Elkhart Brass
Fire Fighting Equipment

2900G Series Gear Actuated Fire Apparatus Valves

INSTALLATION
&
OPERATING INSTRUCTIONS

P/N 98087000 REV-C (ECN 120213)

Table of Contents

I. SYSTEM DESCRIPTION: ……4

II. VALVE STATUS INDICATOR: (Optional 81383001) ……...…4

A. Reverse polarity protection….……4

B. Electrical Specifications……...……...4

III. INSTALLATION INSTRUCTIONS……5

A. Valve Installation……6

B. Hand-wheel Assembly……...…….7

C. Determining Shaft Length……..7

D. Repositioning the Handwheel …...……..8

E. Optional Indicator Light Module ……8

IV. OPERATING INSTRUCTIONS …….8

V. SYSTEM LAYOUT DRAWING …….9

I. SYSTEM DESCRIPTION:

The 2900G series gear actuated valve line includes ball valves in 1.5", 2.0", 2.5", 3" and 4" sizes, also butterfly valves in 2", 4", 5", and 6" sizes. A segmental gear made of aluminum bronze and a worm made of a stainless steel alloy controls the valve opening and closing. This actuator design allows easy and precise control of large flows, and provides compliance with the opening and closing time requirements of NFPA 1901.

The hand wheel assembly is designed for remote operation of gear-actuated valves. Two universal joints, which are provided, and an optional connecting rod (supplied by others) are used to couple the valve and handwheel together for remote operation. The handwheel assembly allows rotational alignment of the handwheel relative to the shaft. This allows the end user to line up the spinners of adjacent handwheels when the valves are closed. See Figure 6 for a layout drawing of the complete valve system.

An optional indicator light module (81383001) provides an indication of valve status by means of three high intensity LED's with a large viewing angle that can be seen even in bright sunlight. The module is sealed from the environment according to the specifications for a NEMA 4 enclosure for reliable service. The electrical components used in the system are interconnected with a harness utilizing environmentally sealed connectors. This intermediate harness is available from Elkhart Brass in several standard lengths. See Figure 5 for part numbers and information.

II. OPTIONAL VALVE STATUS INDICATOR (81383001):

The 81383001 valve status indicator includes three high intensity LED's (Red, Amber, and Green) for reliable status indication under all ambient lighting conditions. These LED's provide the following signals to the operator:

SIGNAL	MEANING
Red	Valve is in the fully closed position
Green	Valve is in the fully open position
Amber	Valve is in a throttled position

A. Reverse Polarity Protection:

If polarity is reversed at time of system installation or at any time during maintenance or troubleshooting, no damage will result. The LED's will not light when polarity to the module is reversed.

B. Electrical Specifications:

Normal operating voltage	12 VDC
Operating voltage range	11 VDC – 20VDC
Operating temperature range	-40°F to 150°F

III. INSTALLATION INSTRUCTIONS:

A. Valve Installation:

The 2900G ball valves sizes 1.5" through 3.0" are bi-directional and can be installed in either direction. The 2940G 4.0" valve should be installed with the arrow on the body pointing in the direction of flow except in a tank to pump application where the arrow should be pointing towards the tank. The 2950G butterfly valves are bi-directional and can be installed in either direction.

Gear Case Repositioning:
The gear case may be installed in one of four positions relative to the ball valve assembly as shown in Figure 1 below. There are two possible positions for the gear cases used on the butterfly valves as shown in Figure 2 below. If installation interference is encountered due to gear case position, the following steps will allow simple repositioning of the gear case:

