Chapter: CUSTOM MODIFICATIONS

Topic: Custom Valve Configuration Diagram

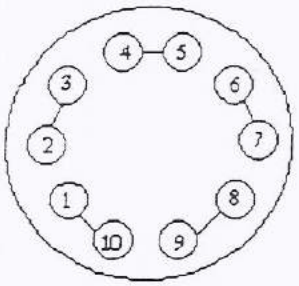
Most of the gas chromatographs manufactured by SRI that employ multi-port gas valves follow a standard gas line connection and flow path scheme that is specific to the user's application and/or dictated by the analytical test method. The majority of these gas valve schemes have been diagrammed and are included in the Injector and Gas Valves section of the unit's manual. The page header information will quickly identify the different application diagrams for the user's reference. In certain cases, the ten-port valve must be plumbed differently in order to perform a unique function as required by the user of the instrument. If manual entries have been made on this diagram page, the SRI gas chromatograph that accompanies this manual has been equipped with a ten port valve that has been custom-configured to the specifications of the user.

All custom plumbing of this ten-port valve will be documented on this page by the builder for the user's reference. Please note that there are TWO diagrams shown on this page. The first diagram represents the relationship between port connections and flow scheme when the valve is in the LOAD position (rotated counter-clockwise). The second diagram represents the relationship between port connections and flow scheme when the valve is in the INJECT position (rotated clockwise). These diagrams are applicable to both manually-operated valves and automated valves built into this chromatograph.

APPLICATION OF VALVE: _____

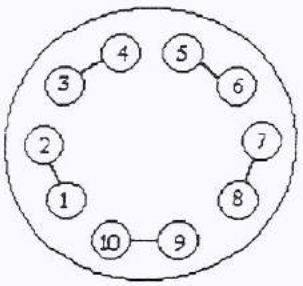
_____

10 PORT GAS VALVE



Valve in LOAD position

10 PORT GAS VALVE



Valve in INJECT position

DESCRIPTION OF CONNECTIONS MADE AT EACH PORT OF GAS VALVE

1	_____	6	_____
2	_____	7	_____
3	_____	8	_____
4	_____	9	_____
5	_____	10	_____

Chapter: INJECTORS AND GAS VALVES

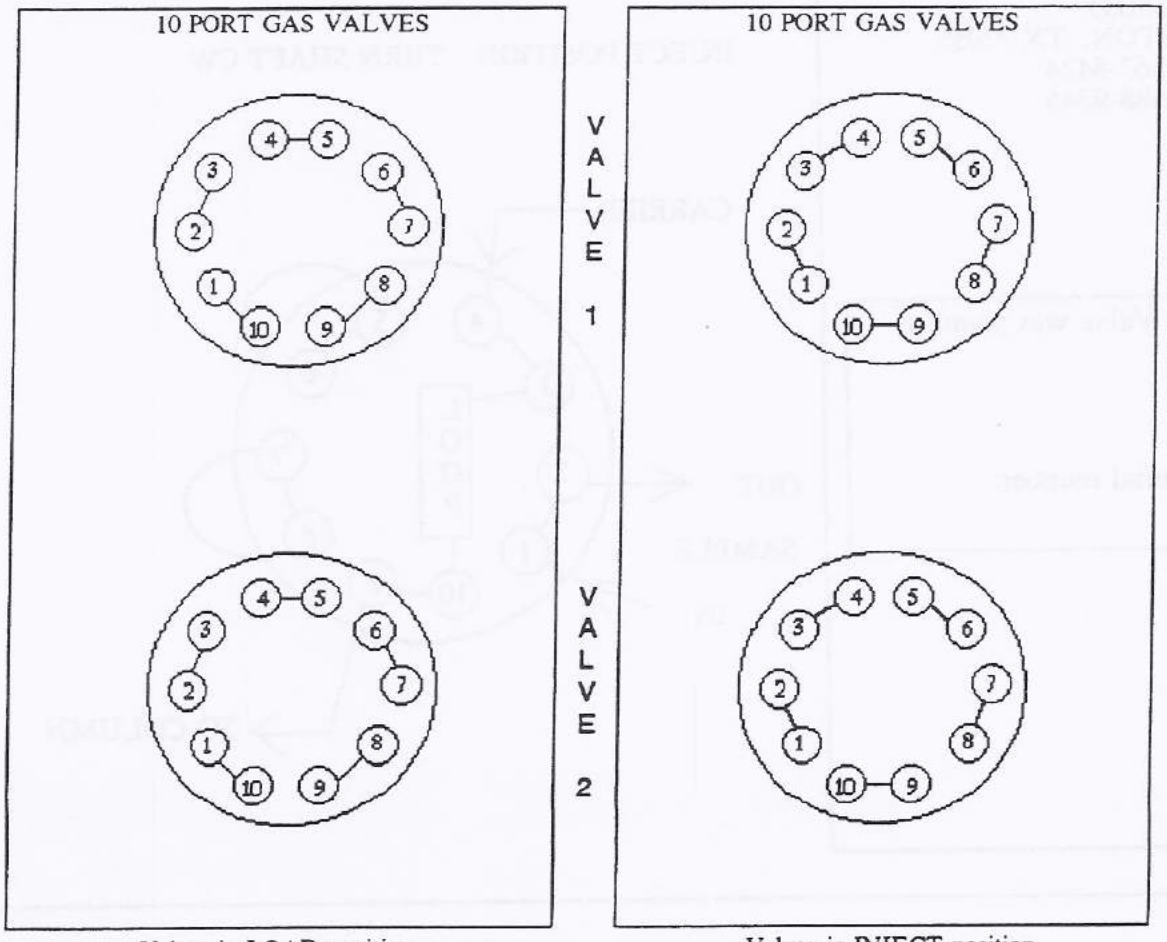
Topic: Custom Dual Valve Configuration Diagram

