

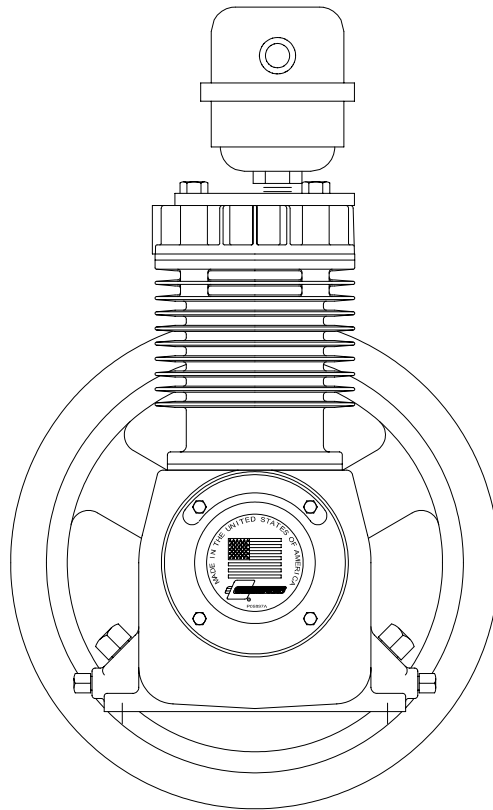


**OPERATION/MAINTENANCE  
MANUAL & PARTS LIST**

**SINGLE STAGE, AIR COMPRESSORS & UNITS  
FEATURING A1, B1 & C1 PUMPS**



**THIS MANUAL CONTAINS IMPORTANT SAFETY INFORMATION AND SHOULD ALWAYS BE AVAILABLE TO THOSE PERSONNEL OPERATING THIS UNIT. READ, UNDERSTAND AND RETAIN ALL INSTRUCTIONS BEFORE OPERATING THIS EQUIPMENT TO PREVENT INJURY OR EQUIPMENT DAMAGE.**



**C497-A  
(Ref. Drawing)**

**MODEL NUMBERS**

**A1 MODEL PUMP  
B1 MODEL PUMP  
C1 MODEL PUMP**

## **MAINTAIN COMPRESSOR RELIABILITY AND PERFORMANCE WITH GENUINE CHAMPION COMPRESSOR PARTS AND SUPPORT SERVICES**

Champion Compressor genuine parts, manufactured to design tolerances, are developed for optimum dependability – specifically for Champion compressor systems. Design and material innovations are the result of years of experience with hundreds of different compressor applications. Reliability in materials and quality assurance are incorporated in our genuine replacement parts.

Your authorized Champion Compressor distributor offers all the backup you'll need. A worldwide network of authorized distributors provides the finest product support in the air compressor industry. Your authorized distributor can support your Champion air compressor with these services:

1. Trained parts specialists to assist you in selecting the correct replacement parts.
2. A full line of factory tested CHAMPLUB™ compressor lubricants specifically formulated for use in Champion compressors.
3. Repair and maintenance kits designed with the necessary parts to simplify servicing your compressor.

Authorized distributor service technicians are factory trained and skilled in compressor maintenance and repair. They are ready to respond and assist you by providing fast, expert maintenance and repair services.

**For the location of your local authorized Champion Air Compressor distributor, refer to the yellow pages of your phone directory or contact:**

**Factory:**

Champion  
1301 North Euclid Avenue  
Princeton, IL 61356

Phone: (815) 875-3321

Fax: (815) 872-0421

E-Mail: [Champion@Championpneumatic.com](mailto:Champion@Championpneumatic.com)

### **INSTRUCTIONS FOR ORDERING REPAIR PARTS**

When ordering parts, specify Compressor MODEL, HORSEPOWER and SERIAL NUMBER (see nameplate on unit). All orders for Parts should be placed with the nearest authorized distributor.

Order by part number and description. Reference numbers are for your convenience only.

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## SAFETY AND OPERATION PRECAUTIONS

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Because an air compressor is a piece of machinery with moving and rotating parts, the same precautions should be observed as with any piece of machinery of this type where carelessness in operation or maintenance is hazardous to personnel. In addition to the many obvious safety rules that should be followed with this type of machinery, the additional safety precautions as listed below must be observed:

1. Read all instructions completely before operating air compressor or unit.
2. For installation, follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
3. Electric motors must be securely and adequately grounded. This can be accomplished by wiring with a grounded, metal-clad raceway system to the starter; by using a separate ground wire connected to the bare metal of the motor frame; or other suitable means.
4. Protect the power cable from coming in contact with sharp objects. Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.
5. Make certain that the power source conforms to the requirements of your equipment.
6. Pull main electrical disconnect switch and disconnect any separate control lines, if used, before attempting to work or perform maintenance on the air compressor or unit. "Lock out" or "Tag out" all power sources.
7. Do not attempt to remove any compressor parts without first relieving the entire system of pressure.
8. Do not attempt to service any part while machine is in an operational mode.
9. Do not operate the compressor at pressures in excess of its rating.
10. Do not operate compressor at speeds in excess of its rating.
11. Periodically check all safety devices for proper operation. Do not change pressure setting or restrict operation in any way.
12. Be sure no tools, or rags or loose parts are left on the compressor or drive parts.
13. Do not use flammable solvents for cleaning the air inlet filter or element and other parts.
14. Exercise cleanliness during maintenance and when making repairs. Keep dirt away from parts by covering parts and exposed openings with clean cloth or Kraft paper.
15. Do not operate the compressor without guards, shields and screens in place.
16. Do not install a shut-off valve in the discharge line, unless a pressure relief valve, of proper design and size, is installed in the line between the compressor unit and shut-off valve.
17. Do not operate compressor in areas where there is a possibility of ingesting flammable or toxic fumes.
18. Be careful when touching the exterior of a recently run motor - it may be hot enough to be painful or cause injury. With modern motors this condition is normal if operated at rated load - modern motors are built to operate at higher temperatures.
19. Inspect unit daily to observe and correct any unsafe operating conditions found.
20. Do not "play around" with compressed air, nor direct air stream at body, because this can cause injuries.
21. Compressed air from this machine absolutely must not be used for food processing or breathing air without adequate downstream filters, purifiers and controls.
22. Always use an air pressure regulating device at the point of use, and do not use air pressure greater than marked maximum pressure of attachment.
23. Check hoses for weak or worn condition before each use and make certain that all connections are secure.
24. Always wear safety glasses when using compressed air gun.

The user of any air compressor package manufactured by **Champion** – A Gardner Denver Co., is hereby warned that failure to follow the preceding Safety and Operation Precautions can result in injuries or equipment damage. However, **Champion** – A Gardner Denver Co., does not state as fact or does not mean to imply that the preceding list of Safety and Operating Precautions is all inclusive, and further that the observance of this list will prevent all injuries or equipment damage.

## EXPLANATION OF SAFETY INSTRUCTIONS SYMBOLS AND DECALS



### DANGER

Indicates immediate hazards which will result in severe injury or death.



### WARNING

Indicates hazards or unsafe practice which could result in severe injury or death.



### CAUTION

Indicates hazards or unsafe practice which could result in damage to the Champion compressor or minor injury.

### NOTICE

Notice is used to notify people of installation, operation or maintenance information which is important but not hazard-related.

## SAFETY AND OPERATION PRECAUTIONS

OBSERVE, UNDERSTAND AND RETAIN THE INFORMATION GIVEN IN THE SAFETY PRECAUTION DECALS AS SHOWN IN THE PARTS LIST SECTION



### DANGER

This reciprocating compressor must not be used for breathing air. To do so will cause serious injury whether air is supplied direct from the compressor source or to breathing tanks for later use. Any and all liabilities for damage or loss due to injury, death and/or property damage including consequential damages stemming from the use of this compressor to supply breathing air, will be disclaimed by the manufacturer.



### WARNING

The use of this compressor as a booster pump and/or to compress a medium other than atmospheric air is strictly non-approved and can result in equipment damage and/or injury. Non-approved uses will also void the warranty.



### CAUTION

This unit may be equipped with special options which may not be included in this manual. User must read, understand and retain all information sent with special options.

## **INTRODUCTION**

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Champion Climate Control Series compressors are the result of advanced engineering and skilled manufacturing. To be assured of receiving maximum service from this machine the owner must exercise care in its operation and maintenance. This book is written to give the operator and maintenance department essential information for day-to-day operation, maintenance and adjustment. Careful adherence to these instructions will result in economical operation and minimum downtime.

### **Express Limited Warranty**

**CHAMPION** warrants each new piece of equipment manufactured by **CHAMPION** to be free from defects in material and workmanship under normal use and service for a period of twelve (12) months from date of installation or eighteen (18) months from date of shipment by **CHAMPION** or **CHAMPION** distributor, whichever may occur first.

