

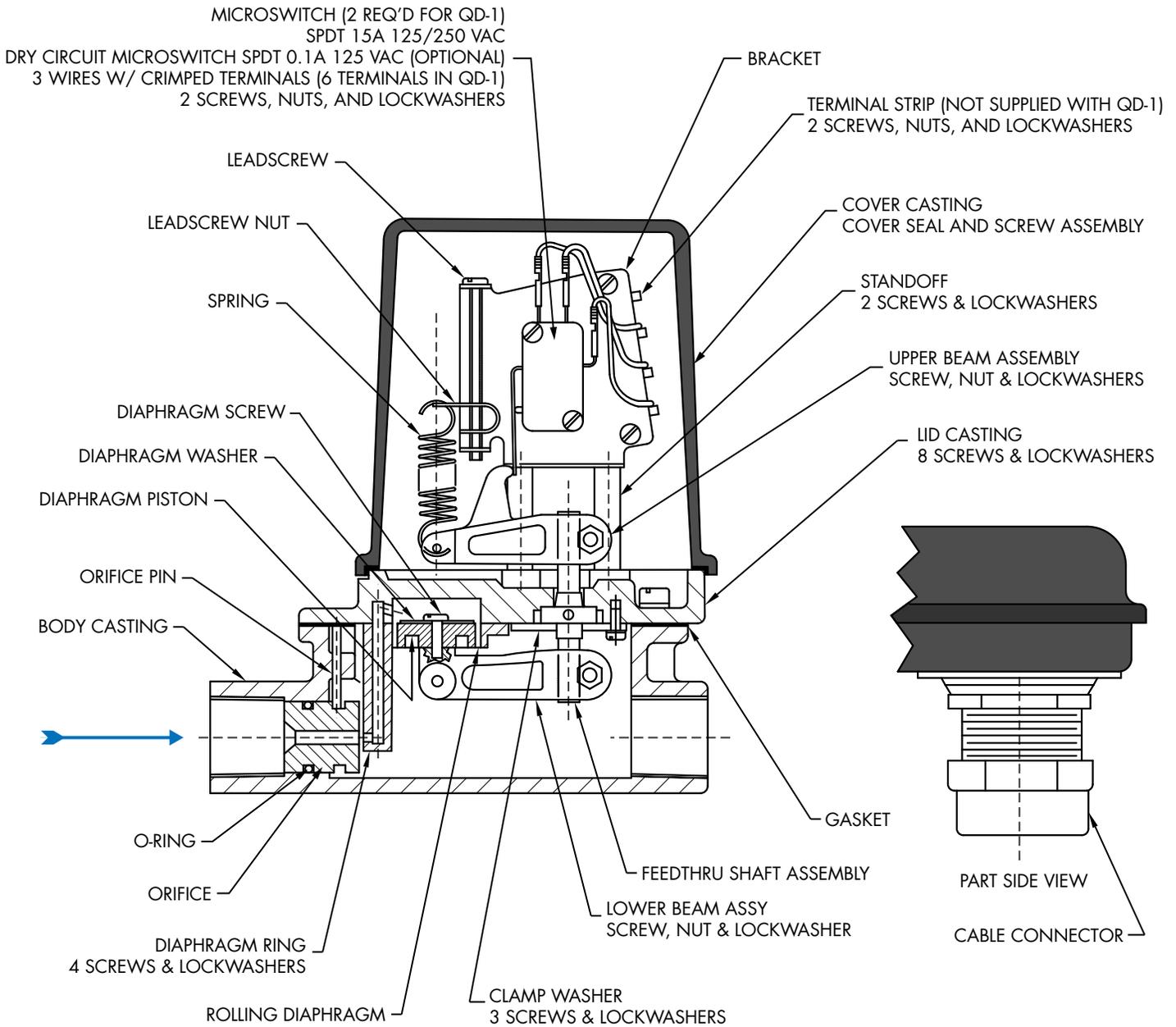
MODEL Q-1

Q-1, QD-1

HARWIL CORPORATION

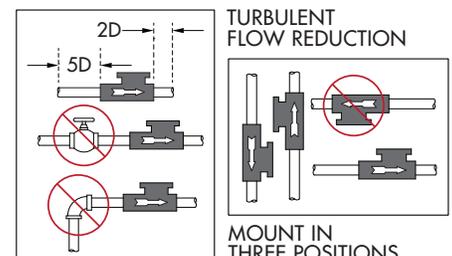
541 KINETIC DRIVE, OXNARD, CA 93030
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INSTALLATION INSTRUCTIONS



PARTS LIST FLUID FLOW SWITCH

ULTRA RELIABLE SINCE 1956



INSTALLATION INSTRUCTIONS

The gasket seal located between the main body casting and the lid casting is a cork-rubber composition which is subject to a slight creep for a short period after application of initial clamping load. All gaskets are properly clamped before shipment; however, during shipping and storage, the gasket may compress, allowing the body-lid clamp bolts to become slightly loose. Tighten these bolts before assembling the flow switch in your system.

