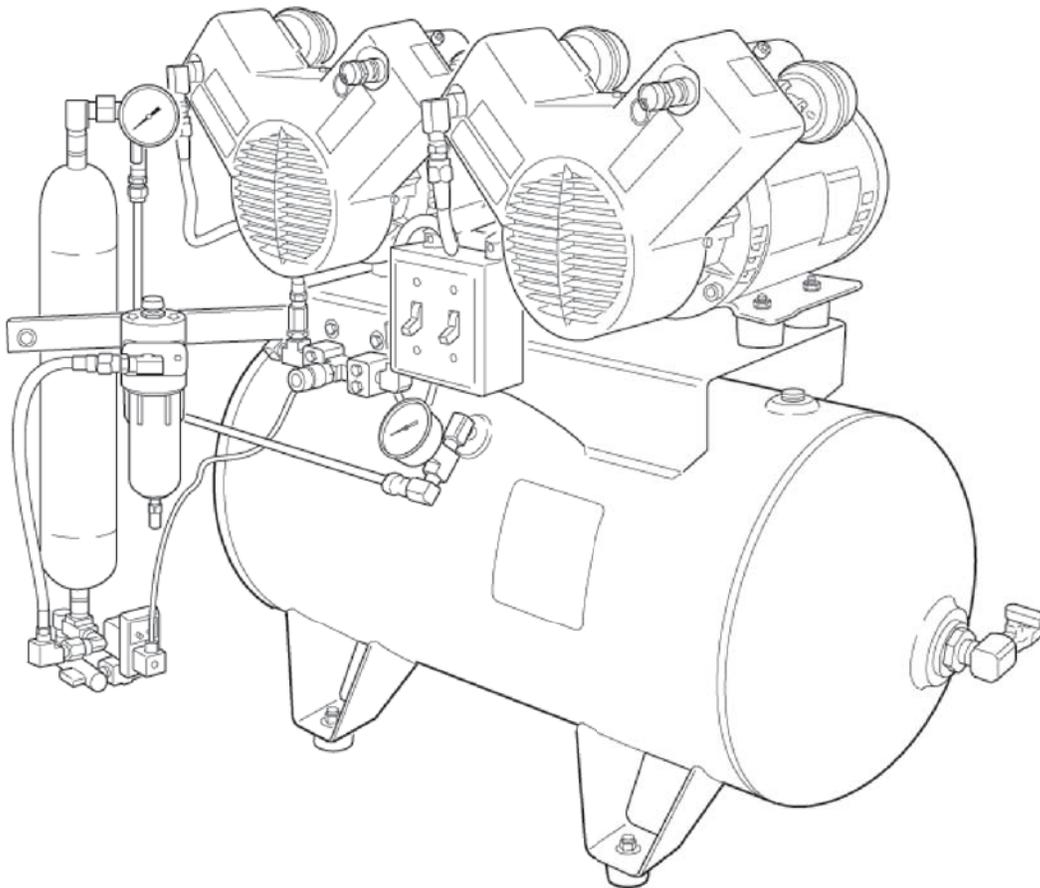


# Compressor Service & Maintenance Manual

## C Series COMPRESSOR

- (D)C1103
- (D)C1203
- (D)C2106
- (D)C2206
- (D)C3210





## Compressor Service, Maintenance, and Parts Manual

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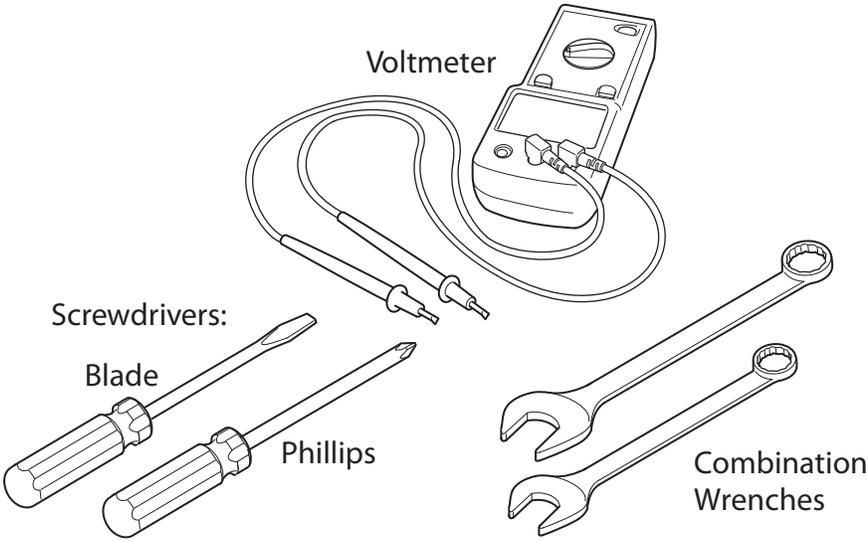
### **Section V ILLUSTRATED PARTS BREAKDOWN**

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**Introduction**

This manual contains the necessary information to perform all “field serviceable” aspects of the DCI Oil-less Air Compressor line. Please take the time to read this manual and understand the proper operation and service procedures before attempting to service this machine. Our unique dryer purge system operates much differently than conventional air compressors. Understanding the proper operation and design will ensure years of dependable operation.

Below is a listing of the basic tools required to properly service this equipment.



If you have any questions or need assistance in regards to any aspect of the service and / or repair of this machine, please contact the DCI Technical Support Department at:

Technical Support  
1-800-624-2793

## INTRODUCTION

This manual contains the necessary instructions for the maintenance and/or service of the DCI air compressors.

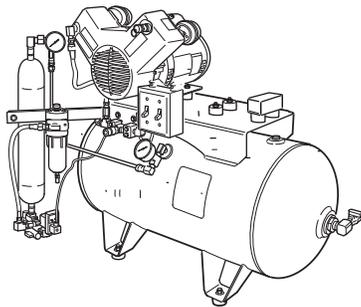
There are 3 basic configurations available; single and dual head available in 115V and 230V, and the triple head available in 230V.