**CHAMPION** makes no warranty in respect to components and accessories furnished to **CHAMPION** by third parties, such as ELECTRIC MOTORS, GASOLINE ENGINES and CONTROLS, which are warranted only to the extent of the original manufacturer's warranty to **CHAMPION**. To have warranty consideration, electric motors must be equipped with thermal overload protection.

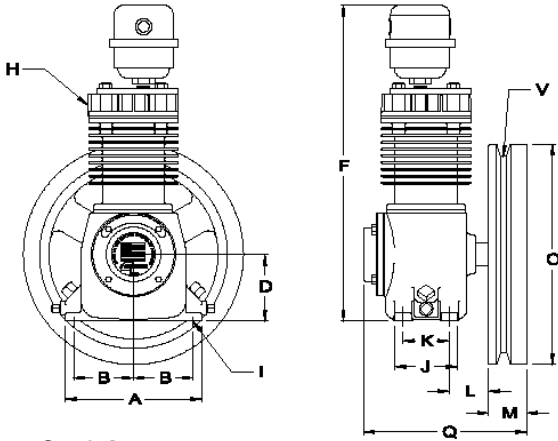
When a compressor pump, or component is changed or replaced during the warranty period, the newly replaced item is warranted for only the remainder of the original warranty period.

Repair, replacement or refund in the manner and within the time provided shall constitute **CHAMPION'S** sole liability and your exclusive remedy resulting from any nonconformity or defect. **CHAMPION** SHALL NOT IN ANY EVENT BE LIABLE FOR ANY DAMAGES, WHETHER BASED ON CONTRACT, WARRANTY, NEGLIGENCE, STRICT LIABILITY OR OTHERWISE, INCLUDING WITHOUT LIMITATION ANY CONSEQUENTIAL, INCIDENTAL OR SPECIAL DAMAGES, ARISING WITH RESPECT TO THE EQUIPMENT OR ITS FAILURE TO OPERATE EVEN IF **CHAMPION** HAS BEEN ADVISED OF THE POSSIBILITY THEREOF.

**CHAMPION** MAKES NO OTHER WARRANTY OR REPRESENTATION OF ANY KIND, EXCEPT THAT OF TITLE, AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY EXPRESSLY DISCLAIMED. NO SALESMAN OR OTHER REPRESENTATIVE OF **CHAMPION** HAS AUTHORITY TO MAKE ANY WARRANTIES.

## SINGLE STAGE AIR COMPRESSORS - MODELS A1, B1 & C1

### DIMENSIONS



**C446-A**  
(Ref. Drawing)

ITEM	MODELS			
	A1	B1	C1	
A	Base Width	6-1/4	6-1/4	6-1/4
B	Hole Spacing (Width)	5-1/2	5-1/2	5-1/2
D	Base to Shaft	3-1/16	3-1/16	3-1/16
F	Pump Height	10-1/2	10-3/4	10-3/4
H	Pipe Size	3/8	3/8	3/8
I	Hole Diameter	11/32	11/32	11/32
J	Base Depth	2-7/8	2-7/8	2-7/8
K	Hole Spacing (Depth)	2-1/8	2-1/8	2-1/8
L	Flywheel to Hole	1-13/16	1-13/16	1-13/16
M	Flywheel to Width	3/4	1-3/4	1-3/4
O	Flywheel to Diameter	9	10-1/8	10-1/8
Q	Overall Depth	7-3/16	7-3/16	7-3/16
V	No and Sections	1VA	1VA	1VA

**Note:** Rotation of Flywheel: Clockwise when viewed from front end, flywheel to rear

### SPECIFICATIONS

MODEL	BORE & STROKE (INCHES)	NUMBER CYLINDERS	OIL CAPACITY (OZ.)	WEIGHT (LBS.)	MAXIMUM INTERMITTENT PRESSURE (PSIG)	MIN./MAX. RPM
A1	1-3/4 x 2	1	6	23	125	400/1020
B1	2-3/8 x 2	1	6	24-3/4	125	400/1000
C1	2-5/8 x 2	1	6	24-3/4	125	400/100

#### PERFORMANCE DATA FOR A1 COMPRESSOR

Motor HP	Press. PSIG	Displ. CFM	Pump Speed RPM	Motor Pulley OD-Inches
1/2	50	2.8	1020	2.75
	75	2.8	1020	2.75
	100	2.8	1020	2.75
	125	2.8	1020	2.75

#### PERFORMANCE DATA FOR C1 COMPRESSOR

Motor HP	Press. PSIG	Displ. CFM	Pump Speed RPM	Motor Pulley OD-Inches
1	50	5.8	940	2.75
	75	5.4	885	2.60
	100	5.0	815	2.40
	125	4.7	765	2.25

#### PERFORMANCE DATA FOR B1 COMPRESSOR

Motor HP	Press. PSIG	Displ. CFM	Pump Speed RPM	Motor Pulley OD-Inches
3/4	50	4.3	850	2.50
	75	4.1	815	2.40
	100	3.9	765	2.25
	125	3.6	715	2.10

All data based on 3600 RPM electric motors as a power source

Pulley Dia. (approx.) =  $\frac{\text{Compressor RPM} \times \text{Flywheel Dia.}}{\text{Motor of Engine RPM}}$

## **INSTALLATION**

 <b>WARNING</b>
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<b>Do not operate unit if damaged during shipping, handling or use. Operating unit if damaged may result in injury.</b>
---

1. Permanently installed compressors must be located in a clean, well ventilated dry room so compressor receives adequate supply of fresh, clean, cool and dry air. It is recommended that a compressor, used for painting, be located in a separate room from that area wherein body sanding and painting is done. Abrasive particles or paint, found to have clogged the air intake filters and intake valves, shall automatically void warranty.
2. Compressors should never be located so close to a wall or other obstruction that flow of air through the fan bladed flywheel, which cools the compressor, is impeded. Permanently mounted units should have flywheel at least 12" from wall.
3. Place stationary compressors on firm level ground or flooring. Permanent installations require bolting to floor. Bolt holes in tank or base feet are provided. Before bolting or lagging down, shim compressor level. Avoid putting a stress on a tank foot by pulling it down to floor. This will only result in abnormal vibration, and possible cracking of Air Receiver. It is recommended that optional vibro-isolator pads be installed on unit. Tanks bolted directly to a concrete floor without padding will not be warranted against cracking. Champion vibro-isolators must be used for extended warranty to apply to ASME air receivers.
4. If installing a bare pump or a base mounted unit, make certain the system has adequate pressure limiting controls. Controls could be a pressure switch with unloader for start/stop operation or a pilot valve for continuous operation. If a pilot valve is used, the compressor must be equipped with head unloaders. Control air must be piped from the air receiver to the pilot valve.
5. A properly sized air check valve must be installed in the discharge piping, between the compressor outlet and the inlet of any receiver tank(s) in the system.

 <b>DANGER</b>
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<b>Do not install isolating valves between compressor outlet and air receiver. This will cause excessive pressure if valve is closed, and cause injury and equipment damage.</b>
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 <b>WARNING</b>
--

<b>Always use an air pressure regulating device at the point of use. Failure to do so can result in injury or equipment damage.</b>
---

 <b>CAUTION</b>
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- |   |
|---|
| <ul style="list-style-type: none"><li>● <b>Do not install in an area where ambient temperature is below 32 degrees F or above 100 degrees F.</b></li><li>● <b>Do not install unit in an area where air is dirty and/or chemical laden.</b></li><li>● <b>Unit is not to be installed outdoors.</b></li></ul> |
|---|



## INSTALLATION (CONT'D)

### ELECTRICAL POWER SUPPLY

It is essential that the power supply and the supply wiring are adequately sized and that the voltage correspond to the unit specifications. Branch circuit protection must be provided at installation as specified in the National Electrical Code.

All wiring should be performed by a licensed electrician or electrical contractor. Wiring must meet applicable codes for area of installation. The table gives recommended wire sizes based on the 1999 NEC.

#### WIRE SIZE (AWG) - 75°C COPPER - 30°C AMBIENT

MOTOR HP	3 PHASE				1 PHASE		
	200/208V	230V	460V	575V	115V	208V	230V
1/2	14	14	14	14	14	14	14
3/4	14	14	14	14	12	14	14
1	14	14	14	14	12	14	14

All models, except as noted below, require a properly sized magnetic starter as specified in the National Electric Code (NEC). See Figure 1-1 for simplex wiring diagram.

