STATE OF CALIFORNIA

AIR RESOURCES BOARD

AIR MONITORING QUALITY ASSURANCE

VOLUME II

STANDARD OPERATING PROCEDURES

FOR

AIR QUALITY MONITORING

APPENDIX F

AADCO MODEL 737-12 PURE AIR GENERATOR

MONITORING AND LABORATORY DIVISION

JANUARY 1989

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VOLUME II

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APPENDIX F.1

STATION OPERATOR'S PROCEDURE

FOR THE

AADCO MODEL 737-12 PURE AIR GENERATOR

MONITORING AND LABORATORY DIVISION

JANUARY 1989

F.1.0 GENERAL INFORMATION

F.1.0.1 THEORY - In conjunction with a low temperature catalyst for the destruction of methane, the AADCO pure air generator produces clean air from pressurized unclean air by chromatographic techniques. A detailed discussion of the principle of operation is contained in the Manufacturer's Instruction Manual.

This appendix supplements the manufacturer's manual with instructions for installing, servicing, and troubleshooting the pure air generator.

F.1.0.2 PNEUMATIC AND PURIFICATION CYCLE (see Figure F.1.0.1) - A compressor, contained in a separate sound-proofed module, provides compressed air for the pure air generator. After connection to the reactor module, the compressor output is "teed" to an air operated discharge unloader valve through a check valve, to the input of a compressed air reservoir (ballast tank). The ballast tank contains approximately 90 liters of compressed air at an average of 65 psig. The internal pressure is controlled by an unloader pilot valve on the ballast tank which senses the pressure. At a pressure of approximately 75 psig, the valve opens and allows a pressure head to be placed on the air-operated discharge unloader valve. The air-operated discharge unloader valve is normally closed and forces the compressor to direct compressed air into the ballast tank. However, the pressure head from the pilot valve actuates a plunger in the unloader valve, allowing the valve to open to atmosphere. The compressor, seeking the path of least resistance, pumps to the atmosphere. A horizontal check valve inline between the input of the ballast tank and the output of the compressor prevents the compressed air in the ballast tank from escaping to the atmosphere. As air is drawn from the tank during normal cycling, the internal pressure decreases. When the internal pressure in the tank reaches approximately 55 psig, the pilot valve closes and eliminates the pressure head from the discharge unloader valve. Consequently, the discharge unloader valve plunger returns to its normally closed position, forcing the compressor to once again replenish the air in ballast tank. When the internal pressure in the tank reaches 75 psig, the pilot valve opens and the compressor cycle repeats.

The AADCO produces pure air by utilizing two parallel chromatographic columns. Three-way solenoid valves at the inlet of each column direct compressed air from the ballast tank through the columns. As the air passes through a column, selective absorption removes unwanted impurities from the air. Programmed by a 60-second cam time, the solenoids cycle the air flow between the two columns at 30-second intervals. During each cycle, a portion of the clean air effluent from the column in use backflushes the unused column to remove impurities. The backflush is controlled at the output of the columns by a single purge set valve. This valve is set at the factory for optimum backflush and should not be adjusted. The backflushed stream is then vented

to atmosphere. The clean air output from each chromatographic column is directed through a pressure regulator, flowmeter and methane reactor. After passing through a cooling column, the clean air is directed to a bulkhead fitting at the rear of the reactor module, ready for use.

F.1.0.3 CAUTIONS

1. The methane reactor is hot and will burn you if you touch it.

2. There are 120 VAC terminals inside both the reactor module and compressor module. Unless absolutely necessary, disconnect AC power when working on the pure air generator.

3. The ballast tank contains compressed air. Do not disconnect any lines from the ballast tank without first slowly bleeding the pressure out of the tank.

4. The pure air generator takes approximately one hour to reach its operating dewpoint of -65EF. Do not connect the pure air generator output to any instruments before this time.