NOTE: ALL VOLTAGES +/- 5%

### Configurations

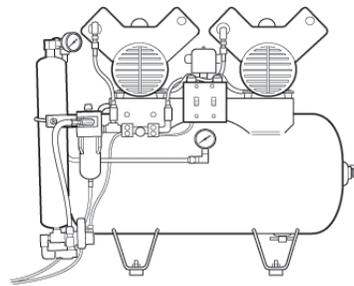
1. Single 1 horsepower compressor head on 20 gal. Horizontal tank. (See Fig. A)
2. Dual 1 horsepower compressor heads on 20 gal. Horizontal tank. (See Fig. B)
3. Dual 1 horsepower heads on 30 gal. horizontal tank. (Not Shown)

Fig. A

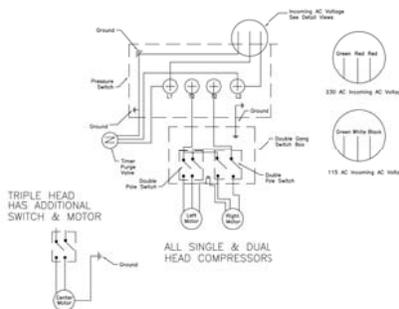


Picture of Single  
Horizontal Compressor  
Model #C1103 & #C1203

Fig. B



Picture of Dual  
Horizontal Compressor  
Model # C2106 & #C2206



Picture of Triple  
Horizontal Compressor  
Model # C3210

**Model Specifications**

**MODEL SPECIFICATIONS**

Model	CFM @ 80PSI	Total HP	Tank Capacity	Dimensions (inches)			Voltage	Amps	Circuit Breaker
				L	D	H			
C1103	3.95	1	20	34	24	29.5	115	13.4	15
C1203	3.95	1	20	34	24	29.5	230	6.7	10
C2106	7.95	2	20	34	24	29.5	115	26.8	30
C2206	7.95	2	20	34	24	29.5	230	13.4	15
C3210	11.85	3	30	46	26	36	230	21.1	30

NOTE: ALL VOLTAGES ARE +/- 5%

MODEL NUMBER	MAXIMUM SIMULTANEOUS USERS
C1103	3
C1203	3
C2106	6
C2206	6
C3210	10

NOTE: Number of users based on 1.5cfm @ 80psi per user. Additional equipment such as air abrasion units, blow-guns, and lab equipment should be factored into the system requirements.

Site Requirement Templates and additional technical information available through our Technical Service Department.

## THEORY OF OPERATION

### While Running

To start the compressor, the user shall activate the compressor head or heads with the power switches located on the front center of the machine. The selected motors will then begin to run and build pressure in the tank and piping system.

- A. The air is taken in through the intake filters, located on the rear of each compressor cylinder. The dirt and dust is filtered out of the intake filter to 5 microns in this process.
- B. The air is then compressed with the pistons in each cylinder, and then travels through the after-cooler (copper) tubing, which cools the air to help condense any moisture “humidity” taken in during the process of compression.
- C. The wet / dirty compressed air and condensed moisture then travel through a coalescing filter assembly. This filter allows the condensed moisture to fall to the bottom of the filter bowl via gravity, where it will be automatically expelled via the float drain contained in the bottom of the filter bowl. The compressed air also travels through the coalescing filter element, which removes 99.998% of all particles down to 0.01 microns. A filter change indicator located on the top of the filter housing shows the condition of the element, and alerts the operator as to when the element is in need of replacement. GREEN indicates the element has more useful life, while RED indicates the element is in need of replacement.

**NOTE:** The indicator only functions while compressed air is traveling through the filter with compressor running. The indicator will ALWAYS read “GREEN” with compressors not running.

- D. The compressed air then travels through the bottom of the desiccant “drying chamber”, where the remaining contained moisture is reduced to a pressure dewpoint of -100°F, and then travels into the main storage tank for use in the dental operatory.
- E. When reaching its cut-off pressure of 100psi, the pressure switch will open and the compressor motors will stop.

**NOTE:** The time operated dryer purge valve DOES NOT open and purge when compressor stops, as it does on most competitive brands. See Theory of Operation “While Not Running” for more information as to the proper operation of our purge valve.