No further creep of the gasket will occur after the second tightening. The Q-1 fluid flow switch is supplied with tapped holes for standard 1/2" pipe. Insert in line with arrow on the side of the casting pointed in the direction of flow.

NOTE: Care should be exercised to prevent pipe thread sealant (putty, Teflon tape, etc.) from entering the flow switch and restricting flow through the calibrated orifice.

ELECTRICAL WIRING

FIGURE 1: Wiring schematic for power applied to load when flow is GREATER than the set point (power to load interrupted when flow is LESS than set point).

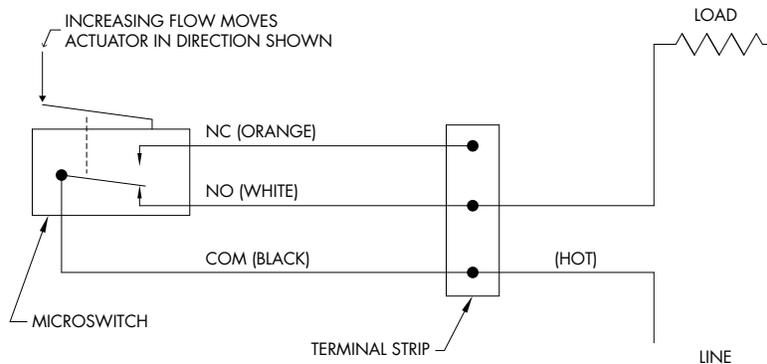
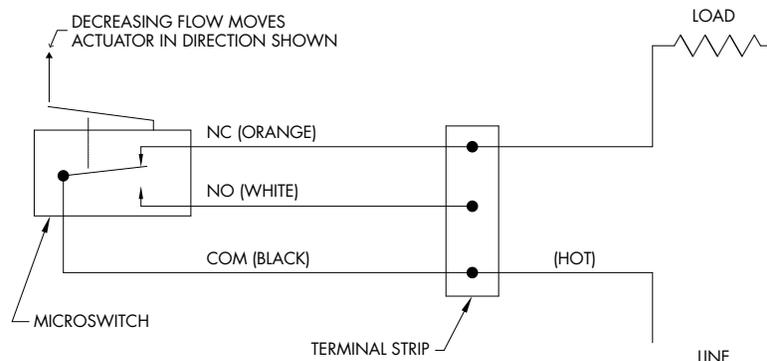
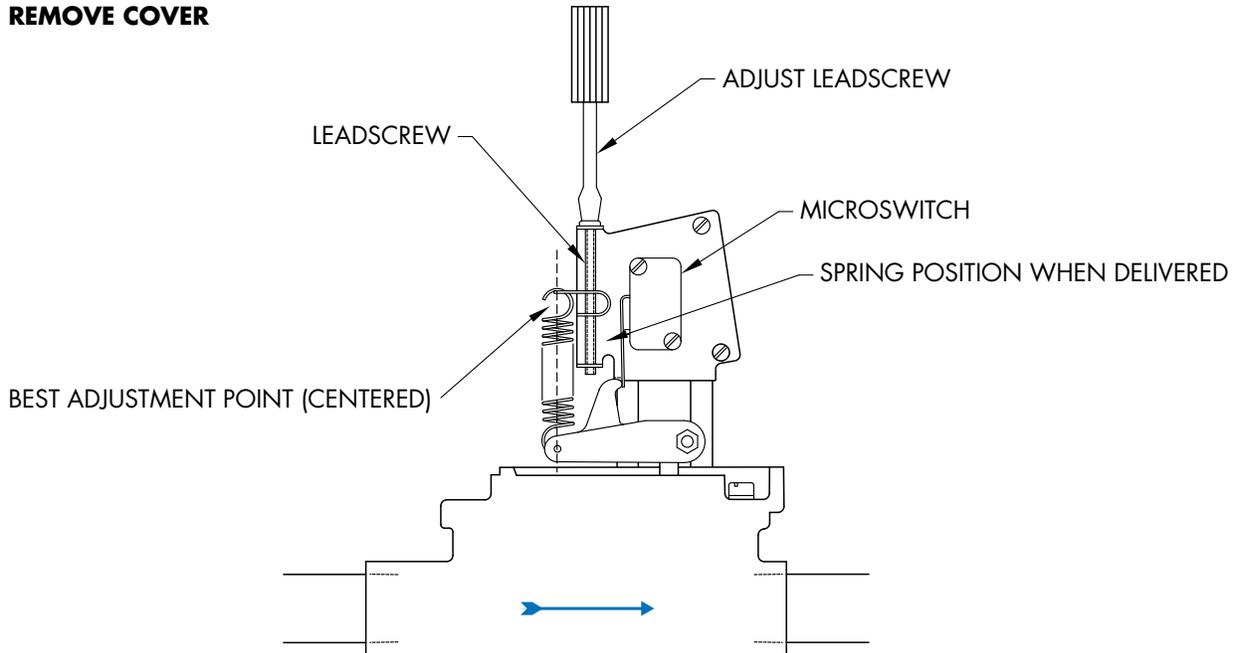