Units furnished with thermal overload protected (TOLP) motors rated for 3600 RPM, 115 volt, 208 volt or 230 volt, 60 hertz, single phase do not require a manual or magnetic starter. See Figure 1-2.

If ordered with a factory mounted magnetic starter, compressor is wired at factory. It is necessary only to bring lines from a properly sized disconnect switch to the magnetic starter mounted on the unit.

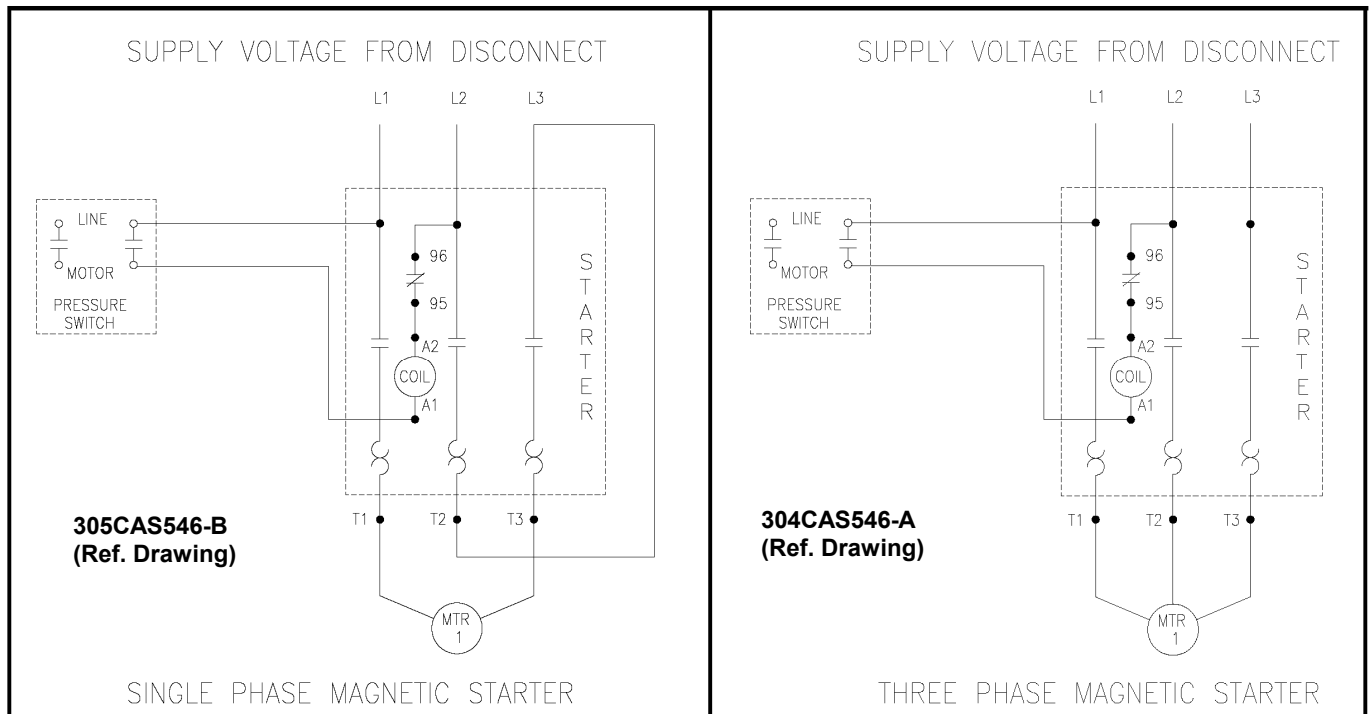


Figure 1 – 1 Simplex Wiring Diagram

## INSTALLATION (CONT'D)

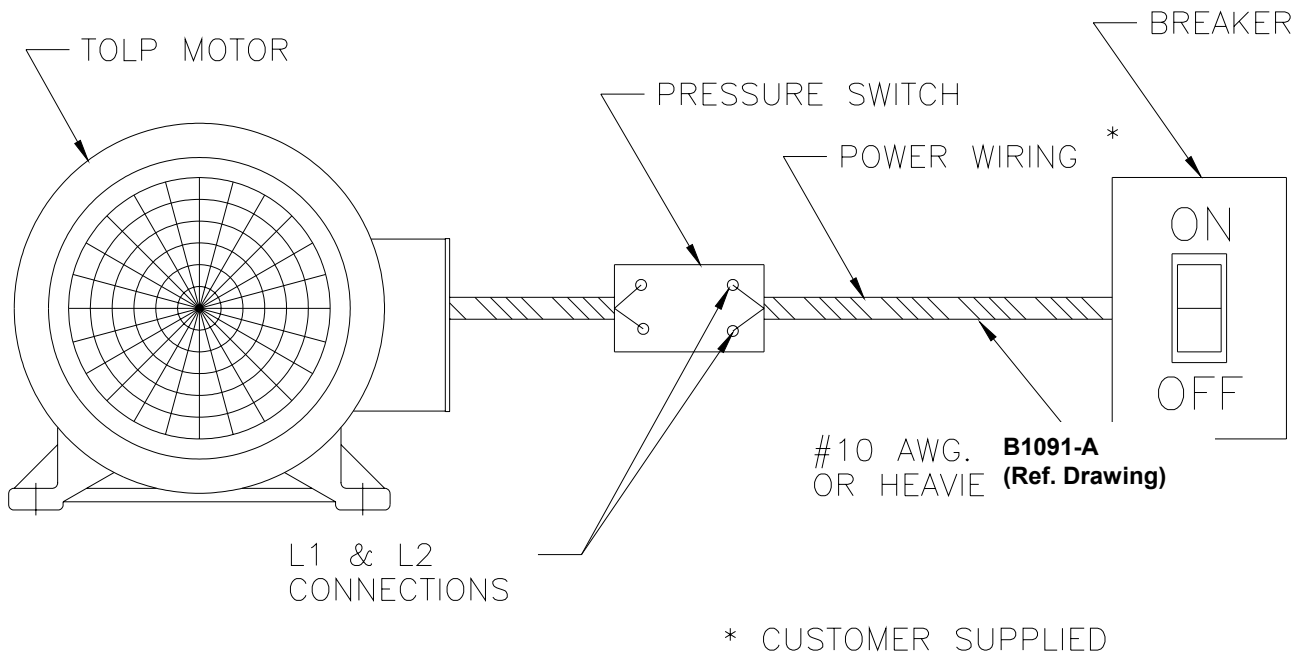


Figure1 - 2 Wiring Diagram



### CAUTION

Wiring must be such that when viewing compressor from opposite shaft end, rotation of shaft is clockwise as shown by arrow on guard. Wrong direction rotation for any length of time will result in damage to compressor.

### GROUNDING INSTRUCTIONS

This product should be connected to a grounded, metallic, permanent wiring system, or an equipment-grounding terminal or lead on the product.

### AIR LINE PIPING

Connection to air system should be of the same size, or larger, than discharge pipe out of unit. A union connection to the unit and water drop leg is recommended. Install a flexible connector between the discharge of the unit and the plant air piping. Plant air piping should be periodically inspected for leaks using a soap and water solution for detection on all pipe joints. Air leaks waste energy and are expensive.



### WARNING

Never use plastic pipe or improperly rated metal pipe. Improper piping material can burst and cause injury or property damage.

## **OPERATION**

This compressor has been inspected, thoroughly tested and approved at the factory. For this unit to give long satisfactory service it must be installed and operated properly. This compressor has been designed for a 80%/ON – 20%/OFF duty cycle.

Simplex units have a pressure switch that senses changes in receiver pressure and automatically starts and stops the compressor at preset pressure limits. If the receiver pressure falls below the cut-in pressure setting of the pressure switch the compressor will run until the cut-out pressure setting of the pressure switch has been reached.

Units furnished with head unloaders are equipped with a needle valve, pilot valve and head unloaders to provide continuous run capabilities. The pilot valve acts as an automatic air switch allowing air to flow from the receiver to the head unloader mechanism, thus actuating it. To operate unit in continuous run, open needle valve located next to pilot valve. The pilot valve is now able to sense receiver pressure. When the receiver pressure reaches the cut-out pressure setting of the pilot valve, the pilot valve opens and air is released to the unloader mechanism. The compressor stops compressing air and runs unloaded until the cut-in pressure setting of the pilot valve has been reached. At this time air released from the unloader mechanism and the compressor starts compressing again. Continuous run is recommended if motor starts exceed 8 starts/hour.

### **Initial Start Up**

1. Inspect unit for any visible signs of damage that would have occurred in shipment or during installation.
2. Pull main disconnect switch to unit to assure that no power is coming into the unit. “Lock Out” or “Tag Out” switch. Connect power leads to start.

