TECHNICAL MANUAL

OPERATOR, UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

FOR

WATER PURIFICATION BARGES (NSN 1930-01-234-2165) VOLUME 7 COMPRESSED AIR SYSTEM

This technical manual is an authentication of the manufacturer's commercial literature and does not conform with the format and content requirements normally associated with the Army technical manuals. This technical manual does, however, contain all essential information required to operate and maintain the equipment.

***This manual supersedes TM 55-1930-209-14&P-7, 30 January 1989.**

HEADQUARTERS, DEPARTMENT OF THE ARMY
15 OCTOBER 1992

WARNINGS AND SAFETY NOTICES

WARNING

**DANGEROUS VOLTAGES AND HAZARDOUS MATERIALS
ARE USED IN THIS EQUIPMENT.
DO NOT TAKE CHANCES!**

GENERAL WARNINGS

- Always redtag electrical equipment, controls, circuits, and switches before beginning repairs.
- Do not service or adjust high voltage electrical equipment when alone.
- Do not overload circuits.
- Always use authorized, insulated tools and test equipment when working on electrical equipment.
- Remove all jewelry before working on or around electrical equipment with exposed current-carrying areas.
- Do not wear clothing with exposed metal fasteners when working on electrical equipment.
- Always use approved breathing apparatus when working with chemicals.
- Avoid chemical contact with eyes, skin, and clothing.
- Always wear safety glasses, gloves, and rubber aprons when handling chemicals.
- Wear protective clothing and safety glasses as required when working on barge equipment.
- Always wear approved ear protection in noise hazard areas.

SPECIFIC WARNINGS

- Do not connect any new circuit to an existing circuit.
- Do not energize circuits if water condensation is present.
- If any sparks are seen, stop operation immediately Determine cause and take corrective action.
- Never touch radio antennas of fixed-base radio transmitters. When transmitting, antennas contain high voltage.
- Always use approved breathing apparatus when handling material in multimedia filters and chlorination unit descaling acid crystals. Do not breathe dust from these materials.
- Avoid breathing vapors from coagulant aid chemicals. Use in a well-ventilated area. In case of chemical contact with skin, wash with water. For eyes, immediately flush at eyewash station and obtain medical help as soon as possible.
- Always wear work gloves and shirts with full length buttoned sleeves when handling fuel oil and gasoline.

- Do not smoke or have open flames within 10 feet when handling fuel oil or gas. Only minimum number of personnel necessary to conduct fueling operation is permitted in area.
- Before starting any repairs on compressed air system, always release pressure from air receiver and compressor and open and redtag circuit breakers.
- On air compressor, do not adjust automatic regulator switch (pressure switch) and pilot valve settings.
- To avoid flying particles lodging in eyes, do not use compressed air to "dust-off" clothing or workspace.
- Stay dear of anchor cables when operating anchor winches.
- Always wear safety glasses or face shield when using power tools.
- Always wear lifevests when on weatherdeck and throughout the barge during storm conditions.
- Lifevests are to be worn at all times aboard workboat.
- Only qualified persons will operate and maintain arc and fuel gas welders.
- When welding, always make sure those working with or near the welder wear proper clothing: heavy, hole-free gloves, heavy shirt, cuffless trousers, high shoes, and cap. Keep clothing dry and free of oil and other flammable substances.
- Use dry heavy canvas drop cloth to cover work area and adjacent deck when arc welding.
- Before welding on bulkheads, deck plating and similar surfaces, always check carefully to make sure that the other side of the surface to be welded does not hide fuel or compressed gas tanks, flammable or hazardous materials, or electrical equipment or wiring.
- When welding, keep your head out of the fumes and make sure area is well ventilated.
- Before welding on surfaces which have been cleaned with cleaning solutions containing chlorinated hydrocarbons, always wash with water, dry and ventilate area thoroughly.
- Use shield with proper filter lens when welding. Do not allow others near welding operations to assist or observe without proper eye protection. This must include side shields during slag chipping operations.
- Warn personnel in area during welding operations not to look at arc or expose themselves to hot spatter or metal.
- In an extreme emergency, when welding is required in void 2 port, shut down chlorination system. Close all valves. Cover the parts of chlorination system not being welded with a heavy canvas drop cloth. Turn on vent 8 and, if available, provide additional forced air ventilation.

- Before welding on fuel oil or sludge tank, make sure tank is gas-free by: 1) removing all liquid from tank, 2) cleaning tank thoroughly, 3) seeing that tank is thoroughly dry, and 4) force ventilating tank.

- Connect arc welding work cable as dose to welding area as possible. Work cables connected to barge framework or other locations far from welding site increase the possibility of the welding current passing through lifting chains, crane cables or other possible circuit paths. This can create fire hazards or weaken lifting chains or crane cables until they break or fall.

- Always weld with all doors, portholes, and hatches propped open and necessary ventilation systems operating.

- Take frequent breaks away from the area where you are welding.

- Do not take oxygen and acetylene tanks into confined areas when welding.

- Always use a friction lighter to start oxyacetylene torch.

- Always maintain all welding equipment in proper working condition. If you have any doubts about the safety of any welding equipment, do not use the welder.

ELECTRICAL SHOCK SAFETY STEPS

Five safety steps to follow if someone is the victim of electrical shock.

1. Do not try to pull or grab individual.

2. Turn off electrical power when possible.

3. If you can not turn off electrical power, pull, push, or lift person to safety using a wooden pole, rope, or some other insulating material.

4. Get medical help as soon as possible.

5. After the injured person is free of contact with the source of electrical shock, move the person a short distance away and, if needed, start CPR immediately.

INTRODUCTION TO

TM 55-1930-209-14&P-7

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Troop Support Command, ATTN: AMSTR-MMTS, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished directly to you.

1. SCOPE

   TM 55-1930-209-14&P covers the Reverse Osmosis Water Purification Barges, Models 300-WPB-1, 300-WPB-2 and 300-WPB-3, NSN 1930-01-234-2165. This manual consists of twenty-one volumes.

2. REVERSE OSMOSIS WATER PURIFICATION BARGES

   The Reverse Osmosis Water Purification Barges provide up to 300,000 gallons of drinking water per 24 hour period. The drinking water, converted from seawater or brackish water, is for use by a Rapid Deployment Force in a forward area. When needed, the drinking water can be pumped to a shore facility or to another vessel. This manual provides operation and maintenance procedures for all the component systems on the barges.

3. VOLUME 1 -- NORMAL OPERATIONS
   This volume provides information and procedures on normal Reverse Osmosis Water Purification Barge operations, including barge movement and deployment, communications and electrical power systems, drinking water production, shutdown, and required operational maintenance. Emergency shutdown procedures are also provided.

4. VOLUME 2 -- SEAWATER SYSTEM

   This volume describes operation and maintenance of the seawater system which supplies seawater to the Reverse Osmosis Water Purification Units (ROWPUs) for processing to the air conditioning unit for cooling to the ballast tank for barge trimming to the chlorination unit for priming and cooling, and to the diesel generators for cooling

5. VOLUME 3 -- REVERSE OSMOSIS WATER PURIFICATION UNIT (ROWPU) SYSTEM

   Volume 3 provides operation and maintenance procedures for the ROWPU System which processes seawater or brackish water to produce drinking water. Normally, this system processes seawater supplied by the seawater system (TM 55-1930-209-14&P-2) to create product water. Chlorine is then added to this product water by the chlorination system (TM 55-1930-209-14&P-4). The resultant drinking water is discharged into four storage tanks that are part of the drinking water system (TM 55-1930-209-14&P-5).

6. VOLUME 4 -- CHLORINATION SYSTEM

   Operation and maintenance procedures for the chlorination system onboard the Water Purification Barges are contained in this volume. This system produces chlorine in a sodium hypochlorite solution, upon demand, to water processed by the ROWPU system just before the water enters the four drinking water storage tanks.

7. VOLUME 5 -- DRINKING WATER SYSTEM

The drinking water system provides storage for water produced by the ROWPUs and includes pumps and valves to move this water from onboard storage tanks to the shore discharge system, to another vessel, or overboard. The drinking water system also provides a pressurized water supply for drinking and washing onboard the barges.

8. VOLUME 6 -- SHORE DISCHARGE SYSTEM

This volume provides operation and maintenance procedures for the shore discharge system which transfers drinking water from barge storage tanks to holding/storage facilities ashore.

9. VOLUME 7 -- COMPRESSED AIR SYSTEM

Volume 7 describes the operation and maintenance of the compressed air system which provides compressed air to five air stations in the ROWPU space, one in the workshop, and one on stem weatherdeck. This system also provides compressed air to two air stations for blowdown of seachests in void 2 starboard and void 4 port. Compressed air is used on the barges to operate air-powered impact tools, to propel air through the shore discharge hose, to blowdown seachest, and for general cleaning blowdown.

10. VOLUME 8 -- FUEL OIL SYSTEM

This volume provides operation and maintenance procedures for the fuel oil system which functions as a centralized receiving storage and distribution system for diesel fuel used for barge operations. This onboard fuel system provides fuel for two 155 kW diesel ship service generators, a 20 kW ship auxiliary generator, two ROWPU high-pressure pump diesel engines, and a fueling station for the barge workboat.

11. VOLUME 9 -- ELECTRICAL POWER SYSTEMS

Operation and maintenance procedures for the two electrical power systems installed aboard the Water Purification Barges are contained in Volume 9. The normal electrical power system generates, controls and distributes all electrical power for operating the water purification system and its auxiliary systems. The emergency electrical system supplies 24 Vdc from a battery bank to 24 Vdc equipment and converts to 24 Vdc through an inverter to 120 Vdc to power emergency lighting and equipment.

12. VOLUME 10 -- LIGHTING SYSTEM

Volume 10 contains operation and maintenance procedures for the onboard lighting systems for the Water Purification Barges. This system supplies interior and exterior lighting. Normal and emergency interior lighting is provided in the deckhouse ROWPU space, dayroom, workshop, and voids. Exterior lighting consists of searchlights and floodlights for use at night or during reduced visibility. Lights on the weatherdecks and standard navigation and status lights are for use during operation and towing.

13. VOLUME 11 -- EQUIPMENT MONITORING SYSTEM

This volume provides operation and maintenance procedures for the equipment monitoring system which monitors the operation of several equipment components onboard the Water Purification Barges. This system monitors operating conditions such as amount of drinking water in storage tanks and temperature of diesel engine cooling water. Sensors detect unacceptable operating conditions, the main processor flashes at double intensity and remote alarms (horns, strobe lights and buzzer alert crewmembers that corrective action is necessary.

14. VOLUME 12 -- COMMUNICATIONS SYSTEM

Operation and maintenance procedures for the communications system are provided in Volume 12. This system consists of three separate communications methods, radio communications, foghorn and intercom telephones.

15. VOLUME 13-- HANDLING EQUIPMENT

This volume contains operation and maintenance procedures for handling equipment used for lifting, transporting and repositioning equipment and materials onboard the barges. The system includes a bridge crane, bow crane and a void 4 trolley hoist.

16. VOLUME 14 -- ANCHOR, MOORING, AND TOWING EQUIPMENT

Volume 14 describes the operation and maintenance procedures for the anchor mooring, and towing equipment on the Water Purification Barges This equipment provides a method to hold (anchor) the barges in a fixed position offshore, at dockside, or next to another vessel and a method to move the barges from one location to another.

17. VOLUME 15 -- MISCELLANEOUS EQUIPMENT (DAYROOM, WORKSHOP, ACCESSES, AND SANITATION SYSTEMS)

Volume 15 addresses operation and maintenance procedures for miscellaneous equipment installed on the Water Purification Barges This equipment includes the dayroom on the forward starboard side of deckhouse, the workshop on the forward portside of deckhouse, accesses such as deckhouse doors and portholes and various accesses to and from the voids, and two separate sanitation systems (toilets and bilge). Additional equipment addressed in this volume includes: guard rails, rubber fendering, removable rubber floor mats, eyewash stations, component labels, caution, warning and danger signs, and storage areas.

18. VOLUME 16 -- VENTILATION, HEATING, AND AIR CONDITIONING SYSTEMS

This volume contains operation and maintenance procedures for the deckhouse and voids ventilation systems and the heating and air conditioning (HAC) system installed on the Water Purification Barges. The ventilation system provides fresh air circulation in the deckhouse and voids with 17 hatches and 10 ventilation fans. The HAC controls the temperature in the dayroom and deckhouse.

19. VOLUME 17 -- WORKBOAT, LIFESAVING, AND FIREFIGHTING EQUIPMENT

Volume 17 includes procedures for the operation and maintenance of

a. Workboat -provides water transportation for crew members and visitors, small cargo items, transportation of the messenger line for the shore discharge hose and similar work-related tasks associated with operating the Water Purification Barges.

b. Lifesaving Equipment -installed on the barges and consisting of 2 liferafts, 15 Type II and 24 Type V lifevests and 4 lifesaving rings.

c. Firefighting Equipment -installed on the barges and consisting of Halon 1301 system, 2 CO2 hose reel units, a smoke detector system, 17 portable CO2 fire extinguishers, 5 dry chemical fire extinguishers, 5 self-contained breathing apparatuses, and a portable, engine driven firefighting pump. -The workboat also has a 1 O-pound, portable, dry chemical fire extinguisher.

20. VOLUME 18 -- SUPPORTING APPENDICES FOR VOLUMES 1-17.

Volume 18 contains the Maintenance Allocation Chart, Components of End Item List, Tools and Test Equipment List, Expendable/Durable Supplies and Materials List and the Repair Parts and Special

All of the information contained in this volume is common to volumes 1-17 and does not appear in each individual volume.

Appendix A in volumes 1-17 provides information unique to each volume. Appendix B in volumes 1-17 provides manufacturers manuals and instructions unique to the system described in each volume. Appendixes C-G are located in Volume 18.

21. VOLUME 19 -- PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

    Volume 19 contains PMCS pertinent to all onboard systems for the Reverse Osmosis Water Purification Barges.

22. VOLUME 20 -- SUPPLEMENTAL DATA

    Volume 20 contains the Basic Issue Items List, and additional Authorization List for all onboard systems for the Reverse Osmosis Water Purification Barges.

23. VOLUME 21 -- WINCH, DOUBLE DRUM, DIESEL

    This volume contains operation and maintenance procedures for the 20-ton double drum diesel engine winch used on the Water Purification Barges. Appendix B of Volume 21 contains the Maintenance Allocation Chart and the Repair Parts and Special Tools List for the winch.

TECHNICAL MANUAL
NO. 55-1930-209-14&P-7

HEADQUARTERS
DEPARTMENT OF THE ARMY,
WASHINGTON D.C., 15 OCTOBER 1992

TECHNICAL MANUAL

OPERATORS', UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

FOR
WATER PURIFICATION BARGES
(NSN 1930-01-234-2165)
VOLUME 7
COMPRESSED AIR SYSTEM

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Troop Support Command, ATTN: AMSTR-MMTS, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished directly to you.

* Supersedes TM 55-1930-209-14&P-7, 30 January 1989

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NOTE

The following appendices, common to all TM's in this series, are in TM-55-1930-209-14&P-18.

MAINTENANCE ALLOCATION CHART (MAC)
TOOLS AND TEST EQUIPMENT LIST (TTEL)
EXPENDABLE /DURABLE SUPPLIES AND MATERIALS LIST (ESML)
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)
REPAIR PARTS LIST TO FIGURE NUMBER CROSS-REFERENCE LIST

NOTE

The following appendices, common to all TM's in this series, are in TM 55-1930-209-14&P-20.

COMPONENTS OF END ITEM LIST (COEIL) AND BASIC ISSUE ITEMS LIST (BIILL)
ADDITIONAL AUTHORIZED ITEMS LIST (AAL)

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CHAPTER 1 INTRODUCTION

Section I. General

1-1 Purpose. This technical manual (TM) describes the operation and maintenance of the compressed air system on Water Purification Barges. Differences between the compressed air system on Barge 1 and other barges are noted in appropriate paragraphs and figures. Otherwise, information pertains to all barges. Information on other systems installed onboard is in TM 55-1930-209-14&P-1 thru P-6 and P-8 thru P-17. TM 55-1930-209-14&P-18 and TM 55-1930-209-14&P-20 contains appendices common to all TM's. Location of major components is shown in Figure 1-4.

1-2 Scope. The compressed air system provides air to nine Reverse Osmosis Water Purification Unit (ROWPU) air stations. Six of these (stations 1, 2, 4, 5 and 7 in ROWPU space, station 3 in workshop) are for operating air-powered impact tools and general cleaning blowdown. The seventh outlet (station 6) provides air for propelling a PIG (an 8-inch long polyfoam cylinder) through the shore discharge hose to force out water in the hose before reeling in the hose. Stations 8 and 9 provide regulated compressed air for blowdown of two seachests to remove foreign material that may be clogging seachest intakes.

1-3 Warranties and guarantees. Warranty/guarantee information is contained in Chapter 7.

1-4 Maintenance forms and records. Maintenance forms and records are explained in DA PAM 738-750, The Army Maintenance Management System (TAMMS).

1-5 Destruction of Army materiel to prevent enemy use. This shall be as directed in TM 750-244-3.

1-6 Storage. For storage of this system, refer to Chapter 5.

Section II. Description and data

1-7 Description. This system provides compressed air to five air stations in the ROWPU space, one in the workshop, and one on stern weatherdeck. It also provides compressed air to two air stations for blowdown of seachests in void 2 starboard and void 4 port. These outlets, with other major components, valves, and piping are shown schematically in Figure 1-2 for Barge 1 and in Figure 1-3 for Barges 2 and 3. System outlets are listed in Table 1-1. In addition, this system is shown in drawings listed in Appendix A.

1-7.1 System capabilities, defined. Compressed air system capabilities are stated in cubic feet per minute (cfm), Hertz (Hz), National Pipe Thread (NPT), phase (ph), pounds per square inch (psi) and Volt alternating current (Vac), and Volt direct current (Vdc).

1-8 Capabilities. This system provides compressed air up to 155 psi for seven air stations and 40 psi for two for seachests blowdown stations.

1-9 Special limitations. Use of air station 6 and its associated 25-foot air hose is restricted to providing compressed air for forcing water out of the shore discharge hose prior to reeling in this hose.