FIGURE 2: Wiring schematic for power applied to load when flow is LESS than the set point (power to load interrupted when flow is GREATER than set point).



Q-1 FLOW SWITCH OPERATIONAL ADJUSTMENT

REMOVE COVER



SWITCH POINT ADJUSTMENT

1. Remove cover.
2. Adjust fluid flow in system to desired rate **WITHOUT** regard to Q-1 switch point setting.
3. The switch point adjusting mechanism consists of an adjusting screw, a "U" shaped leadscrew nut, and a helical spring.

CLOCKWISE rotation of the adjusting screw changes the microswitch actuation point toward **HIGHER** flow rates.

NOTES: All Q-1 units are factory set at the lower end of the flow range, e.g. the adjusting screw is set at the low flow counter-clockwise position.

The leadscrew nut locks the adjusting screw in position, maintaining the flow switch set point under all environmental conditions.

4. Turn the adjusting screw in a clockwise direction until the microswitch is actuated, while maintaining the desired fluid flow rate in the system. Turn the adjusting screw **TWO (2)** additional turns in the clockwise direction and then slowly back off in a counter-clockwise direction, until the microswitch is again actuated. The Q-1 flow switch is now set for maximum sensitivity for detecting small flow changes.
5. When set for maximum sensitivity (100% point) as described above, flow turbulence may cause rapid on/off switching (dithering) of the microswitch contacts, resulting in reduced switch contact life

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and “noise” in the electrical circuit. This is eliminated by turning the adjusting screw in a counter-clockwise direction until the dithering is eliminated. This results in an operational switch point that is slightly below the normal operating flow rate (80%) of the system. The operational set point is normally well below (i.e. 50% below) the most sensitive set point described in step 4. This eliminates nuisance trips while detecting major reduction in the rate of flow. Care must be taken so as not to set the operational switch point below the minimum flow requirements of the system. Refer to Figure