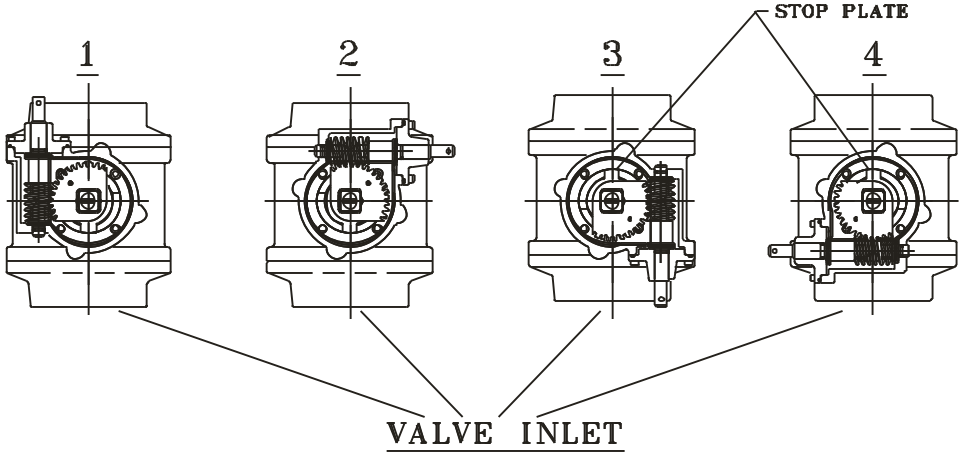


Fig. 1
GEARCASE POSITIONS

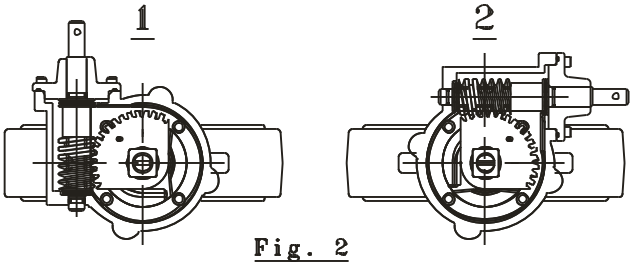


Fig. 2
GEARCASE POSITIONS
NOTE: THESE VALVES ARE BI-DIRECTIONAL

Ball Valves;

1. Place the valve in the fully closed position. Note that the slot in the end of the actuator shaft shows the position of the ball. When the slot is at a right angle to the waterway, the valve is fully closed.

2. Remove the four socket head cap screws from the gear case cover, and then pull the cover from the gear case. Rotating the cover slightly will ease removal.

3. Remove the thrust washer and gear segment from the gear case. Note that rotating the worm slightly will ease gear segment removal.

4. Remove the four socket head cap screws that secure the gear case to the valve body. Do not remove the stop plate from the actuator shaft.

5. Rotate the gear case to the desired position. (Note: Inspect the O-ring between the gear case and the valve body for any damage and proper location.)

6. Apply Loctite #242 to the four screws and reinstall them to secure the gear case to the valve body. Torque the screws to 120-150 in-lbs.

7. Install the gear segment in the correct position as shown in Figure 1 above. Note that rotating the worm slightly will ease gear segment installation.

8. Apply petroleum base grease to the thrust washer and install.

9. Reassemble the gear case cover on the gear case taking care not to damage the cover O-ring.

10. Apply Loctite #242 to the four socket head cap screws and reinstall and tighten them to secure the gear case cover.

Butterfly Valves;

1. Place the valve in the fully closed position. Note that the slot in the end of the actuator shaft shows the position of the disc. When the slot is at a right angle to the waterway, the valve is fully closed.

2. Remove the four socket head cap screws from the gear case cover, and then pull the cover from the gear case. Rotating the cover slightly will ease removal.

3. Remove the thrust washer and gear segment from the gear case. Note that rotating the worm slightly will ease gear segment removal.

4. Remove the four hex head bolts that secure the gear case assembly to the mounting flange on the valve body.

5. Rotate the gear case assembly to the desired position while making sure the valve remains closed.

6. Apply Loctite #242 to the four hex head bolts then reinstall and tighten them to secure the gear case assembly to the mounting flange on the valve body.
.

7. Install the gear segment in the correct position as shown in Figure 2 above. Note that rotating the worm slightly will ease gear segment installation.