 <b>WARNING</b>
<b>Do not attempt to operate compressor on voltage other than that specified on order or on compressor motor.</b>

3. Check compressor oil level. Add oil as required. See “Compressor Oil Specifications” Section.  
**NOTE:** Do not mix oil type, weights or brands.
4. Activate main disconnect switch.
5. “Jog” motor and check for proper rotation by direction arrow. If rotation is wrong, reverse input connections on the magnetic starter.
6. Close receiver outlet hand valve and start.
7. With receiver hand valve closed, let machine pump up to operating pressure. At this stage the automatic controls will take over. Check for proper cycling operation.
8. Check for proper operation of any options. Refer to individual option instruction sheet.
9. When the initial run period has shown no operating problems, shut unit down and recheck oil level.
10. Open receiver hand valve. The air compressor unit is now ready for use.

 <b>WARNING</b>
<b>This unit can start automatically without warning.</b>

## **GUIDE TO MAINTENANCE**

To obtain reliable and satisfactory service, this unit requires a consistent preventive maintenance schedule. Maintenance schedule pages are included in the back of this manual to aid in keeping the proper records.



### **WARNING**

**Before performing any maintenance function, switch main disconnect switch to "off" position to assure no power is entering unit. "Lock Out" or "Tag Out" all sources of power. Be sure all air pressure in unit is relieved. Failure to do this may result in injury or equipment damage.**

### **DAILY MAINTENANCE**

1. Check oil level of both compressor and engine if so equipped. Add quality lubricating oil as required. See Section on "Oil Specifications".
2. Drain moisture from tank by opening tank drain valve located in bottom of tank. Do not open drain valve if tank pressure exceeds 25 PSIG.
3. Turn off compressor at the end of each day's operation. Turn off power supply at wall switch.

### **WEEKLY MAINTENANCE**

1. Clean dust and foreign matter from cylinder head, motor, fan blade, air lines, intercooler and tank.
2. Remove and clean intake air filters.



### **WARNING**

**Do not exceed 15 PSIG nozzle pressure when cleaning element parts with compressed air. Do not direct compressed air against human skin. Serious injury could result. Never wash elements in fuel oil, gasoline or flammable solvent.**

3. Check V-belts for tightness. The V-belts must be tight enough to transmit the necessary power to the compressor. Adjust the V-belts as follows:
  - a. Remove bolts and guard to access compressor drive.
  - b. Loosen mounting hardware which secures motor to base. Slide motor within slots of baseplate to desired position.
  - c. Apply pressure with finger to one belt at midpoint span. Tension is correct if top of belt aligns with bottom of adjacent belt. Make further adjustments if necessary.
  - d. Check the alignment of pulleys. Adjust if necessary.
  - e. Tighten mounting hardware to secure motor on base.
  - f. Re-install guard and secure with bolts.



### **WARNING**

**Never operate unit without belt guard in place. Removal will expose rotating parts which can cause injury or equipment damage.**

## EVERY 90 DAYS OR 500 HOURS MAINTENANCE

1. Change crankcase oil. Use type and grade oil as specified in the section on "Compressor Oil Specifications".
2. Check entire system for air leakage around fittings, connections, and gaskets, using soap solution and brush.
3. Tighten nuts and capscrews as required.
4. Check and clean compressor valves, replace springs, discs and seats when worn or damaged.



### CAUTION

**Valves must be reinstalled in original position. Valve gaskets should be replaced each time valves are serviced.**

5. Pull ring on all pressure relief valves to assure proper operation.

## GENERAL MAINTENANCE NOTES

**PRESSURE RELIEF VALVE:** The pressure relief valve is an automatic pop valve. Each valve is properly adjusted for the maximum pressure permitted by tank specifications and working pressure of the unit on which it is installed. If it should pop, it will be necessary to drain all the air out of the tank in order to reseal properly. Do not readjust.

**TANK DRAIN VALVE:** Drain valve is located at bottom of tank. Open drain valve daily to drain condensation. Do not open drain valve if tank pressure exceeds 25 PSIG. The automatic tank drain equipped compressor requires draining manually once a week.

**PRESSURE SWITCH:** The pressure switch is automatic and will start compressor at low pressure and stop when the maximum pressure is reached. It is adjusted to start and stop compressor at the proper pressure for the unit on which it is installed. Do not readjust.

**BELTS:** Drive belts must be kept tight enough to prevent slipping. If belts slip or squeak, see V-belt maintenance in preceding section.



### CAUTION

**If belts are too tight, overload will be put on motor and motor bearings.**

**COMPRESSOR VALVES:** If compressor fails to pump air or seems slow in filling up tank, disconnect unit from power source and remove valves and clean thoroughly, using compressed air and a soft wire brush. After cleaning exceptional care must be taken that all parts are replaced in exactly the same position and all joints must be tight or the compressor will not function properly. When all valves are replaced and connections tight, close hand valve at tank outlet for final test. Valve gaskets should be replaced each time valves are removed from pump.

## GENERAL MAINTENANCE (Cont'd.)

**CHECK VALVE:** The check valve closes when the compressor stops operating, preventing air from flowing out of the tank through the pressure release valve. After the compressor stops operating, if air continues to escape through the release valve, it is an indication that the check valve is leaking. This can be corrected by removing check valve and cleaning disc and seat. If check valve is worn badly, replace same.



### WARNING

**Before removing check valve be sure all air is drained out of tank and power is disconnected. Failure to do so may result in injury or equipment damage.**

**COMPRESSOR LUBRICATION:** Fill crankcase to proper level as indicated by oil sight gauge. Keep crankcase filled as required by usage. It is recommended that only Champlub recip lubricant be used. This is a 30-weight, non-detergent industrial oil with rust and oxidation inhibitors specially formulated for reciprocating compressors. Do not mix oil types, weights or brands.

**MOTOR LUBRICATION:** Long time satisfactory operation of an electric motor depends in large measure on proper lubrication of the bearings. Bearing grease will lose its lubricating ability overtime, not suddenly. Refer to the motor manufacturer's instructions for the type of grease and lubrication intervals.

**PILOT VALVE:** The pilot valve actuates the head unloader mechanism to provide a means of stopping or starting the compression of air by the compressor without stopping or starting the electric motor.

## GENERAL MAINTENANCE (Cont'd.)

### COMPRESSOR PILOT VALVE PRESSURE ADJUSTMENT

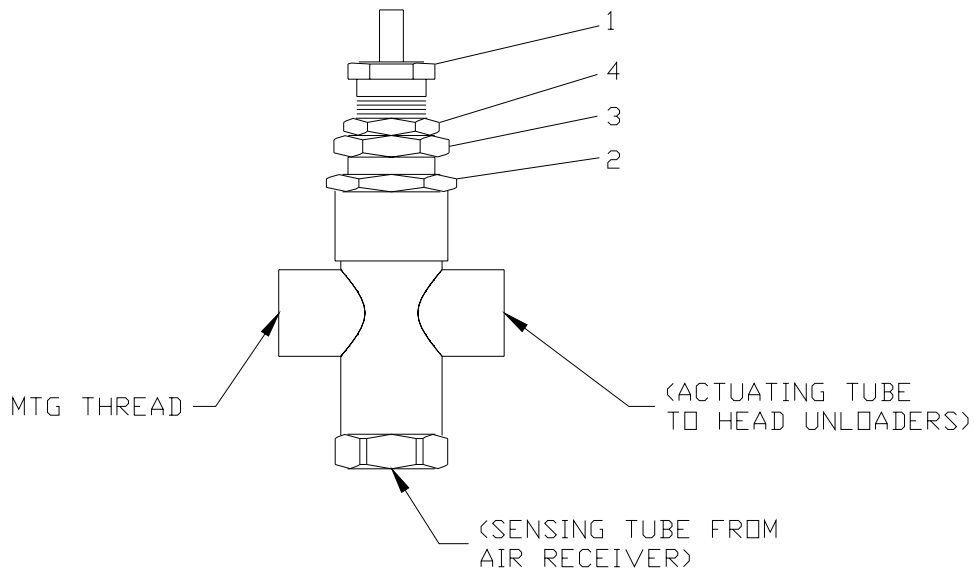
Proceed with the following instructions while compressor is running:

1. Loosen locknut (4) and back off several turns. Do not turn differential pressure adjustment nut (3).
2. Check reading on the tank pressure gauge. Set the compressor maximum pressure by turning threaded cap (1) clockwise to increase pressure or counter clockwise to decrease pressure. Pressure setting must be 5 psig less than setting of pressure switch.
3. After pressure is set, tighten locknut (4). Be careful not to move threaded cap (1).