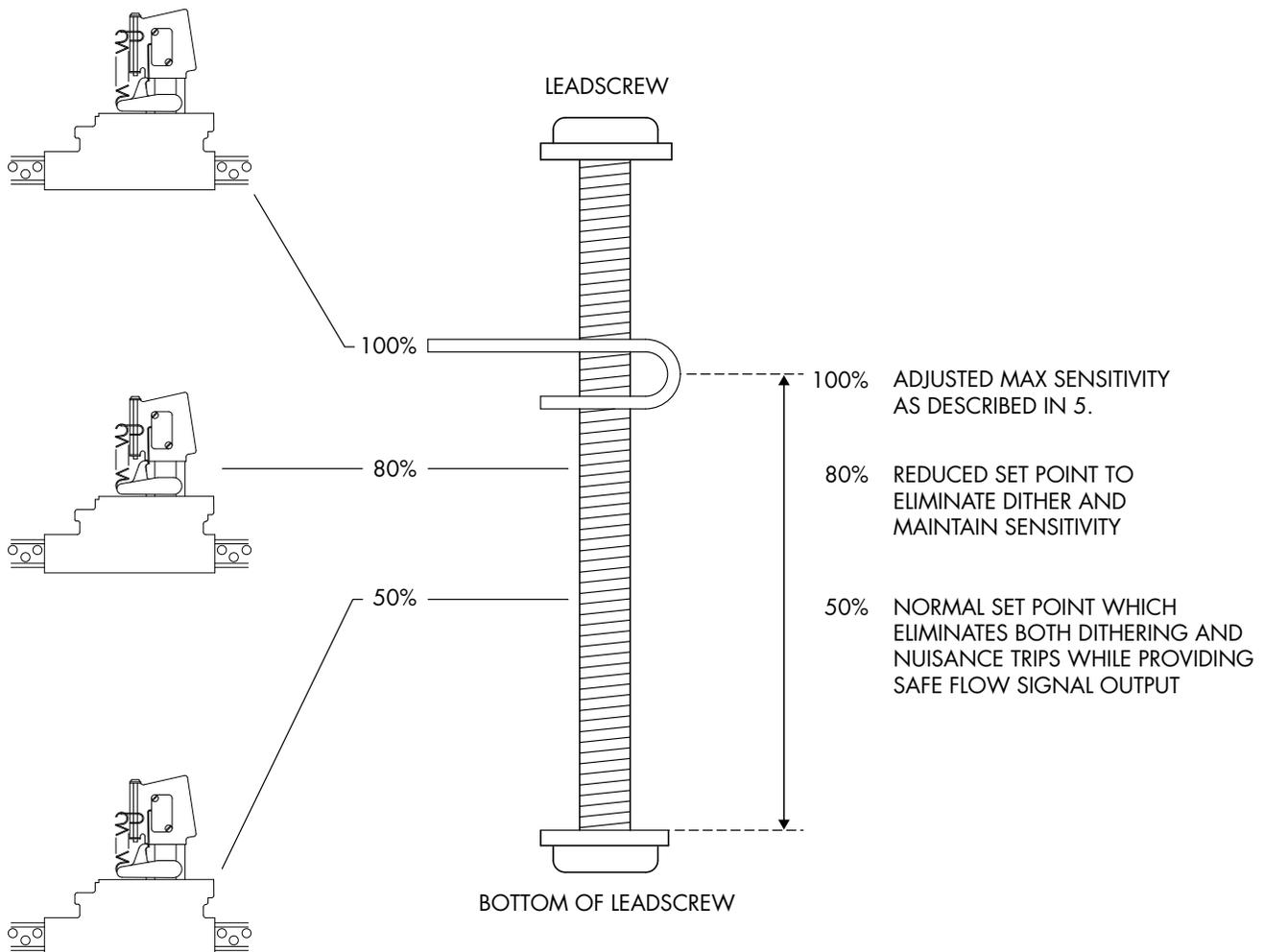


FIG. 4

4 below.

6. Microswitch actuation point may be monitored during the adjustment procedure detailed in steps 4 and 5 by an audible click or with an ohmmeter before connecting line power to the terminal strip, or by monitoring the voltage supplied to the load through the microswitch.
7. If the system flow rate is changed, the Q-1 can be adjusted to monitor the new flow rate by turning the adjusting screw in a counter-clockwise direction to the minimum flow position and then proceeding as in 4 and 5 above.

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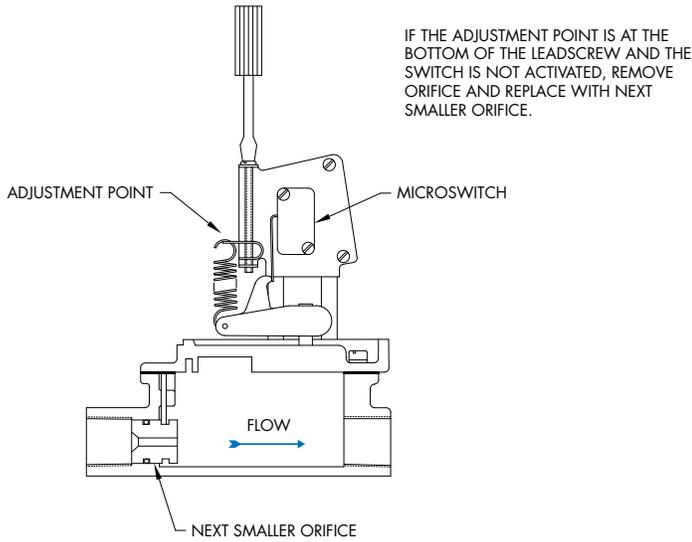