Most of the gas chromatographs manufactured by SRI that employ multi-port gas valves follow a standard gas line connection and flow path scheme that is specific to the user's application and/or dictated by the analytical test method. The majority of these gas valve schemes have been diagrammed and are included in this section of the unit's manual. The page header information will quickly identify the different application diagrams for the user's reference. In certain cases, the ten-port valve must be plumbed differently in order to perform a unique function as required by the user of the instrument. In some applications, dual valves are required and utilized. If manual entries have been made on this diagram page, the SRI gas chromatograph that accompanies this manual has been equipped with dual ten port valves that have been custom-configured to the specifications of the user.

All custom plumbing of these ten-port valves will be documented on this page by the builder for the user's reference. Please note that there are TWO diagrams shown on this page. The first diagram represents the relationship between port connections and flow scheme when the valves are in the LOAD position (rotated counter-clockwise). The second diagram represents the relationship between port connections and flow scheme when the valves are in the INJECT position (rotated clockwise). These diagrams apply to both manually-operated valves and automated valves built into this chromatograph.

APPLICATION OF VALVES: _____

_____



Valves in LOAD position

Valves in INJECT position

Chapter: INJECTORS & GAS VALVES

Topic: LOOP SAMPLING 6 PORT MODE REV. 9-7-91

SRI has plumbed the valve in your GC according to the accompanying schematic.

In the LOAD position:

Carrier gas flows onto the column while sample gas flows through the sample loop.

In the INJECT position:

Carrier gas flows through the sample loop and then onto the column.

Valco's ten port valve catalog has a large assortment of plumbing applications. You can order Valco's catalog from:

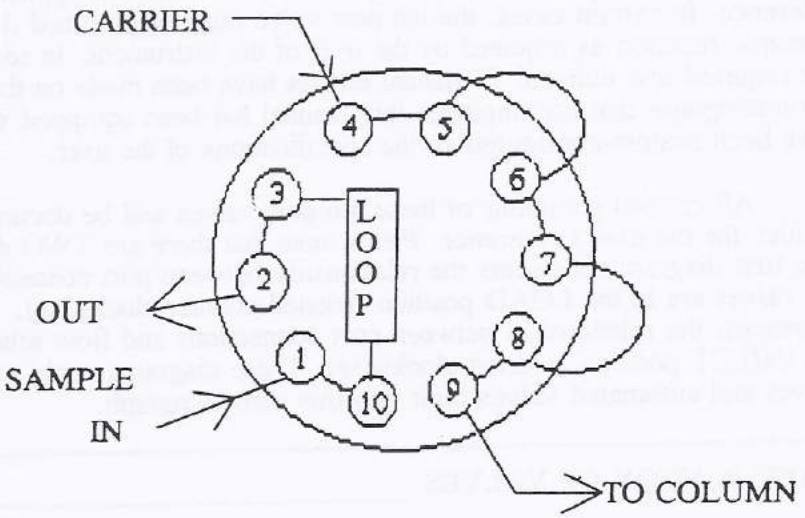
VALCO
BOX 55603
HOUSTON, TX 77055
(800) 367-8424
(713) 688-9345

Your Valve was plumbed by:

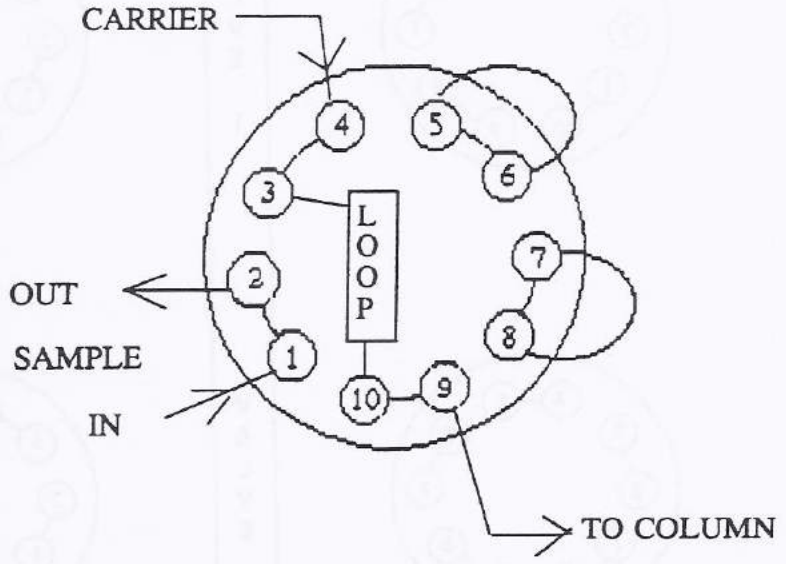
Date:

GC serial number:

LOAD POSITION - TURN SHAFT CCW



INJECT POSITION - TURN SHAFT CW



Chapter: INJECTORS & GAS VALVES
Topic: ALTERNATE LOOP SAMPLING OF TWO DIFFERENT STREAMS

REV. 9-7-91

SRI has plumbed the valve in your GC according to the accompanying schematic.

In the LOAD position:

Sample loop A is in position to be loaded while sample loop B has carrier gas flowing through it onto the column.

In the INJECT position:

Sample loop B is in position to be loaded while sample loop A has carrier gas flowing through it onto the column.

Valco's ten port valve catalog has a large assortment of plumbing applications. You can order Valco's catalog from:

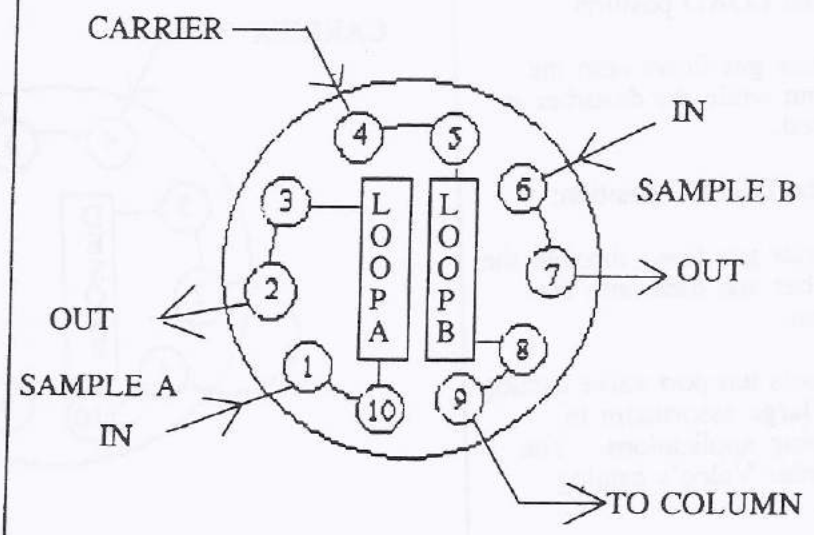
VALCO
BOX 55603
HOUSTON, TX 77055
(800) 367-8424
(713) 688-9345

Your Valve was plumbed by:

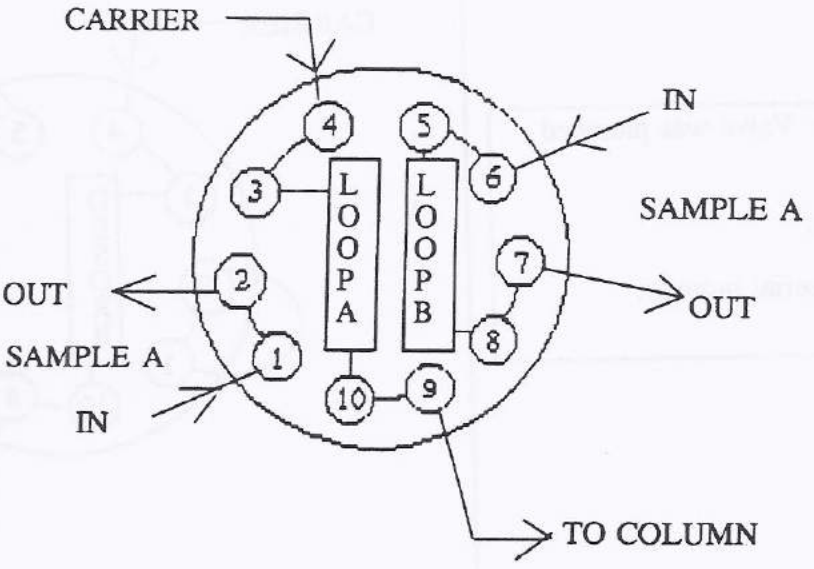
Date:

GC serial number:

LOAD POSITION - TURN SHAFT CCW



INJECT POSITION - TURN SHAFT CW



SRI has plumbed the valve in your GC according to the accompanying schematic.

In the LOAD position:

Carrier gas flows onto the column while the desorber is isolated.

In the INJECT position:

Carrier gas flows through the desorber and then onto the column.