## Theory of Operation

## THEORY OF OPERATION

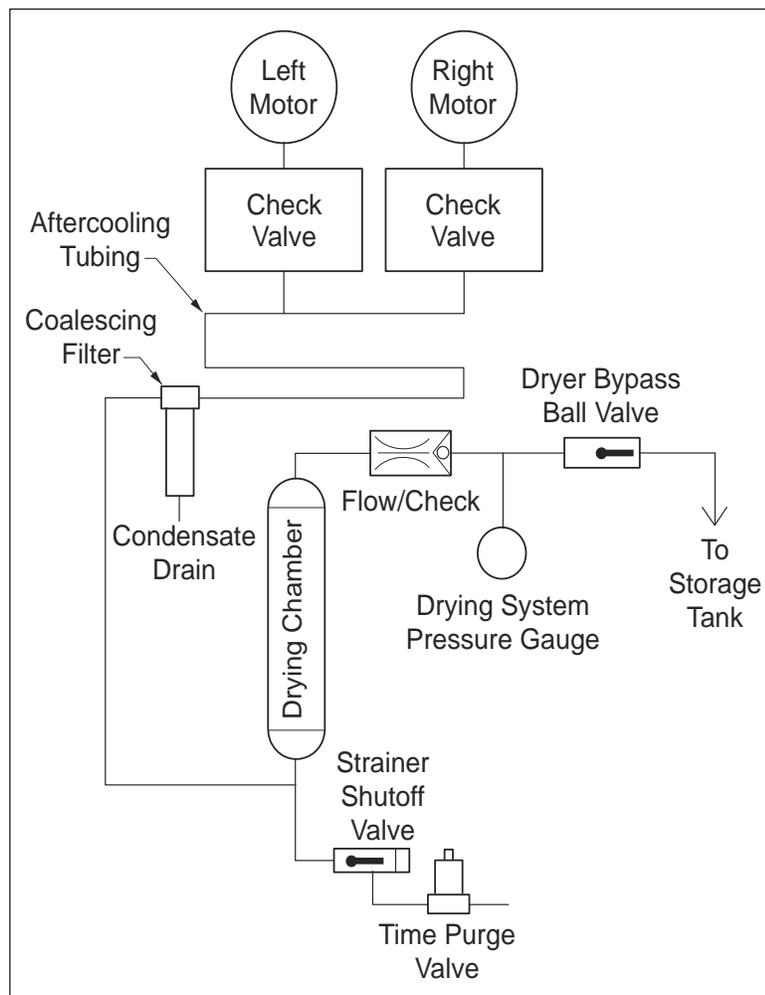
## While Not Running

- A. When the motors stop after reaching the cut-out pressure of 100psi, the user will have clean / dry air ready for use in the dental operatory. The compressor will remain in this “idle” state until the tank pressure drops to 80 psi, at which time the compressor motors will turn on and return the running mode of operation.
- B. The “Time Operated” dryer purge valve operates on a time basis instead of a “single cycle” basis used on most other types of dental air compressors. Two timers, “located on the front of the valve assembly”, control how often and the duration of each purge cycle.

**NOTE:** The compressor does not purge when the compressor cycles off!

- C. The “Left” timer knob on the purge valve, controls the duration of the purge cycles. This timer is factory preset and should not be adjusted. The factory setting is at the maximum of 10 seconds.
- D. The “Right” timer knob on the purge valve controls how often the compressor purges moisture from the drying chamber. The factory setting is 7 minutes, and should NOT be adjusted.
- E. A “TEST” button is located between the two timer knobs to allow a technician to verify that the valve is operating correctly.

By purging the drying chamber on a time basis, the DCI air compressors ensure the drying chamber desiccant remains dry, even during heavy usages, for consistent air quality.



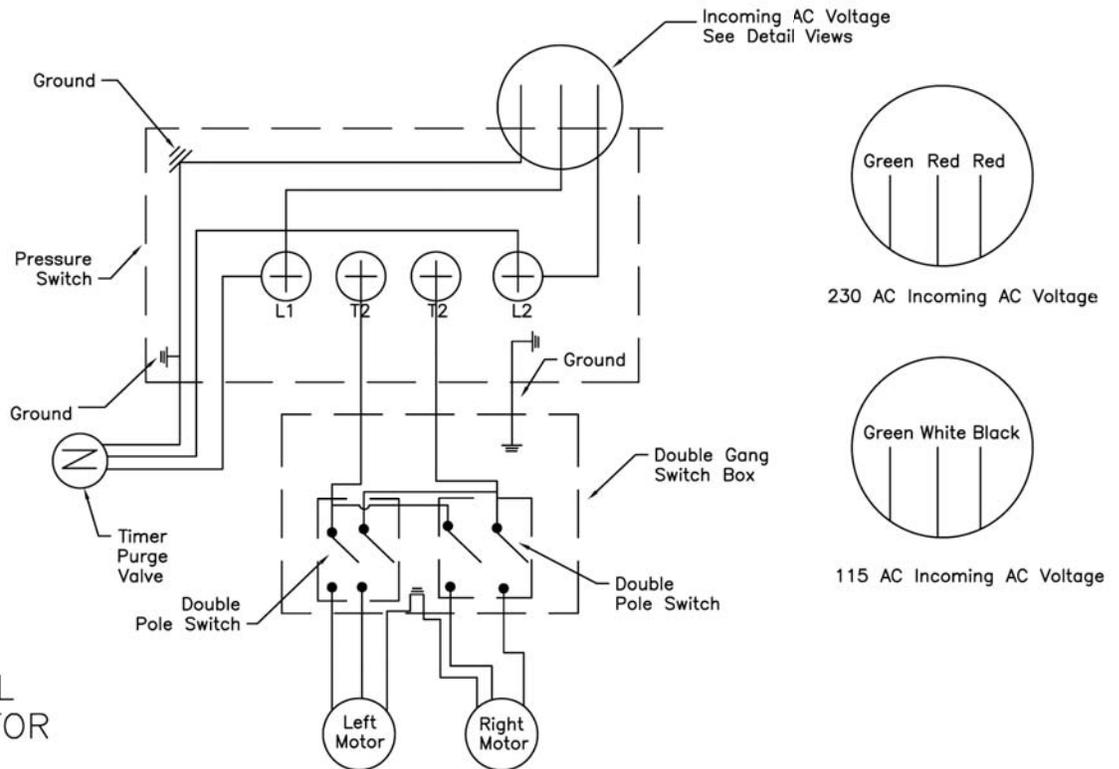
Plumbing Schematic

Theory of Operation

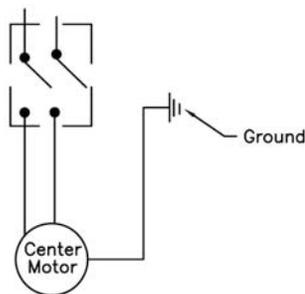
THEORY OF OPERATION

While Not Running

Electrical Schematic



TRIPLE HEAD  
HAS ADDITIONAL  
SWITCH & MOTOR



ALL SINGLE & DUAL  
HEAD COMPRESSORS

**Maintenance**

**MAINTENANCE**

**COMPRESSOR MAINTENANCE SCHEDULE**

Maintenance Item	Frequency
Intake Filter Elements	Every Six Months (semi-annually)
Coalescing Filter Element	Every 90 Days
Time Operated Purge Valve	Every 60 Days
Tank Drain	Every 90 Days

**A. Compressor Head Intake Filter Elements**

Dirty intake filter elements reduce the amount of air the compressor can take in. This reduces air output and increases the load of the motors. Every six months, remove the intake filter cover as shown in (Fig. D), to check for excessive dirt or discoloration. Replace with DCI Part Number 2012 if needed. The filters are located on the rear of each compressor cylinder.