### COMPRESSOR PILOT VALVE DIFFERENTIAL PRESSURE ADJUSTMENT

Proceed with the following instructions while compressor is running:


1. Loosen locknut (2) and back off several turns.
2. Check reading on the tank pressure gauge. Set the pressure to 30 psig differential (unload at 95 psig, reload at 125 psig). Turn nut (3) clockwise to increase differential pressure or counterclockwise to decrease differential pressure.
3. After pressure is set, tighten locknut (2). Be careful not to move nut (3).




**B890-B**  
**(Ref. Drawing)**

## **COMPRESSOR OIL SPECIFICATIONS**

Compressors shipped on units are factory filled with Champlub hydrocarbon based recip lubricants. Compressors shipped as pump only, do not have any oil in the crankcase. Be sure to add oil prior to start-up. Champlub is an ISO 100 non-detergent industrial lubricant with rust and oxidation inhibitors specially formulated for reciprocating compressors. It is recommended this compressor be maintained using this oil for ambient temperatures above 32°F.

 <b>CAUTION</b>
<b>Do not mix oil types, weights or brands.</b>

 <b>CAUTION</b>
<b>“Emulsification of oil (white milky substance) indicates unsafe accumulation of moisture and may be evidence compressor is oversized for application. Failure to promptly consult your local distributor, or Champion Customer Service, can be grounds to deny warranty.”</b>

### **NOTES:**

1. Normal break-in period of Champion air compressors is 25 hours.
2. For the first 100 hours of compressor operation, a careful and regular check of the oil level should be made. Maintain oil level at the full line.

### **LUBRICANT**

CHAMPLUB	
DESCRIPTION	PART NUMBER
1 – Quart Case (12/case)	P09479A
1 – Gallon Case (4/case)	P08909A
5 – Gallon Pail	P08908A
55 – Gallon Drum	P08907A

### **TORQUE VALVES**

SPECIFIC APPLICATION	FASTENER SIZE & THREAD	TORQUE INCH-POUNDS
CRANKCASE COVER	1/4 – 20	60
CYLINDER FLANGE BOLT	5/16 – 18	228
CONNECTING ROD BOLT	1/4 – 28	100
HEAD BOLT (ALUMINUM HEAD)	5/16 – 18	228
HEAD BOLT (CAST IRON HEAD)	5/16 – 18	144



## TROUBLE SHOOTING CHART FOR COMPRESSOR



### WARNING

Always disconnect unit from power supply and relieve all pressure from air tank before performing any maintenance. Failure to do so may result in equipment damage or injury. A Lock Out" or "Tag Out" all power sources.



Never operate unit without belt guard in place.

Never use gasoline or flammable solvent on or around compressor unit. Explosion may result.

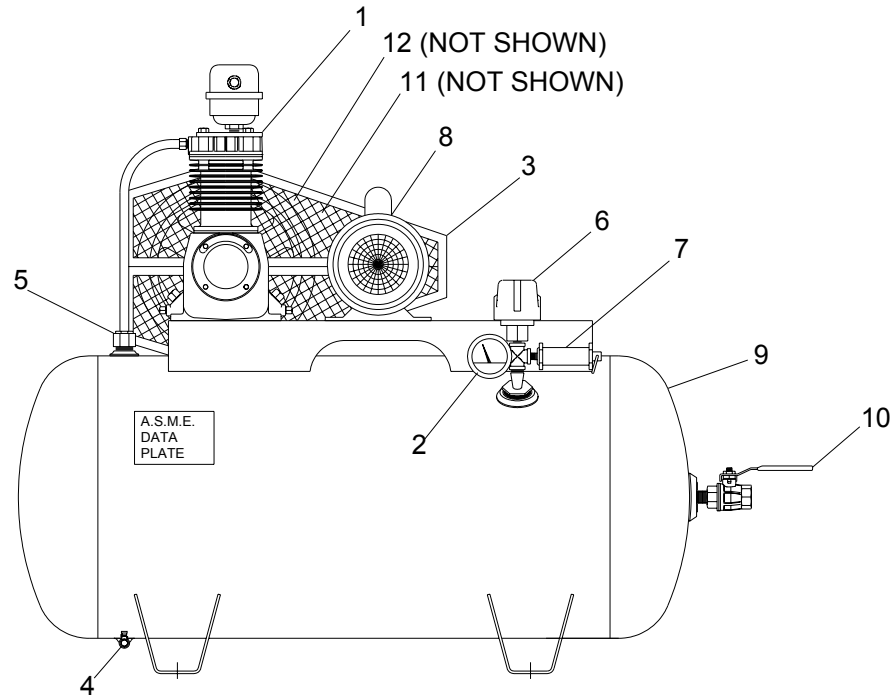
### Troubleshooting Chart

Symptom	Possible Cause(s)	Corrective Action
Motor will not start.	<ol style="list-style-type: none"> <li>1. Main switch and fuses open.</li> <li>2. Starter heater coils open.</li> <li>3. Starter tripped</li> <li>4. Defective pressure switch-contacts will not close</li> <li>5. Low voltage.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check all fuses and switches. Check for loose or faulty wires.</li> <li>2. Check overload relay in starter. Reset starter.</li> <li>3. Reset starter. If starter trips repeatedly, have electrical system inspected by an electrician.</li> <li>4. Repair or replace pressure switch.</li> </ol> <p> <b>Warning</b> – Relieve tank pressure before servicing.</p> <ol style="list-style-type: none"> <li>5. Check with voltmeter. Be sure voltage corresponds to unit specifications.</li> </ol>
Starter trips repeatedly.	<ol style="list-style-type: none"> <li>1. Improperly adjusted pressure switch.</li> <li>2. Faulty check valve.</li> <li>3. Incorrect fuse size or magnetic starter heaters.</li> <li>4. Low voltage.</li> <li>5. Defective motor.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust or replace.</li> </ol> <p> <b>Warning</b> – Relieve tank pressure before servicing.</p> <ol style="list-style-type: none"> <li>2. Clean or replace</li> </ol> <p> <b>Warning</b> – Relieve tank pressure before servicing.</p> <ol style="list-style-type: none"> <li>3. Be sure that fuses and heaters are properly rated.</li> <li>4. Check with voltmeter. Be sure voltage corresponds to unit specifications.</li> <li>5. Replace motor.</li> </ol>
Tank pressure builds up slowly.	<ol style="list-style-type: none"> <li>1. Air leaks.</li> <li>2. Dirty air filter.</li> <li>3. Defective compressor valves</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten fittings.</li> <li>2. Clean or replace.</li> <li>3. Install new valve plate assembly.</li> </ol>
Tank pressure builds up quickly.	<ol style="list-style-type: none"> <li>1. Excessive water in tank.</li> </ol>	<ol style="list-style-type: none"> <li>1. Drain tank.</li> </ol>
Discharge pressure relief valve pops off while compressor is running.	<ol style="list-style-type: none"> <li>1. Wrong pressure switch setting.</li> <li>2. Defective ASME relief valve.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust to correct setting.</li> <li>2. Replace valve.</li> </ol> <p> <b>Warning</b> – Relieve tank pressure before servicing.</p>
Compressor will not unload (Units with head unloaders)	<ol style="list-style-type: none"> <li>1. Wrong pilot valve setting.</li> <li>2. Defective pilot valve.</li> <li>3. Lack of air to pilot valve..</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust to correct setting</li> <li>2. Replace pilot valve.</li> <li>3. Open needle valve to pilot valve.</li> </ol>
Excessive belt wear.	<ol style="list-style-type: none"> <li>1. Pulley out of alignment.</li> <li>2. Belts too tight or too loose.</li> </ol>	<ol style="list-style-type: none"> <li>1. Realign motor pulley.</li> <li>2. Adjust belt tension.</li> </ol>
Compressor runs hot.	<ol style="list-style-type: none"> <li>1. Improper flywheel rotation</li> <li>2. Defective compressor valves.</li> <li>3. Dirty air filter.</li> <li>4. Dirty cylinder.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check for correct rotation. (Counter clockwise when viewed from drive side.</li> <li>2. Install new valve plate assembly.</li> <li>3. Clean or replace.</li> <li>4. Clean cylinder fins.</li> </ol>
Excessive oil consumption.	<ol style="list-style-type: none"> <li>1. Dirty air filter.</li> <li>2. Wrong oil viscosity.</li> <li>3. Oil leaks.</li> <li>4. Worn piston rings.</li> <li>5. Scored cylinder</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean or replace.</li> <li>2. Refill with proper viscosity oil.</li> <li>3. Tighten bolts. Replace gaskets.</li> <li>4. Replace rings.</li> <li>5. Replace cylinder.</li> </ol>

**Troubleshooting Chart (Cont'd)**

Symptom	Possible Cause(s)	Corrective Action
Air escapes from unloader pressure switch when unit is running.	1. Defective pressure switch..	1. Replace pressure switch.   <b>Warning</b> – Relieve tank pressure before servicing
Air continues to escape from unloader on pressure switch when unit is stopped.	1. Check valve stuck in open position.	1. Replace check valve.   <b>Warning</b> – Relieve tank pressure before servicing.