Valco's ten port valve catalog has a large assortment of plumbing applications. You can order Valco's catalog from:

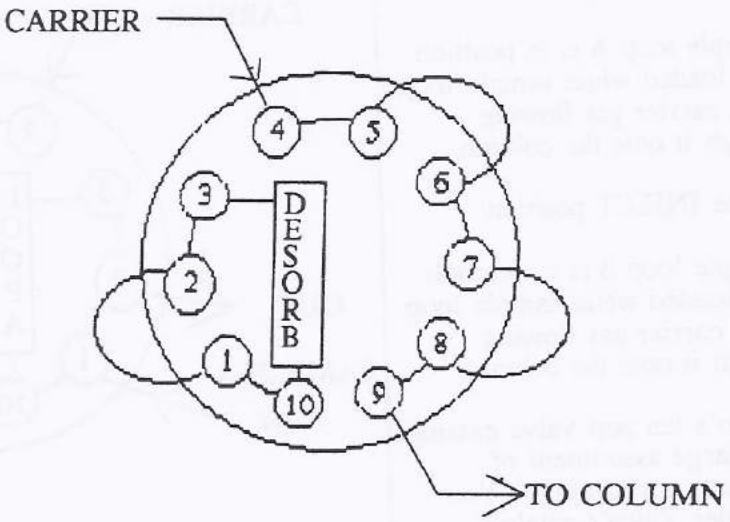
VALCO
BOX 55603
HOUSTON, TX 77055
(800) 367-8424
(713) 688-9345

Your Valve was plumbed by:

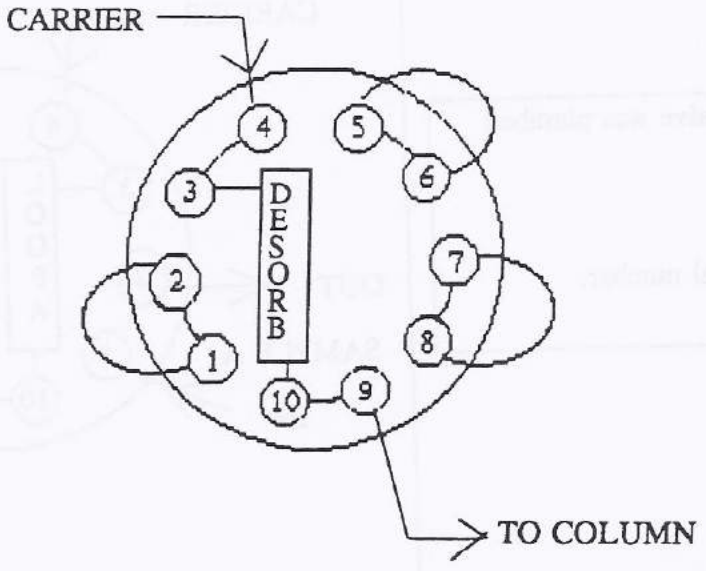
Date:

GC serial number:

LOAD POSITION - TURN SHAFT CCW



INJECT POSITION - TURN SHAFT CW



Chapter: INJECTORS & GAS VALVES
Topic: SIMULTANEOUS INJECTION OF THE SAME SAMPLE INTO TWO SEPARATE COLUMNS

REV. 9-7-91

SRI has plumbed the valve in your GC according to the accompanying schematic.

In the LOAD position:

Both sample loops are in the load position while carrier A flows onto column A and carrier B flows onto column B.

In the INJECT position:

Carrier A flows through loop A onto column A while carrier B flows through loop B onto column B.

Valco's ten port valve catalog has a large assortment of plumbing applications. You can order Valco's catalog from:

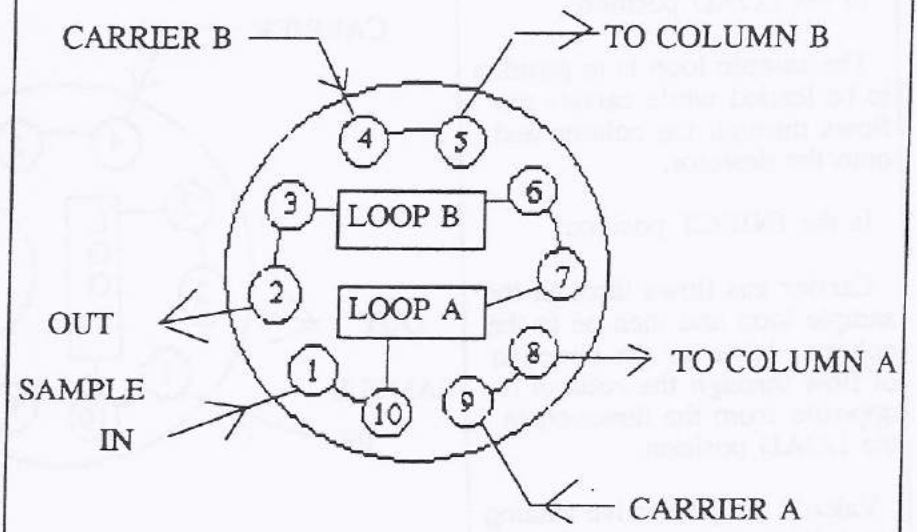
VALCO
BOX 55603
HOUSTON, TX 77055
(800) 367-8424
(713) 688-9345