1-10 Performance characteristics

Air compressor

a.	Barge 1	
	Rating	31.3 cfm at 125 psi
	Capacity	80-gallon receiver, 175 psi
	Electrical power	440 Vac, 3 ph, 60 Hz
b.	Barges 2 and 3	
	Rating	24.2 cfm at 125 psi
	Capacity	80-gallon receiver, 175 psi
	Electrical power	440 Vac, 3 ph 60 Hz

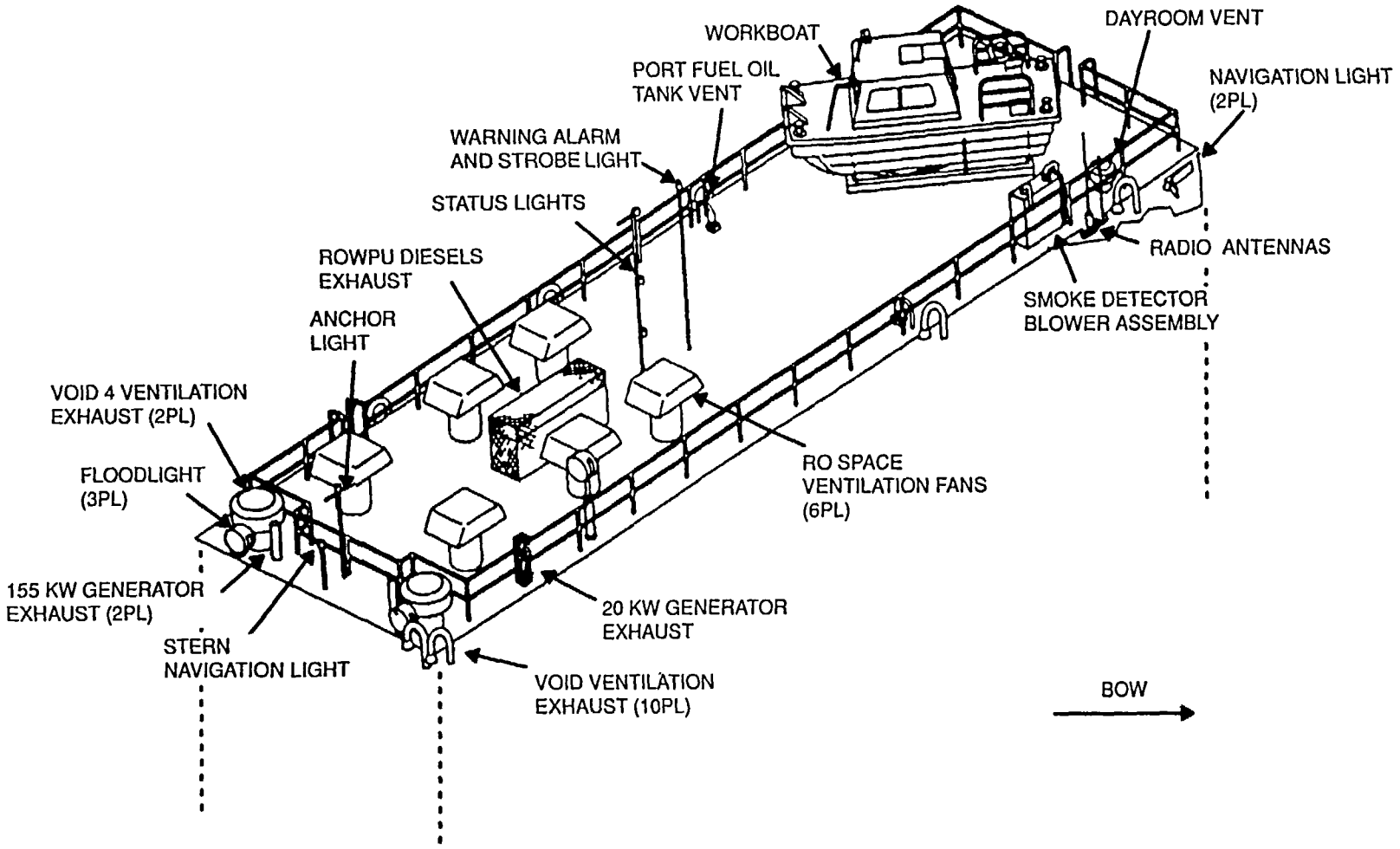


Figure 1-1. Major Components of ROWPU Barge Systems and Equipment - Deckhouse Roof (Sheet 1 of 3)

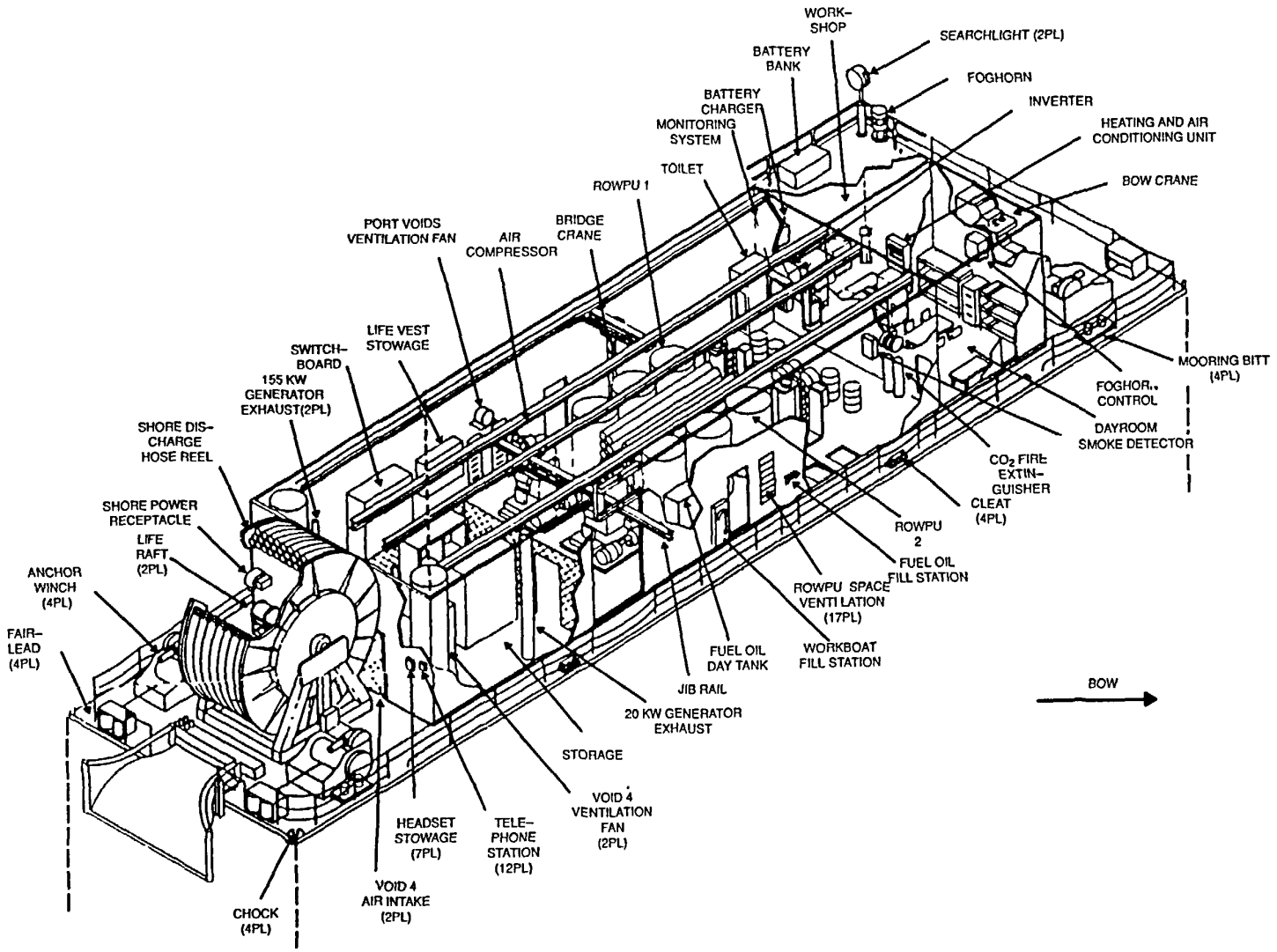


Figure 1-1. Major Components of ROWPU Barge Systems and Equipment - Deckhouse (Sheet 2 of 3)

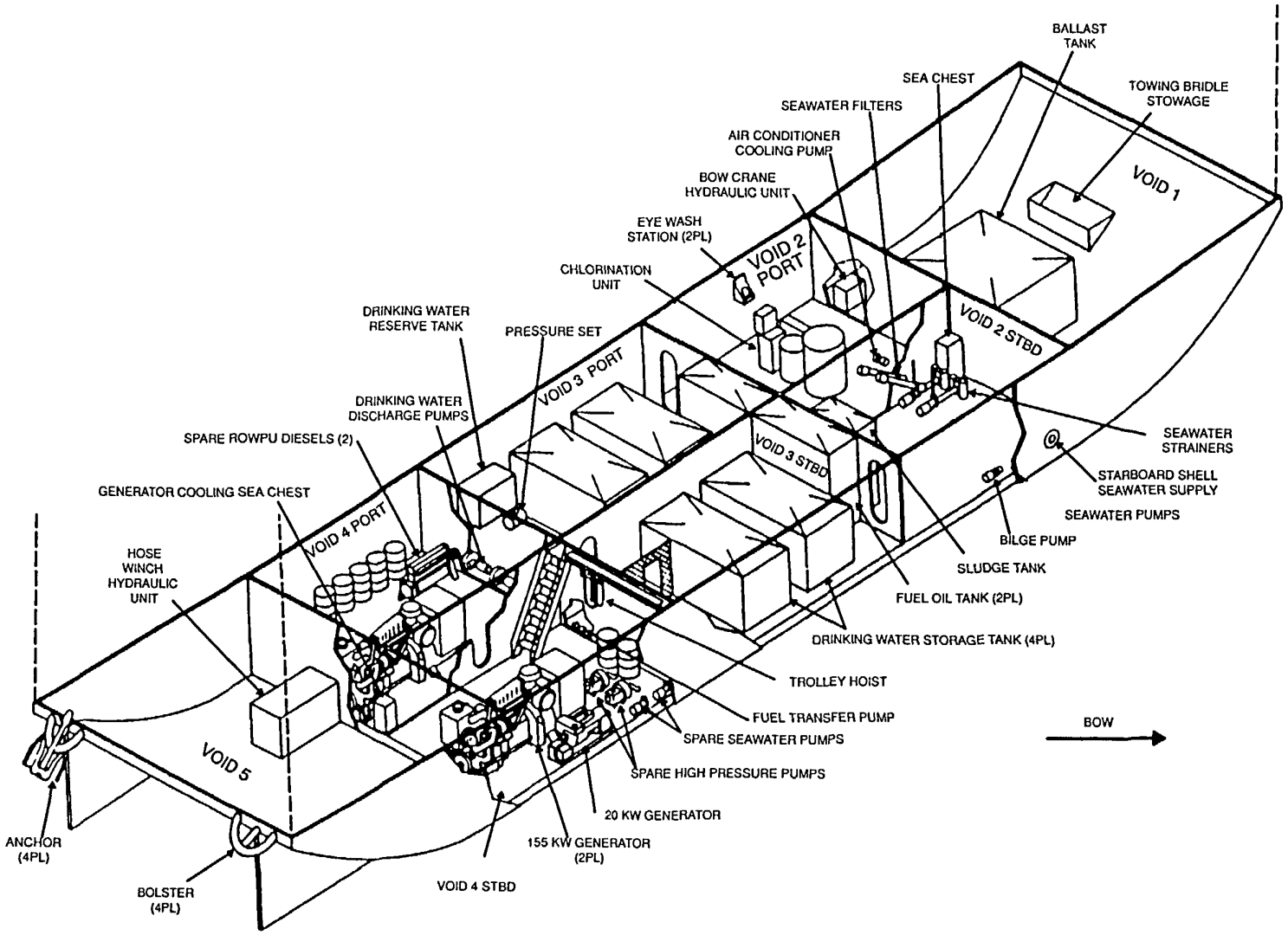


Figure 1-1. Major Components of ROWPU Barge Systems and Equipment - Voids (Sheet 3 of 3)

