably result in undesirable secondary effects. These secondary effects of improper plug adjustment are as follows:
- a. Leakage.
 - b. Entrance of foreign or abrasive materials between plug and seat, resulting in a damaged sealing surface.
 - c. Higher torque characteristics as damage occurs.
 - d. Possible gear and operator damage as torque becomes excessive.
 - e. Ultimate valve replacement.

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- 4.1.9 The adjustment of the valve gland nuts on standard valves are generally not necessary and should not be made except as specified by the manufacturer.
- 4.1.10 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. The tightening operation should not be attempted without contacting the manufacturer or the Gas System Design Department unless the operator is experienced with this particular adjustment. (Never loosen the packing gland prior to lubrication.)
- 4.1.11 Valves of the Hypreseal 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.
- 4.1.12 The lubrication screw must not be left in the plug stem beyond complete engagement of the threads, otherwise a pocket will be provided where water, dirt, or corrosion products could collect and make the lubricant screw difficult to remove.
- 4.1.13 When specified adjustments to adjustable valves are unsuccessful and proper lubrication cannot be obtained, or when an inoperable hyperseal valve requires adjustment, a material failure report shall be filed with the Gas System Design and Gas Distribution departments.
- 4.1.14 Prior to installing any lubricated plug valve, it must be inspected and lubricated and plastic stem packing added where necessary. This is 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 construction personnel in cooperation with the operating division personnel responsible for the station after construction. All plug valves should be lubricated before installation and visually checked for excretion of lube around the plug port and valve body. If a valve is found to be operating improperly, a request should be made to the Gas System Design Department for instructions.
- 4.1.15 The recommended type of general purpose lubricant for plug valves is Rockwell No. 386, No. 555, No. 555 W.G., or equivalent approved by GSDD and should be used for lubricating these valves in the following service:

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- a. Natural and manufactured gases with water or organic condensates.
- b. LPG systems.
- c. Hydrocarbon liquids.
- d. Glycols.
- e. Water.

4.1.16 The standard sizes and packages of Rockwell 386 and 555 are:

Size	Valve Size	Fitting Size	Units Per Box	Code 386	Code 555
A	1/2"	None	24		50-3078
B	3/4" - 1-1/4" - 2"	1/4"	24	50-3072	50-3067
D	3" - 4" - 6"	1/2"	24	50-3074	50-3069
J	For handgun use on valves fitted with button head fitting		6	50-3076	50-3071

4.2 Ball Valves

All ball valves shall have body cavity blowdown and sealant injection features. For buried service, these features shall be extended aboveground using Grade B schedule 80 seamless pipe.

4.2.1 Rockwell Hypresphere Ball Valves (Old Model - Manufacture Ended 1973)

- a. Lubrication of the Hypresphere valve is more effective when the valve is fully open or fully closed. 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, especially if the valve is difficult to operate. (Caution: When a valve is closed and the line is blown down on what is normally the upstream side of the valve, seat reversal occurs. Before the line is repressured and returned to service, lubricate both valve seats).
- b. The recommended lubricant for sealant on Hypresphere valves is Rockwell No. 386, No. 555, No. 555 W.G., or approved equivalent.

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4.2.2 Rockwell TM Hypresphere Ball Valves (New Model - Manufactured Since 1972)

- a. The Rockwell TM Hypresphere ball valve is designed to require no lubrication for tight shutoff. However, as noted below, lubrication is required to provide for ease of operation when used as a regulator. The valve has a secondary sealant injection system to provide a backup seat seal should the seats become damaged and tight shutoff cannot be obtained.
- b. Both valve seats have sealant injection fittings on the sides of the valve body. In addition, there is a sealant injection fitting at the base of the valve stem to provide a backup stem seal.
- c. Although sealant injection is not necessary for shutoff, Rockwell states that "periodic sealant injection with Rockwell sealant No. 555 or 555 W.G. helps maintain good operating condition and minimizes wear and abrasion on the seats and ball."
- d. Rockwell Hypresphere ball valves used as monitors should be lubricated prior to installation. This should be done by construction personnel in cooperation with the operating division personnel responsible for the station after construction. The valves should be visually checked for excretion of lube around the ball port and valve body. This is to assure proper flow and distribution of lubricant throughout the valve body (and lube extension pipe if used) before installation. Lubrication should be performed as often as necessary to ensure smooth operation when the valve is throttling. The valves should be lubricated in the closed position if possible. If a valve is found to be operating improperly, a request should be made to the Gas System Design Department for instructions.