Your Valve was plumbed by:

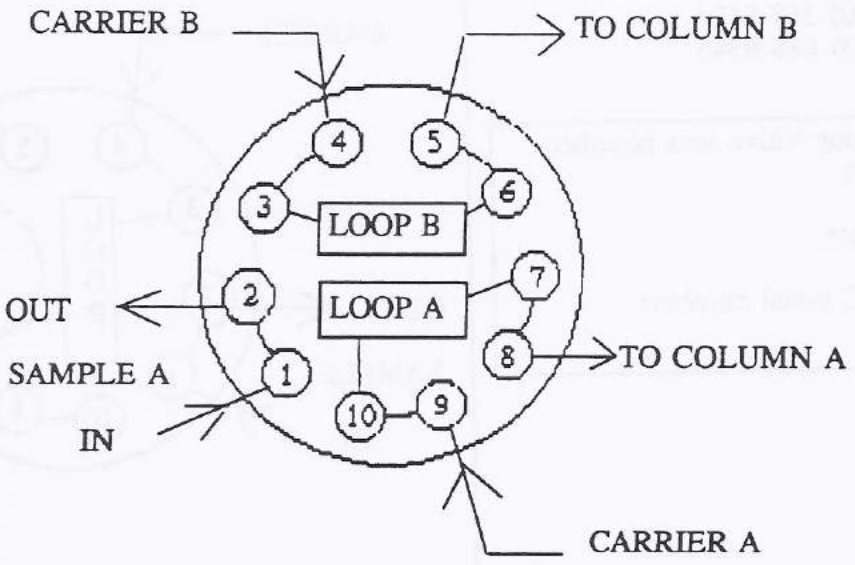
Date:

GC serial number:

LOAD POSITION - TURN SHAFT CCW



INJECT POSITION - TURN SHAFT CW



Chapter: INJECTORS & GAS VALVES
Topic: LOOP SAMPLING WITH BACKFLUSH TO DETECTOR

REV. 9-7-91

SRI has plumbed the valve in your GC according to the accompanying schematic.

In the LOAD position:

The sample loop is in position to be loaded while carrier gas flows through the column and onto the detector.

In the INJECT position:

Carrier gas flows through the sample loop and then on to the column, however the direction of flow through the column is opposite from the direction in the LOAD position.

Valco's ten port valve catalog has a large assortment of plumbing applications. You can order Valco's catalog from:

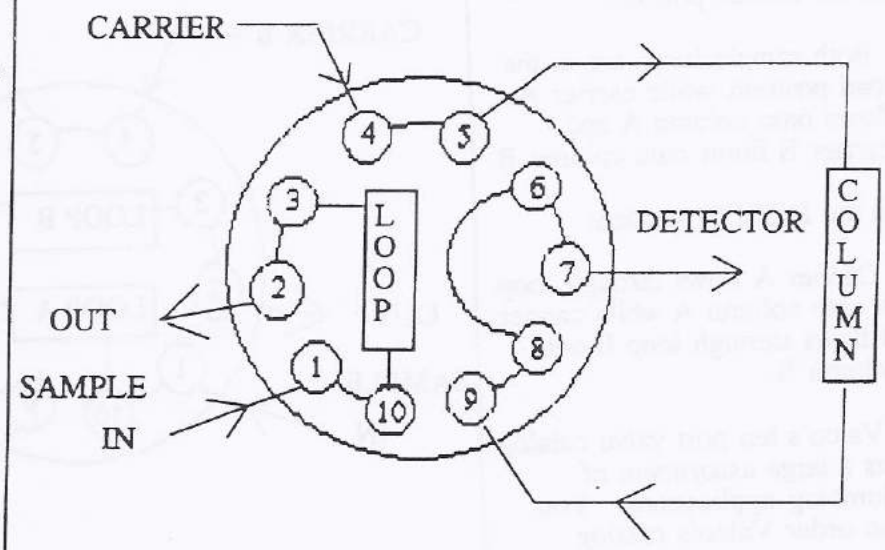
VALCO
BOX 55603
HOUSTON, TX 77055
(800) 367-8424
(713) 688-9345

Your Valve was plumbed by:

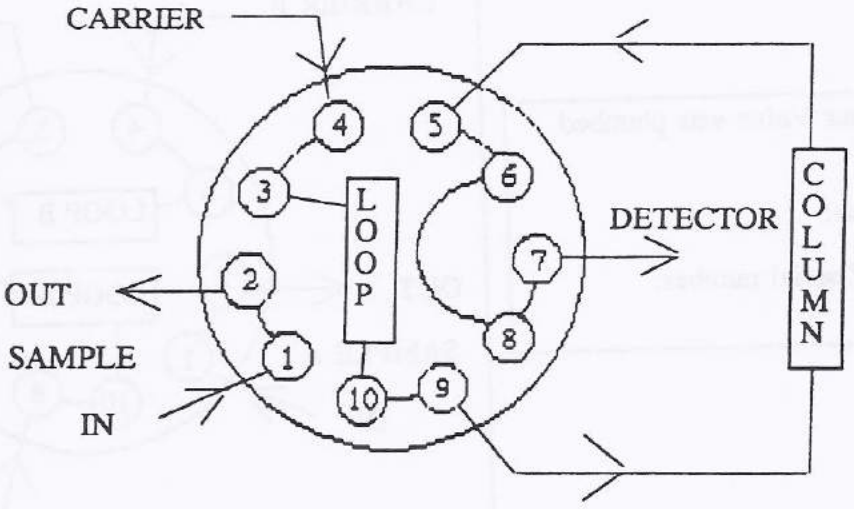
Date:

GC serial number:

LOAD POSITION - TURN SHAFT CCW



INJECT POSITION - TURN SHAFT CW



Chapter: INJECTORS & GAS VALVES
Topic: LOOP SAMPLING WITH BACKFLUSH OF PRE-COLUMN TO VENT

REV. 9-7-91

SRI has plumbed the valve in your GC according to the accompanying schematic.

In the LOAD position:

The sample loop is in position for loading. Column 1 has carrier flowing through and out the vent. Column 2 has flow from carrier 2.

In the INJECT position:

Carrier 2 is venting while carrier 1 flows through column 1 and 2. The direction of flow through column 1 in the INJECT position is reversed from the LOAD position.

Valco's ten port valve catalog has a large assortment of plumbing applications. You can order Valco's catalog from:

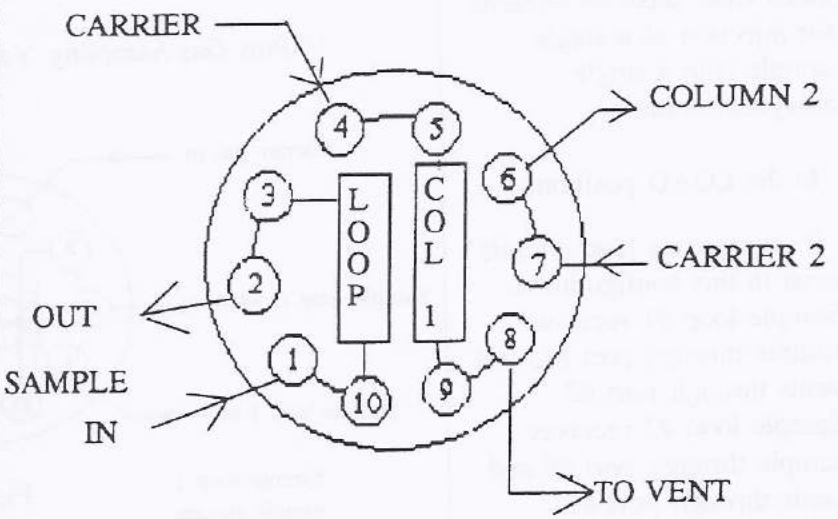
VALCO
BOX 55603
HOUSTON, TX 77055
(800) 367-8424
(713) 688-9345

Your Valve was plumbed by:

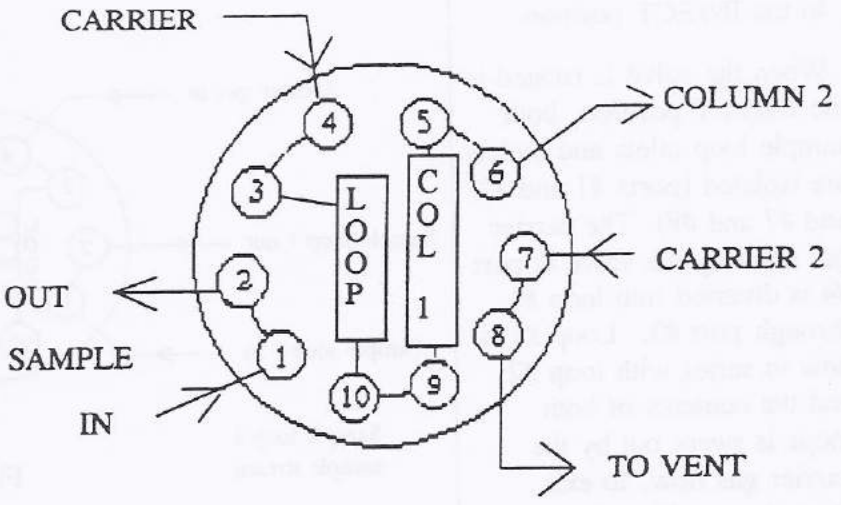
Date:

GC serial number:

LOAD POSITION - TURN SHAFT CCW



INJECT POSITION - TURN SHAFT CW



Chapter: INJECTORS & GAS VALVES

Topic: Dual Loop Injection of Two Separate Streams Onto One Column

The following is a description of the 10 port gas sampling valve plumbed to permit the loading of dual loops from separate streams for injection as a single sample onto a single analytical column.