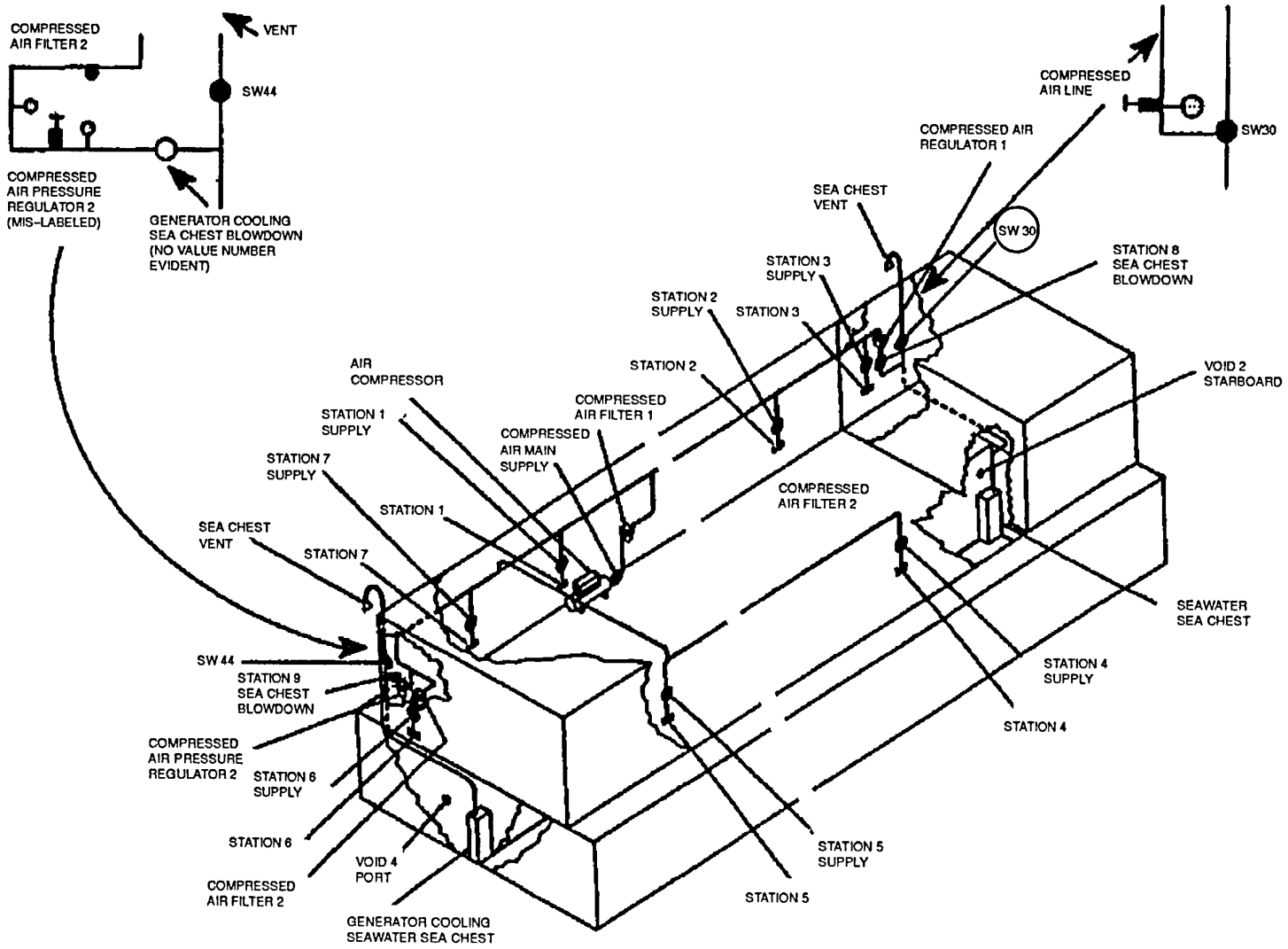


Figure 1-2. Location of Compressed Air System Components - Barge 1

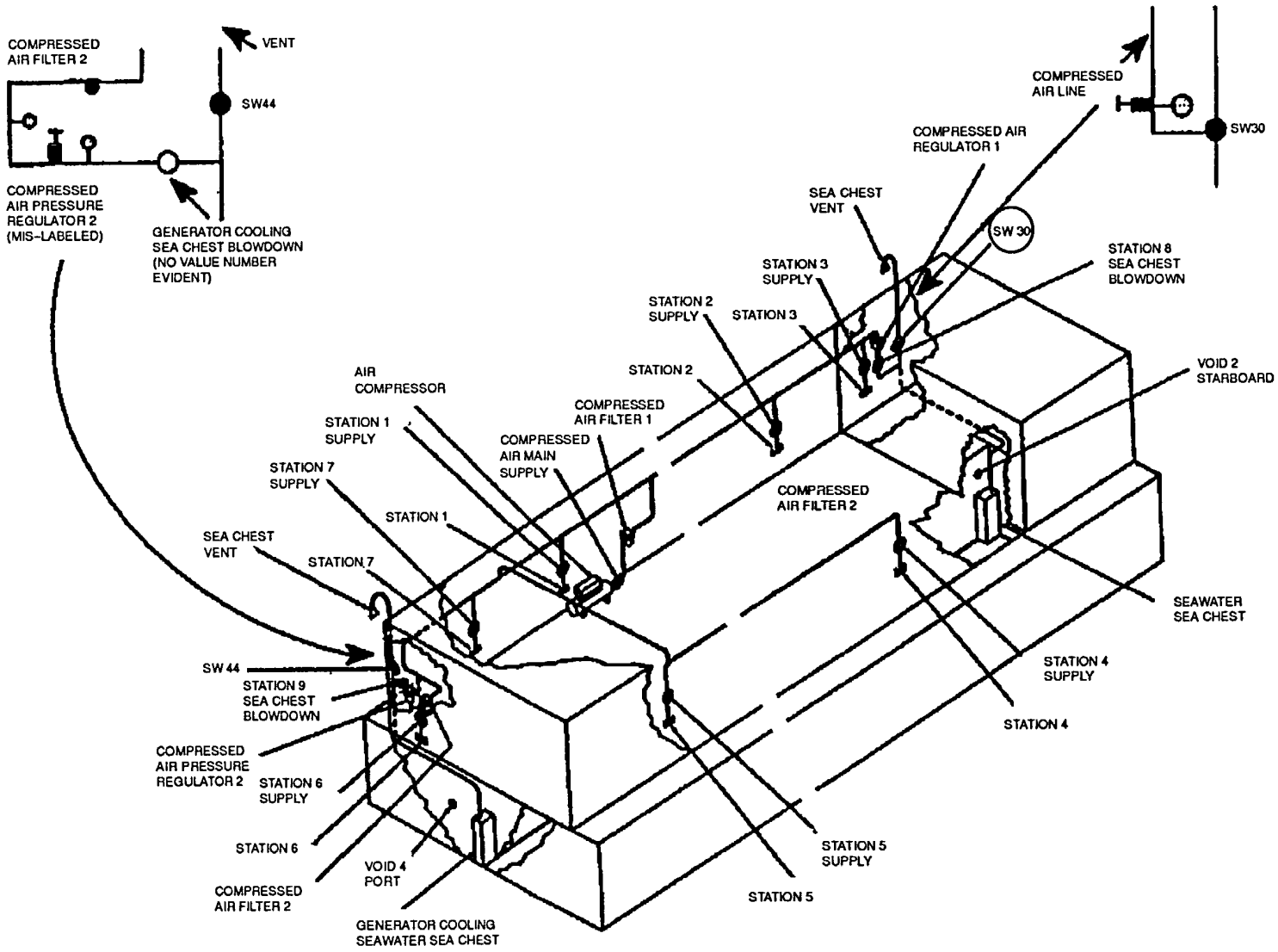


Figure 1-3. Location of Compressed Air System Components - Barges 2 and 3

Table 1-1. Compressed Air System Major Components

Component	Location and Function
Electric Controller	ROWPU space port bulkhead near compressor. Starts, stops, and provides automatic compressor operation.
Compressor w/ Receiver	ROWPU space portside aft. Compresses air to 155 psi and stores it in an 80-gallon receiver.
Automatic Air Pressure Regulator (Pressure Switch)	On top of receiver. When compressor controller is in AUTO, this mechanism turns compressor on and off to maintain pressure in receiver within factory set limits.
Receiver Pressure Gauge	Mounted on side of receiver. Indicates air pressure in receiver.
Receiver Safety Valve	Mounted on top of receiver. Factory set to relieve air pressure in receiver if it exceeds 175 psi.
Receiver Drain Cock	On bottom of receiver. Provides opening for relieving air pressure in receiver. Drains moisture from receiver.
Main Supply Valve	Forward end of receiver. Controls flow of compressed air to air supply lines. Isolates receiver from lines.
Air Filter 1	In air supply pipe near compressor. Removes particles and moisture from air passing from receiver to air supply lines.
Air Filter 2	In air supply line immediately in front of air station 6 Removes oil and particles from line to air station 6 to preclude contamination of drinking water shore discharge hose.
Air Pressure Regulator 1 with Air Pressure Gauge	Workshop port bulkhead. Reduces air pressure to 40 psi for blowdown of seachest in void port 2. Indicates air pressure in line beyond regulator.
Air Pressure Regulator 2 with Air Pressure Gauge	ROWPU space aft bulkhead behind void 4 air ducts Reduces air pressure to 40 psi for blowdown of seachest in void 4 port. Indicates air pressure in line beyond regulator.
Air Station 1	ROWPU space port bulkhead near air compressor. Provides air to quick disconnect coupling for pneumatic equipment.
Air Station 2	ROWPU space port bulkhead amidships. Same function as Air Station 1.
Air Station 3	Workshop port bulkhead Same function as Air Station 1.
Air Station 4	ROWPU space starboard bulkhead forward. Same function as Air Station 1.
Air Station 5	ROWPU space starboard bulkhead aft of sliding door. Same function as Air Station 1.
Air Station 6	Weatherdeck stern portside. Provides 155 psi to quick disconnect exclusively for powering PIG through shore discharge hose.
Air Station 7	ROWPU space port bulkhead aft of switchboard. Same function as Air Station 1.

Table 1-1. Compressed Air System Major Components (continued)

Component	Location and Function
Air Station 8 Seawater Seachest Blowdown Valve	Workshop port bulkhead In air supply line beyond air pressure regulator 1 with air pressure gauge. Controls air for blowdown of seachest In void 2 port. Used In conjunction with seawater valve SW30.
Air Station 9 Generator Cooling Seachest Blowdown Valve	ROWPU space aft bulkhead In air supply line beyond air pressure regulator 2 with air pressure gauge. Controls air for blowdown of seachest In void 4 port. Used In conjunction with seawater valve SW44.
Airhose, 50 Feet Self-Retracting	Attached to air stations. Provides air pressure from air stations to pneumatic equipment.
Airhose, 25 Feet Self-Retracting	Dedicated hose used only for providing air pressure to drive PIG through shore discharge hose.
Seawater Valve SW30*	Workshop port bulkhead. Used with seawater seachest blowdown valve to blowdown seachest in void 2 port. When opened, this valve vents forward seachest to atmosphere through venting pipe to deckhouse top. When closed, valve forces air from air station into seachest for blowdown.
Seawater Valve SW44*	ROWPU space rear bulkhead. Similar function as SW30.

*Serves as integral part of both compressed air system and seawater system.

1-11 Equipment specifications

a. Air compressor (Barge 1)

Manufacturer	atlas Copco Standard Pneumatic, Inc.
AGEC	59379
art no.	LE8T
Stage	Single
Capacity	31.3 cfm at 125 psi
Receiver	
Capacity	80 gallons, 175 psi
Motor	
Horsepower	7 1/2
Voltage	440 Vac, 3 ph, 60 Hz

b. Air compressor (Barges 2 and 3)

Manufacturer	Dayton Electric Manufacturing Co.
CAGEC	16327
Part no.	1Z785D
Stage	Two CCW
Capacity	24.2 cfm at 125 psi
Receiver	
Capacity	80 gallons, 175 psi
Motor	
Model	9NO75E
Type	P
Duty	Continuous
Rating	7 1/2 Hp, 440 Vac, 3 ph, 60 Hz

c. Automatic air pressure regulator (pressure switch)

Manufacturer	Dayton Electric Manufacturing Co
CAGEC	16327
Part no.	4X678
Type	GHG-2
Class	3013
Form	Z
Serial	C

d. Air filter 1

Manufacturer	Arrow Pneumatics, Inc.
CAGEC	04049
Part no.	08F53A
Size (nominal)	1 in
Quantity	1

e. Oil removing filter (air filter 2)

CAGEC	04049
Manufacturer	Arrow Pneumatics, Inc.
Part no.	11 F51 E
Type	Grade A Element
Size (nominal)	1 In
Quantity	1

f. Air pressure regulator 1 w/ gauge

Manufacturer	Arrow Pneumatics, Inc.
CAGEC	04049
Part no	07R311A
Size (Nominal)	1/2-in NPT
Capacity	0-60 psi
Quantity	1

g. Air pressure regulator 2 w/ gauge

Manufacturer	Arrow Pneumatics, Inc.
CAGEC	04049
Part no	08R511A
Size (Nominal)	1 In NPT
Capacity	0-60 psi
Quantity	1

h. Globe valve

Specification	ANS B16.34
CAGEC	80204
Part no.	ANS B16.34 Type II, service G
Size	1/2 in nominal
Connection	Threaded
Rating	150 lb
Material	Steel
Quantity	8

i. Air hose (shore discharge hose blowout)

Manufacturer	Parker-Hannifin Corp.
CAGEC	87373
Part no.	A0625-MC6-ML6
Type	Self-retracting
Size	3/8 In NPT both ends, 25 feet long
Quantity	1

j. Air hose (pneumatic tool)

Manufacturer	Parker-Hannifin Corp.
CAGEC	87373
Part no.	A0650-MC6-MLC
Type	Self-retracting
Size	3/8 in NPT both ends, 50 feet long
Quantity	3

k. Quick disconnect half coupling (air station)

Military specification	MIL-C-4109
CAGEC	81349
Part no.	M1409-051200C
Type	Quick disconnect female
Size	3/8-in body size by 3/8-in male thread
Material	Steel
Quantity	7

l. Quick disconnect half coupling (air hose)

Military specification	MIL-C-4109
CAGEC	81349
Part no.	M4109-141200C
Type	Quick disconnect male
Size	3/8-in body size by 3/8-in female thread
Material	Steel
Quantity	4

m. Quick disconnect half coupling (air hose)

Military specification	MIL-C-4109
CAGEC	81349
Part no.	M4109-061200C
Type	Quick disconnect female
Size	3/8-in body size by 3/8-in male thread
Material	Steel
Quantity	4

n. Air impact wrench

Manufacturer	Dayton Electric Manufacturing Co.
CAGEC	16327
Part no.	2Z853C
Drive	1/2 in
Air inlet	1/4 in NPT
Max. operating pressure	90 psi
Free speed (no load)	9000 rpm
Torque	20 to 175 ft lbs @ 90 psi
Average air consumption	4 cfm
Bolt capacity	1/2 in
Weight	5 lb

o. Air compressor motor controller

Manufacturer	Square D Co. Bell Electric Products Division
CAGEC	81487
Part no.	8538-SCA-21-AFT
Type	Nonreversing w/nonfusible disconnect switch
Rating	10 hp, 440 Vac, 3 ph, 60 Hz
Thermal unit	
Part no.	B17.5
Quantity	3
Quantity	1

p. Globe valve

Specification	ANS B16.34
FSCM	80204
Part no.	ANS B16.34 Type II, service G
Size	1 in nominal
Connection	Threaded
Rating	150 lb
Material	Steel
Quantity	2

1-12 Items furnished

1-12.1 Components installed as part of the compressed air system are listed on parts list in drawings referenced in Appendix A and in Components of End Item List in TM 55-1930-209-14&P-20.

1-12.2 Common and bulk items onboard are listed in Expendable Supplies and Materials List in TM 55-1930-209-14&P-20.

1-12.3 Repair parts and special tools onboard are listed in Repair Parts and Special Tools List in of TM 55-1930-209-14&P-1 8.

1-13 Items required but not furnished. All required items are furnished.

1-14 Tools and test equipment. Use existing tools and equipment onboard. A complete list of tools and test equipment onboard is in Tools and Test Equipment List in TM 55-1930-209-14&P-18.

CHAPTER 2 DESCRIPTION OF OPERATION

2-1 Activation. When compressor starts, air is drawn through intake filter, manifold, and suction discs into compressor cylinders. This air is compressed, then discharged through delivery discs to temperature reducer where heat is partially removed From temperature reducer, compressed air is discharged through a check valve into receiver, increasing air pressure in receiver. When system is set on automatic (normal setting), compressor Is controlled by an automatic air regulator switch (pressure switch). When air pressure in receiver reaches factory set upper limit, compressor will unload and turn Itself off. When air in receiver reaches factory set lower limit on pressure switch, compressor will be activated and pump air into receiver. When system is set on manual and START button Is pushed, compressor pumps air into receiver until STOP button is pushed.

2-2 Air flow. Opening air compressor main air supply valve directs compressed air from receiver through air filter 1 for removal of moisture and particles This air then flows to the air stations In the ROWPU space and workshop. Quick disconnect couplings at these air stations permit connection of a 50-foot airhose so pneumatic tools may be used. Air also goes through air filter 2 before reaching air station 6 This filter traps oil and grease and prevents contamination of drinking water shore discharge hose when compressed air pushes PIG through hose prior to hose retrieval. Compressed air pressure regulators 1 and 2 further reduce air pressure to a manually set level, normally 40 psi, for blowdown of seachests in void 2 starboard and void 4 port.

CHAPTER 3 OPERATING INSTRUCTIONS

Section I. Operating controls and indicators

3-1. Operating controls and indicators

3-1.1 Controls

a. Power panel 1 circuit breaker 3P5, on ROWPU space port bulkhead, controls power to air compressor's electrical controller. See TM 55-1930-209-14&P-9 for details on electrical power panels

b. Air compressor electric controller (Figure 3-1), on ROWPU space port bulkhead above compressor, controls electrical power to compressor.

c. Receiver drain cock, on bottom of receiver (Figures 3-2 and 3-3), drains moisture and air from receiver. Turn T-handle clockwise to open and counterclockwise to close.

d. Safety valve, on receiver topside forward, automatically maintains pressure in receiver at not more than 155 psi.

e. Automatic air regulator (pressure switch), on receiver topside, automatically maintains air pressure in receiver between factory set limits indicated on name/data plates by switching power ON and OFF

f. Main supply valve, on forward end of receiver, controls air supply to system. Turn handle parallel with pipe to turn air pressure ON, turn handle to right angle with pipe to turn air pressure OFF.

g. Air pressure regulator 1 (Figure 3-4), on workshop port bulkhead, controls air pressure for blowdown of forward seachest in void 2 starboard Regulator Is normally set to 40 psi Turn T-handle on regulator clockwise to decrease pressure, counterclockwise to increase pressure.

h. Air station 8 seachest blowdown valve (Figure 1-2), on workshop port bulkhead, contr6ls compressed air for blowdown of forward seachest. Valve is used with SW30.

i. Seawater system valve SW30, on workshop port bulkhead, controls air vent for forward seawater seachest. Its normal position is open to vent air from seachest to atmosphere through venting pipe to deckhouse top. When closed, and air station 8 seawater seachest blowdown valve is open, air pressure Is forced into seachest to blow out debris.

j. Air pressure regulator 2 (Figure 3-4), on ROWPU space aft bulkhead near port bulkhead, controls air pressure used in blowdown of generator cooling water seachest. Regulator is normally set to 40 psi and works the same as air pressure regulator 1.

k. Air station 9 generator cooling seachest blowdown valve, on ROWPU space aft bulkhead, controls compressed air for blowdown of generator cooling seachest In void 4 port. Valve is used with SW44.

l. Seawater valve SW44, on ROWPU space aft bulkhead, controls air vent for generator cooling water seachest. It works with generator cooling water seachest blowdown valve in similar manner as forward seachest blowdown valve and SW30.

3-1.2 Indicators

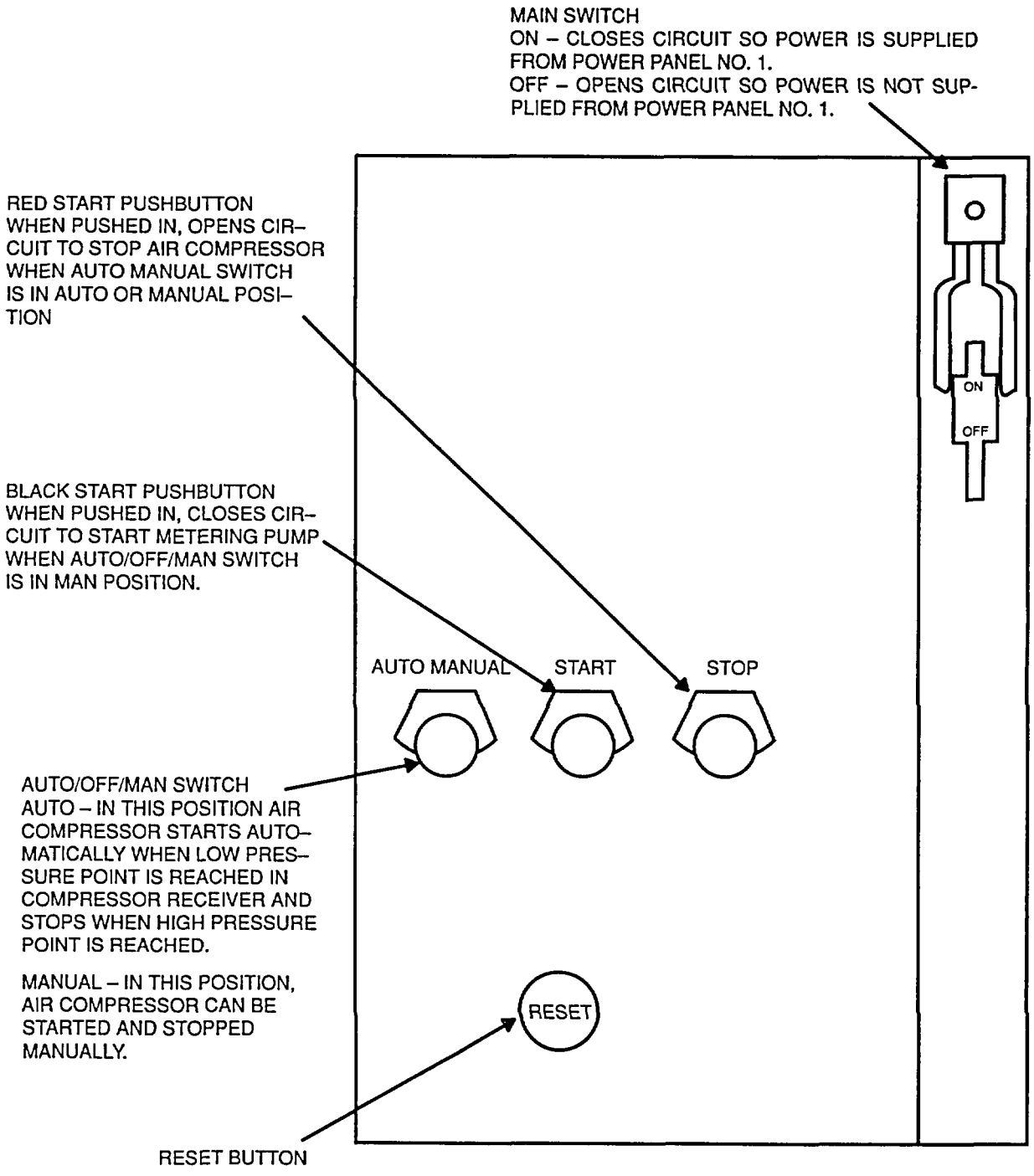
a. Air compressor electric controller, on ROWPU space port bulkhead near compressor, indicates status of compressor as either START, STOP, AUTOMATIC, or MANUAL (Figure 3-1).

b. Receiver pressure gauge, located on top side forward of air receiver, indicates amount of pressure in air receiver.

c. Oil sight glass on compressor indicates oil level in compressor.

d. Air regulator pressure gauge 1, on workshop port bulkhead, indicates air pressure as regulated by pressure regulator 1. Normal reading should be 40 psi for air station 8 forward seachest blowdown.

e. Air regulator pressure gauge 2, on ROWPU space aft bulkhead near port bulkhead, indicates air pressure as regulated by pressure regulator 2. Normal reading should be 40 psi for air station 9 generator cooling water seachest blowdown.