5. Do not restrict the “DUMP” outlet, as it will prevent proper backflushing of the purification columns.

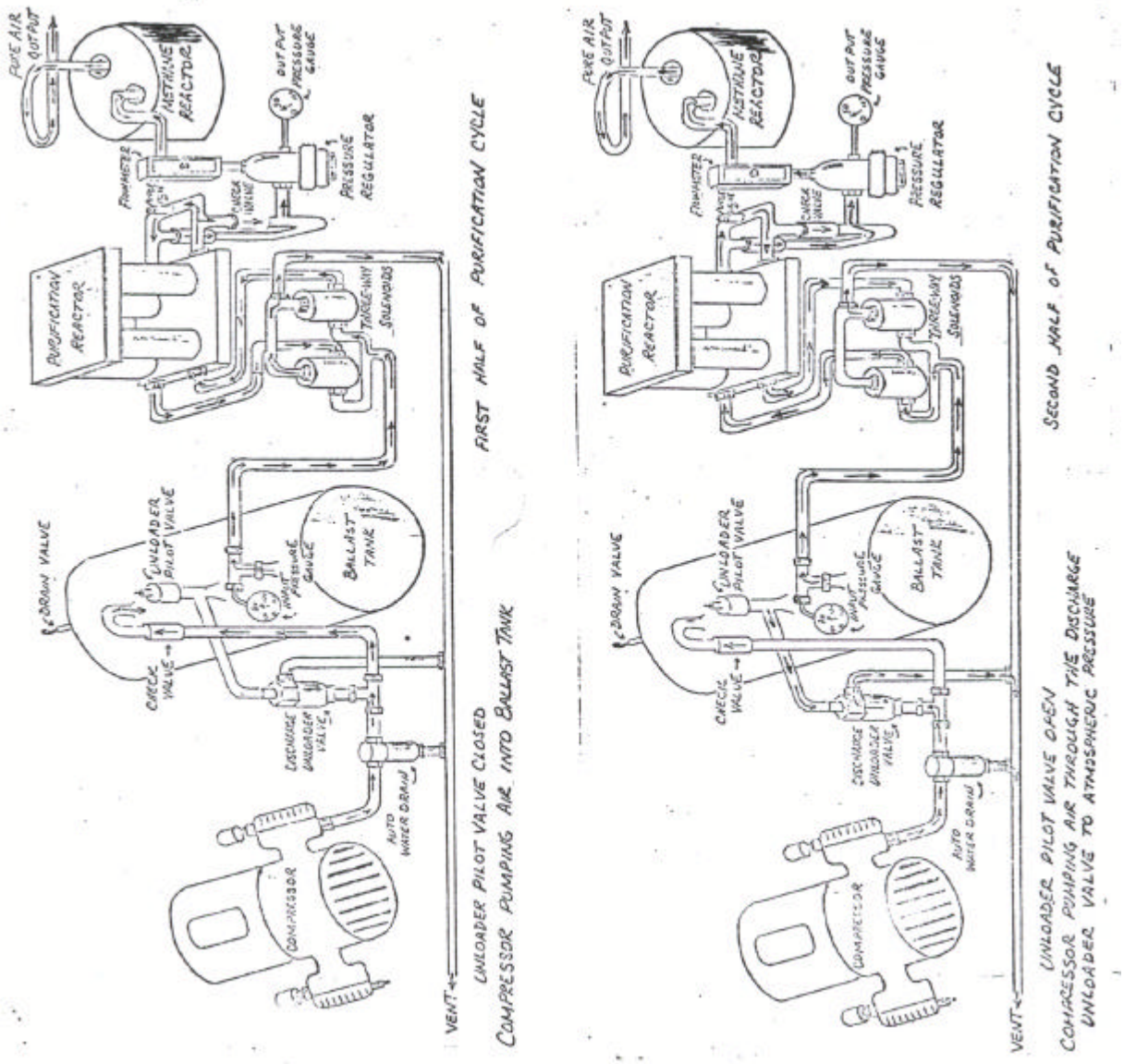

Figure F.1.0.1
Pneumatic and Purification Cycle

F.1.1 INSTALLATION PROCEDURE

F.1.1.1 PHYSICAL INSPECTIONS

Unpack the pure air generator and check for external shipping damage. Support the compressor module between two level surfaces with the bottom exposed. **DO NOT INVERT**. Remove the two red headed bolts using a 1/2" wrench (save bolts for later use). Remove the covers and check for loose fittings, broken terminal strips, loose wires, etc.

F.1.1.2 INITIAL SET-UP

Rack mount the AADCO in the 19-inch vertical instrument rack provided. Locate the pure air generator in a convenient place in the air monitoring station. Mount the compressor module immediately below the reactor module and leave at least 6 inches of free space below the compressor to prevent overheating.

F.1.1.3 MODULE CONNECTIONS

Interconnect the dump fittings, the pump fittings, and the AC power sockets from the reactor module to the compressor module using the 1/4" DEKABON tubing, flex tubing, and the short AC power cord, respectively. Connect a drain line from the 1/8" water drain outlet on the reactor module to a suitable water trap. (A small plastic container is adequate.) Connect the remaining AC power socket on the reactor module to available AC power using the longer AC power cord. The current loading for the system is approximately 15 amperes. If possible, a separate 20 ampere circuit should be designated to handle the AADCO and the Dasibi Model 1005 C2 Gas Calibrator.

F.1.1.4 START-UP

Depress the "PUMP" switch. The compressor should start, the "PUMP" indicator lamp should light and the input pressure should rise to between 70 and 75 psig and then bypass air through the unloader valve. Depress the "POWER" switch. The "POWER" indicator lamp should light, the methane reactor indicating lamp should light, and the output pressure gauge should indicate 30 psig. The input pressure should then cycle between approximately 55 and 75 psig. If the system is operating but not cycling between the proper pressures, see Section F.1.3.1. If necessary, adjust the output pressure to 30 psig. (For installations requiring a continuous compressed gas supply for operation of HC analyzers, see Section F.1.1.7.) Set the output flow adjust valve so that the indicated output flow reads between 2.0 and 4.0 on the flowmeter. Secure the

covers on both modules. Continuously run the pure air generator at the settings for 1 hour before connection to the calibrator. Initially, drain the ballast tank daily or each time the station is serviced.

This will allow the dewpoint of the output pure air to reach a steady state. If experience indicates that draining the ballast tank weekly is more than adequate, the frequency of drainage may be reduced.

F.1.1.5 SHUT DOWN

If it is necessary to shut down the AADCO, cap the pure air output, and then depress the "POWER" switch. Capping the pure air outlet prevents moisture from accumulating in the methane reactor as the reactor cools. After the output pressure decreases to zero, depress the "PUMP" switch, and the input pressure should go to zero.

F.1.1.6 CONNECTION TO THE DASIBI GAS CALIBRATION SYSTEM

See Figure F.1.1.1. The recommended tubing for connection to the calibrator is DEKABON. Connect a line from the output of the pure air generator to the air inlet of the calibrator.

F.1.1.7 USING THE AADCO AS A COMPRESSED GAS SUPPLY

In addition to supplying pure air for the Dasibi calibrator, the AADCO should be used as support air for the Beckman 6800. With the exception of teeing in a line from the pure air output of the generator to the service air input of the Beckman 6800 and operating at an output pressure of 50 psig, the connection of the pure air generator is identical to the procedure in Section F.1.1.6 (see Figure F.1.1.1).