8. Apply petroleum base grease to the thrust washer and install.

9. Reassemble the gear case cover on the gear case taking care not to damage the cover O-ring.

10. Apply Loctite #242 to the four socket head cap screws and reinstall and tighten them to secure the gear case cover.

B. Handwheel Assembly:

The handwheel assembly (81031001) is installed in the pump control panel. The layout drawing on page 8 shows the details for the cutouts that need to be made in the pump panel. Check for clearance behind control panel to allow for universal joints and connecting rod to valve. The pressure gage for each discharge valve should be installed above the handwheel controlling that valve.

The universal joints are attached to the valve worm shaft and handwheel assembly (81031001) to couple the rotating shafts that are not collinear. A neoprene rubber boot retains a lubricant around the bearing surface of the universal joint and prevents contaminants from entering. The maximum operating angle should be no greater than 40°.
Cut out a 1.031" diameter hole in predetermined location in the panel as shown in layout drawing. Remove the universal joint and the large hex nut from the assembly and then install the handwheel assembly through front of the control panel. Install the large hex nut on the back side of the panel; do not fully tighten the nut yet. Install the universal joint on the handwheel assembly with the roll pin provided.

C. Determining Shaft Length:

Measure the distance from the universal joint on the valve to the universal joint on the handwheel assembly (see Figure 4). Add 5/8" to each end of the connecting rod for engagement inside universal joints. Cut the connecting rod to length and insert rod ends into universal joints. Using the universal joints as drill jigs; drill a 3/16" diameter hole through each end of the rod. Drive one of the 3/16" diameter roll pins provided into each of the universal joints to attach the shaft at both ends. Finally, tighten the hex nut on the handwheel assembly.

D. Repositioning the Handwheel

The handwheel attachment design allows the wheel to be repositioned relative to the handwheel shaft. This feature is useful if it is desired, for instance, to have the spinners of adjacent handwheels in the same position when the valves are fully closed.

Holding the handwheel and/or the swivel, loosen the jam nut in the center of the handwheel hub (9/16" socket). Pull the handwheel loose from the shaft and rotate the handwheel to the desired position. While holding the handwheel and/or swivel, tighten the jam nut to 150 to 200 in-lbs. Press the cap plug provided in to the center of the handwheel hub.

E. Optional Indicator Light Module:

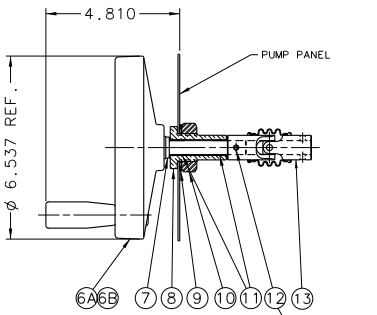
The 81383001 indicator light module is installed in the pump control panel above the handwheel assembly. A panel cutout template can be found on the layout drawing provided on page 8. Check for clearance behind the control panel to allow for the wiring harness and light module. Insert the light module through the panel cut out and secure it to the control panel using the stainless steel nuts and lock washers provided. The pressure gage for each discharge valve should be installed above the light module controlling that valve. Mounting location temperature should not exceed 150°F.

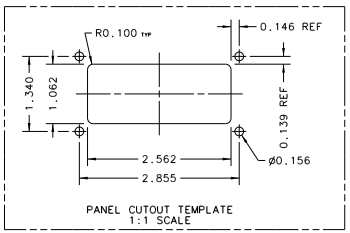
Each indicator light module (81383001) includes a power input connector with red and black wire leads, as shown on the layout drawing. The leads have crimp connectors with heat shrink tubing. Strip approximately 5/16" of insulation from the power source wire and insert the stripped end into the crimp connector of the red lead and crimp with a suitable crimper. Similarly, strip and crimp the ground wire to the black lead. After crimping, use a heat gun or other heat source to shrink the tubing until the adhesive melts and flows to seal the connection
An interconnecting harness is offered in several different lengths to connect the indicator light module to the valve assembly. The harnesses may be used in combination with one another to provide the length needed for your application. Refer to the layout drawing for harness lengths and part numbers.