NOTE

LOCATED IN ROWPU SPACE ON PORT BULKHEAD BETWEEN AIR COMPRESSOR AND LIFEVEST STORAGE CONTAINER.

Figure 3-1. Air Compressor Electric Controller

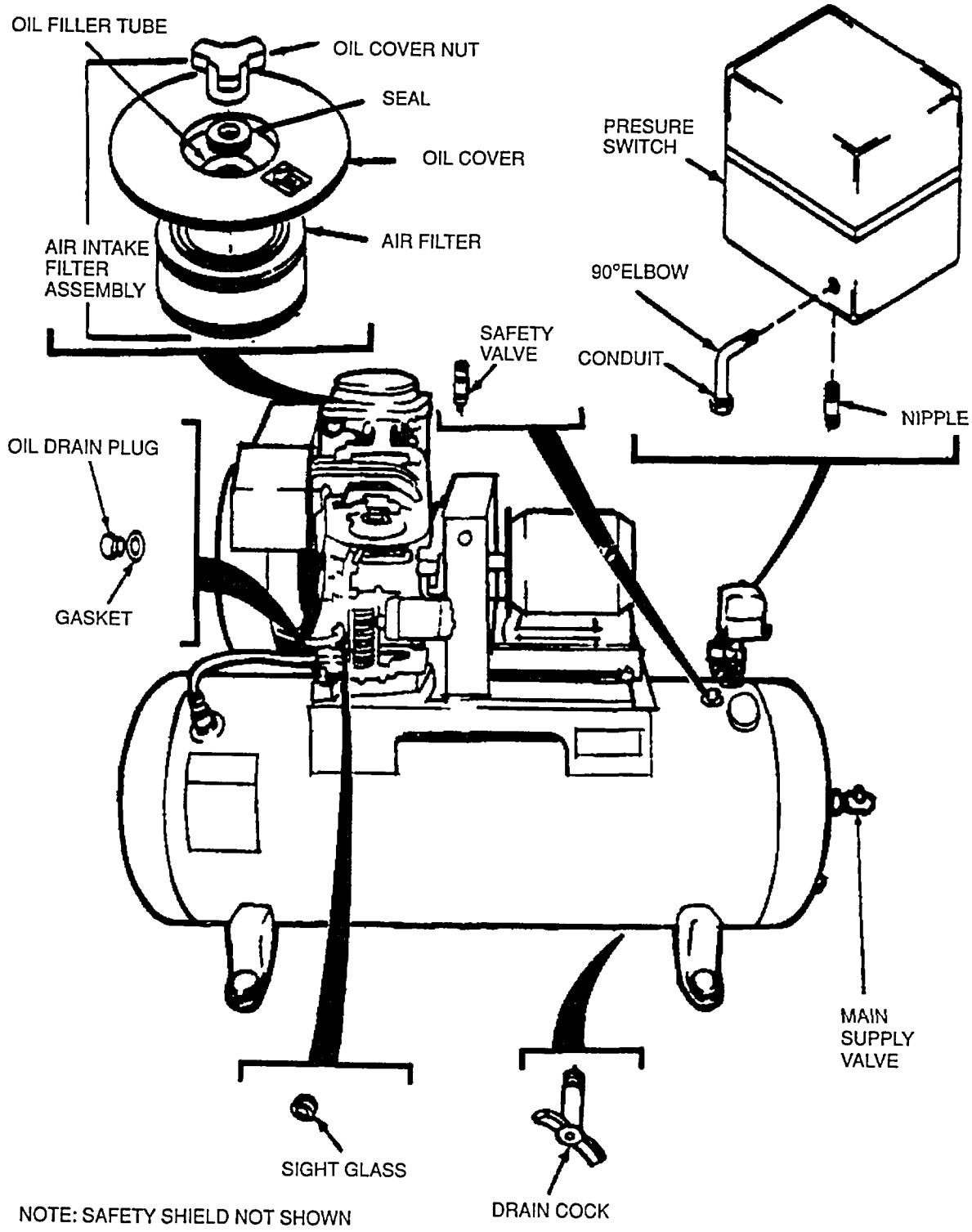
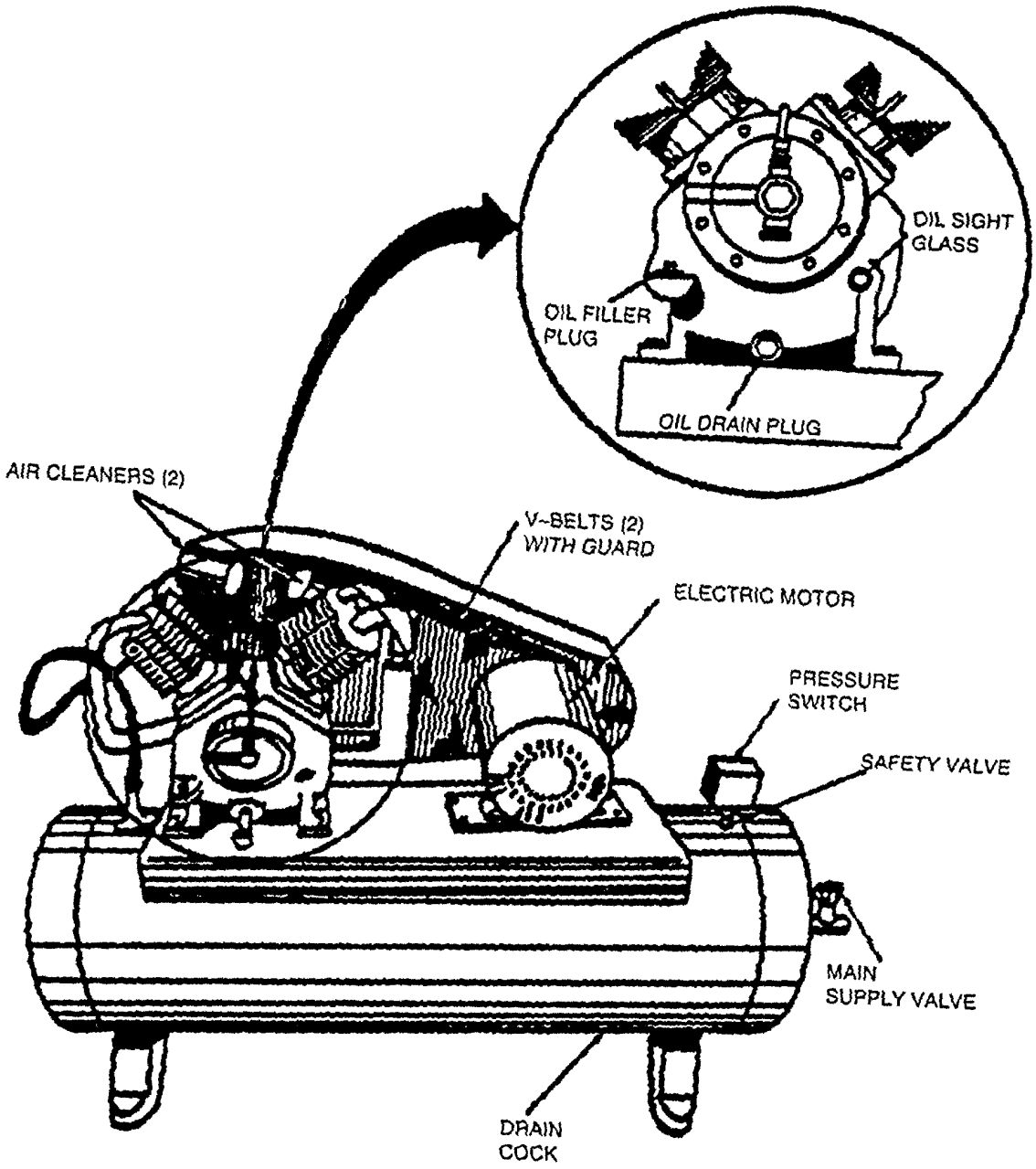
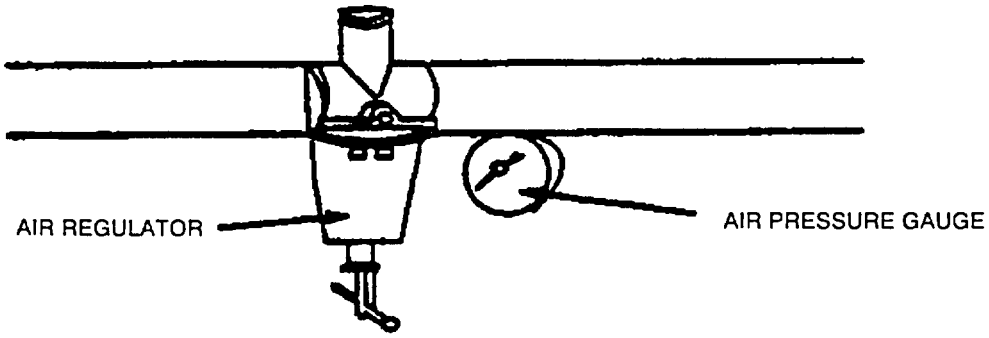


Figure 3-2. Barge 1 Air Compressor/Receiver



NOTE
SAFETY SHIELD NOT SHOWN

Figure 3-3. Barges 2 and 3 Air Compressor/Receiver



NOTE

AIR REGULATOR PRESSURE ADJUSTING SCREW. TURN CLOCKWISE TO DECREASE PRESSURE. COUNTERCLOCKWISE TO INCREASE PRESSURE

Figure 3-4. Exterior View of Air Pressure Regulator with Gauge

Section II. Prestart procedures

3-2 Prestart. Prestart procedures Include before operation preventive maintenance checks and procedures. See Appendix C.

3-2.1 Startup after extended shutdown. Refer to paragraph 3-8.2 for extended shutdown information.

a. Check major components for loose wires. Make sure fittings are tight, gauges are clean and have Intact glass faces. Check pipes for leaks Repair or replace as necessary.

b. Check oil level in sight glass on compressor as follows:

(1) Barge 1 (Figure 3-2). Oil should be visible in lower half of sight glass. If oil cannot be seen in sight glass, remove oil cover nut in center of air intake assembly. Carefully pour not more than one pint of oil into oil tube. Do not spill oil onto air filter assembly. Continue to add oil one pint at a time until oil level is between bottom and halfway mark on sight glass Do not overfill Use only detergent oil, SAE 10W, API classification CD or SF, or MIL-L-2104 or MIL-L-46152.

CAUTION

On Barges 2 and 3 air compressors, NEVER allow oil level to fall more than 1/8 Inch below full level mark on sight glass.

(2) Barges 2 and 3, (Figure 3-3). Oil should be up to full level mark on sight glass. If not, unscrew oil plug to left of sight glass and add a non-detergent, rust and oxidation inhibiting Industrial oil with viscosity equivalent to an SAE grade 20 weight motor oil. See page 5, Form 5S 1408, Operating and Service Guide for Dayton Speedaire Models, for recommended oils by brand name and designation Add oil until It reaches full level mark on sight glass. DO NOT OVERFILL. Replace oil filler plug.

c. Close compressed air main supply valve on forward end of receiver by turning handle at right angle to pipe.

d. Drain air filters 1 and 2 by opening drain valves on bottom of filters (Figure 3-5). When water and moisture have drained, close drain valves.

WARNING

When bleeding pressure from air compressor drain cock, ALWAYS use protective shield to protect eyes and face from flying particles. Wear gloves and avoid skin damage by closing buttons, collars, and rolling down shirt sleeves on work clothing.

e. Drain receiver by turning drain cock clockwise (small T-handle) on bottom of tank (Figures 3-2 and 3-3). When draining is complete, close valve.

f. Turn adjusting screw on bottom of pressure regulators 1 and 2 counterclockwise until screw turns freely (Figure 3-5).

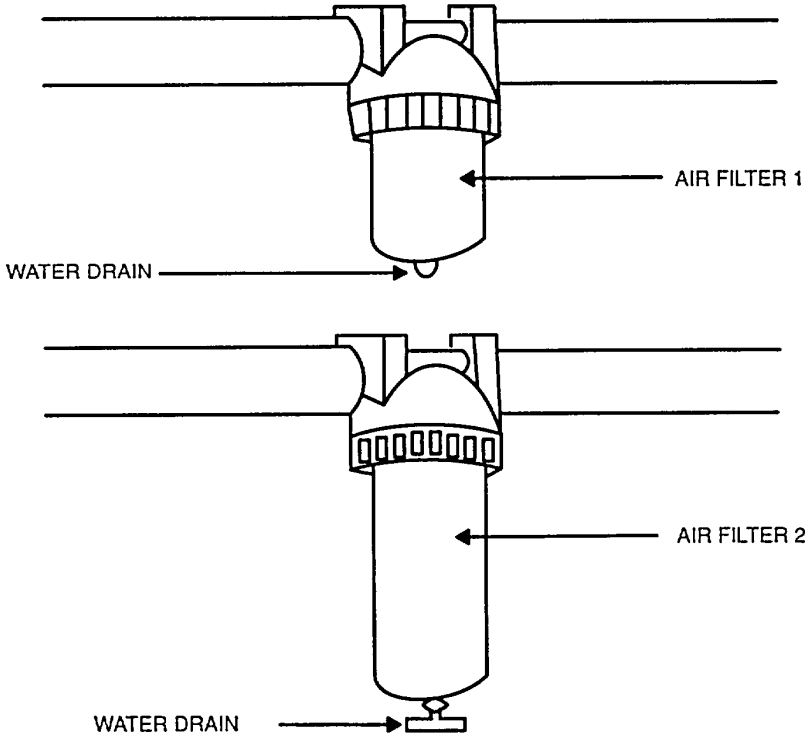


Figure 3-5. Exterior View of Air Filter 1 and Air Filter 2

g. Check that air station valves 1 thru 9 are closed.

h. Make sure switchboard circuit breaker P5 is closed (ON) to provide power to power panel 1.

i. Make sure power panel 1 circuit breaker 3P5 is closed (ON) to provide power to air compressor electric controller.

j. Turn controller AUTO MANUAL switch (Figure 3-1) to MANUAL.

WARNING

DO NOT leave air compressor unattended when controller is set to MANUAL mode of operation.

k. Push controller ON-OFF main switch (Figure 3-1) to ON.

l. Push controller START button (Figure 3-1).

WARNING

Never allow air pressure to reach more than 155 psi as shown on receiver pressure gauge.

m. When receiver pressure gauge reads 155 psi, push controller STOP button.

n. Open main supply valve by turning handle parallel with pipe (Figures 3-2, 3-3).

o. Set pressure regulators 1 and 2 by turning adjusting screw on bottom of regulators to obtain 40 psi Turn clockwise to decrease air pressure beyond regulator and turn counterclockwise to increase air pressure beyond regulator.

p. Turn AUTO-MANUAL switch to AUTO Compressor now automatically turns on and off to maintain air pressure In the system.

3-2.2 Startup after temporary shutdown. Refer to paragraph 3-8.1 for temporary shutdown information.

a. Make sure electric controller ON-OFF switch is ON.

b. Turn AUTO-MANUAL switch to AUTO.

c. When receiver pressure gauge indicates 155 psi, open main supply valve by turning handle parallel with pipe.

d. Make sure pressure regulators 1 and 2 indicate 40 psi each. If not, adjust according to step 3-2.1o .

e. Compressor now automatically turns on and off to maintain air pressure In the system.

Section III. Operating procedures

3-3 General. During operations, perform following preventive maintenance checks:

WARNING

System MUST NOT be operated without an operating safety valve

a. Make sure receiver pressure gauge indicates no more than 155 psi when compressor is set for AUTO. If gauge indicates greater pressure, pull test link on air safety valve Air should escape Iron receiver. If air does not escape, replace safety valve by following procedures in paragraph 4-5.4. This valve cannot be adjusted or repaired.

b. Make sure air pressure gauges on air pressure regulators 1 and 2 Indicate 40 psi. If not, adjust according to step 3-2.1 o.

c. Make sure system is operating normally. When set on AUTO, compressor should cycle on and off to maintain proper air pressure. If not, shutdown using extended shutdown procedures in paragraph 3-8.2 and troubleshoot using troubleshooting procedures in Chapter 4 (Table 4-1). Make required repair/adjustments.

d. Check for damage to pressure gauges, regulators, filters, and compressor/receiver. Repair or replace as necessary.

e. Check pipes for loose or missing fasteners or leaks. Repair or replace as necessary.

WARNINGS

DO NOT use compressed air to clean clothing or work space High pressure (HP) air turns small particles into dangerous projectiles that may injure people.

When using compressed air to clean equipment, ALWAYS use protective shield to protect eyes and face from flying particles. Wear gloves and avoid skin damage by closing buttons and collars and rolling down shirt sleeves on work clothing

3-4 Operating compressed air stations 1 thru 5 and 7

a. Connect air hose to compressed air station quick disconnect coupling (Figure 3-6). Open air station air valve by turning counterclockwise.

b. Upon completion, close compressed air station air valve by turning clockwise.

c. If hose is self-retracting, It may remain attached to quick disconnect coupling. If not self-retracting, remove hose and stow in workshop storage area.

3-5 Using air impact wrench with air stations 1 thru 5 and 7

WARNINGS

Always wear safety glasses when operating an air impact wrench Use only Impact wrench sockets. DO NOT use sockets from a hand wrench set.

3-5.1 Pre-operational procedures

a. Make sure compressed air system has been purged of moisture within last four hours. If not, open draincock on bottom of air filter 1 until all moisture has been drained from system.

b. Select proper sockets for the assigned task. Loose, worn, or cracked sockets reduce wrench impact power and may create a hazard for the operator. When possible, use deep sockets in place of long, springy extension bars which absorb impact Always use simplest socket hookup possible, as multiple connections reduce available impact.

c. If more than one air hose Is necessary to reach the job location, all except the short leader hose to the tool should be 1/2 Inch Inside diameter If couplers are used, they must not be directly connected to the wrench air inlet. This makes the tool bulky and unwieldy and puts unnecessary strain on the tool inlet threads.

d. Once a day, before using the wrench, pour about one tablespoon of oil into air inlet Use a turbine or spindle grade oil with 100-150 Saybolt Universal Seconds viscosity. This oil goes in the air inlet where the hose is connected, not in the oil hole on the side of the wrench body.

e. Make sure air inlet screen is clean and installed in hose adapter.