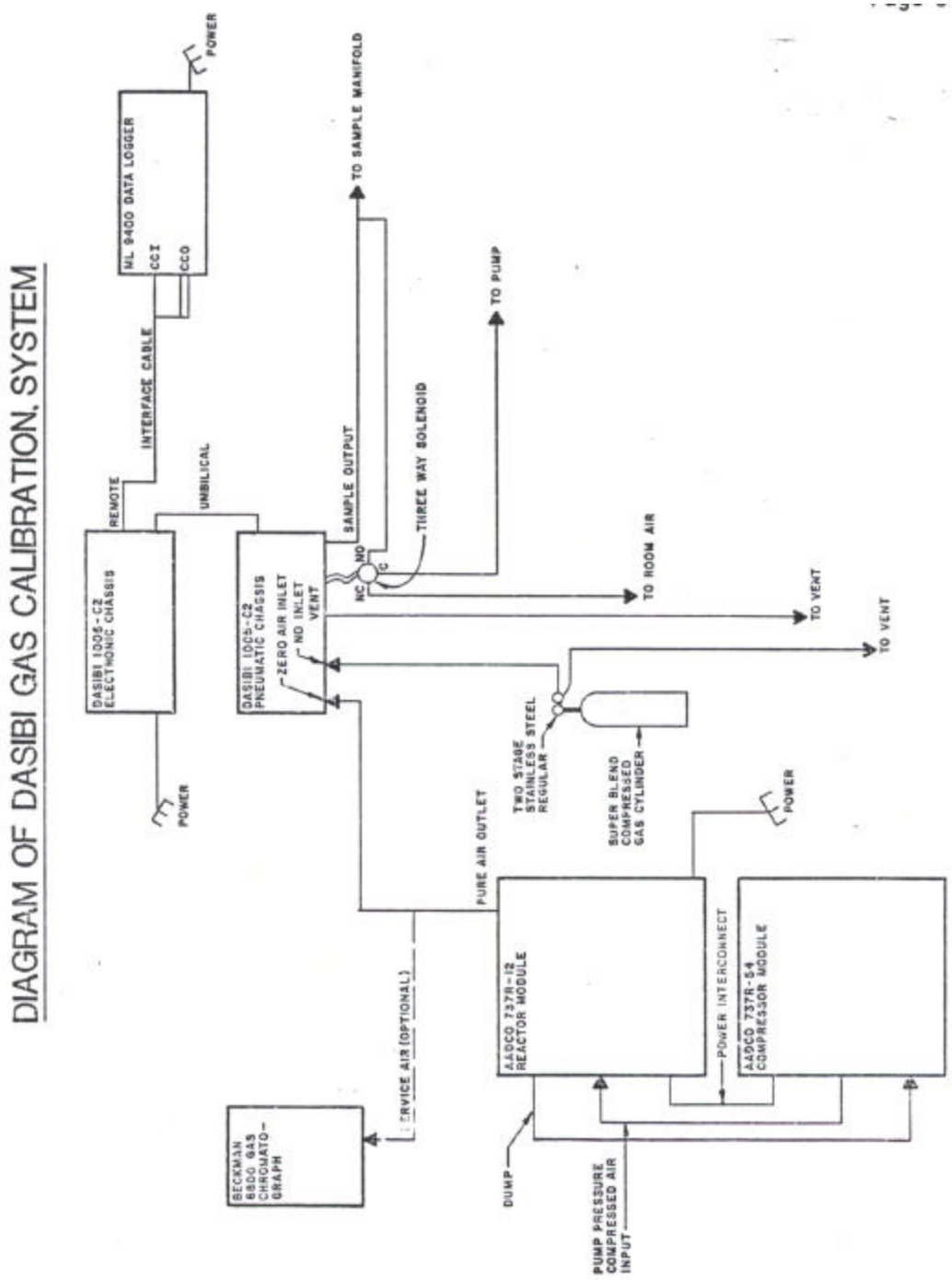

Figure F.1.1.1
Diagram of the Dasibi Gas Calibration System

F.1.2 ROUTINE SERVICE CHECKS

F.1.2.1 GENERAL INFORMATION

Perform the following service checks routinely using the attached schedule (Table F.1.2.1), and the procedures documented in this Section and in Section F.1.3. Checks may be performed more frequently but should be performed at least at the prescribed intervals. Also attached is a copy of the Monthly Quality Control Maintenance Checksheet (Figure F.1.2.1) which you should complete weekly and forward monthly to your supervisor. All daily and weekly checks should be performed with the Dasibi calibrator in the "STOP" mode.

F.1.2.2 DAILY CHECKS

1. Output Pressure - The output pressure gauge should indicate 30 psig $\pm$ 2 psig and should be constant throughout the cycling of the input pressure. Adjust, if necessary. Record the indicated output pressure weekly and every time an adjustment is made.

2. Input Pressure - As the unloader valve cycles, the input pressure gauge will cycle between 55 and 75 psig. If the pressure is not cycling between 55 psig and 75 psig, adjust the valve using the procedure given in Section F.1.3.1. Record the cycle pressures weekly and every time an adjustment is made.

3. Methane Reactor - Verify that the indicator lamp is cycling on and off, indicating proper temperature control.

4. Output Flow - Verify that the output flow meter is reading between 2.0 and 4.0, representing approximately 2-5 SLPM. Record the output flow weekly and every time an adjustment is made. Adjust, if necessary, the output flow using the procedure in Section F.1.1.6.2.

5. Check Charts Traces - Check the previous day's Dasibi calibrator data for indication of pure air generator malfunction, such as contaminated zero air or unusual span points (indicating inadequate zero air flow).

F.1.2.3 WEEKLY CHECKS

1. Duty Cycle - the 3-way solenoids at the input to the two heatless air dryer columns are timed to energize alternately every 30 seconds. There is an audible click at the actuation. Time the duration each solenoid is energized and record the times in the spaces provided on the checksheet. The time for one complete cycles should be 60 seconds ±2 seconds and there should be equal energize timing for each solenoid.

2. Input Pressure Cycle Time

   a. In the upper block, record the time the unloader pilot valve is actuated and applying pressure to the discharge unloader valve, allowing the compressor to pump to atmospheric pressure. Audible clicks at the unloader pilot valve indicate the start and finish of each cycle. During this time, and at constant output flow, the input pressure gauge should indicate a pressure loss. The cycle time should be reasonably constant from week to week. Unusually rapid loss of pressure indicates a system leak.

   b. In the lower block, record the time that the unloader pilot valve is closed and therefore, allowing the compressor to direct air into the ballast tank. Audible clicks at the unloader valve indicate the start and finish of the cycle. During this time, and at constant output flow, the input pressure gauge should be reasonably constant from week to week. An unusually long cycle time may indicate that the compressor should be rebuilt.

3. Drain Ballast Tank - Drain the water from the ballast tank by opening the toggle valve on the reactor module. The frequency of this check should be varied, depending upon your experience at a particular site.

4. Methane Reactor Temperature - On those units equipped with a methane reactor temperature measuring circuit, record the temperature. The temperature should be 290E± 10EC.