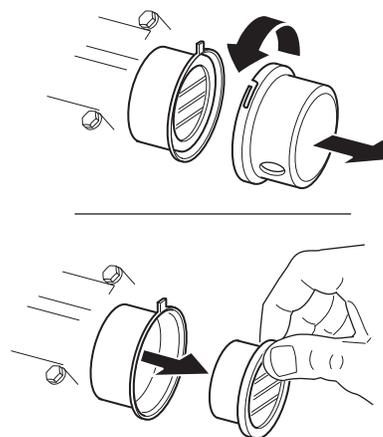


Fig. D

**B. Coalescing Filter Element**

The coalescing filter element should be checked with the compressor motors running. If the indicator located on the top of the filter housing remains GREEN, the filter element has additional useful life. However, if the indicator turns RED, the element should be changed. To change the element, first turn off the compressor motor switches. Then turn off the Dryer bypass valve as shown in (Fig. E). With dryer bypass valve in OFF position, press the TEST button on the time operated purge valve to bleed pressure off of the drying system. Depressurization of the drying system can be confirmed by reading the drying system pressure gauge located on top of the drying chamber.

**WARNING: DO NOT ATTEMPT TO SERVICE WITH SYSTEM PRESSURIZED.**

Unscrew the filter bowl by turning counter-clockwise. Lower the filter bowl to access the filter element contained inside. The filter element is held in place with an O-ring and internal ridges located in the bowl. Replace with DCI Part Number 2006, and reassemble the filter bowl. Turn the dryer bypass valve to the ON position and check compressor for proper operation by turning the power switches on.

**NOTE: A “popping” relief valve indicates a clogged coalescing element OR the Dryer Bypass valve is closed.**

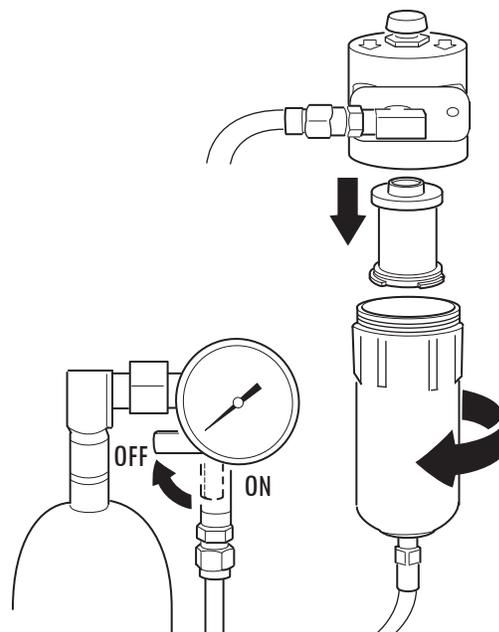


Fig. E

## MAINTENANCE

## C. Time Operated Purge Valve

The time operated purge valve should be checked for proper operation every 60 days. To test, press the TEST button located between the two timer adjustment knobs (see Fig. F). If air escapes from the valve, it is working properly. If no air is expelled, verify that the filter / strainer valve is in the ON position “parallel with floor”. Check the filter screen inside the filter / strainer valve as shown in Fig. G. If the strainer / shutoff valve is on and the screen is not clogged, replace the Time Operated Purge Valve with DCI part Number 2011 for 230 volt models, or DCI Part number 2848 for 115 volt models.

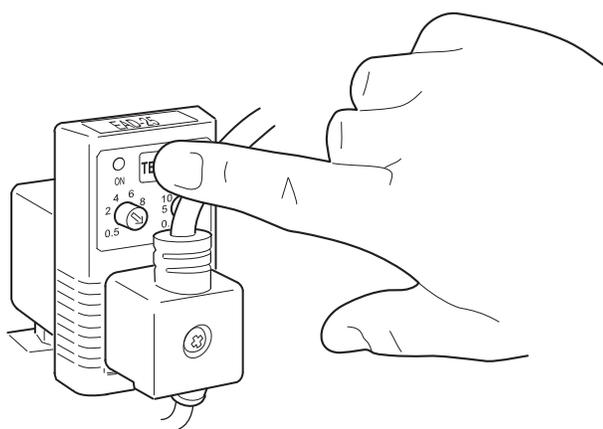


Fig. F

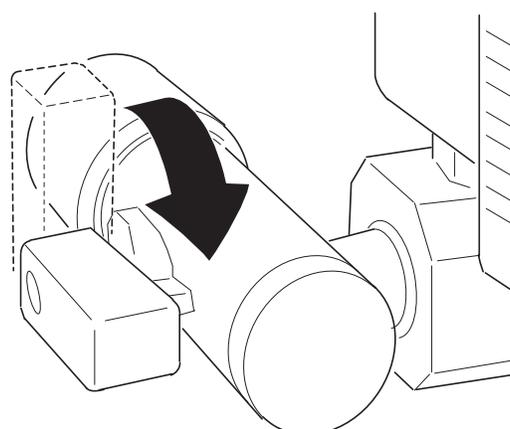


Fig. G

## D. Tank Drain

The tank drain “petcock” should be opened to check for moisture in the storage tank every 90 days. The tank drain is located at the bottom right hand side of the storage tank. (See Fig. H) If no moisture is present, the drying system is working properly. If moisture is present, refer to the Time Operated Purge Valve section above.