FIG 5A

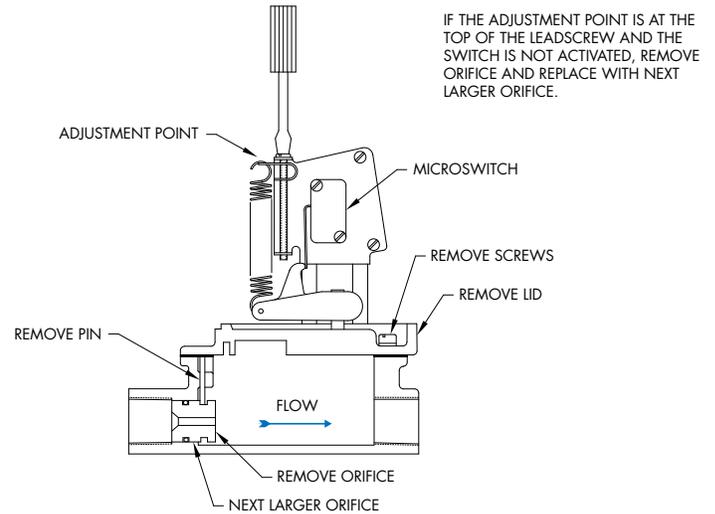
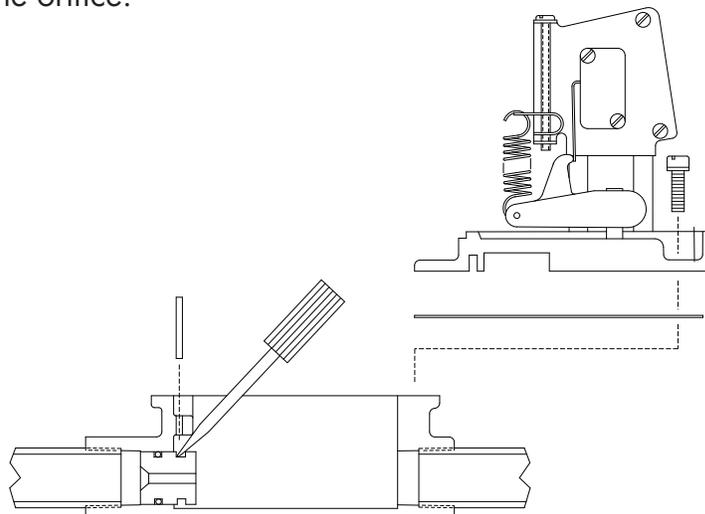