F.1.2.4 MONTHLY CHECKS

1. Fans - Verify that both fans in the compressor module and the one fan in the reactor module are operating. Failure of either of the fans in the compressor module may result in overheating and thermal shutdown of the compressor.

2. Discharge Unloader Valve - Monthly, lubricate the plunger “O”-ring. See Section F.1.3.2 for lubrication procedures of the “O”-ring.

3. Compressor Safety Relief Valve - Check the valve for leakage at the relief ports. Excessive leaks may prevent the build-up of proper input pressure.

F.1.2.5 QUARTERLY CHECKS

1. Solenoid Leak Check - Disconnect the line from the auto water drain to the vent and cap both ends. Monitor the purge flow at the “DUMP” of the reactor module during the last 4 seconds of the 30-second cycle for each solenoid. There should be no flow during this period. Isolate the malfunctioning solenoid by disconnecting each electrical quick connect and repeating the test.

2. System Leak Check (Methane Reactor Leak Check) - Cap the “PURE AIR” outlet. Pressurize the system to normal pressures. At the end of the five minutes, observe the output flowmeter. The flowmeter should read zero flow. This procedure only checks the methane reactor and associated tubing downstream of the flowmeter. Several problems have been detected in this area.

F.1.2.6 ADDITIONAL CHECKS

1. Auto Water Drain Filter - Replace this filter as it becomes coated with dirt. Frequency of replacement will be determined by air monitoring station location, and by the load on the compressor. One good indication that the filter is dirty is that the compressor safety relief valve will start “poppin”. If this occurs, replace the filter immediately or the compressor may be damaged.

2. Unloader Pilot Valve - As required, clean and readjust the unloader pilot valve using the procedure in Section F.1.3.1.

3. Compressor - As required, rebuild the compressor using the procedure in Section F.1.3.3.

Table F.1.2.1

Maintenance Schedule for the
AADCO Model 737-12 Pure Air Generator

	Daily*	Weekly	Monthly	Quarterly	Four Month Intervals
Input Pressure	X				
Output Pressure	X				
Output Flow	X				
Methane Reactor	X				
Duty Cycle		X			
Input Pressure Timing Cycle		X			
Drain Ballast Tank		X			
Q.C. Checksheet		X	X		
Fans			X		
Compressor Safety Relief Valve			X		
Discharge Unloader Valve			X		
Solenoid Leak Check				X	
System Leak Check				X	
Rebuild Compressor	As Required				
Auto Water Drain Filter	As Required				
Unloader Pilot Valve	As Required				

*or each day the operator services the analyzer.

CALIFORNIA AIR RESOURCES BOARD
MONTHLY QUALITY CONTROL MAINTENANCE CHECKSHEET
AADCO MODEL 737-12 PURE AIR GENERATOR

LOCATION:_____ MONTH/YEAR:_____
STATION NUMBER:_____ TECHNICIAN:_____
PROPERTY NUMBER: REACTOR_____, COMP._____ AGENCY:_____

DATE	INPUT PRESSURE				OUTPUT PRESSURE		OUTPUT FLOW		TIMING		METHANE REACTOR TEMP.
	LOWER		UPPER						DUTY CYCLE (SEC.)	INPUT PRESS. (SEC.)	
	AS FOUND	FINAL	AS FOUND	FINAL	AS FOUND	FINAL	AS FOUND	FINAL			
									/	/	
									/	/	
									/	/	
									/	/	
									/	/	
									/	/	
									/	/	
									/	/	

OPERATOR INSTRUCTIONS:

1) DAILY CHECKS: INPUT PRESSURE, OUTPUT PRESSURE, OUTPUT FLOW, METHANE REACTOR CYCLING, (RECORD WEEKLY) CHECK CHART TRACES.
2) WEEKLY CHECKS: DUTY CYCLE TIMING, INPUT PRESSURE CYCLE TIMING.
3) MONTHLY CHECKS: FANS, COMPRESSOR SAFETY RELIEF VALVE, DISCHARGE UNLOADER VALVE, DATE CHECKED:_____.
4) QUARTERLY CHECKS: SOLENOID SYSTEM LEAK CHECK: DATE LAST CHECKED:_____.
5) AS REQUIRED: REPLACE AUTO WATER DRAIN FILTER, CLEAN AND READJUST UNLOADER PILOT VALVE. REBUILD COMPRESSOR: DATE LAST REBUILT:_____.

DATE	COMMENTS OR MAINTENANCE PERFORMED:

PTSD -27 (9/83)

REVIEWED BY:_____DATE:_____

Figure F.1.2.1
Monthly Quality Control Maintenance Checksheet

F.1.3 DETAILED MAINTENANCE PROCEDURES

F.1.3.1 CLEANING AND ADJUSTING THE UNLOADER PILOT VALVE (See Figure F.1.3.1.) Since the unloading ball is the only vital moving part in the unloader pilot valve, the valve should require very little servicing. To insure proper operation, the filter screen and the inside of the unloader valve must be kept clean. To clean, disassemble the valve and clean all parts with alcohol. Lubricate all parts with a light coat of silicone oil and reassemble.

If the valve has been disassembled for cleaning, or if the pressure settings are improper, the valve must be readjusted. This is done using the following procedure:

1. A preliminary adjustment must be made before attempting to set either the unloading (high pressure) or the differential (low) pressure. Loosen the locknut (Part 1) and turn the differential pressure adjusting screw (Part 2) clockwise until it bottoms (not forced). Then, back the screw off one half turn.

2. With the system operating, adjust the high pressure by loosening the locknut (Part 3) and adjusting the unloading pressure adjustment screw (Part 4). A clockwise rotation of the screw increases the unloading pressure; counterclockwise decreases the pressure. Set the high pressure between 70 and 75 psig. Verify that at this pressure, the compressor safety relief valve is not popping off. If it is, refer to Section F.1.4-Troubleshooting. Under no circumstances should the factory preset compressor relief valve be reset. Tighten the locknut.

3. Set the low pressure settings to 55 $\pm$5 psig, by adjusting the differential pressure adjusting screw. Turn this screw in 1/8th turn increments; clockwise to increase the pressure and counterclockwise to decrease the pressure. Tighten the locknut.