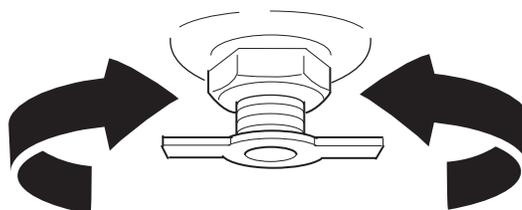


Fig. H

## Troubleshooting Chart

## TROUBLESHOOTING CHART

SYMPTOMS	CAUSES	POSSIBLE REMEDY
Compressor Will Not Run	No Power Improper Line Voltage Tripped Overload Pressure Switch System Already at Pressure	Check circuit breaker. Ensure that supply voltage matches equipment ratings. Check for loose wiring. Check contact points and adjust or replace. Bleed pressure from system to ensure proper starting.
Compressor Will Not Start, "hums"	Improper Line Voltage Open Start Capacitor Open Start Winding	Ensure supply voltage matches equipment ratings. Replace Start Capacitor. Replace Compressor Head.
Motor Overheats	Improper Voltage Ambient Temperature Too High Too Many Starts Per Hour Cycle Time Too Long Clogged Intake Filter	Ensure supply voltage matches equipment ratings. Improve ventilation; add a fan. Check for air leaks and repair; add additional compressor. Check for air leaks and repair; add additional compressor. Replace intake Filter.
High System Pressure	Pressure Switch	Improperly set or defective pressure switch.
Low System Pressure	Pressure Switch System Undersized	Improperly set or defective pressure switch. Additional or larger compressor required.
Relief Valve "popping"	Clogged Coalescing Filter Element Dryer Bypass Valve Is Closed Faulty Relief Valve	Replace coalescing filter element. Replace relief valve. Open Valve.

**Troubleshooting Chart**

**TROUBLESHOOTING CHART**

<b>SYMPTOMS</b>	<b>CAUSES</b>	<b>POSSIBLE REMEDY</b>
Compressor Overheats	Clogged Air Intake Filter	Clean or replace intake filter element.
	Exhaust Valve	Clean & Replace valve-plate.
	Too Much Run Time	Air leaks; compressor too small to meet demand.
	Ambient Temperature Too High	Add ventilation and \ or cooling to equipment room.
Moisture In Air Lines	Time Operated Purge Valve	Clean or replace solenoid valve assembly.
	Timers Incorrectly Set	Left Timer knob “duration of purge” set at 10 seconds. Right Timer knob “purge interval” set at 7 minutes.
	Strainer Valve Off or Clogged	Clean strainer and ensure valve is on.
	Coalescing Filter Auto-Drain	Clean or replace as needed.
	Desiccant Failure	Replace drying chamber assembly.
	Compressor Undersized	Additional or larger compressor to met demand requirements.
	Faulty Dental Unit Diaphragm	Check Master shut-off and water relay diaphragms.

## Electrical

## ELECTRICAL

## A. Electrical Components

1. **Pressure Switch:** Turns on or off the power supplied to the individual compressor motor switches. The pressure switch is preset to run the compressors to 100psi and then open, therefore stopping the motor(s). When the system pressure drops to 80psi, the switch closes, running the compressor motors to 100psi again.

To test the switch, bleed all pressure from the tank. Remove the pressure switch top cover with a 3/8" wrench. With an AC voltmeter, place the test leads on the outer terminals as shown in Fig. I. The voltage indicated should agree with the machine data plate, either 115 or 230 volt AC. If no voltage is present, check the circuit breaker.

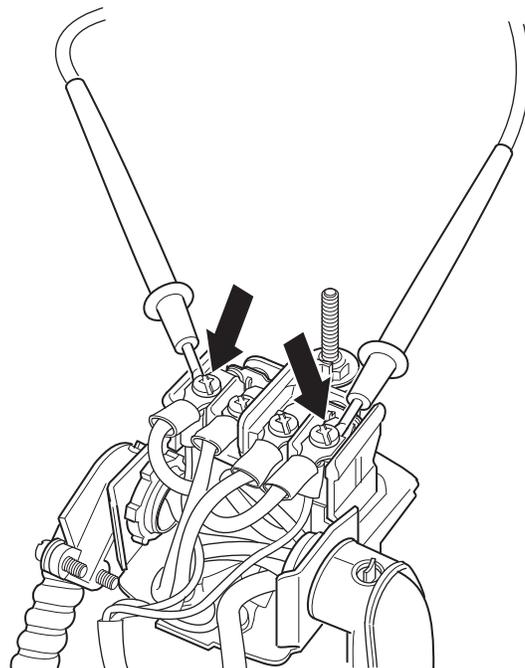


Fig. I

If the proper voltage is present on the outer terminals, move the voltmeter test leads to the inner terminals of the pressure switch as shown in Fig. J. If NO voltage is present, the pressure switch is defective. If voltage is present, proceed to the next step.

Turn the machine power on, and wait for compressor to reach 100psi and stop running. The 3/8" adjusting screw may be turned clockwise to increase the cutoff pressure or counter-clockwise to decrease the cutoff pressure. The maximum pressure cutoff should not exceed 100psi. If the compressor will not cut off at the desired preset pressure, or will not stop under any condition, the pressure switch is defective.

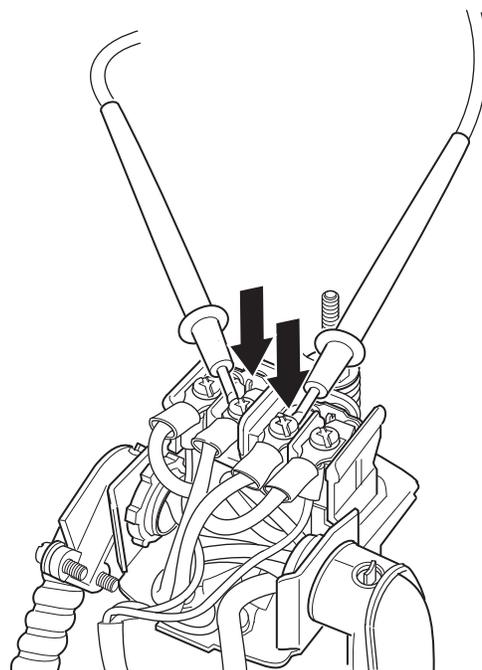


Fig. J

**Electrical**

2. **Power Switches:** The toggle switches located on the front center of the compressor control the individual compressor motors. If the pressure switch is operating correctly, remove the motor terminal cover on the back of the desired compressor motor. With the power switch in the on “up” position, check for voltage to the compressor motor as shown in Fig. K. If the proper voltage is present, the power switch is good. If no voltage is present at the motor, replace the corresponding power switch.