In the LOAD position:

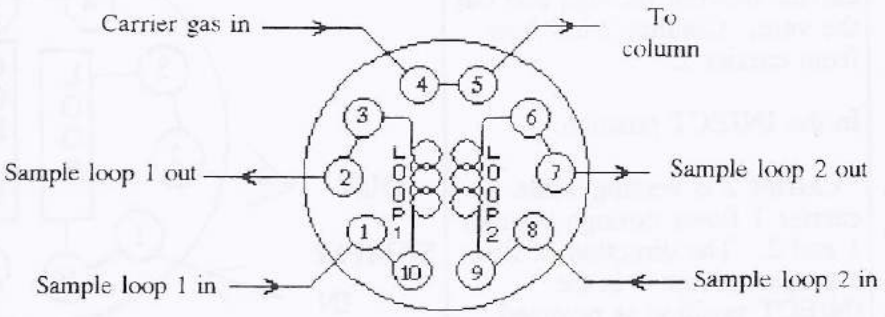
Two separate loop circuits exist in this configuration. Sample loop #1 receives sample through port #1, and vents through port #2. Sample loop #2 receives sample through port #8 and vents through port #7. Meanwhile the carrier gas is routed into port #4 from the injector, through the valve, and out through port #5 to the analytical column and detector.

In the INJECT position:

When the valve is rotated to the INJECT position, both sample loop inlets and outlets are isolated (ports #1 and #2, and #7 and #8). The carrier gas entering the valve at port #4 is diverted into loop #1 through port #3. Loop #1 is now in series with loop #2 and the contents of both loops is swept out by the carrier gas flow, to exit through port #5 to the analytical column for analysis. At no time is the carrier gas flow to the column interrupted, protecting both the column and the detector.

This gas sampling valve configuration permits two separate loops to be loaded simultaneously from two streams and injected together onto the analytical column.

10 Port Gas Sampling Valve in LOAD Position

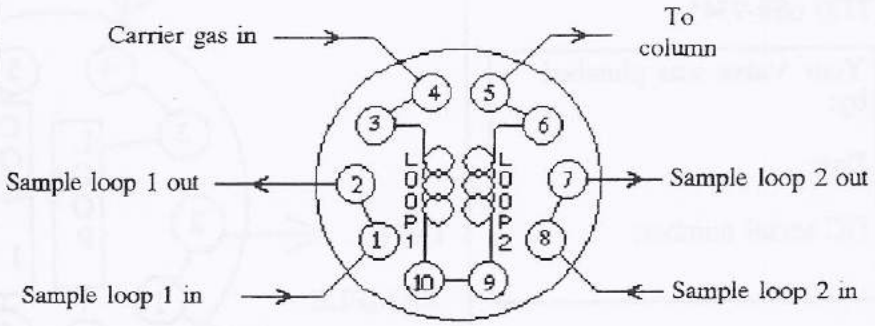


Sample loop 1 sample stream

Fig. 1

Sample loop 2 internal standard

10 Port Gas Sampling Valve in INJECT Position



Sample loop 1 sample stream

Fig. 2

Sample loop 2 internal standard

This configuration is convenient for applications where an internal standard must be inserted into the sample prior to analysis. Both samples are then merged and deposited on-column for analysis when the sampling valve is rotated to the INJECT position.

Chapter: INJECTORS & VALVES
Topic: Liquid and Loop Sampling with Backflush of Pre-column to Vent (Using External Liquid Sample Valve)

SRI has plumbed the valves in your GC according to the accompanying schematic.

In the LOAD position:

The liquid sample valve (LSV) in in position for loading while the gas sample valve is in inject position.

In the INJECT position:

Carrier gas flows through the liquid sample slot in LSV and the 10-port valve then on to the column.

The 10-port valve remains in the inject position throughout the injection procedure and then switches to load position for vent.

Valco's ten port valve catalogue has a large assortment of plumbing applications. You can order Valco's catalogue from:

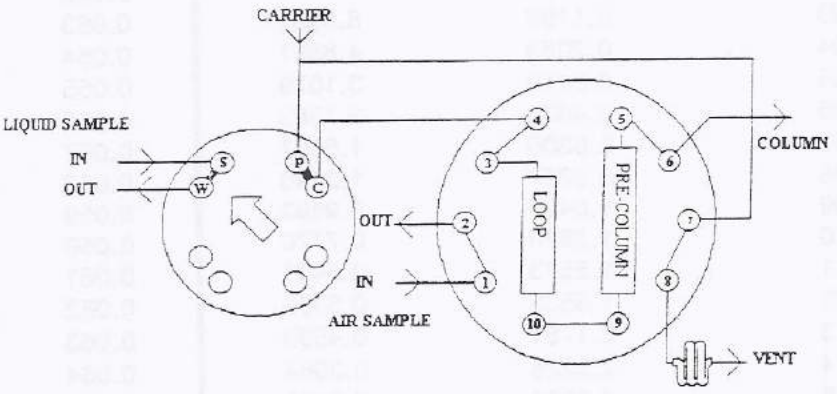
VALCO
BOX 55603
HOUSTON, TX 77055
(800) 367-8424
(713) 688-9345