3-5.2 Operating the air impact wrench

a. Turn torque regulator on front of handle to low power position by rotating knurled knob fully clockwise as you look down on the tool from above.

b. Place tool on bolt or nut to be worked and squeeze trigger. Slowly rotate knurled knob counterclockwise until desired power is being applied. If disassembling rusty or other hard to remove bolts/nuts, turn knob fully counterclockwise. If nut/bolt does not start to move in three to five seconds, try other means of removing it.

c. If wrench appears to be losing power, follow troubleshooting procedures on page 2 of Operating Instructions and Parts Manual, Air Impact Wrench, in Appendix B.

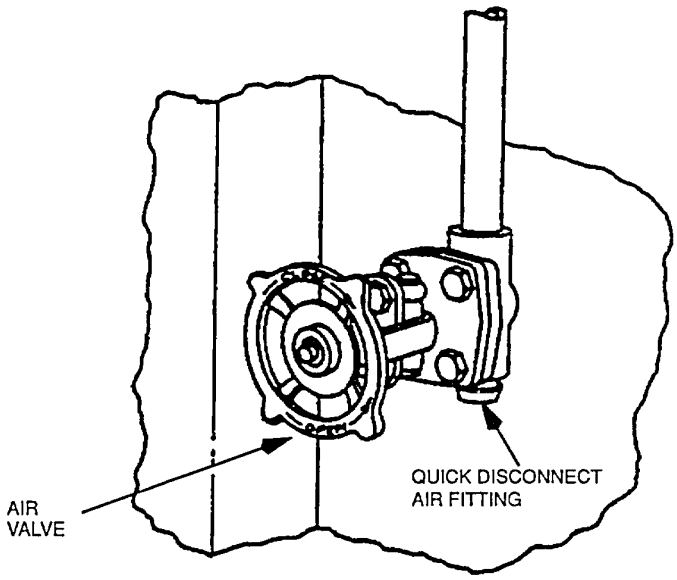


Figure 3-6. Air Station Air Valve and Quick Disconnect

3-6 Operating compressed air station 6 to power the PIG

CAUTION

Shore discharge hose must remain free of oil and dirt. Use only designated 25 foot air hose on compressed air station 6 for supplying compressed air to power PIG through shore discharge hose.

a. Hold a dry, clean white cloth in front of air station 6 air outlet and open air valve by turning valve counterclockwise. Blow compressed air through cloth. Smell air coming out of air valve. If air smells oily or specks of dirt or oil and grease show on white cloth, check oil level in air compressor. If overfilled, drain to authorized level Change air filter 2 by following procedures in paragraph 4-5.3 and again check air quality with white cloth. Continue to troubleshoot and change air filter 2 until air from air station 6 is free of oil smell and stain.

b. Close shore discharge valves SD1 and SD2 by turning clockwise until tight.

c. On PIG launcher insertion point, unlock two quick disconnect couplers and pull cap off insertion tube (Figure 3-7). Insert clean PIG into tube, replace cap, and lock two quick disconnect couplers.

d. Connect designated 25-foot airhose to compressed air station 6 quick disconnect coupling and to compressed air fitting on PIG insertion point cap (Figure 3-7).

e. Make sure PIG receiver has been installed on shore end of shore discharge hose and is ready to receive PIG.

f. Open shore discharge valve SD2 by turning counterclockwise until it stops.

g. Notify all crewmembers not to use any other compressed air stations until PIG has pushed all water out of shore discharge hose h. Open compressed air station 6 air valve by turning valve counterclockwise until it stops.

NOTE

PIG normally takes about 15 to 20 minutes to push water out of shore discharge hose.

i. When PIG arrives in PIG receiver onshore, close compressed air station 6 air valve by turning clockwise until it stops.

j. Close valve SD2 by turning clockwise until tight.

k. Disconnect airhose and return to storage.

3-7 Operating compressed air system for seachests blowdown

a. Make sure air pressure gauges on air pressure regulators 1 and 2 indicate 40 psi. If not, adjust according to step 3-2.10.

b. Follow procedures In TM 55-1930-209-14&P-2 for seachests blowdown.

3-8 Shutdown procedures. This section provides temporary and extended shutdown procedures, including after operation preventive maintenance checks and services. Temporary shutdown is for a period of less than 12 hours. Extended shutdown Is for a period greater than 12 hours, but less than 7 days. If system is to be shutdown longer than 7 days, refer to Chapter 5.

3-8.1 Temporary shutdown (less than 12 hours)

a. Turn AUTO-MANUAL switch on electric controller (Figure 3-1) to MANUAL.

b. Push electric controller STOP button.

c. Close main supply valve on forward end of receiver by turning handle at right angles to pipe.

WARNING

When bleeding receiver and air filters 1 and 2, ALWAYS use protective shield to protect eyes and face from flying particles. Wear gloves and avoid skin damage by closing buttons and collars and rolling down shirt sleeves on work clothing.

d. Drain air filters 1 and 2 by opening drain valves on bottom of filters (Figure 3-5). When all moisture has drained, close valves.

e. Open receiver drain cock In bottom of receiver by turning clockwise (Figures 3-2 and 3-3). Allow air and moisture to escape. When all moisture has drained, close valve.

f. Check oil level in sight glass on compressor as follows:

(1) Barge 1 (Figure 3-2) . Oil should be visible in lower half of sight glass. If oil can not be seen in sight glass, remove oil cover nut in center of air Intake assembly. Carefully pour no more than one pint of oil into oil tube. Do not spill oil onto air filter assembly. Continue to add oil one pint at a time until oil level is between bottom and halfway mark on sight glass. Do NOT overfill. Use only detergent oil, SAE 10W, API classification CD or SF, or MIL-L-2104 or MIL-L-46152.

CAUTION

On Barges 2 and 3 air compressors, never allow oil level to fall more than 1/8 Inch below full level.

(2) Barges 2 and 3 (Figure 3-3). Oil should be up to full level mark on sight glass. If not, unscrew oil plug to left of sight glass and add a non-detergent, rust and oxidation inhibiting industrial oil with viscosity equivalent to an SAE grade 20 weight motor oil. See page 5, Form 5S 1408, Operating and Service Guide for Dayton Speedaire Models, for recommended oils by brand name and designation. Add oil until it reaches full level mark on sight glass. DO NOT OVERFILL. Replace oil filler plug.

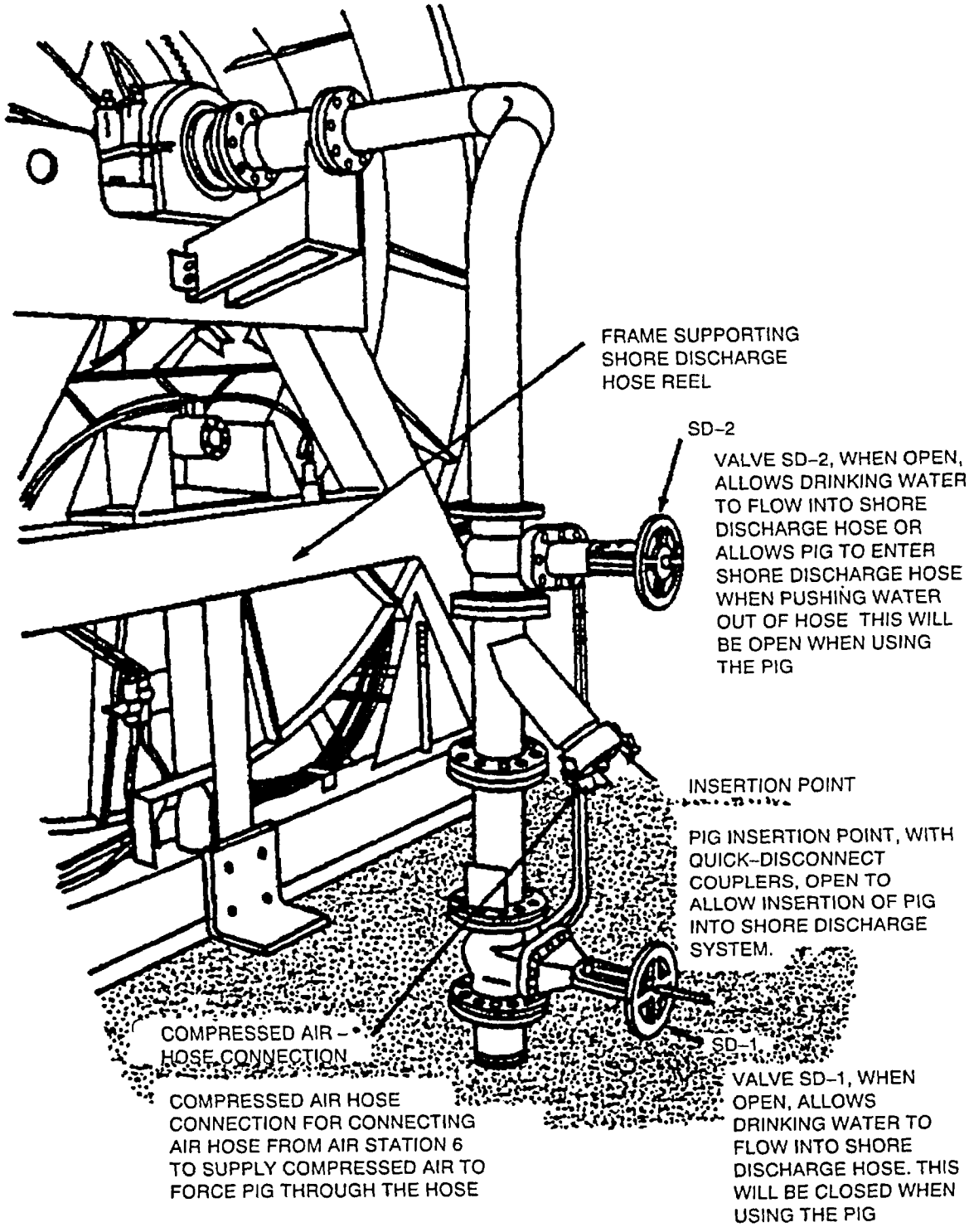


Figure 3-7. PIG Launcher Controls

3-8.2 Extended shutdown

a. Perform procedures in paragraph 3-8.1.

b. Pull controller main ON-OFF switch (Figure 3-1) to OFF.

c. Open (OFF) power panel 1 circuit breaker 3P5.

WARNING

When bleeding receiver drain cock, ALWAYS use protective shield to protect eyes and face from flying particles. Wear gloves and avoid skin damage by closing buttons, collars and rolling down shirt sleeves on work clothing.

d. Drain air and water from receiver by opening drain cock on bottom of receiver (Figures 3-2 and 3-3). Turn small handle clockwise until it stops. When receiver pressure gauge reads 0 psi, close drain cock.

e. Open drain valves on bottom of air filters 1 and 2 (Figure 3-5).

f. Open air station valves 1 through 5 and 7 by turning counterclockwise until they stop (Figure 3-8). Leave the valve open.

g. Make sure air station valves 6, 8 and 9 are closed.

h. Check for damage to pressure gauges and regulators, filters, and compressor/receiver. Repair or replace as necessary.

i. Check pipes for loose or missing fasteners or leaks. Repair as necessary.

3-9 Emergency shutdown

3-9.1 General. The barge has two emergency shutdown modes. One mode shuts down individual systems such as the ventilation system or a diesel HP pump, and the other mode shuts down all barge operating systems.

Both systems are operated by pushing a red button protected by a metal guard. On system shutdowns, this button shuts off either fuel or electrical power to that system only. On total shutdown, this button shuts off all fuel and electrical power to all operating systems.

Emergency system shutdown red buttons are on the ROWPU space starboard bulkhead just aft of the personnel door. These seven emergency system shutoff buttons (Figure 3-8) control shore power, ventilation systems, ROWPU 1 diesel HP pump, ROWPU 2 diesel HP pump, ship auxiliary generator, ship service generator 1, and ship service generator 2.

Emergency total shutdown red buttons are:

- On ROWPU space starboard bulkhead aft of personnel door above and forward of row of system emergency shutoff buttons.
- Outside ROWPU space starboard door on weatherdeck.
- Outside ROWPU space port door on weatherdeck.
- Inside ROWPU space port door to weatherdeck.
- Outside dayroom door to weatherdeck.
- Inside dayroom door to weatherdeck.

3-9.2 Emergency shutdown procedures

a. In an emergency, push appropriate red button to shutdown either a selected system or all operating systems.

b. When emergency situation has been corrected, reset emergency button by turning collar behind button one-quarter turn clockwise Button will pop out and again be in ready position.

c. After emergency button is reset, restart compressed air system according to procedures in Section II and Section III.

Section IV. Operation under extreme conditions

3-10 General. Operation of this system in extreme temperatures and high humidity requires special maintenance procedures. These conditions are discussed below.

3-10.1 Operating in extreme heat. Operating compressor in continued high temperature (average daily temperatures in ROWPU space exceeding 90 degrees F) tends to break down oil protection. Under these conditions on Barge 1, shorten oil change intervals from semiannually to quarterly and 1000 hours to 500 hours On Barges 2 and 3, shorten oil change interval from every other month to monthly.

3-10.2 Operating in high humidity. Operating in high humidity, often combined with high temperatures, creates large amounts of moisture in receiver, valves, filters, and pipes. If not eliminated, this moisture creates corrosion that leads to clogged pipes and leaks. To prevent this, when humidity is high, entire system should be shutdown every 12 hours of operation and completely drained. This requires opening receiver drain cock, opening air filter drains, and opening all air station valves.

3-10.3 Operating in extreme cold. This system is in ROWPU space, which has several heat-generating items and requires continued above freezing temperatures for processing water. Therefore, its operation in extreme cold is most unlikely.

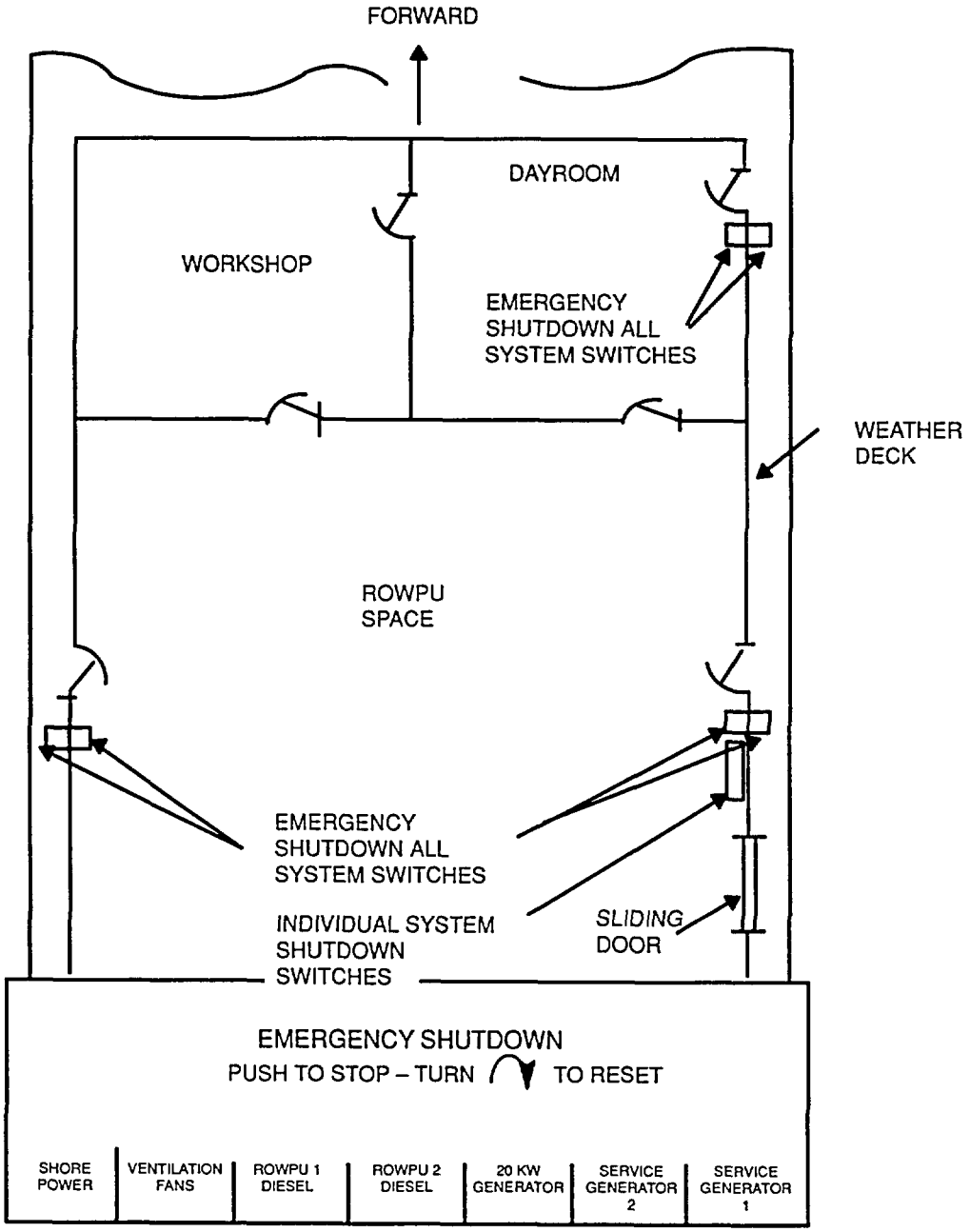


Figure 3-8. Location of Controls for Emergency Shutdown Systems

CHAPTER 4 MAINTENANCE INSTRUCTIONS

Section I. General

4-1 Maintenance concept

4-1.1 Unit level and intermediate support Intermediate Direct Support/Intermediate General Support (IDS/IGS) maintenance on compressed air system is performed onboard by crewmembers whenever possible.

4-1.2 IDS/IGS maintenance beyond capability of crewmembers is provided by a shore-based area support maintenance unit. This unit also determines if depot support maintenance is required.

4-1.3 Intermediate support maintenance Is accomplished by replacement of components or major end Items.

4-1.4 Unless other intermediate support maintenance procedures are directed, IDS/IGS maintenance normally is provided by an Army Transportation Corps floating craft intermediate support maintenance unit serving terminal operating area Components to be disposed of are processed by this unit.