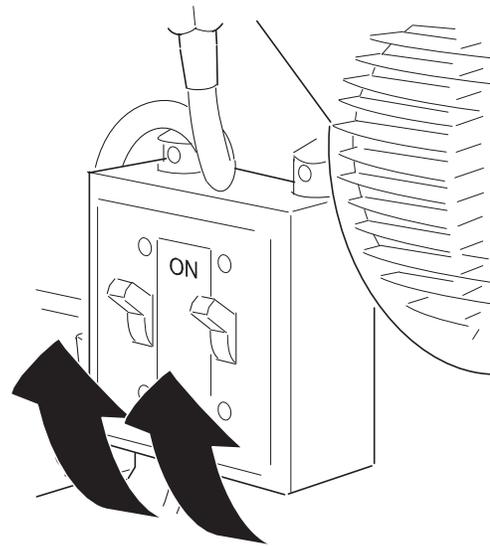


Fig.K

3. **Compressor Motor (head):** The compressor motor turns the compressor crankshaft to generate airflow to the system. If the correct voltage is present on the L1 and L2 terminals as described in the testing procedure listed above, but the compressor hums and does not start, the start capacitor is defective. If the correct voltage is present but nothing happens, the head is defective.

To replace the motor, it is not required to cut the spade terminals from the wiring (see Figures L and M) for proper disassembly without cutting factory wiring.

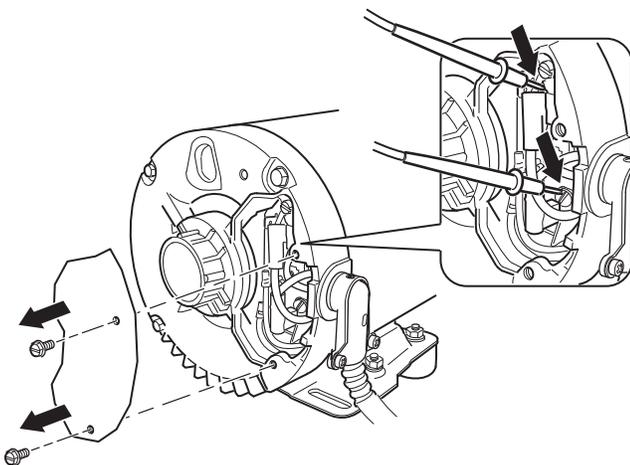


Fig. L

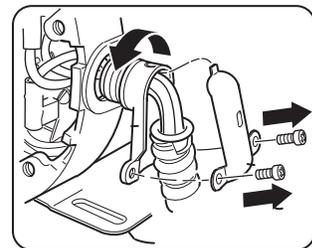


Fig. M

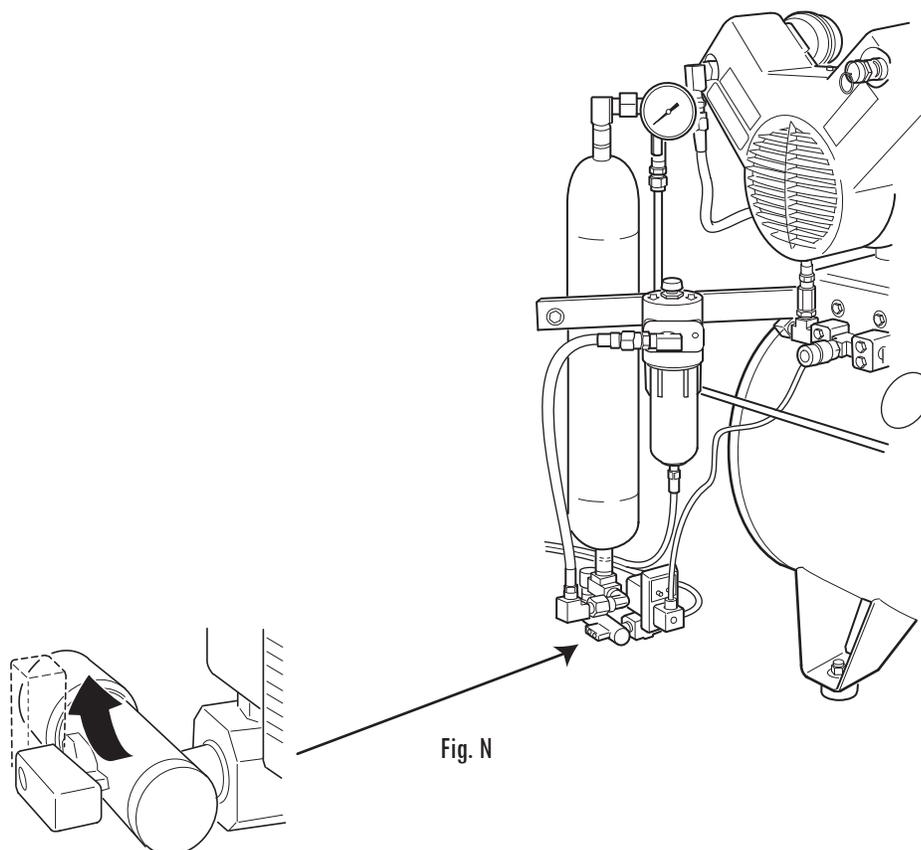
After removing the wiring from the compressor motor, the motor may be removed by unscrewing the air discharge hose on the front left cylinder, and removing the four 1/2” nuts securing the head to the vibration isolation mounts.