4.2.3 TK and Grove Ball Valves

- a. TK and Grove Model B-4 and B-5 ball valves are designed to require no lubrication for bubble tight shutoff. Lubricate the valve using the fittings provided only if positive shutoff cannot otherwise be obtained. Valves which do not provide positive shutoff should be checked for possible valve seat or ball damage. Once the valve is lubricated, lubrication must be continued to obtain positive shutoff.

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b. The recommended lubricant for shutoff on TK and Grove Model B-4 and B-5 ball valves is Rockwell No. 386, No. 555 or approved equivalent.

c. Grove Model BVR-4 and BVR-5 ball valve regulators should be lubricated prior to installation. Lubrication should be performed by construction personnel in cooperation with the operating division personnel responsible for the station after construction. The valves should be visually checked for excretion of lube around the ball part and valve body. This is to assure proper flow and distribution of lubricant throughout the valve body (and lube extension pipe if used) before installation.

After release to operation, lubrication should be performed as often as necessary to ensure smooth operation when the valve is throttling. The valves should be lubricated in the closed position if possible. If a valve is found to be operating improperly, a request should be made to the Gas System Design Department for instruction.

d. The recommended lubricant for BVR-4 and BVR-5 ball valve regulators is Mobilplex Type 47 grease manufactured by the Mobil Oil Corporation. (Do not use Rockwell No. 386 or No. 555 sealant on Grove ball valve regulators.)

e. Grove regulating valves with retractable seats (commonly known as Arcron Model) must not be lubricated, as this would destroy the retractable seat feature. The valve has no grease fittings to lubricate the valve seats. It does, however, have Zerk fittings under the Arcron cover for lubricating the operator. Mobilplex Type 47 should be used to grease these fittings.

f. Prior to installing any TK or Grove ball valve, all body reliefs should be removed and plugged. These are only necessary for valves in liquid service. Use a steel plug with a pressure rating at least equal to that of the valve. Also, the shipping tabs and lifting eyes should be removed and all body bolts tightened.

4.2.4 W-K-M Dynaseal Ball Valves

a. The W-K-M Dynaseal ball valves are designed to require no lubrication for bubble tight shutoff. However, it may be necessary to inject sealant (Emergency Seat

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Renewal), if the seats become damaged. The recommended sealant for shutoff is W-K-M Lubricant 103, or approved equivalent, such as Rockwell No. 386 or No. 555. Close valve and inject sealant at both seats under block and bleed conditions.

- b. Should a leak develop around the stem, it can be stopped under pressure by injecting W-K-M plastic stem packing 107.

4.3 Gate Valves

4.3.1 Kerotest M-1 Gate Valves

- a. The Kerotest M-1 gate valve does not require lubrication or gland tightening. A stem leak requires replacement of packing seals and gland gasket. Repack valve and lubricate as described in the procedure for "Primary or Secondary" repacking. The primary repacking procedure may be done with line pressurized. See Kerotest M-1 Gate Valve Operations Manual.
- b. If the bonnet gasket leaks, the bonnet screws should be retightened per torque specifications found in the Kerotest operations manual. If leakage persists, remove valve from service, disassemble, and inspect for damage to the gasket or sealing area. Replace gasket and/or polish sealing area with very fine emery cloth. Coat bonnet gasket with light film of multipurpose grease and reassemble.
- c. Caution should be taken if the valves are in the open position in a pipeline for a period of time. Sediment or dirt can collect inside the valve and block the wedge from fully closing. When these valves are to be closed, it should be done slowly. The valve should not be closed completely but "throttled" for a short time in order that the turbulence created will flush away any sediment or dirt that might have settled in the valve. In the event of an emergency, the valve should be closed as quickly as possible.
- d. When complete shutoff is not obtained, the valve may be reseated using the following procedure. Throttle to flush out loose sediment. Close valve with moderate effort. This will force wedge partially into seat and loosen accumulated sediment. Open valve one or two turns to retract wedge from seat. Repeat procedure if necessary.

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4.3.2 EV-11 "Stirrup" Gate Valve

- a. The EV-11 gate valve requires no lubrication for a bubble tight seal. Lubrication is required only during cleaning and inspection.
- b. If a leak develops in the bonnet, the capscrews should be retightened to manufacturers' torque specifications. If leak persists replacement of the bonnet O-Ring will be necessary.
- c. A stem leak will require replacement of the stem seal and gland bushing O-rings. The replacement of the stem seal and gland bushing O-Rings can be done under pressure if the manufacturer's repair procedure is followed.
- d. If complete shutoff cannot be obtained, it may be necessary to disassemble the valve and clean or replace the wedge seals.
- e. Refer to EV-11 gate valve maintenance instructions for repair procedures and torque requirement when repairs are necessary.

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