4. Observe the pneumatic cycling and, if necessary, readjust the valve.

F.1.3.2 CLEANING AND LUBRICATING THE AIR OPERATED DISCHARGE UNLOADER VALVE (See Figures F.1.3.2 and F.1.3.3 for the numbered locations) - The plunger with the “O”- ring is the only free moving part in the unloader valve and moves back and forth within the plunger body. The constant cycling of this “O”- ring causes it to dry out and may actually cause the valve to “stick” open. This will result in fluctuating output pressures and low input pressures. The definitive symptom of this problem is a continuous flow of air out the unloader valve exhaust port to the dump. Periodic valve and “O”- ring lubrication will remedy this problem. The procedure follows:

1. Shut down the system and bleed all pressure from the ballast tank.

2. Remove the unloader valve from the system. This is most easily accomplished by first loosening the nuts at occasions 1, 3, and 5. Using a large wrench, grasp the tee fitting which is screwed to the most forward hole of the ballast tank and rotate the entire fitting, with connections, slightly counterclockwise. This will relieve the tension of the connections and the unloader valve should slip out.

3. Using two large wrenches placed at locations 2 and 4 disassemble the valve. The base, spring, valve, seat disc, and one screw will be in one piece and the valve "O"- ring and plunger body will be in the second piece.

4. Place the left end of the plunger body on a smooth, clean surface and insert a small rod through the fitting (10) until the internal parts are exposed. Clean all parts with alcohol and then lubricate each part with a very light coat of silicone oil.

5. Return the plunger to the cleaned chamber and seat it at the bottom of the plunger body. Replace the valve seat, insuring that the single-shoulder side is facing in. Replace the valve "O"- ring and gently press it into place with a flat screwdriver blade.

6. Wipe the valve seat disc with a soft cloth and then reassemble the unloader valve. Tighten the connections and reinstall the unloader valve, reversing the operation of Step 2 above.

NOTE: It is imperative that the valve is properly oriented so that the base is towards the compressor. See Figure F.1.3.3 for confirmation of proper assembly.

F.1.3.3 <u>REBUILDING THE COMPRESSOR</u> (See Figure F.1.3.4 and F.1.3.5)

1. General Information - The pump base is supported by four spring shock mounts, loosely retained by four steel rods with a tinnerman nut on each end. Tinnerman nuts are retained by a spring steel clip which will grip a smooth steel rod and lock in place when pushed on.

2. Removal of the Compressor from the Silencer Housing.

   a. Remove the spreader rod from the cooling fan housings.

b. Remove the compressor power cord from the terminal strip on the back of the silencer housing.

c. Disconnect the air pressure line from the compressor.

d. Remove both filter holders from the heads.

e. Place a 2-inch block under one cylinder head and lay the compressor case over on its side, with the 2-inch block supporting the cylinder head. Then, with a pair of water pump pliers, remove the four tinnerman nuts on the silencer housing bottom. The nuts may be removed by gripping them with pliers and working the pliers back and forth while pulling. If the tinnerman nuts are removed with care, they may be reused.

f. Set the compressor case upright and lift the compressor from the case.

3. Compressor disassembly - Do not lubricate the oilless piston pump! The teflon impregnated rings are self-lubricating. The motor bearings are sealed and cannot be lubricated. Do not flush the pump out with solvent, alcohol, or acetone. Clean the stainless steel valves with water. All other parts may be cleaned with cleaning solvents. The compressor is disassembled as follows:

a. Remove the cooling fan shroud.

b. Loosen all cylinder head screws (4 each head), but do not remove them at this time.

c. Loosen the two manifold nuts, one on each head.

d. Remove the cylinder screws (2 each cylinder) and remove the cylinder assemblies.

e. Remove the cylinder heads.

NOTE: Be sure to note each head valve and valve plate position as they are disassembled.

4. Compressor Assembly - The part numbers that are to be replaced are circled on Figure F.1.3.4. Use the following procedure for replacing the worn parts and reassembling the compressor.

4. Compressor Assembly - The part numbers that are to be replaced are circled on Figure F.1.3.4. Use the following procedure for replacing the worn parts and reassembling the compressor.

   a. Install the new piston seals, piston rings and rider rings on each piston rod assembly. Situate the piston ring joints opposite each other and the rider ring joints at 90Eangles.

   b. Install the cylinders to the motor bracket with the cylinder crews and lock washes. Tighten the screws finger tight. Move the piston to top dead center. Adjust each cylinder flush (using straight edge) with the tops of the piston and tighten the cylinder screws.

   c. On each cylinder head, install the new valves and gaskets in reverse order of disassembly. Attach one head to the cylinder and tighten the head bolts. Before the second head is installed, the manifold must be positioned between the heads. First, install both nuts and a new sleeve on each end of the manifold. Then, position the manifold into the elbows on the pump heads. Start the manifold nuts on the elbows and tighten them finger tight. Install the second cylinder head in the cylinder and tighten the head screws.

   d. Tighten the manifold nuts on each head.

   e. Install the cooling fan shroud.

5. Reinstallation of the compressor in the Silencer Housing.

   a. Reinstall the compressor in its case by inserting the four steel rods, with a tinnerman nut in one end, through the bottom of the pump case. Then, set the pump case on a flat surface which prevents the rods from sliding out when the pump is installed.

   b. Install one shock mount spring over each steel rod. Insure that each spring is firmly seated on the pump guide mounting bracket.

   c. Lower the pump into the case, guiding the four steel rods through the pump mounting bracket holes. Make sure that the four pump shock mount springs are firmly seated on the pump guide mounting bracket.

d. Tighten the tinnerman nuts on the steel rods. Do this by depressing pump shock mount springs (exposing rod ends) and pushing the nuts firmly on the rods. If spring clips are not damaged, they will grip the rods.

e. Install the filter holders with new felt filters. Filters are held in place by a rivet stud which can be easily removed.

f. Install the air pressure line.

g. Install the power cord to the terminal strip on back of the silencer housing.

h. Install the spreader rod on the cooling housings and adjust so that there is no clearance between the silencer housing and cooling fan housings.

i. Plug the compressor into a suitable outlet and verify proper operation. Reinstall the compressor in the instrument rack and reconnect it to the reactor module.