FIG 5B

ORIFICE CHANGE

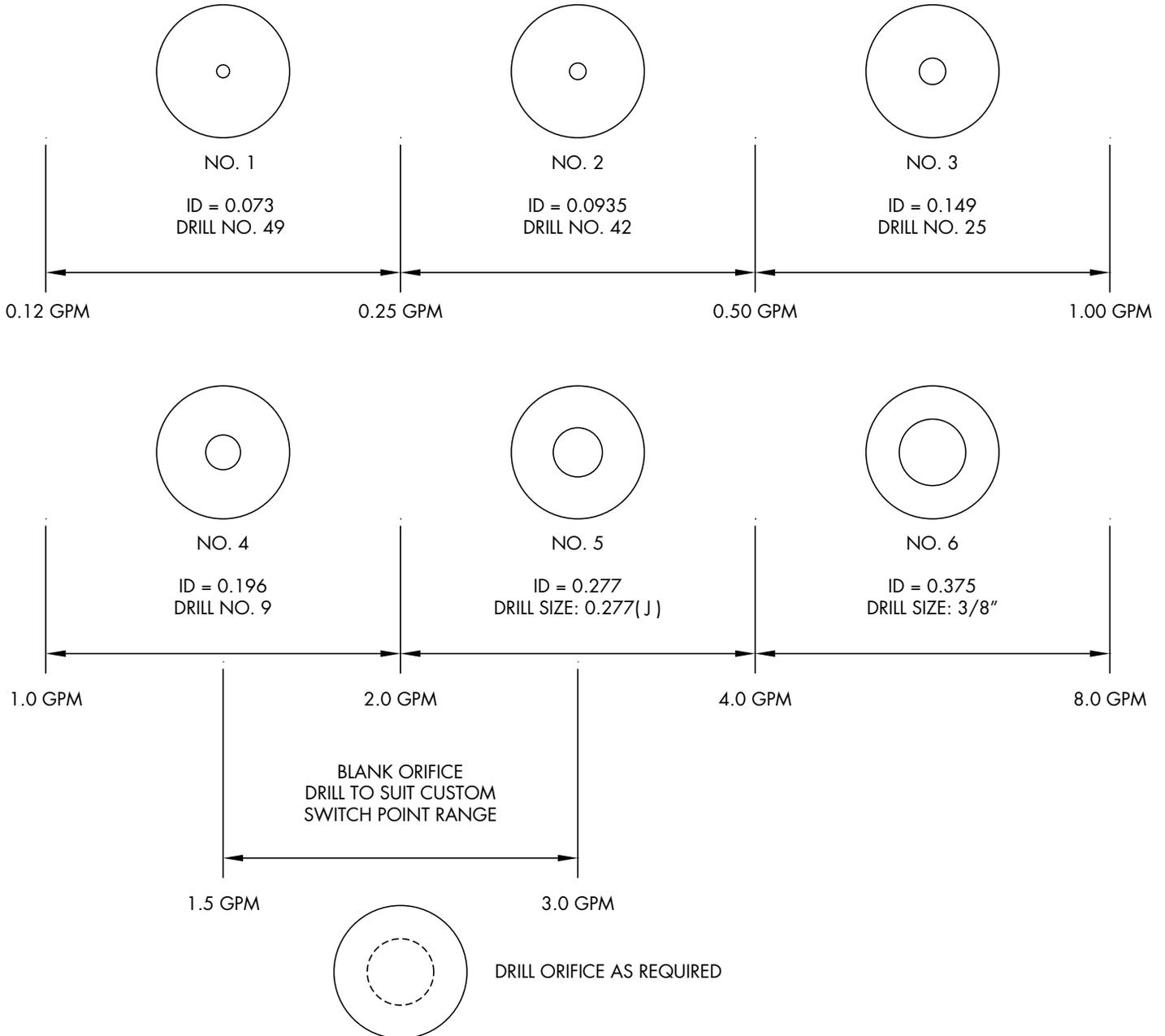
NOTE: It is not necessary to remove the main body of the switch from the line to change the orifice.

1. Remove the cover.
2. Remove the lid casting from the main body casting.
3. Remove the $\frac{1}{8}$ " diameter orifice retaining pin.
4. Insert a small screw driver blade into the groove located in the exposed end of the orifice and pry the orifice toward the body cavity. (FIG 6)
5. Drop the new orifice in the body cavity with the O-ring toward the upstream hole and press it into place.
6. Insert the $\frac{1}{8}$ " orifice retaining pin. NOTE: Be sure to check that the pin is properly located in the groove provided in the orifice.



WHEN THE ADJUSTMENT SPRING RUNS OUT OF TRAVEL OR ACTUATES AT EITHER END OF THE LEADSCREW, YOU MUST CHANGE THE ORIFICE AND READJUST SWITCH.

ORIFICE SELECTION GUIDE



Model Q-1 is provided with blank orifices which can be drilled by the user to create customized flow set-point ranges, as illustrated above.