**UNIT REPAIR ILLUSTRATION**  
**MODELS: 30A5H, 30B7H & 20C10H**



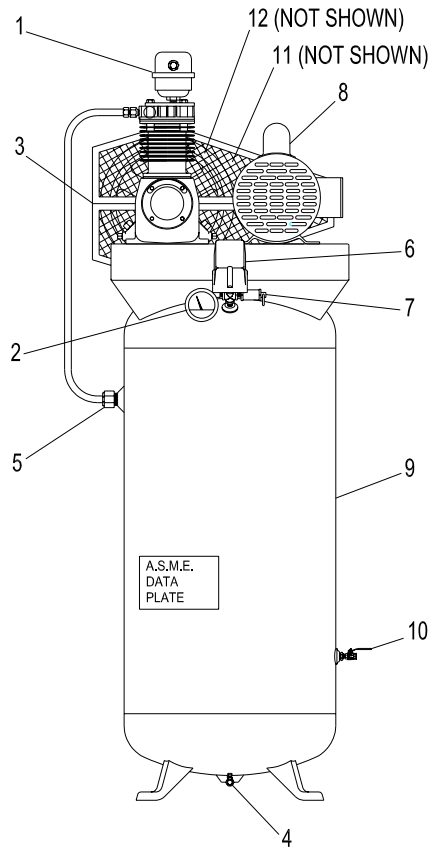
**C494-A**  
**(Ref. Drawing)**

**REPAIR PARTS LIST**

	<b>MODELS</b>			
	30A5H	30B7H	30C10H	
1. Pump	A1	B1	C1	
2. Pressure Gauge	M1249	M1249	M1249	
3. Belt Guard	Z706	Z706	Z706	
4. Drain Valve	VP1022988	VP1022988	VP1022988	
5. Check Valve	P05654A	P05654A	P05654A	
6. Pressure Switch	P14208A	P14208A	P14208A	
7. Pressure Relief Valve	M2839	M2839	M2839	
8. Motor	1/2 HP	3/4 HP	1 HP	
9. Tank	P02236D	P02236D	P02236D	
10. Isolation Valve	VP1022988	VP1022988	VP1022988	
*11. Pulley	1 PHASE	P04203A	M2005A	P04204A
	3 PHASE	P09965A	P09948A	P04204A
*12. Belts	1 PHASE	4L380 (1)	4L410 (1)	4L400 (1)
	3 PHASE	4L410 (1)	4L430 (1)	4L400 (1)

\* **NOTE:** 1/2 HP UNITS WITH 1 PHASE, 230 VOLT MOTOR USE:  
 PULLEY: P09965A  
 BELTS: 4L440 (1)

**UNIT REPAIR ILLUSTRATION**  
**MODELS: 30A5V, 30B7V & 30C10V**



**C495-A**  
**(Ref. Drawing)**

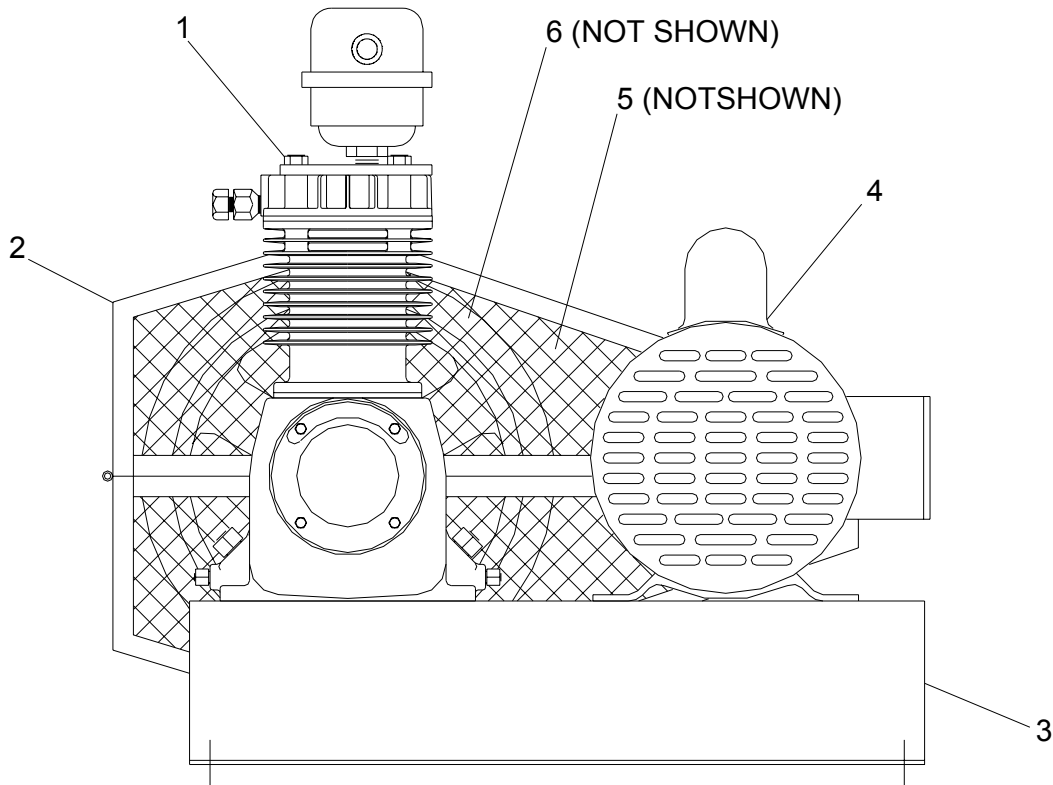
**REPAIR PARTS LIST**

		<b>MODELS</b>		
		30A5V	30B7V	30C10V
1.	Pump	A1	B1	C1
2.	Pressure Gauge	M1249	M1249	M1249
3.	Belt Guard	Z706	Z706	Z706
4.	Drain Valve	VP1022988	VP1022988	VP1022988
5.	Check Valve	P05654A	P05654A	P05654A
6.	Pressure Switch	P14208A	P14208A	P14208A
7.	Pressure Relief Valve	M2839	M2839	M2839
8.	Motor	1/2 HP	3/4 HP	1 HP
9.	Tank	P02231C	P02231C	P02231C
10.	Isolation Valve	VP1022988	VP1022988	VP1022988
* 11.	Pulley	1 PHASE	P04203A	M2005A
		3 PHASE	P09965A	P09948A
* 12.	Belts	1 PHASE	4L380 (1)	4L410 (1)
		3 PHASE	4L410 (1)	4L430 (1)

\* **NOTE:** 1/2 HP UNITS WITH 1 PHASE, 230 VOLT MOTOR USE:  
 PULLEY: P09965A  
 BELTS: 4L440 (1)

# UNIT REPAIR ILLUSTRATION

MODELS: BMA5, BMB7, BMC10, BMB5SS & BMC7SS



C496-A  
(Ref. Drawing)