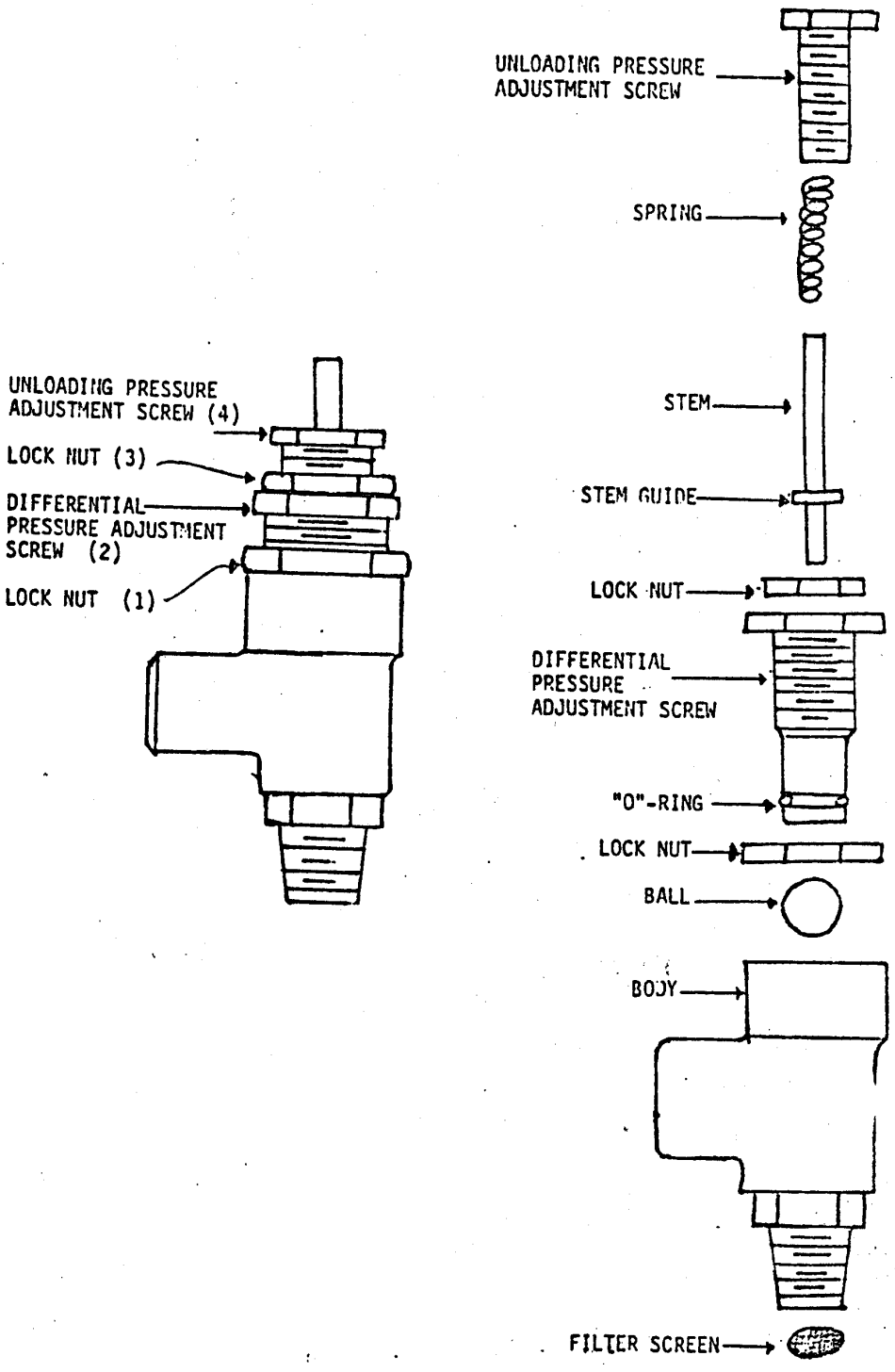

Figure F.1.3.1
Exploded View - Unloader Pilot Valve

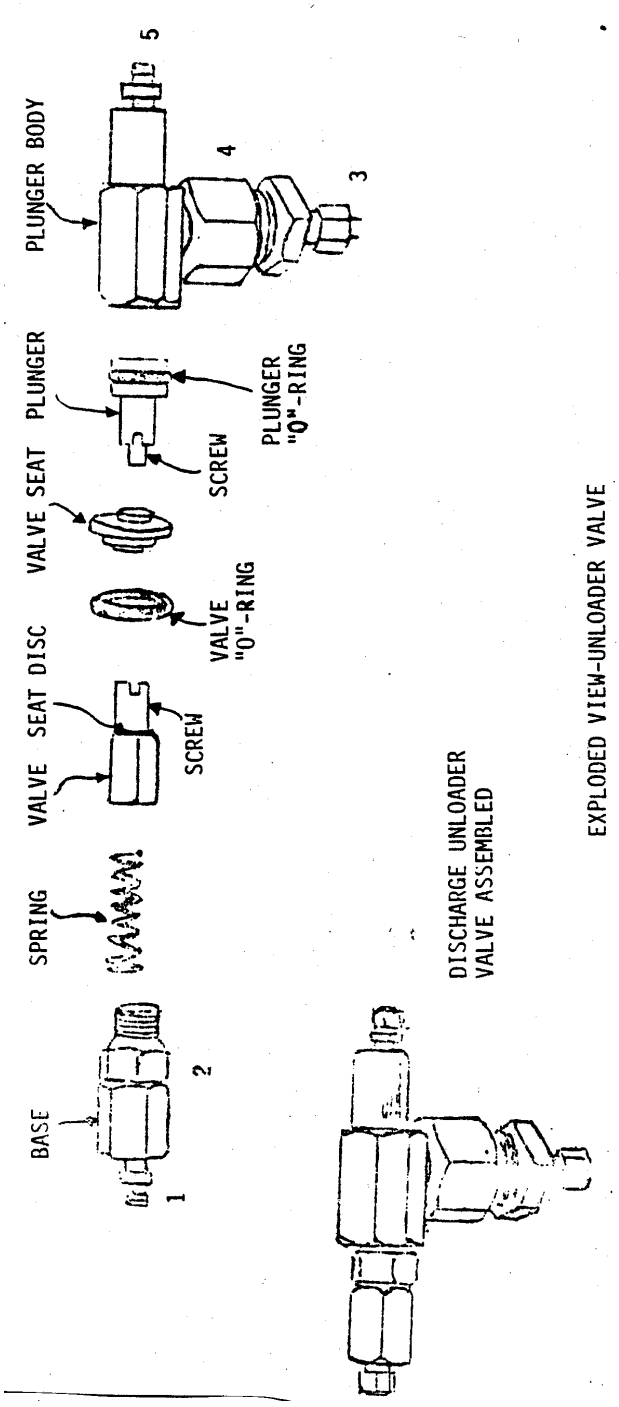

Figure F.1.3.2
Exploded View - Discharge Unloader Valve

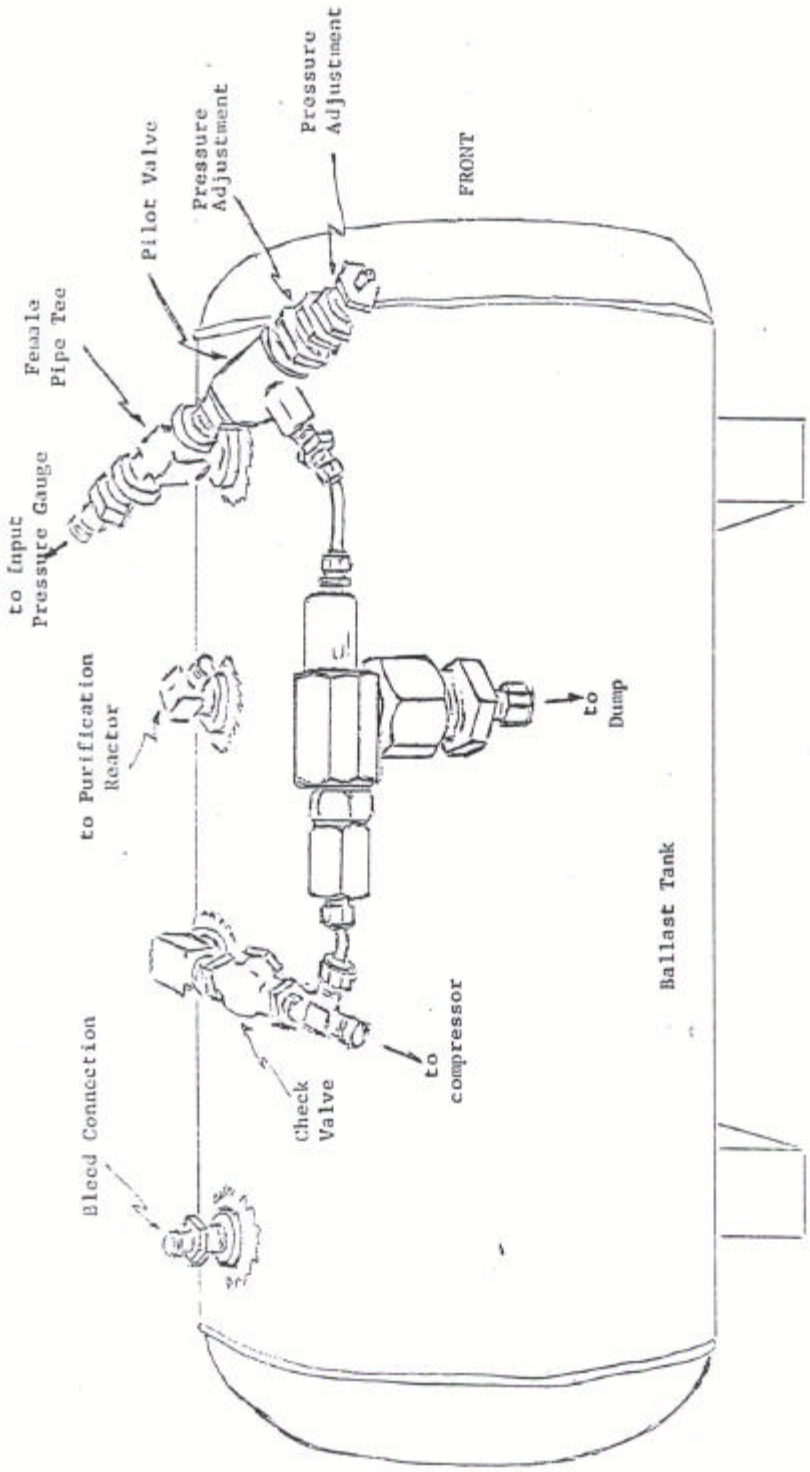

Figure F.1.3.3
Pilot Valve/Unloader Valve System

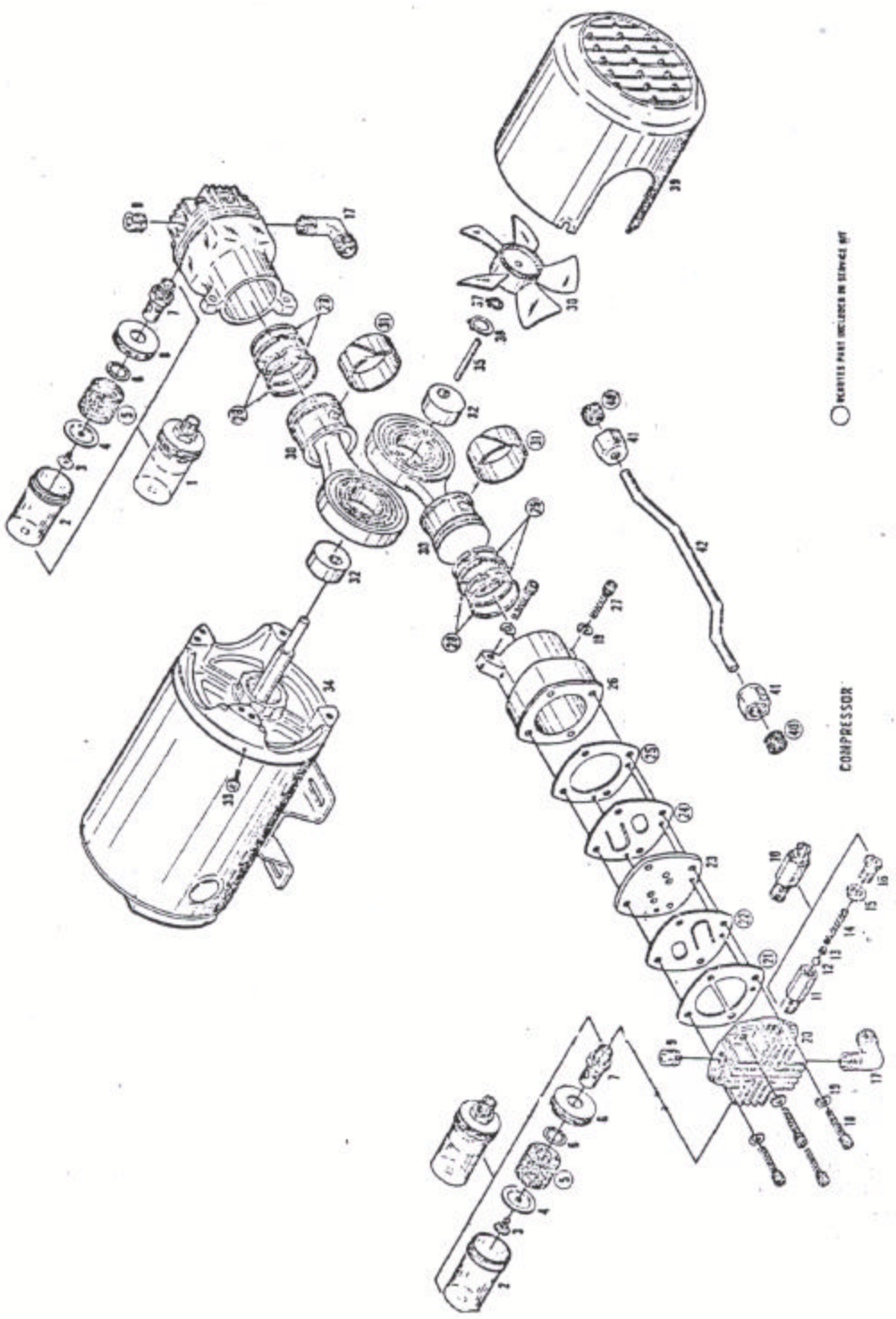

Figure F.1.3.4
Gast Compressor Schematic

REF. NO.	PART NO.	DESCRIPTION	QUANTITY REQUIRED 5HCD
1	B300A	INLET FILTER	2
2	B306	JAR	2
3	B378	RIVET STUD	2
4	AA730	END CAP	2
5	B344A	FELT	2
6	B307	RETAINING RING	2
7	B303	BODY	2
8	B305	CAP	2
9	BA503	PIPE PLUG	2
10	AF570S	SAFETY VALVE	1
11	AF608	BODY	1
12	ST14A	VALL	1
13	AF579	SPRING BUTTON	1
14	AF609	SPRING	1
15	AA96A	LOCK NUT	1
16	AA314	ADJUSTMENT SCREW	1
17	AF537A	MANIFOLD ELBOW	2
18	BB619	HEAD SCREW	8
19	BC115	LOCKWASHER	12
20	AF507	CYLINDER HEAD	2
21	AF520	HEAD GASKET	2
22	AF545	VALVE OUTLET	2
23	AF543	VALVE PLATE	2
24	AF544	VALVE INLET	2
25	AF521	CYLINDER GASKET	2
26	AF509	CYLINDER	2
27	BB619	CYLINDER SCREW	4
28	AF541	PISTON RING	4
29	AF540	PISTON SEAL	4
30	AF561	PISTON ROD ASSEMBLY	2