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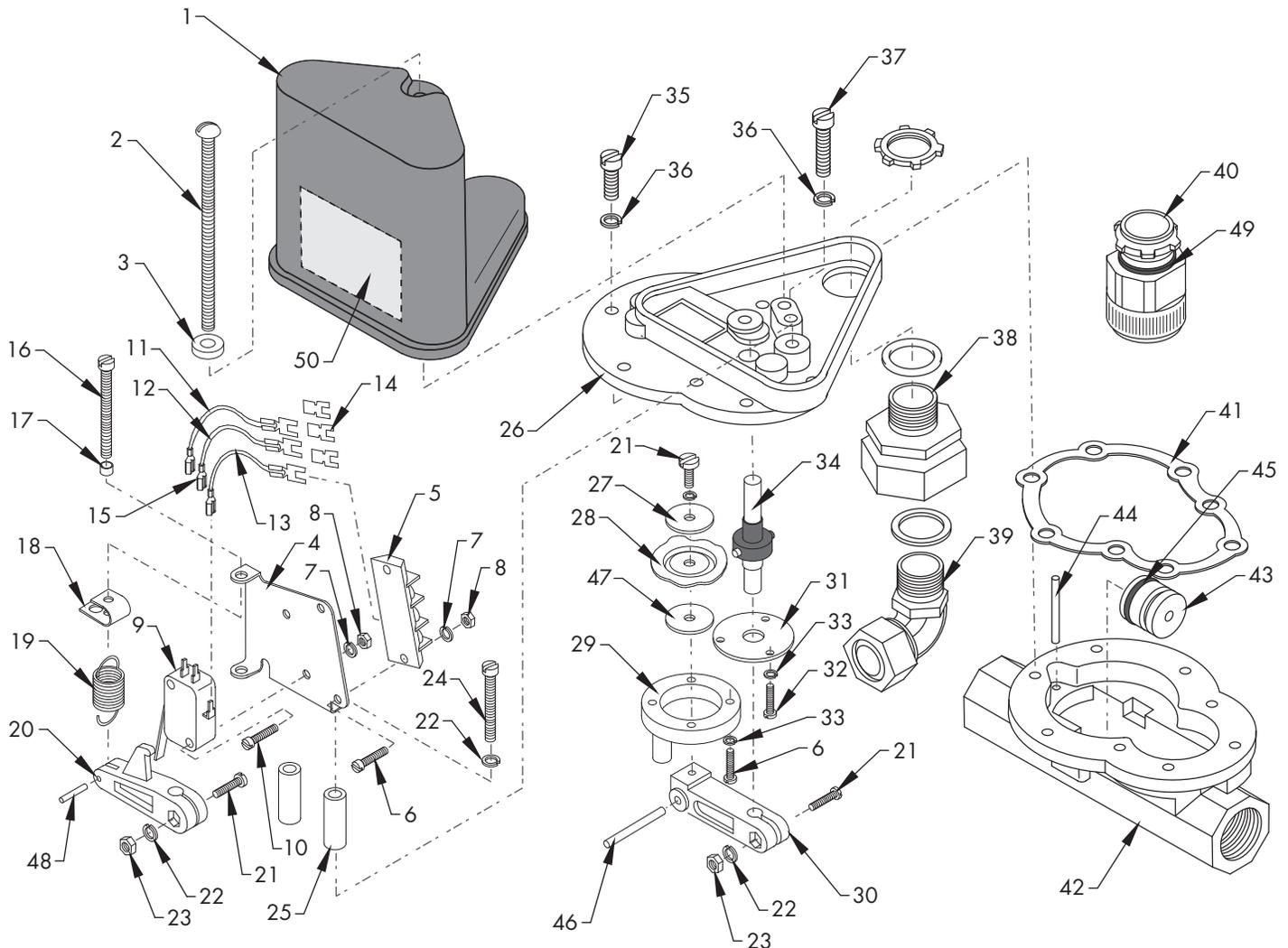
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#	PART NAME	QTY	PART #	Q-1 #	PART NAME	QTY	PART #
1	COVER CASTING	(1)	20100	34	FEED THRU SHAFT - ASSEMBLY ONLY	(1)	20114
2	SCREW	(1)	129-S		RUBBER (OPTIONAL)	(1)	20134
3	LOCK WASHER	(1)	321-W		PIN	(1)	20135
4	BRACKET	(1)	20101	35	SCREW	(7)	107-S
5	TERMINAL STRIP	(1)	20102	36	WASHER	(8)	319-W
6	SCREW	(6)	111-S	37	SCREW	(1)	134-S
7	WASHER	(6)	322-W	38	CONNECTOR CABLE (OPTIONAL)	(1)	20115
8	NUT	(6)	219-N	39	CONNECTOR CABLE (OPTIONAL)	(1)	20116
9	MICROSWITCH	(1)	20103	40	CONNECTOR CABLE (OPTIONAL)	(1)	
10	SCREW	(2)	116-S		BODY	(1)	10429
11	WIRE	(1)	20104		NUT	(1)	10430
12	WIRE	(2)	20105		GROMMET #A (OPTIONAL)	(1)	10440
13	WIRE	(1)	20106		GROMMET #AA (OPTIONAL)	(1)	10441
14	TERMINALS	(3)	706-T		GROMMET #B (OPTIONAL)	(1)	10442
15	TERMINALS	(3)	707-T		GROMMET #C (OPTIONAL)	(1)	10443
16	LEAD SCREW	(1)	132-S		LOCK NUT	(1)	101-DC
17	SHRINK WRAP	(1)	901-F		O-RING	(1)	20117
18	LEAD SCREW NUT	(1)	20107	41	GASKET	(1)	20118
19	SPRING	(1)	20108	42	BODY CASTING	(1)	20119
20	UPPER BEAM ASSEMBLY	(1)	20109	43	ORIFICE #1 (OPTIONAL)	(1)	20120
21	SCREW	(3)	103-S		ORIFICE #2 (OPTIONAL)	(1)	20121
22	LOCK WASHER	(3)	323-W		ORIFICE #3 (OPTIONAL)	(1)	20122
23	NUT	(3)	203-N		ORIFICE #4 (OPTIONAL)	(1)	20123
24	SCREW	(2)	117-S		ORIFICE #5 (OPTIONAL)	(1)	20124
25	STAND OFF	(2)	405-SP		ORIFICE #6 (OPTIONAL)	(1)	20125
26	LID CASTING	(1)	20110	44	PIN/ORIFICE	(1)	20126
27	WASHER	(1)	320-W	45	O-RING	(1)	20127
28	DIAPHRAGM - ROLLING	(1)	20111	46	PIN - LOWER BEAM ASSEMBLY	(1)	20128
29	RING	(1)	20112	47	WASHER - LOWER BEAM ASSEMBLY	(1)	20129
30	LOWER BEAM ASSEMBLY	(1)	20113	48	PIN - UPPER BEAM ASSEMBLY	(1)	20130
31	WASHER	(1)	324-W	49	DIAPHRAGM	(1)	20131
32	SCREW	(3)	107-S	50	LABEL	(1)	21136
33	WASHER	(7)	302-W				