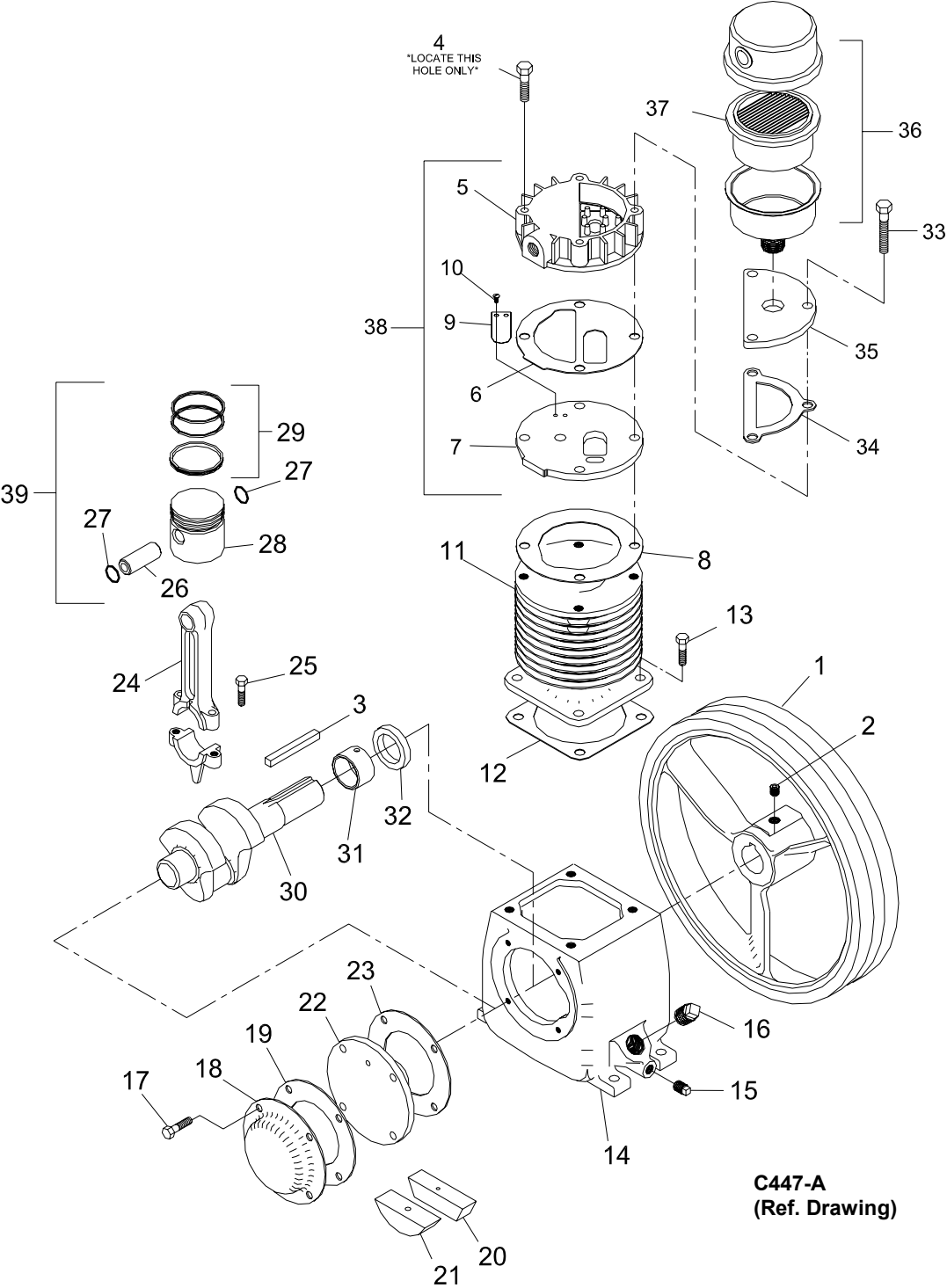
## REPAIR PARTS LIST

		MODELS				
		BMA5	BMB7	BMC10	BMB5SS	BMBC7SS
1.	Pump	A1	B1	C1	B1	C1
2.	Belt Guard	Z706	Z706	Z706	Z706	Z706
3.	Base Plate	P05958B	P05958B	P05958B	P05958B	P05958B
4.	Motor	1/2 HP	3/4 HP	1 HP	1/2 HP	3/4 HP
* 5.	1 PHASE	P04203A	M2005A	P04204A	M2005A	P04204A
	3 PHASE	P09965A	P09948A	P04204A	P09947A	P04927A
* 6.	1 PHASE	4L380 (1)	4L410 (1)	4L400 (1)	4L400 (1)	4L400 (1)
	3 PHASE	4L410 (1)	4L430 (1)	4L400 (1)	4L400 (1)	4L400 (1)

\* **NOTE:** 1/2 HP UNITS WITH A1 PUMP AND 1 PHASE, 230 VOLT MOTOR USE:  
 PULLEY: P09965A  
 BELTS: 4L440 (1)

# COMPRESSOR REPAIR PARTS LIST

MODELS: A1, B1 & C1



## COMPRESSOR REPAIR PARTS LIST

MODELS: A1, B1 & C1

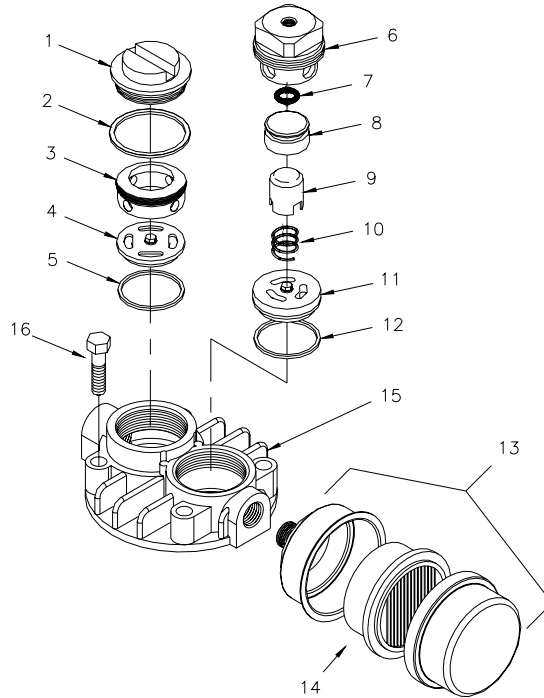
REF. NO.	DESCRIPTION	MODEL A1 PART NO.	MODEL B1 PART NO.	MODEL C1 PART NO.	QTY
1	Flywheel .....	M837	A7B	A7B	1
2	Set Screw .....	M922A	M568	M568	1
3	Machinery Key .....	U8	U8	U8	1
4	Capscrew .....	M3127	M3127	M3127	1
5	Reed Valve Head .....	M1561	M1561	M1561	1
6	Reed Valve Plate Gasket .....	M1564	M1564	M1564	1
7	Valve Plate .....	M1562	M1562	M1562	1
8	Head Gasket .....	P09152A	B31	B31	1
9	Reed Valve .....	P07497A	P07497A	P07497A	2
10	Screw, Thread Rolling .....	M1565	M1565	M1565	4
11	Cylinder .....	C6B	B6A	P02012B	1
12	Cylinder Flange Gasket .....	A29	A29	A29	1
13	Capscrew .....	M2339	M2339	M2339	4
14	Crankcase .....	A9	A9	A9	1
15	Oil Drain Plug .....	M1795	M1795	M1795	2
16	Oil Fill Plug .....	M1796	M1796	M1796	2
17	Capscrew .....	M2340	M2340	M2340	4
18	Breather Chamber Assembly (Includes Items 20, 21 & 22) .....	Z1652	Z1652	Z1652	1
19	Crankcase Cover Gasket .....	C30	C30	C30	1
20	Breather Element .....	P04581A	P04581A	P04581A	1
21	Breather Oil Separator Element .....	P04582A	P04582A	P04582A	1
22	Crankcase Cover .....	A14A	A14A	A14A	1
23	Crankcase Cover Gasket Set .....	Z132	Z132	Z132	1
24	Connecting Rod (Includes Item 25) .....	Z1485	Z1485	Z1485	1
25	Connecting Rod Bolt .....	M564	M564	M564	2
26	Piston Pin .....	C21A	B21	A21	1
27	Piston Pin Retaining Ring .....	A102	A102	A102	2
28	Piston w/Pin & Retainers (Includes Items 26 & 27) .....	ZC4A	ZB4A	ZA4A	1
29	Piston Ring Set .....	ZC10	ZB10	ZA10	1
30	Crankshaft .....	A5	A5	A5	1
31	Main Bearing Sleeve .....	P05808B	P05808B	P05808B	1
32	Oil Seal .....	OSA5A	OSA5A	OSA5A	1
33	Capscrew .....	M3507	M3507	M3507	3
34	Gasket, Inlet Filter Plate .....	P09924A	P09924A	P09924A	1
35	Plate, Inlet Filter .....	P09922A	P09922A	P09922A	1
36	Filter Silencer 1/2 NPT .....	P09892A	P09892A	P09892A	1
37	Element, Filter .....	P09974A	P09974A	P09974A	1
38	Head Assembly (Includes Items 5, 6, 7, 9, & 10) .....	Z653	Z653	Z653	1
39	Piston Assembly (Includes Items 28 & 29) .....	Z3606	Z3605	Z3604	1
---	Complete Compressor Pump Gasket Set (Includes Items 6, 8, 12, 19 & 23) .....	Z766	Z767	Z767	1

## CONSTANT SPEED HEAD UNLOADER For Air Compressor Models A1, B1 and C1.

**NOTE:** This is optional equipment and may not be included on your unit.

The purpose of constant speed unloading is to provide a means of stopping or starting the compression of air by the compressor without stopping or starting the electric motor or gasoline engine after each cycle.