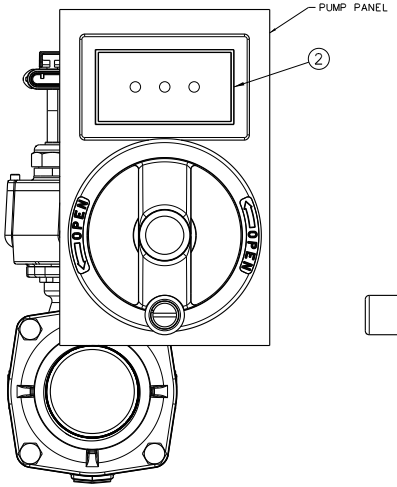
Do a final check of the valve (and optional 81383001 status indicator if used) for proper operation.

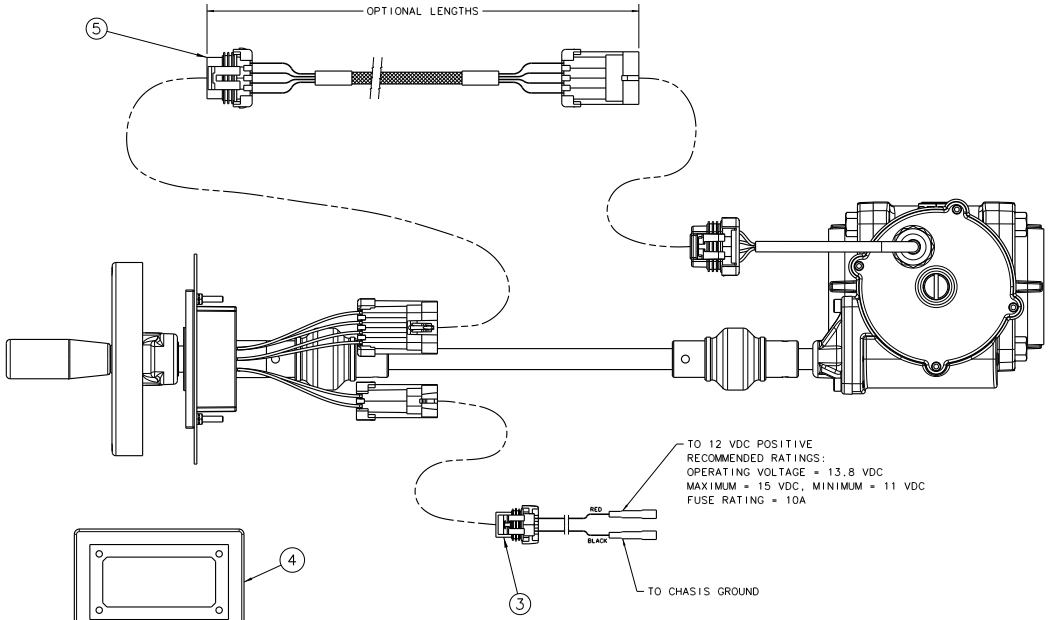
IV. OPERATING INSTRUCTIONS:

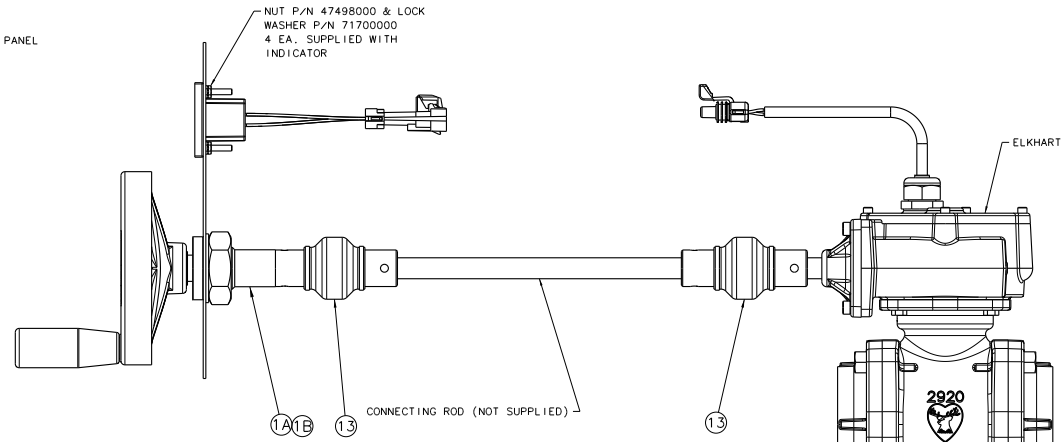
Turn the handwheel counter clockwise (CCW) to open the valve and clockwise (CW) to close the valve. There are mechanical stops at the full closed and full open positions. LED valve position display is described in section II.