## Time Operated Purge Valve

To Replace the Time Operated Purge Valve

1. Remove the Philips head screw that holds the electrical connector in place, and pull the electrical connector off of the timer assembly.
2. Turn "OFF" the strainer / shutoff valve in Fig. N.
3. Remove the valve and replace with DCI Part Number 2011 for 230 volt machines OR DCI Part Number 2848 for 115 volt models.
4. Return the strainer / shutoff valve to the On position.

**NOTE:** Make sure the coil voltage matches that of the machine data tag.



## PNEUMATIC

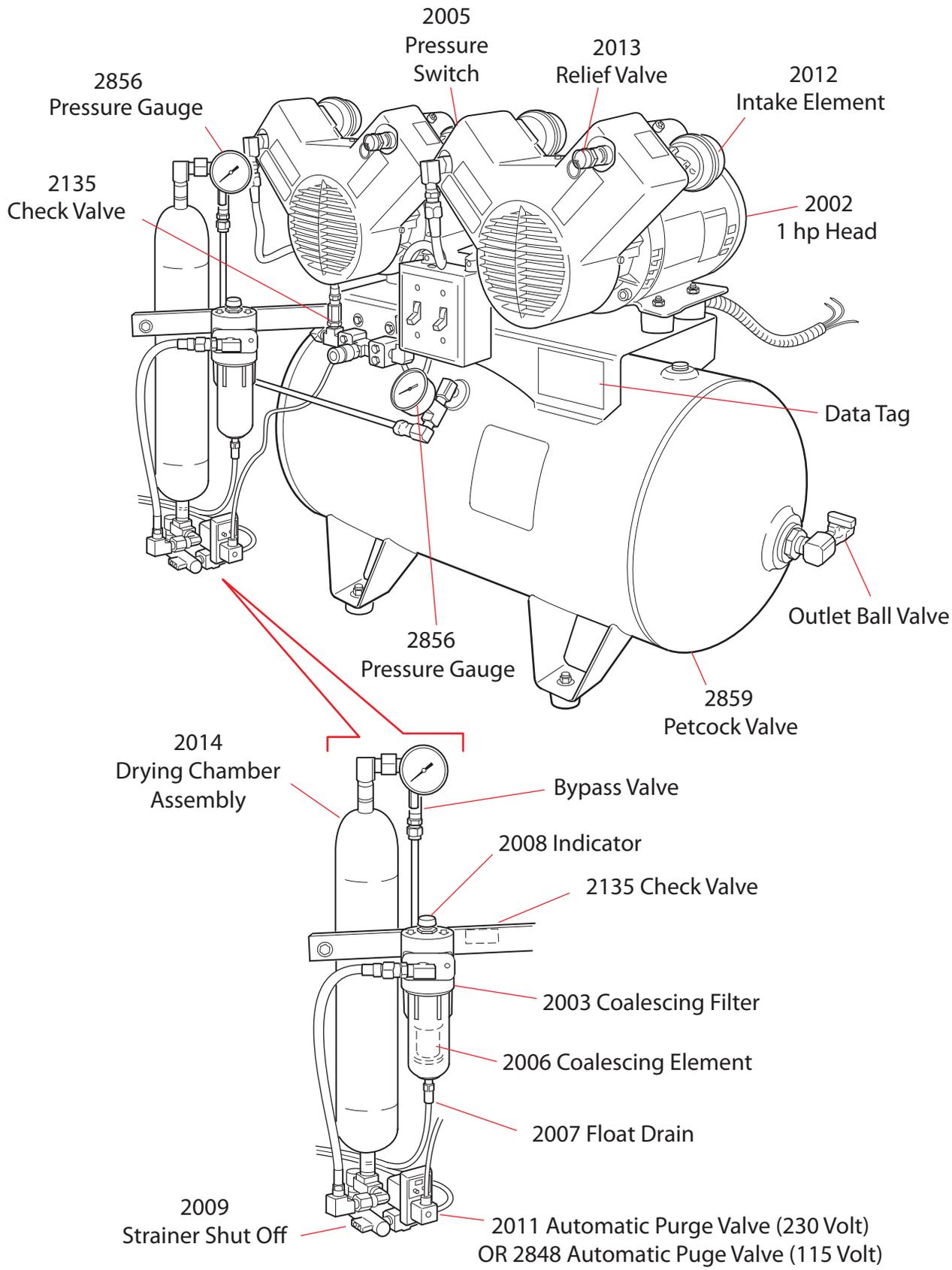
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**WARNING:** HIGH SYSTEM PRESSURES MAY CAUSE SERIOUS INJURY.  
ALWAYS DEPRESSURIZE THE ENTIRE SYSTEM BEFORE ATTEMPTING TO SERVICE PNEUMATIC COMPONENTS.