4-1.5 Maintenance Allocation Chart is In TM 55-1930-209-14&P-18. For maintenance on other systems onboard, consult appropriate manuals.

4-2 Maintenance procedures. Maintenance instructions are contained in the following sections: Section II. Preventive maintenance checks and services, Section III Troubleshooting; and Section IV, Maintenance procedures.

Section II. Preventive maintenance checks and services

4-3 See TM 55-1930-209-14&P-7, Appendix C for preventive maintenance checks and services for the Compressed Air System See TM 55-1930-209-14&P-19 for complete preventive maintenance checks and services for all ROWPU Barge Systems.

Section III. Troubleshooting

4-4 Troubleshooting procedures

a. Troubleshoot compressed air system according to Table 4-1.

b. Troubleshoot Barge 1 compressor/receiver according to paragraph 5, Instruction Book and Parts List for Direct air Compressors, in Appendix B

c. Troubleshoot Barges 2 and 3 compressors/receivers according to Troubleshooting Chart included as part of Form 5S1408, Operating Manual and Service Guide for Dayton Speedaire Compressors, In Appendix B

Table 4-1. Troubleshooting Procedures for Compressed Air System

Problem	Possible Cause	Suggested Action
1. No air pressure or low air pressure at air station (Chapter 3, Section III)	a. Air station valve closed	a. Open air station valve
	b. Main supply valve closed	b. Open main supply valve
	c. Air filter 1 or 2 clogged	c. Drain, clean and/or replace filter elements
	d. Pipe leaks or blockages	d. Check pipes, listen for hissing sound of compressed air escaping. Repair or replace as necessary
	e. Compressor/receiver not producing air	e. Troubleshoot compressor/receiver by following manufacturer's troubleshooting procedures
2. No air pressure or low air pressure for seachest blowdown (Chapter 3, Section III)	a. Seawater valves SW30 and/or SW44 not in proper position	a. Close valves for seachest blowdown as specified in TM 55-1930-209-14&P-2
	b. Main supply valve closed	b. Open main supply valve
	c. Air pressure regulator 1 or 2 not properly set	c. Make sure it is set for 40 psi for seachest blowdown. Reset if necessary.
	d. Air filter 1 clogged	d. Drain, clean and/or replace filter elements
	e. Pipe leaks or blockages	e. Check pipes, listen for hissing sound of compressed air escaping. Repair or replace as necessary
	f. Other air station valves open or leaking	f. Make sure all other air station valves are closed and not leaking
	g. Compressor/receiver not functioning properly	g. Troubleshoot compressor/receiver by following manufacturers' troubleshooting procedures

Section IV. Maintenance procedures

4-5 General. Maintenance for this system consists of disassembling, repairing/replacing, and reassembling Items listed in the repair parts listed In TM 55-1930-209-14&P-18. When performing maintenance, be sure to observe precautions listed in manufacturers' manuals/instructions and the following

a. Always use new seals and gaskets, same as original, before reassembling components that have been disassembled for repair. Carefully install so as not to damage during assembly.

b. When replacing gaskets, make sure mating surfaces are clean and free of old gasket material, adhesive, oil, or grease. These precautions will ensure a leak-proof joint.

c. When replacing O-rings, make sure all surfaces are clean and free of dirt, grit or foreign material. Prior to installation, apply a thin coat of silicone grease to O-ring for ease of assembly. Protect O-rings by applying tape over threads, sharp corners and edges of components in which the O-ring will be placed.

WARNING

Be sure electrical power is off and air pressure is zero before performing maintenance on this system Open power panel 1 circuit breaker 3P5. Turn compressor electric controller OFF. Bleed air pressure from receiver by opening receiver drain cock. Bleed air pressure from lines by turning air station air valves counterclockwise until they stop. Observe safety precautions listed In front of this volume and those specified in manufacturers' manuals/instructions.

d. When replacing electrical components, follow proper procedures for soldering or crimping connections. Check all grounding Make sure current carrying members are properly insulated to avoid short-circuiting Check for abrasions and chafing of Insulation on wires and cables. Repair with tape or replace as necessary.

4-5.1 Air pressure regulators 1 and 2

4-5.1.1 Repair. Upon detection of leaks, pressure fluctuation or pressure creep, or for semiannual maintenance services, perform these procedures:

a. Shut down air compressor system by following procedures In paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATE REPAIRS BEING MADE."

c. On air pressure regulator, unscrew bottom plug (or pressure gauge If installed in this manner) and remove bottom plug O-ring, bottom spring and disc assembly. Inspect valve seat for damage or wear. See Figure 4-1 for Identification of parts.

d. Inspect valve seat in head casting for foreign material or damage. Clean with soapy water, rinse, and dry with lint-free cloth.

e. Replace any damaged parts using repair kit (CAGEC 04049, Part No. 1586R) parts (bottom plug O-ring, bottom spring, and/or disc assembly).

f. Assemble pressure regulator in sequence shown in Figure 4-1.

g. Start air compressor system by following procedures in paragraph 3-21 .

h. Check for proper operation If still malfunctioning, shut down air compressor system by following procedures in paragraph 3-8.2 Then perform steps j through s i. If working properly, proceed to step r.

j Remove six screws attaching bonnet to head casting and remove bonnet.

k. Remove spring button, adjusting spring and relieving diaphragm. Figure 4-1 shows parts identification.

l. Inspect diaphragm and diaphragm seat In head casting for tears, wear, or foreign material

m. Replace damaged or worn parts using adjusting spring kit parts (relieving diaphragm, adjusting spring, and/or spring button).

n. Assemble parts in sequence shown in Figure 4-1. Install bonnet and secure with six screws.

o. Back off adjusting screw until it turns freely.

p. Remove red tag from power panel 1 circuit breaker 3P5.

q. Start air compressor system by following procedures in paragraph 3-2.1.

r. Adjust pressure regulator to required setting of 40 psi. Turn adjusting screw clockwise to increase pressure reading and counterclockwise to decrease pressure reading.

s. Record completion of this maintenance item in log book.

4-5.1.2 Replacement. If the pressure regulators do not work properly after repair and adjusting, replace following these procedures.

a. Shutdown air compressor system by following procedures in paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATE REPAIRS BEING MADE."

c. Disconnect the union nearest the regulator and then disconnect the airlines at the regulator.

d. Connect the airlines to the new regulator making certain air flow is in the direction of the arrow on the new regulator. Reconnect the union. Use pipe tape to prevent air leaks.

e. Restart the compressor system and adjust the regulator as necessary following the procedures In paragraph 3-2.1

4-5.2 Air filter 1

4-5.2.1 Repair. If maintenance on pressure regulators indicates dirt and grit in system, and for semiannual maintenance services, perform these procedures.

a. Shut down air compressor system by following procedures In paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNINGDO NOT ACTIVATEREPAIRS BEING MADE."

c. Manually, without using a wrench, unscrew ring nut attaching bowl guard and plastic filter bowl to filter head and remove guard, bowl and bowl gasket (Figure 4-2).

d Unscrew filter element screw and carefully remove lower baffle, gasket, filter element, gasket, shroud, and upper baffle. Place them on clean cloth in sequence shown in Figure 4-2.

e. Wash filter element in soap and water, rinse, and allow to dry. Replace element (NSN 4330-00-803-1028) if cracked, chipped, deformed or unable to clean to original color.

f. Wash filter bowl and all other parts with soapy water. Rinse and dry with lint-free cloth.

g. Inspect each part and replace any damaged or worn parts using bowl kit (CAGEC 04049, P/N 36017-BKF-329).

h. Assemble parts in sequence shown In Figure 4-2 on filter element screw. Screw filter element screw into filter head.

i. Carefully install plastic filter bowl, guard and gasket. Then secure to filter head with ring nut. Tighten hand-tight without using a wrench.

j. Remove red tag from power panel 1 circuit breaker 3P5.

k. Start air compressor system by following procedures in paragraph 3-2.1.

l. Record completion of this maintenance item in log book

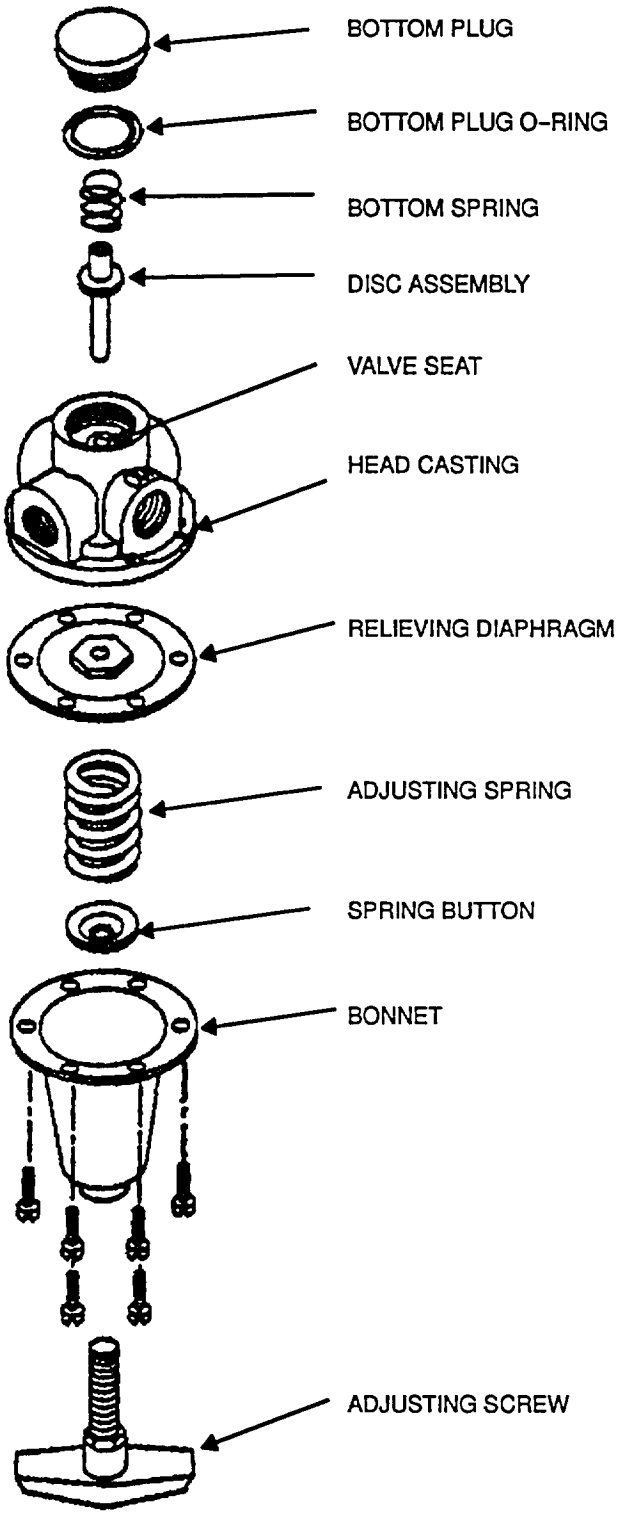


Figure 4-1. Air Pressure Regulators 1 and 2, Exploded View

4-5.2.2 Replacement

a. Shut the compressor system down following the procedure in paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATE REPAIRS BEING MADE."

c. Disconnect the union nearest the filter 1 and then disconnect the air lines from the filter 1.

d. Connect air lines to the new filter making certain the air flow is in the direction of the arrow on the new regulator. Reconnect the union. Use pipe tape on threads to prevent leaks.

e. Start compressor system by following procedures in paragraph 3-2.1 and check for leaks.

4-5.3 Air filter 2

4-5.3.1 Repair. If air station 6 fails air quality check required in paragraph 3-6a and for semiannual maintenance services, perform these procedures.

a. Shut down air compressor system by following procedures in paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNINGDO NOTACTIVATE REPAIRS BEING MADE."

c. Without using a wrench, manually unscrew bowl ring nut attaching metal bowl to filter head (Figure 4-3). Remove bowl ring nut, metal bowl and bowl O-ring.

d. Unscrew hex nut and remove rod O-ring gasket, filter element and gasket O-ring. Rod/element screw should remain attached to filter head. If rod/element screw unscrews from filter head, screw it back into filter head.

e. Replace filter element (CAGEC 31408, P/N CKF-507). If gasket O-ring, and rod O-ring gasket are worn or damaged, replace them.

f. Place gasket O-ring on top of new filter element and slide element over rod/element screw. Hold in place by hand and install rod O-ring gasket over rod/element screw. Screw on hex nut. Before tightening nut, check that filter element is squarely set against filter head. Then tighten hex nut hand tight.

g. Clean metal bowl with warm soapy water, rinse, and dry with lint-free cloth NOTE Bowl O-ring must be replaced dry, without any silicone lubricant.

h. Replace bowl O-ring, If damaged or worn.

i. Carefully install bowl O-ring and metal bowl. Hold in place by hand and screw bowl ring nut onto threads on filter head. Make sure O-ring is properly seated and then tighten hand-tight.

j. Remove red tag from power panel 1 circuit breaker 3P5.

k. Start air compressor system by following procedures in paragraph 3-2.1.

l. Record completion of this maintenance item in log book.

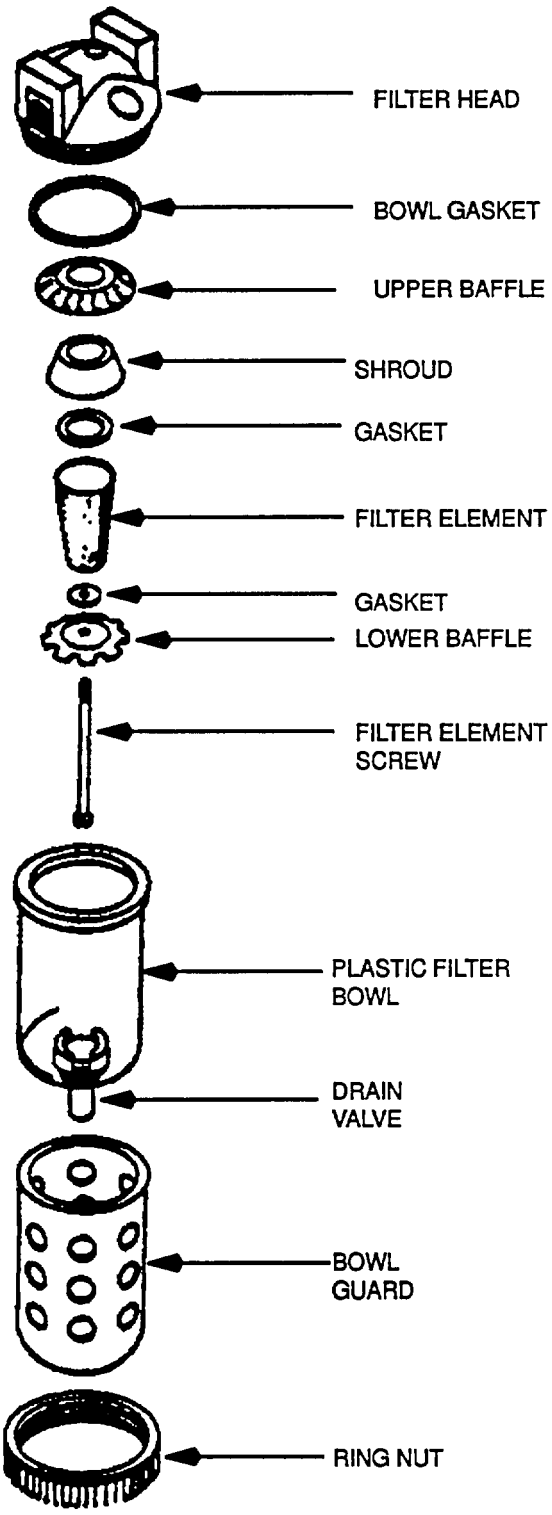


Figure 4-2. Air Filter 1, Exploded View

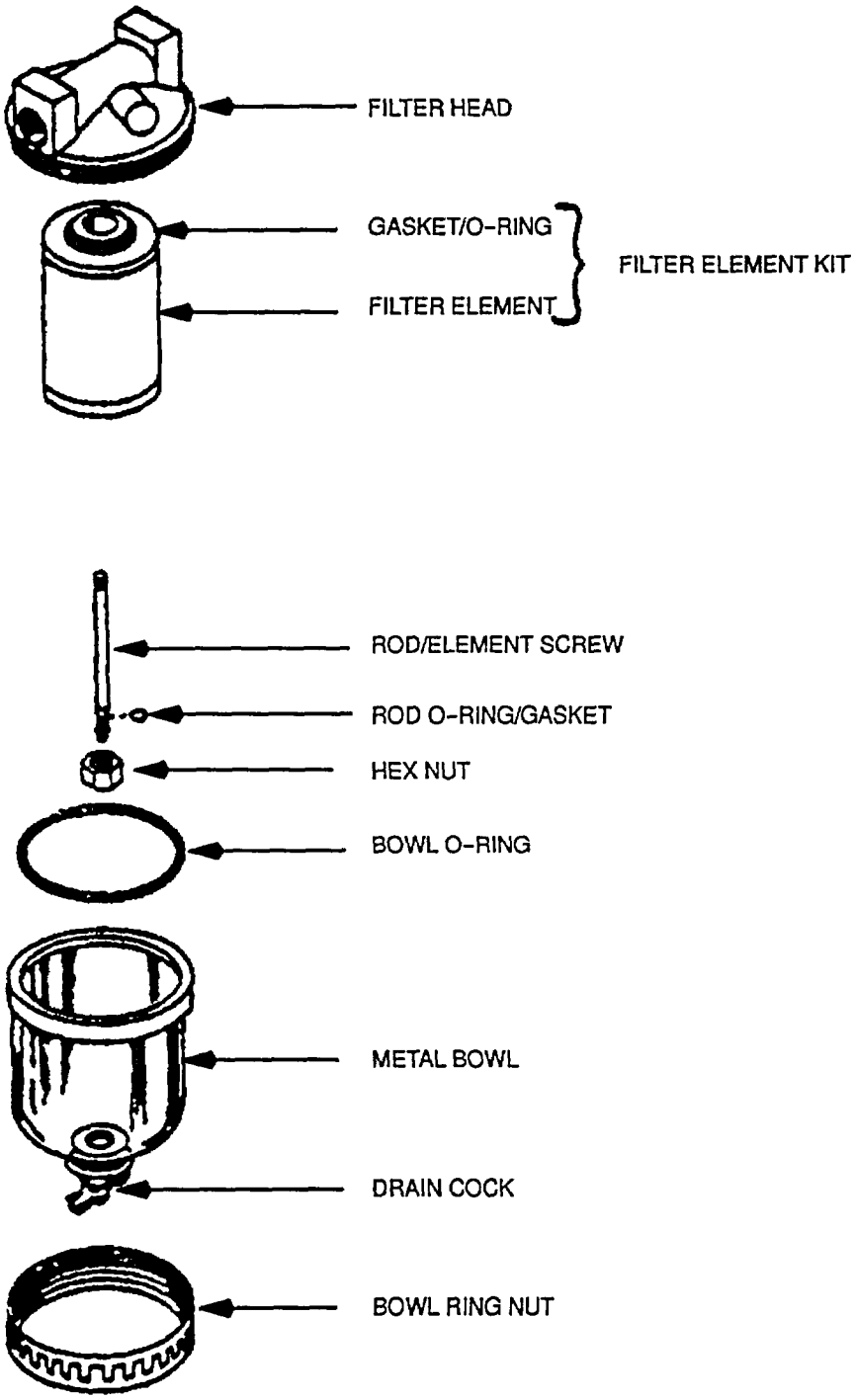


Figure 4-3. Air Filter 2, Exploded View

4-5.3.2 Replacement

a. Shut down air compressor system following procedures in paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATE REPAIRS BEING MADE.

c. Disconnect the union nearest to air filter 2 and disconnect air lines from filter 2.

d. Connect air lines to new filter making certain the air flow is in the direction of the arrow on the new regulator. Reconnect the union Use pipe tape on threads to prevent leaks.

e. Start air compressor system by following the procedures in paragraph 3-2.1 and check for leaks.