B2	13	41042000	UNIVERSAL JOINT	2
B1	12	51236000	PIN - ROLL 79-040-187-0812	4
	11	16681000	BUSHING - THOMSON NYLINER TYPE 5, #BL8-F	2
	10	47482000	NUT - JAM	1
	9	71701000	WASHER - 1" LOCK (ZINC-PLT) INTERNAL TOOTH	1
	8	11679001	ADAPTER - PANEL	1
	7	64043001	SHAFT - HANDWHEEL	1
	6B	81203004	6.5" HANDWHEEL SUB-ASSEMBLY	1

(81208001) REMOTE OPERATED
USED W/ 2940, 2954, 2955, 2956

B2	13	41042000	UNIVERSAL JOINT	2
B1	12	51236000	PIN - ROLL 79-040-187-0812	4
	11	16681000	BUSHING - THOMSON NYLINER TYPE 5, #BL8-F	2
	10	47482000	NUT - JAM	1
	9	71701000	WASHER - 1" LOCK (ZINC-PLT) INTERNAL TOOTH	1
	8	11679001	ADAPTER - PANEL	1
	7	64043001	SHAFT - HANDWHEEL	1
	6A	81020004	5" HANDWHEEL SUB-ASSEMBLY	1

(81031001) REMOTE OPERATED
USED W/ 2915, 2920, 2925, 2930

5	36783500	HARNESS - INTERMEDIATE 120" (LIGHT MODULE - MANUAL VALVE)	1
5	36783400	HARNESS - INTERMEDIATE 96" (LIGHT MODULE - MANUAL VALVE)	1
5	36783300	HARNESS - INTERMEDIATE 60" (LIGHT MODULE - MANUAL VALVE)	1
5	36783200	HARNESS - INTERMEDIATE 36" (LIGHT MODULE - MANUAL VALVE)	1
5	36783100	HARNESS - INTERMEDIATE 12" (LIGHT MODULE - MANUAL VALVE)	1

REQUIRED HARNESS (CHOOSE ONE)

A	4	51497000	BEZEL CHROM POS IND	1
	3	36781000	HARNESS - POWER	1
	2	81383001	VALVE POSITION INDICATOR	1
	1B	81208001	REMOTE OPER SUB W/ 6.5" HANDWHEEL	1
	1A	81031001	REMOTE OPER SUB W/ 5" HANDWHEEL	1

REV.		BY	E.C.N.
	WAS QTY 1 2) P/N 41042000 QTY 2 WAS QTY 2 1) P/N 51236000 QTY 4	GDW	0708 13
B	ADD CHRM BEZEL	ENC	0503 21
A	RELEASED TO PROD.	ENC	0507 01

MATERIAL:

ELKHART BRASS MFG. CO., INC.
ELKHART, INDIANA

GEAR OPERATED VALVE
SYSTEM LAYOUT

DRN BY	EJD	SCALE	3/4
CHKD BY	RDM	DATE	1/25/05
STANDARD TOLERANCE 3 PLACE DEC. = ± .010 4 PLACE DEC. = ± .005 ANGLES = ± 0°30'0"		ORT. NO.	2920-G, 2925-G 2930-G, 2956-G
		PART NO.	98303000

SDRC REMOVE ALL BURRS AND SHARP CORNERS UNLESS OTHERWISE SPECIFIED DO NOT SCALE PRINT

98303000 REV. B