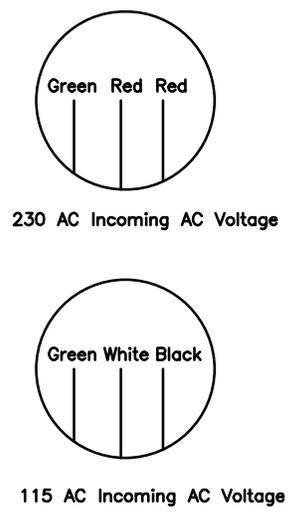
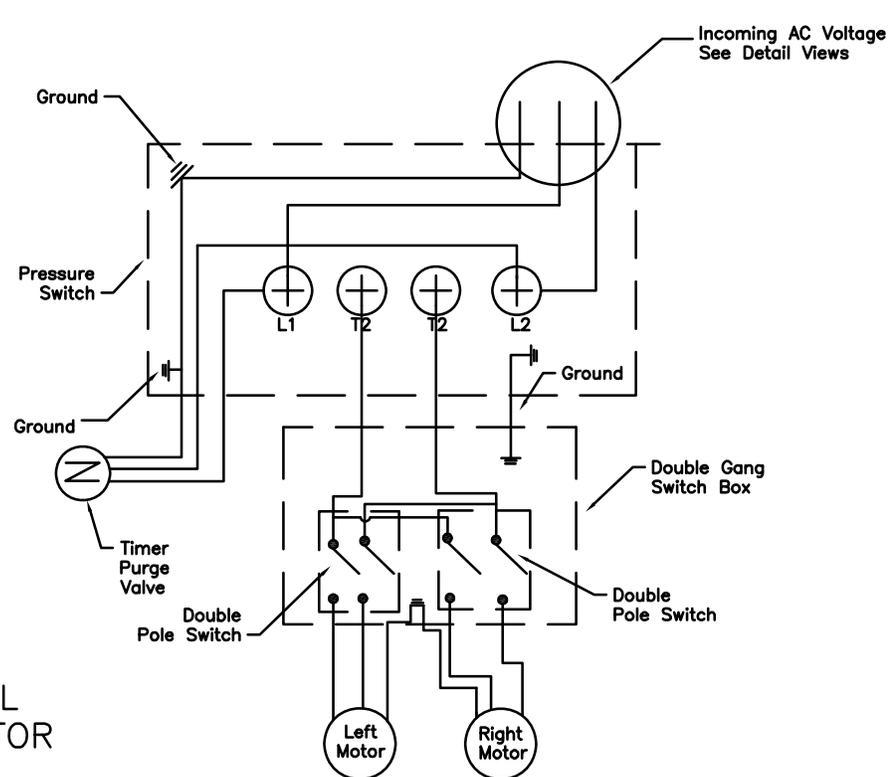
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- 1. Replacing the check valves.** If a check valve failure occurs, the symptom will be air escaping through one of the compressor heads with the compressor NOT running. To replace a defective check valve, unscrew "counterclockwise" the air discharge hose fitting from the appropriate compressor head. Once the air discharge hose is disconnected from the compressor head, the check valve, along with the discharge hose, may be removed from the discharge manifold by unscrewing the check valve "counterclockwise", and replaced with a new check valve. Reverse this process to reassemble the check valve / discharge hose assembly.
- 2. Replacing the Differential Filter Indicator.** If the differential indicator becomes stuck in either the red OR green indicating position, the indicator needs replacement. Replace the differential filter indicator by unscrewing the entire assembly "counterclockwise" with a 15/16" - 6 point / box end wrench. Install the new indicator in the reverse order.
- 3. Automatic Filter Float Drain.** Unscrew the coalescing filter bowl from the filter head. Using a 9/16 wrench, unscrew the retaining nut on the bottom of the filter bowl. With the retaining nut removed, the automatic float drain will be removed from the filter bowl. Replace in the reverse order.
- 4. Replacing Desiccant Chamber.** To replace the desiccant chamber, remove the rigid stainless steel tubing from the dryer bypass valve at the compression fitting, located at the dryer bypass valve. Remove the top plumbing manifold assembly from the top of the desiccant chamber, by turning counterclockwise. Remove the electrical cord from the dryer purge valve by removing the Philips head retaining screw, and pulling the cable away from the valve timer block. Next, remove the flexible discharge hose from the discharge side of the coalescing filter, and then unscrew the bottom manifold assembly from the bottom of the desiccant chamber. Replace the desiccant chamber and reassemble in the reverse order.

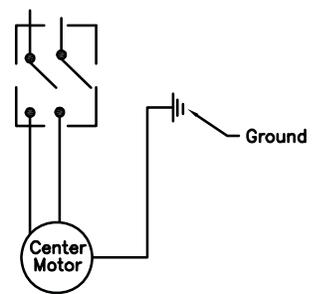
**Parts Call-Out**



**Electrical Schematic**

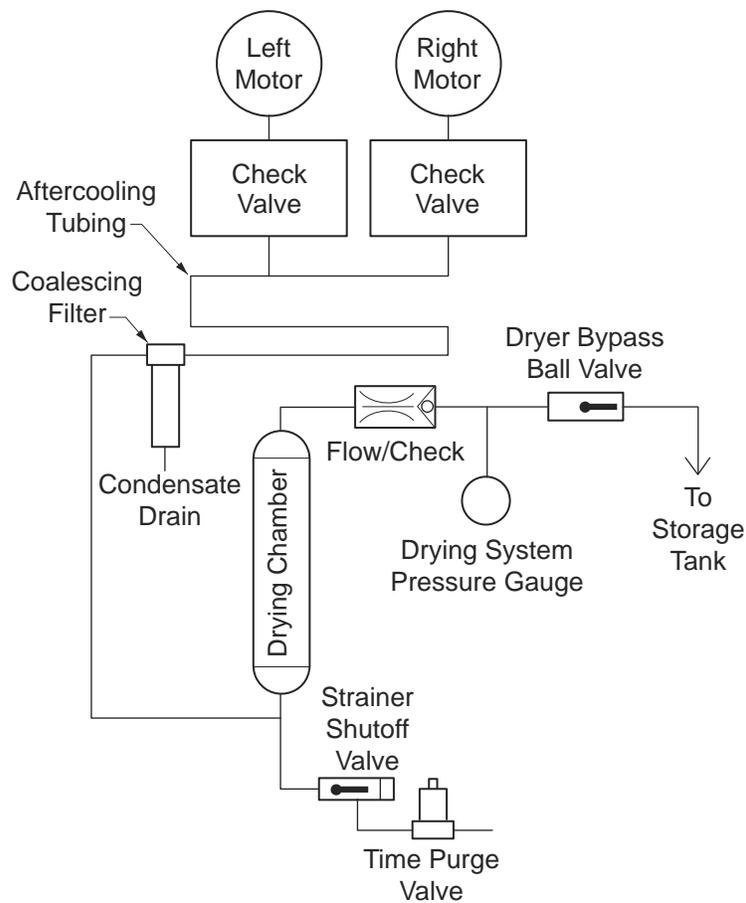


TRIPLE HEAD  
 HAS ADDITIONAL  
 SWITCH & MOTOR



ALL SINGLE & DUAL  
 HEAD COMPRESSORS

**Plumbing Schematic**







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