4-5.4 Safety valve. If air compressor safety valve fails its monthly maintenance check, perform these procedures:

a. Shut down air compressor system by following procedures in paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATE REPAIRS BEING MADE."

c. Unscrew safety valve.

d. Screw In new safety valve (Barge 1 P/N 9710-5332-00) (Barges 2 and 3 P/N 91A033175-001) wrench tight.

e. Remove red tag from power panel 1 circuit breaker 3P5 f. Start air compressor system by following procedures in paragraph 3-2.1.

g. When receiver pressure gauge reads at least 100 psi, check receiver safety valve by pulling safety link. Air should escape from receiver through valve. If not, repeat above procedures and install another new safety valve. This valve is NOT adjustable or repairable.

h. Record completion of this maintenance item in log book.

4-5.5 Automatic air pressure regulator (pressure switch). If compressor/receiver troubleshooting indicates pressure switch may be faulty, perform these procedures:

a. Shut down air compressor system by following procedures In paragraph 3-8.2

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATE REPAIRS BEING MADE."

c. On pressure switch on top of receiver (Figures 3-2 and 3-3), unscrew nipple from receiver.

d. Disconnect nipple from tee and conduit from 90° elbow. Remove pressure switch

e. Install new pressure switch (Barge 1 P/N 9710-530201) (Barges 2 and 3 CAGEC 16327, P/N 4X678) Connect nipple and 900 elbow. Check all fittings for tightness.

f. Remove red tag from power panel 1 circuit breaker 3P5.

g. Start air compressor system by following procedures in paragraph 3-2.1.

h. Monitor pressure in receiver. Compressor should build this pressure to designated pressure listed on name/data plates.

i. Open air station 1 by turning counterclockwise and bleed air pressure until pressure switch activates compressor Close air station 1 by turning clockwise until it stops Compressor should continue to pump compressed air Into receiver until receiver pressure gauge indicates 155 psi Pressure switch should then cut off air compressor.

j. Record completion of this maintenance item in log book.

4-5.6 Compressor oil change (Barge 1). When oil change is required as part of semiannual maintenance services, perform these procedures:

a. Shut down air compressor system by following procedures in paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 Indicating, "WARNINGDO NOT ACTIVATE REPAIRS BEING MADE." c. Unscrew oil drain plug and gasket and drain oil into container (Figure 3-2).

d. While oil is draining, remove oil cover nut, seal, and oil cover.

e. Upon completion of draining, install oil drain plug with new gasket.

f. Add oil down oil tube until level can be seen in lower half of sight glass.

g. Install oil cover, seal, and oil cover nut. Tighten nut hand tight.

h. Remove red tag from power panel 1 circuit breaker 3P5.

i. Start air compressor system by following procedures in paragraph 3-2.1.

j. When compressor is operating, check drain plug and oil cover for leaks. Tighten as necessary.

k. Record completion of this maintenance item in log book.

4-5.7 Compressor oil change (Barges 2 and 3). When oil change is required as part of monthly or every-other-month maintenance services, perform these procedures.

a. Shut down air compressor system by following procedures In paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATE REPAIRSBEING MADE."

c. Unscrew oil drain plug and gasket and drain oil into container (Figure 3-3).

d. While oil is draining, remove oil filler plug.

e Upon completion of draining, Install oil drain plug with new gasket.

f. Add oil In oil filler hole until oil level in sight glass Is within 1/8 Inch of full level mark on glass Do NOT overfill.

g. Install oil filler plug wrench tight.

h Remove red tag from power panel 1 circuit breaker 3P5.

i. Start air compressor system by following procedures in paragraph 3-2.1.

j. Check oil level in sight glass. It must not be above halfway mark in glass nor lower than 1/8 inch below mark. If not within these markings, add more oil, or drain oil to bring it within these markings.

k. When compressor is operating, check drain plug and oil filler plug for leaks. Tighten as necessary.

l. Record completion of this maintenance item in log book.

4-5.8 Compressor air filter change (Barge 1). When air filter on top of compressor requires cleaning and/or replacing as part of weekly maintenance services, perform these procedures:

a. Shut down air compressor system by following procedures in paragraph 3-8.2

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATE REPAIRS BEING MADE."

c. Unscrew by turning clockwise oil cover nut on top of air Intake assembly on top of compressor.

d. Remove oil seal and oil cover.

e. Lift out air filter and blow out with compressed air, blowing from inside towards outside of filter. If filter still shows signs of dirt, lint and/or oil in the mesh, wash in soapy water and dry with compressed air. If still dirty, replace with new filter (P/N 1503-0189-00).

f. Carefully wipe out Inside of air filter assembly, being very careful not to get dirt or lint into air intakes on each side.

g. Place clean or new filter into assembly, making sure it seats properly in bottom.

h. Place oil cover on top of air filter, install gasket and screw on oil cover nut.

i. Remove red tag from power panel 1 circuit breaker 3P5.

j. Start air compressor system by following procedures In paragraph 3-2.1.

k. Record completion of this maintenance Item In log book.

4-5.9 Compressor air filters change (Barges 2 and 3). When air filters on top of compressor require cleaning and/or replacing as part of monthly or every-other-month maintenance services, perform these procedures.

a. Shut down air compressor system by following procedures in paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 Indicating, "WARNING DO NOT ACTIVATE REPAIRS BEING MADE "

c. On top of compressor, on each of two air intake filters, loosen set screws holding air filters to Intake manifold. Remove assembly by pulling away from intake manifold.

d. Place clean/new air filters (CAGEC 16327, P/N Z66A) onto air intake manifolds by sliding over end of manifold and tightening setscrews.

e. Remove red tag from power panel 1 circuit breaker 3P5.

WARNING

When using compressed air for cleaning components, ALWAYS use protective shield to protect eyes and face from flying particles Wear gloves and avoid skin damage by closing buttons, collars and rolling down shirt sleeves on work clothing.

f. Start air compressor system by following procedures In paragraph 3-2.1.

g. Clean old air filters by using compressed air blowing from inside towards outside. Clean thoroughly until no more dust or particles are blown out of assembly Return clean old air filters to stock for use at next scheduled maintenance Semiannually, replace both air filters with new assemblies (CAGEC 16327, P/N Z66A, muffler assembly, Intake) h Record completion of this maintenance Item in log book.

4-5.10 Pulleys and belts

4-5.10.1 Pulleys and belts inspections (Barges 2 and 3). When pulley clamp bolts, pulley set screws, and drive belts need checking as part of monthly maintenance services, follow these procedures:

a. Shut down air compressor system by following procedures in paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATEREPAIRS BEING MADE."

c. Remove belt guard from compressor by unscrewing three bolts (two have spinlock nuts). Place bolts, washers, and nuts with guard and place where it will not be damaged.

d. With two V-belts exposed, check appearance for frayed, worn, or extra hard and shiny edges or breaks In underneath side of belts If belts show these signs, belts must be replaced In pairs (CAGEC 16327, P/N 3X645) by following procedures In steps e thru i below. If belts are in acceptable condition, proceed to step j

e. Loosen four bolts holding electric motor to base plate, slide motor towards compressor until belts can be slipped off pulleys. Discard old belts.

f. With belts off, and using a torque wrench, check tightness of bolt holding compressor pulley on compressor shaft. Torque to 500 inch pounds. With normal wrench, check tightness of setscrew holding pulley on electric motor shaft. Setscrew must be wrench tight.

g. Place two new belts on compressor pulley and then on motor pulley.

h. Pull motor away from compressor until belts are as tight as possible and while another crewmember holds motor in this position, tighten four bolts holding motor to base plate.

i. With a straight edge, check that pulleys are at right angles to their shafts and that belts in their grooves are running straight. If not, slightly loosen bolts holding electric motor and move motor until pulleys and belts are running straight in their grooves and are square with compressor and motor shafts. Tighten motor bolts. Again check alignment with straight edge. If not properly lined up, loosen motor bolts and try again. When belts are straight, tighten four motor bolts wrench tight.

NOTE

When installing new pulley belts, make sure belt tension is as tight as possible. Pulley belts stretch with use and must be checked for proper tension at next monthly maintenance service.

j. With torque wrench, check tightness of bolt holding compressor pulley on compressor shaft. Torque to 500 Inch pounds.

k. With normal wrench, check tightness of setscrew holding pulley on electric motor shaft. Setscrew must be wrench tight.

l. Lay a straight edge across top of belts from compressor pulley to electric motor pulley and press down on belts with a thumb. Belts should depress between 1/4 and 1/2 Inch if belts depress more than this, follow procedures in step m below. If belts are within tolerances, proceed to step n.

m. Loosen four bolts holding motor to base plate and move motor away from compressor until belts are within tolerances. Tighten motor bolts, check belt tension and then check belt alignment. If all are acceptable, tighten motor bolts wrench tight.

n. Install belt guard using three bolts, spinnuts and washers.

o. Remove red tag from power panel 1 circuit breaker 3P5.

p. Start air compressor system by following procedures in paragraph 3-2.1.

q. Record completion of this maintenance item in log book.

4-5.10.2 Compressor pulley replacement (Barges 2 and 3)

a. Shut down air compressor system by following procedures in paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATE REPAIRS BEING MADE." c. Remove the V-belts following the procedures in paragraph 4-5.10.1.

d. Remove the nut and bolt from the pulley.

e. Remove the pulley and key using a gear puller.

f. Drive a wedge in the slot of the new pulley hub to spread the hub. Spread the hub only enough to slide the pulley over the shaft.

CAUTION
Excessive spreading of the hub could cause damage.

g. With the hub hole away from compressor, slide the pulley onto the shaft until 1/16 inch of the shaft is exposed.

h. Align the keyways on the shaft and hub and insert key. Remove the wedge.

i. Install the bolt and nut. Using a torque wrench tighten to 500 inch pounds.

j. Replace the belts following the procedures in paragraph 4-5.10.1.

k Remove the redtag for power panel 1 circuit breaker 3P5.

l. Start air compressor system by following the procedures in paragraph 3-2.1.

4-5.10.3 Motor pulley replacement (Barges 2 and 3)

a. Shut down compressor air system by following the procedures in paragraph 3-8.2.

b. Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING DO NOT ACTIVATE REPAIRS BEING MADE."

c. Remove the belts by following the procedures in paragraph 4-5.10.1.

d. Remove set screw from the motor pulley.

e. Remove the pulley from motor shaft using a gear puller.

f. Align new pulley on motor shaft with the setscrew hole in line with the flat side of the motor shaft.

g. Gently tap the pulley on the motor shaft using a nonmetallic hammer.

h. Tighten the setscrew wrench tight.

i. Replace the belts and align by following the procedures in paragraph 4-5.10.1.

j. Remove the redtag from the power panel 1 circuit breaker 3P5.

k. Start the compressor air system by following the procedures in paragraph 3-2.1.

4-5.11 Air compressor general. For additional maintenance services on barge 1 air compressor, refer to paragraph 6, and exploded views of parts lists in Instruction Book and Parts just for Direct air Compressors. For Barges 2 and 3, refer to maintenance procedures and parts lists in Operating Manual and Service Guide for Dayton Speedaire Models in Appendix B.

4-5.12 Valve replacement. Replace or repack worn or damaged valves in accordance with TM 55-503.

CHAPTER 5 STORAGE

Section I. Short-term storage

5-1 General. If barge is to be taken out of service for more than 7 days and less than 30 days, follow shutdown procedures in paragraph 3-8.2.

Section II. Administrative storage

5-2 General. If barge is to be taken out of service for more than 30 days but less than 6 months, barge remains a unit responsibility and shall be maintained by unit personnel.

5-2.1 Administrative storage procedures. Perform the following:

a. Shut down compressed air system by following procedures in paragraph 3-8.2.

b. Perform semiannual maintenance services.

c. Open system by:
   (1) Opening drain cock on receiver by turning small handle clockwise until it stops.
   (2) Opening drain valves on air filters 1 and 2.
   (3) Turning adjusting handles on regulators 1 and 2 counterclockwise until they turn freely.
   (4) Opening valves on air stations 1 thru 5 and 7 by turning valves counterclockwise until they stop.
   (5) Opening pipe at lowest joint in the system (6) Opening main supply valve by turning handle parallel with the pipe.

d. Make sure air station valves 6, 8, and 9 are dosed.

e. Clean compressor painted metal surfaces with a clean, lint-free cloth moistened with cleaning solvent Scrub off hard deposits with a bristle brush moistened with solvent. Dry surfaces with a clean lint-free cloth.

f. Clean pressure gauges with a clean, lint-free cloth.

g. Clean compressor controller by wiping with a dean lint-free cloth moistened with silicone spray lubricant or similar substance. If necessary, remove corrosion with a wire brush or sandpaper.

h. Touch up paint in accordance with TB 43-0144 to preclude further corrosion.

5-2.2 Administrative storage Inspection. While in storage, this system should be operated and inspected every 90 days. In meeting this requirement, perform the following:

a. Start compressor system by following procedures in paragraph 3-2.1.

b. Perform periodic inspections and services required by Appendix C.

c. Return system to administrative storage configuration as described in paragraph 5-2.

Section III. Long-term storage

5-3 General. If barge is to be taken out of service for 6 months or more, turn it in to depot for preparation and placement into long-term storage. If barge is in administrative storage and is to be taken out of service and placed in depot long-term storage (6 months or more), process compressed air system for normal operations before releasing to depot.

CHAPTER 6 MANUFACTURER'S SERVICE MANUALS/INSTRUCTIONS

6-1 General. Manufacturers' operation and maintenance manuals listed below provide additional information on components of compressed air system. A ready reference copy of each manual is found in Appendix B. It may be necessary to refer to these manuals and engineering drawings listed In Appendix A while performing procedures discussed in this TM.

Component	Document title	Manufacturer
Air and Oil Filter 3108BG	IS3100-1, Filter Instruction Sheet	Arrow Pneumatics P.O. Box 739 Mundelein, IL 60060 (312) 566-9100
Oil Removing Filter 3300 3308	Form 3300, Series "OlLescer" Oil Removal Filter Parts List and Instruction Sheet	
Pressure Regulator 1584GLP and 1588GHP	IS1500-1, Regulator Instruction Sheet	
Air Impact Wrench Model 2Z853C	Form 5S1138, Operating Instructions & Parts Manual	Dayton Electric Manufacturing Co. 5959 W. Howard St. Chicago, IL 60648 (312) 647-0124
Barge 1 Air Compressor w/Receiver LEBT	Instruction Book and Parts List for Direct air Compressors How to Wire the Automan Compressor	Atlas Copco Standard Pneumatic, Incorporated 4070 W. 150th St Cleveland, OH 44135 (216) 251-9500 or 1-800-321-6098 (toll free)
Barge 2 and 3 Speedaire Air Compressor 1Z7850	Form 5S1408, Air Compressor Operating Manual and Service Guide (For all Dayton Speedaire & Speedaire models) Form 5S1566, Installation Guide/Parts List, Horizontal Air Compressors (Model 1Z785D) Form 5S1717, Specifications, Performance and Parts Manual, Compressor Heads, Models 3Z182B and 3Z183B Explanation of Pilot Valve Compressor Lubricating Oil Mounting Compressor Pulley	Dayton Electric 5959 W. Howard St., Chicago, IL 60648 (312) 647-0124
Compressor motor controller	See TM 55-1930-209-14&P-9	

CHAPTER 7 MANUFACTURERS' WARRANTIES/GUARANTEES

7-1 General. Information on compressed air system component warranties and/or guarantees is supplied below.