The parts called out below replace or are substituted for those found in the regular parts list.



**B1089-A  
(Ref. Drawing)**

### Z6323 HEAD ASSEMBLY

ITEM	PART NO.	DESCRIPTION	NO. REQ.
1	B-28B	Chamber Cap .....	1
2	B-75	Cap Gasket.....	1
3	B-26A	Valve Retainer .....	1
4	Z-122A	Exhaust Valve.....	1
5	U-48	Valve Gasket .....	1
6	P09043B	Cylinder.....	1
7	OR-116	O-Ring .....	1
8	P09044B	Piston.....	1
9	P09045A	Actuating Fork.....	1
10	P09041A	Spring .....	1
11	Z-121A	Intake Valve .....	1
12	U-48	Valve Gasket .....	1
*13	P13704A	Intake Filter .....	1
*14	P13705A	Filter Element.....	1
15	B-1A	Cylinder Head .....	1
16	M2338	Cylinder Head Bolt.....	4
-	HUK102	Constant Speed Head Unloader Kit (Convert Start/Stop Pump To Continuous Run)	1

\* Not Included.



### UNIT HAZARD DECAL LISTING

<u>PAGE</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>
26	PRODUCT LIABILITY DECAL SHEET - MASTER	P10157A
	Unit Pressure Setting	1
	NOT USED	2
	DANGER – Breathing Air	3
	DANGER – Drain Tank Daily	4
	WARNING – Pressure/Safety Valve	5
	NOT USED	6
	DANGER – Valve Maintenance	7
	DANGER – High Voltage	8
	WARNING – Hot Surfaces	9
	WARNING – Do Not Remove Fan Guard	10
	NOTICE - Lubricant	11a
	NOT USED	11b
	DECAL – Synthetic or Food Grade Inserts	12
	NOT USED	13
	DECAL – Pressure Setting: 70 -100 PSIG	14
	NOTICE – Read and Retain Manuals	15
	NOT USED	16
	DECAL – Rotation Direction	17
	NOT USED	18
	DECAL – Pressure Switch	P14677A

### PUMP HAZARD DECAL LISTING

<u>PAGE</u>	<u>DESCRIPTION</u>	<u>PART NO.</u>
27	PUMP DECAL SHEET – MASTER	P13805A
	NOT USED	A1
	NOTICE - Lubricants	A2
	DECAL – Rotation Direction	B
	NOTICE – Read and Retain Manuals	C
	DANGER – Breathing Air	D
	DECAL – Made in the United States of America	E
	IMPORTANT NOTICE – Motor Burn-Outs	F

**DO NOT CONNECT  
INCOMING POWER  
SUPPLY TO PRESSURE  
SWITCH.**

**P14677A**

## UNIT HAZARD DECALS

**1**

**UNIT PRESSURE SETTING**

UNIT PRESSURE FACTORY SET AT

**1**

**UNIT PRESSURE SETTING**

UNIT PRESSURE FACTORY SET AT

**2**



**⚠ WARNING**

DO NOT START ENGINE UNLESS TANK PRESSURE IS BELOW 130 PSIG. TO REDUCE TANK PRESSURE, OPEN VALVE ADJACENT TO THIS DECAL.

**3**



**⚠ DANGER**

Air from this compressor must not be used for food processing or breathing, without adequate filtering. Failure to comply will result in injury or death.


**4**



**⚠ DANGER**

**DRAIN THIS TANK DAILY!**  
Failure to drain moisture will corrode tank material and lead to tank failure which will cause equipment damage, injury, or death.

**5**



**⚠ WARNING**

• RELIEVE TANK PRESSURE BEFORE SERVICING. Failure to do so can result in injury.  
• DO NOT ADJUST PRESSURE SWITCH, PILOT VALVE, OR SAFETY VALVES. Exceeding factory settings can cause equipment damage and injury.

**6**

MODEL: \_\_\_\_\_  
SERIAL NO: \_\_\_\_\_

**12**

**SYNTHETIC**

**FOOD GRADE**

**11a**



**ⓘ NOTICE**

FOR OPTIMUM PERFORMANCE USE ONLY GENUINE CHAMPION LIUBRICANTS. CONTACT LOCAL CHAMPION DISTRIBUTOR FOR ADDITIONAL LUBRICANT AND REPLACEMENT PARTS.

*Champion Lub*

YOUR COMPRESSOR HAS BEEN TESTED AND SHIPPED WITH


**13**

**AC-HC**

**AC-SY**

**AC-FG**

**11b**



**ⓘ NOTICE**

FOR OPTIMUM PERFORMANCE USE ONLY GENUINE GARDNER LIUBRICANTS. CONTACT LOCAL GARDNER DENVER DISTRIBUTOR FOR ADDITIONAL LUBRICANT AND REPLACEMENT PARTS.

**AFDN**

YOUR COMPRESSOR HAS BEEN TESTED AND SHIPPED WITH

85-115 PSIG	95-125 PSIG	130-165 PSIG	140-170 PSIG
140-175 PSIG	215-250 PSIG	20-40 PSIG	60-80 PSIG
60-90 PSIG	70-90 PSIG	70-100 PSIG	80-100 PSIG

**14**

**18**

**RESET**      **RESET**

**ⓘ NOTICE**

Read, understand and retain all labels and Owners Manuals before using this equipment.  
**IMPORTANT:** Please keep the operating Instructions with this compressor unit.

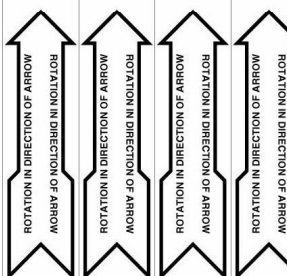
**15**

Master Decal Set  
P/N P10157A

**INSTRUCTIONS**  
**DUAL CONTROL**

This unit is equipped with a dual control valve. Open valve completely for continuous run operation. Close valve completely for start-stop operation.

**16**



**17**

**9**



**⚠ WARNING**

Do not touch hot surfaces! Contact with these surfaces can cause injury.

**10**



**⚠ WARNING**

DO NOT REMOVE BELT OR FAN GUARD  
Removal will expose rotating parts which can cause severe injury and/or property damage.

**7**



**⚠ DANGER**

Valves must be replaced in original position. Failure to do this will result in equipment damage, injury, or death. Do not disassemble valves.

**6**



**⚠ WARNING**

Do not touch hot surfaces! Contact with these surfaces can cause injury.

**10**



**⚠ WARNING**

DO NOT REMOVE BELT OR FAN GUARD  
Removal will expose rotating parts which can cause severe injury and/or property damage.

**8**



**⚠ DANGER**

HIGH VOLTAGE  
DISCONNECT POWER SOURCE BEFORE SERVICING.

## PUMP HAZARD DECALS

**A1**

**⚠ NOTICE**

THIS COMPRESSOR HAS BEEN  
FACTORY FILLED WITH **AEDN**  
 AC-SY     AC-FG  
 AC-HC  
 DO NOT MIX OIL TYPES OR BRANDS.

**A2**

**⚠ NOTICE**

THIS COMPRESSOR HAS BEEN  
FACTORY FILLED WITH *Plasmo-Lube*  
 SYNTHETIC     FOOD GRADE  
 MINERAL  
 DO NOT MIX OIL TYPES OR BRANDS.

**B**

ROTATION IN DIRECTION OF ARROW

ROTATION IN DIRECTION OF ARROW

**C**

**⚠ NOTICE**

Read, understand, & retain all  
Labels and Owners Manuals  
before using this equipment.

**D**

**⚠ DANGER**

AIR FROM THIS COMPRESSOR  
MUST NOT BE USED FOR FOOD  
PROCESSING OR BREATHING  
WITHOUT ADEQUATE FILTERING.

**E**

MADE IN THE UNITED  
STATES OF AMERICA

Master Decal Set  
P/N P13805A

**F** **IMPORTANT NOTICE!**

THIS UNIT IS WIRED FOR AN AC CIRCUIT OF

<input type="checkbox"/> 115 VOLT	<input type="checkbox"/> 60 CYCLE	<input type="checkbox"/> 1 PHASE
<input type="checkbox"/> 230 VOLT	<input type="checkbox"/> OTHER	<input type="checkbox"/> 3 PHASE
<input type="checkbox"/> 460 VOLT		

OTHER ELECTRICAL SPECS \_\_\_\_\_

P05257A

**IMPORTANT**

MOTOR BURN-OUTS ARE NOT COVERED BY  
WARRANTY - Unless Motor is Equipped with  
Factory Installed thermal overload protection  
(in either motor or starting device)

P05257A



\*F3068VER07\*

**CHAMPION**<sup>®</sup>



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