31	AF595	RIDER RING	2
32	AF515D*	ECCENTRIC	2
33	BB411	SCREW	4
34	AF500D*	BRACKET	1
35	AB136D	SQUARE KEY	1
36			
37	AC446	RETAINING RING	1
38	AF547	FAN	1
39	AF549	SHROUD	1
40	AF567A	MANIFOLD SLEEVE	2
41	AF568	MANIFOLD NUT	2
42	AF550B*	MANIFOLD	

To rebuild model 5HCD, order service kit number K263

*When corresponding or ordering spare parts, please give complete model and/or serial number

Figure F.1.3.5
Parts List - Gast Model 5HCD Compressor

F.1.4 TROUBLESHOOTING

F.1.4.1 GENERAL INFORMATION - The Manufacturer's Instruction Manual contains information pertaining to troubleshooting and should be your first source of information. Additional problems which have occurred are outlined below. Space is provided on the Monthly Q.C. Checksheet for recording malfunctions, causes, fixes, and actions taken to prevent reoccurrences.

Cautions listed in Section F.1.0.3 should be observed while performing any troubleshooting or maintenance on the pure air generator.

F.1.4.2 ELECTRICAL MALFUNCTIONS

Problem	Probable Cause	Fix
Power Fuse Blown	Short circuit in Methanator	Replace Methanator
Compressor running intermittently	Compressor overheating	Verify fans are operating. If not, replace fans Increase free air space below compressor
Momentary loss in output pressure at the end of each solenoid duty cycle.	Solenoid timing problem	Check cam timer wiring

F.1.4.3 FLOW MALFUNCTIONS

Problem	Probable Cause	Fix
Low input pressure or inability to maintain proper input pressure	O-ring in discharge unloader sticking	Lubricate O-ring (See Section F.1.3.2).
	Compressor relief valve leaking	Replace relief valve.
	Improper settings on unloader pilot valve	Reset valve using procedure in Section F.1.3.1
	Compressor aging	Rebuild compressor. Use procedure given in Section F.1.3.3.
Pump relief valve relieving (popping off)	Auto-water drain filter plugged	Replace bronze filter element in auto water drain.
Unable to vary output flow	Sticking flowmeter	Clean flowmeter
High output flow or flowmeter pegged	Leak in methanator	Check lines between methan or and flowmeter for leaks. If no leaks replace methanator.