CERTIFICATE OF CONFORMANCE

All Harwil Corporation ("HARWIL") products are manufactured using new materials and components. Our products meet the applicable performance and materials specifications indicated in our current Specifications Sheets and Parts List. HARWIL endeavors to obtain its materials and components from American Companies.

DOMINANCE OF HARWIL LIMITED EXPRESS WARRANTY

Each user **MUST** make appropriate analysis and tests to determine the suitability of the HARWIL product for the intended use prior to purchase.

HARWIL warrants that all HARWIL products will be free from defects in material and workmanship for a period of one year from the date of original shipment. This Warranty shall be LIMITED to the replacement and reconditioning of our products and parts. HARWIL reserves the right and sole discretion to modify or change the composition, design and appearance of its products at anytime.

THIS WARRANTY SHALL BE IN LIEU OF ALL WARRANTIES OF MERCHANTABILITY AND OF ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE RELATING TO HARWIL PRODUCTS AND PARTS. BUYER'S SOLE REMEDY SHALL BE REPLACEMENT OR RECONDITIONING AS SET FORTH HEREIN.

HARWIL SHALL INCUR NO OBLIGATIONS HEREUNDER AND NO LIABILITY IN THE EVENT OF (1) BUYER NOT FULFILLING ITS RESPONSIBILITIES; INCLUDING AS SET FORTH HEREIN; (2) NEGLIGENCE, ALTERATION OR IMPROPER PRODUCT USE, INCLUDING USE WITH NON-COMPATIBLE DEVICES OR CHEMICALS; OR (3) REPAIR BY ANOTHER COMPANY OR PERSON THAN HARWIL.

ANY LAWSUIT RELATING TO THIS LIMITED EXPRESS WARRANTY MUST BE COMMENCED WITHIN ONE YEAR OF THE DATE THE LAWSUIT ACCRUES.

HARWIL provides NO WARRANTY and ASSUMES NO RESPONSIBILITY for corrosive attack on any material, component or design features associated with any of its products.

Corrosion resistance information listed in HARWIL specification sheets, information sheets and product brochures is solely for general background information. This information table has been compiled from literature published by various material suppliers and by equipment manufacturers who use these materials in their products. Inasmuch as these data are based on tests by entities over which HARWIL has no control, HARWIL DOES NOT GUARANTEE AND DOES NOT ACCEPT ANY RESPONSIBILITY FOR THE ACCURACY OF SUCH THIRD PARTY TESTING. When using the table, please remember that in any given case several factors such as concentration, temperature, degrees of agitation and presence of impurities influence the rate of corrosion. The information table is intended, in a general way, to rate materials for resistance to chemicals which contain their usual impurities and for types of equipment in common use. Ratings should be used only as a general tool to first approximation of your material requirements rather than as the final answer.

WHEN IN DOUBT, TEST MATERIALS BEFORE INSTALLATION.

AFTER INSTALLATION, FOLLOW UP WITH SCHEDULED PREVENTATIVE MAINTENANCE AND PERIODIC INSPECTION.