Your Valve was plumbed by:

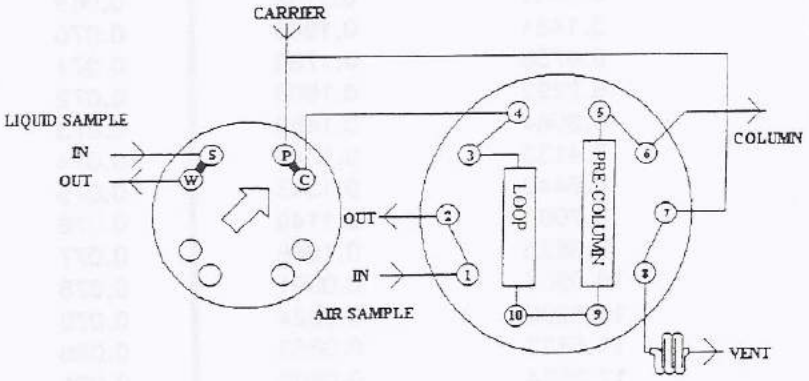
Date:

GC serial number:

LOAD POSITION



INJECT POSITION



TUBE VOLUME SELECTION GUIDE

INTERNAL DIAMETER	MICROLITERS PER INCH	INCHES PER MICROLITER
0.001	0.0129	77.6979
0.002	0.0515	19.4245
0.003	0.1158	8.6331
0.004	0.2059	4.8561
0.005	0.3218	3.1079
0.006	0.4633	2.1583
0.007	0.6306	1.5857
0.008	0.8237	1.2140
0.009	1.0425	0.9592
0.010	1.2870	0.7770
0.011	1.5573	0.6421
0.012	1.8533	0.5396
0.013	2.1751	0.4598
0.014	2.5226	0.3964
0.015	2.8958	0.3453
0.016	3.2948	0.3035
0.017	3.7195	0.2689
0.018	4.1700	0.2398
0.019	4.6462	0.2152
0.020	5.1481	0.1942
0.021	5.6758	0.1762
0.022	6.2292	0.1605
0.023	6.8084	0.1469
0.024	7.4133	0.1349
0.025	8.0440	0.1243
0.026	8.7003	0.1149
0.027	9.3825	0.1066
0.028	10.0903	0.0991
0.029	10.8239	0.0924
0.030	11.5833	0.0863
0.031	12.3684	0.0809
0.032	13.1792	0.0759
0.033	14.0158	0.0713
0.034	14.8781	0.0672
0.035	15.7662	0.0634
0.036	16.6799	0.0600
0.037	17.6195	0.0568
0.038	18.5847	0.0538
0.039	19.5758	0.0511
0.040	20.5925	0.0486
0.041	21.6350	0.0462
0.042	22.7032	0.0440
0.043	23.7972	0.0420
0.044	24.9169	0.0401
0.045	26.0624	0.0384
0.046	27.2336	0.0367
0.047	28.4306	0.0352
0.048	29.6532	0.0337
0.049	30.9017	0.0324
0.050	32.1758	0.0311

INTERNAL DIAMETER	MICROLITERS PER INCH	INCHES PER MICROLITER
0.051	33.4757	0.0299
0.052	34.8014	0.0287
0.053	36.1527	0.0277
0.054	37.5299	0.0266
0.055	38.9327	0.0257
0.056	40.3613	0.0248
0.057	41.8157	0.0239
0.058	43.2958	0.0231
0.059	44.8016	0.0223
0.060	46.3332	0.0216
0.061	47.8905	0.0209
0.062	49.4735	0.0202
0.063	51.0822	0.0196
0.064	52.7167	0.0190
0.065	54.3770	0.0184
0.066	56.0630	0.0178
0.067	57.7747	0.0173
0.068	59.5122	0.0168
0.069	61.2754	0.0163
0.070	63.0643	0.0159
0.071	64.8790	0.0154
0.072	66.7195	0.0150
0.073	68.5856	0.0146
0.074	70.4775	0.0142
0.075	72.3952	0.0138
0.076	74.3386	0.0135
0.077	76.3077	0.0131
0.078	78.3026	0.0128
0.079	80.3232	0.0124
0.080	82.3696	0.0121
0.081	84.4417	0.0118
0.082	86.5395	0.0116
0.083	88.6631	0.0113
0.084	90.8124	0.0110
0.085	92.9875	0.0108
0.086	95.1882	0.0105
0.087	97.4148	0.0103
0.088	99.6670	0.0100
0.089	101.9450	0.0098
0.090	104.2488	0.0096
0.091	106.5783	0.0094
0.092	108.9335	0.0092
0.093	111.3145	0.0090
0.094	113.7212	0.0088
0.095	116.1537	0.0086
0.096	118.6119	0.0084
0.097	121.0958	0.0083
0.098	123.6055	0.0081
0.099	126.1409	0.0079
0.100	128.7020	0.0078