Component	Manufacturer	Duration	Coverage
BARGE 1 Air Compressor w/Receiver LEST	Atlas Copco Standard Pneumatic, Inc 4070 W. 150th St Cleveland, OH 44135 (216) 251-9500	6 months from purchase	Workmanship & materials
BARGES 2 and 3 Air Compressor Model P/N 1Z785D	Dayton Electric Manufacturing Co., 5959 W. Howard St., Chicago, IL 60648 (312) 647-0124	1 year from purchase	Workmanship & materials
Air Impact Wrench Model 2Z853C	Dayton Electric Manufacturing Co., 5959 W. Howard St, Chicago, IL 60648 (312) 647-0124	1 year from purchase	Workmanship & materials
Compressor motor controller	See TM 55-1930-209-14&P-9		

APPENDIX A

REFERENCES

A-1 Drawings

US Army Belvoir Research and Development Center (97403)

13226E1898	Seawater system
13226E1920	Compressed Air System
13226E1929	Shore discharge hose reel installation
13226E1932	Electrical Power Schematic Diagram
13226E1935	Electrical Power System Layout
13226E1939	Motor Controllers Schematic and Wiring Diagram

A-2 Painting

TB 43-0144	Painting of Vessels

A-3 Demolition to Prevent Enemy Use

TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use

A-4 Maintenance

DA PAM 738-750	The Army Maintenance Management System (TAMMS)
TM 55-503	Marine Salvage and Hull Repair

APPENDIX B

MANUFACTURERS' SERVICE MANUALS/INSTRUCTIONS

Component	Document title	Manufacturer
Barge 1 Air Compressor w/Receiver LE8T	Instruction Book and Parts List for Directair Compressors How to Wire the Automan Compressor	Atlas Copco Standard Pneumatic, Incorporated 4070 W. 150th St. Cleveland, OH 44135 (216) 251-9500 or 1-800-321-6098 (toll free)
Barge 2 and 3 Speedaire Air Compressor 1Z7850	Form 5S1408, Air Compressor Operating Manual and Service Guide (For all Dayton Speedaire & Speedaire models) Form 5S1566, Installation Guide/Parts List, Horizontal Air Compressors (Model 1Z785D) Form 5S1717, Specifications, Performance and Parts Manual, Compressor Heads, Models 3Z182B and 3Z183B Explanation of Pilot Valve Compressor Lubricating Oil Mounting Compressor Pulley	Dayton Electric 5959 W. Howard St., Chicago, IL 60648 (312) 647-0124
Air and Oil Filter 3108BG	IS3100-1, Filter Instruction Sheet	Arrow Pneumatics P.O. Box 739 Mundelein, IL 60060 (312) 566-9100
Oil Removing Filter 3308	Form 3300, Series 3300 "OILescer" Oil Removal Filter Parts List and Instruction Sheet	
Pressure Regulator 1584GLP and 1588GHP	IS1500-1, Regulator Instruction Sheet	
Air Impact Wrench Model 2Z853C	Form 5S1138, Operating Instructions & Parts Manual	Dayton Electric Manufacturing Co. 5959 W. Howard St. Chicago, IL 60648 (312) 647- 0124
Compressor motor controller	See TM 55-1930-209-14&P-9	

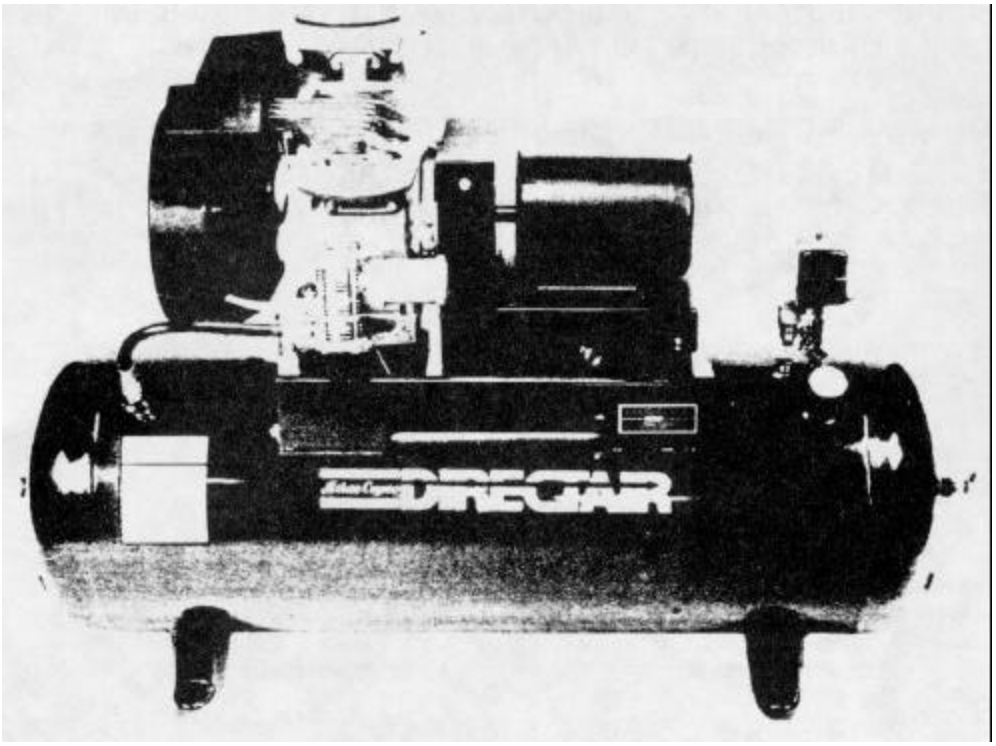
INSTRUCTION BOOK AND

PARTS LIST

FOR

DIRECTAIR

COMPRESSORS



ATLAS COPCO STANDARD PNEUMATIC INC.
4070 WEST 150th STREET
CLEVELAND, OHIO 44135
(216) 251-9500
Toll-free number 1-800-321-6098

ALL RESPONSIBILITY FOR ANY DAMAGE OR INJURY RESULTING FROM NEGLECTING THESE PRECAUTIONS, OR BY NON-OBSERVANCE OF ORDINARY CAUTION AND DUE CARE REQUIRED IN HANDLING, OPERATING, MAINTENANCE OR REPAIR, EVEN IF NOT EXPRESSLY MENTIONED IN THIS BOOK, WILL BE DISCLAIMED BY ATLAS COPCO.

DIRECTAIR SINGLE-STAGE UNITS, REPRESENTED BY THE LETTER "D" IN THE MODEL NUMBER, UTILIZE AN "LE" SERIES PUMP. TWO-STAGE UNITS, REPRESENTED BY THE LETTERS "DT" IN THE MODEL NUMBER UTILIZE AN "LT" SERIES PUMP.

Contents - Instruction book

		Page
1	**Installation and operating instructions**	3
	1.1 General information	3
	1.1.1 Operation - D-series	3
	1.1.2 Operation - DT-series	3
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Contents - Parts list

	Page
Air inlet and crankcase	11
Crank assembly	13
Cylinders and valves 2-3-5-7.5-10 15 HP two stage	15
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Atlas Copco Standard Pneumatic reserves the right to alter the configuration of their compressors without notice

1 Installation and operating instructions for Directair compressors

Read all instructions **carefully** before starting the compressor

1.1 General information

Directair compressors exist in two types, D, which designates single-stage, and DT, which designates two-stage. The D's are available 2 through 15 H P and the DT's, 2 through 25 H P. The D's are built for effective working pressures up to 150 psi max., and the DT's to 175 psi max. The compressors are available as power packs, which consist of the compressor block, motor base, coupling, and motor, and as a complete tank mounted unit

1.1.1 Operation - D-series

Air is drawn through the intake filter, intake manifold, and suction discs into the cylinders. The air is compressed, then discharged through the delivery discs to the temperature reducer, where the heat of the compressed air Is partly removed. From the temperature reducer the compressed air is discharged through the check valve into the tank.

1.1.2 Operation - DT-series

Air is drawn through the intake filter, intake manifold, and into the low pressure cylinder where it is compressed, then discharged through the delivery valve to the intercooler, where the heat from the first stage of compression is removed. The air then enters the high pressure cylinder through the pulsation damper and the suction disc where it is further compressed. It is then discharged through the delivery disc to the cooling caps of the HP cylinder head and from there to the HP temperature reducer. It is then discharged through the check valve into the tank

1.2 Ventilation

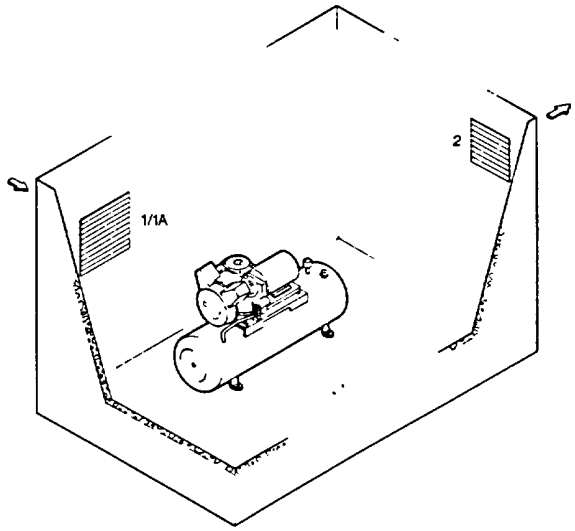
The compressor is equipped with a temperature reducer that is adequate under normal working conditions. Maximizing ventilation at your installation will reduce condensation and greatly enhance compressor life and efficiency

Locate compressor in a clean, cool, well ventilated area, preferably a separate room. DO NOT locate compressor near toxic fumes, as they may affect compressor operation

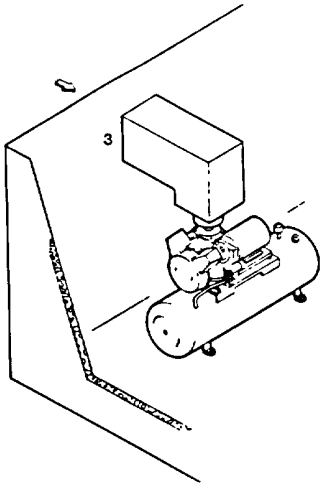
If the compressor is placed in a room, it should be of adequate size to allow for periodic maintenance. The room should have two openings for ventilation. One opening for intake of cool, clean outside air, preferably by using a fan (1). If a fan is not available the minimum size opening (1a) for the intake should be 1'-6" x 1'-6" and should be placed on the lower portion of the wall. The other opening (2) allows for exhaust of hot, moist air, should be 1'-6" x 1'-6" and placed on the upper portion of the wall. See Drawing "A".

If the compressor cannot be located in a separate room, some measures should be taken to allow outside air to be drawn in by the compressor intake. This can be accomplished by using ductwork (3). The ductwork should be canopied over the intake, as shown in Drawing "B". The smallest recommended size of the ductwork opening should be 1'-6" x1'-6".

DRAWING A



DRAWING B



1 Intake fan
1A Intake opening, minimum size 1'-6"x1'-6"
2 Exhaust opening, minimum size 1'-6"x1'-6"
3 Canopied duct work, minimum size 1'-6"x1'-6"

1.3 Piping

Pipe sizes for air mains or lines: "Table 1"

Air mains and lines must be of adequate size and strength for the systems requirements. See table 1 for recommended sizes.

Slope all air lines toward compressor receiver tanks. This will help prevent moisture in branch lines See drawing C.

Valves should be provided in various branches and loops of air systems to allow separation from main system in event of failure or reason for shut-down. These valves should normally be open.

Branch lines to various air tools, and appliances should be brought off top or side of mains to prevent entry of moisture as it condenses in mains. Never connect a branch line at bottom of mains See drawing D.

1.3.1 Piping diagram

DRAWING C

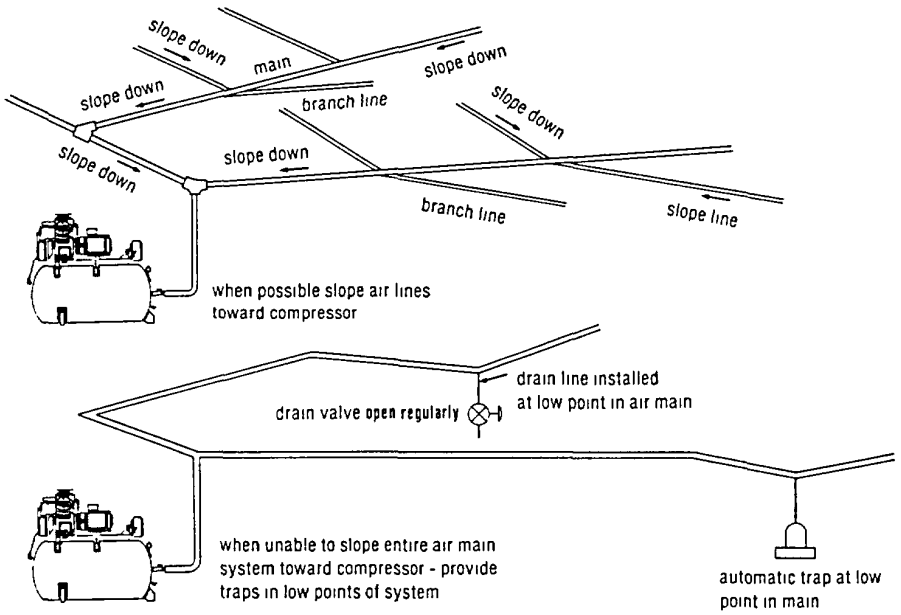
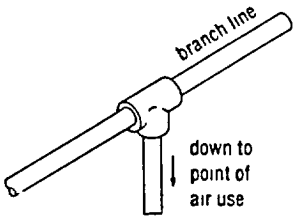


Table 1: Pipe sizes for compressed air lines:

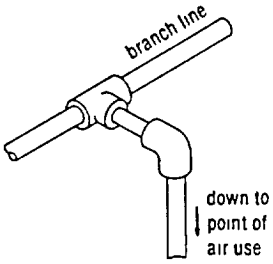
Air	Length of pipe lines in feet							
c.f.m.	**25**	**50**	**75**	**100**	**150**	**200**	**250**	**300**
1	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
2	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
3	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
5	1/2	1/2	1/2	1/2	1/2	1/2	1/2	1/2
10	1/2	1/2	1/2	3/4	3/4	3/4	3/4	3/4
15	1/2	3/4	3/4	3/4	3/4	3/4	3/4	3/4
20	3/4	3/4	3/4	3/4	3/4	3/4	3/4	3/4
25	3/4	3/4	3/4	3/4	3/4	1	1	1
30	3/4	3/4	3/4	3/4	1	1	1	1
35	3/4	3/4	1	1	1	1	1	1
40	3/4	1	1	1	1	1	1	1
50	1	1	1	1	1	1	1	1
60	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4
70	1	1	1	1	1 1/4	1 1/4	1 1/4	1 1/4
80	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2	1 1/2
100	1 1/4	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2	1 1/2

Check all piping and fittings regularly to avoid 'leaks" in the system

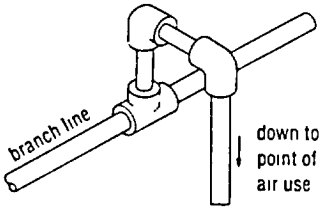
DRAWING D



Poor installation
water condensing in branch line flows down to air tool or appliance



Better installation
water condensing in branch line tends to flow past line to air tool or appliance



Best installation
condensed water in branch cannot enter line down to air tool

1.4 Wiring

All electrical hook up should be done by a certified electrician, in conformity with local electrical codes.

Be sure that:

1. The supply line has the same electrical characteristics (voltage, phase and cycle) as the motor. (Check table 2 for recommended wire size).
2. The electric meter is large enough and service is of adequate ampere rating.
3. The line wire is the proper size and that no other equipment is operated from the same line. Improper wire size will cause excessive motor loads and possible motor burn-outs.

All Directair 3-phase units require a magnetic starter, as do 5 HP and up 1-phase applications.
Never operate the unit without a ground connection.

1.4.1 Table 2: Recommended wire size

Motor HP/phase	Voltage	Wire size	Max. length of line (ft) [1]	Time-delay fuse size
2/1	208	12	75	25
2/1	230	12	75	25
3/1	208	10	75	30
3/1	230	10	75	30
5/1	208	6	100	50
5/1	230	6	100	50
5/1	460	12	100	25
2/3	208	14	75	20
2/3	230	14	75	20
2/3	460	16	75	15
3/3	208	14	75	20
3/3	230	14	75	20
3/3	460	16	75	15
5/3	208	12	100	30
5/3	230	12	100	25
5/3	460	14	100	15
7.5/3	230	8	125	40
7.5/3	460	14	125	20
10/3	208	6	125	50
10/3	230	6	125	50
10/3	460	12	125	25
20/3	230	3	125	90
20/3	460	8	125	40
25/3	230	2	125	100
25/3	460	6	125	50

1) Use an aluminum or copper-clad aluminum wire.

In case of motor failure. return to local authorized motor repair station

2 Initial start-up

1. Check all wiring for loose connections. A loose wire could cause a loss of power or a short circuit. Be sure that the thermal overload relay in the starter is properly set (if applicable) to provide adequate motor overload protection.
2. Check oil level in sight gauge It should be filled to the middle of sight glass. If not, fill to the proper level. Use only a detergent oil with a SAE number 10W, API classification CD or SF, military specification MIL-L-2104C or MILL-461 52, available at your Atlas Copco distributor.
3. Start the compressor and check the rotation of the fan, which should blow air over the cylinder. Stop the compressor immediately if the fan turns in the wrong direction. If unit is 3-phase, interchange any two lines If unit is single phase, see motor nameplate on motor.
4. Check that pressure switch operates at the pressure limits specified.
5. Check all piping for leaks Repair if necessary.
6. Your compressor is now ready for use.

3 Optional dual control instructions

(DIRECTAIR) 5 through 15 HP single-stage units are available with pneumatic dual control. This option allows operation to meet air demand. When air requirements are average the "auto" mode of operation is suggested. When air demand is high, the "constant" mode of operation may be used.

The main components of the dual control system are the pressure switch and the pilot valve. In the auto mode of operation, the compressor is regulated by the pressure switch. When air pressure reaches the preset upper limit of the pressure switch the unit will unload and shut down. When tank pressure drains to the lower limit of the pressure switch, the unit will start up and begin pumping again In the constant mode of operation, the compressor is regulated by the pilot valve. On the top of the pilot valve is a control knob.

By turning this knob counter-clockwise, tank pressure is allowed to flow through it. The unit will pump until the preset upper limit of the pilot valve is reached. At this time, the unit will remain running however, the compressed air is vented to the atmosphere instead of flowing into the tank. When tank pressure decreases to the lower pressure limit the unit will again pump air into the tank.

To return to the stop/start mode of operation, simply turn the control knob on the pilot valve clockwise.

Warning: The pressure switch and pilot valve are preset to specified settings. These settings must not be altered.

4 Maintenance schedule

Routine maintenance insures trouble-free operation and protects your investment. All warranties are void if maintenance is neglected.

Daily:

1. Check oil level, which should be in lower half of the sight glass. Add, if necessary, using oil mentioned “Initial start-up"

2. Turn off power at main fuse box and drain moisture from tank by opening the drain cock in the bottom of the tank.

Weekly:

1. Remove and clean air intake filter with compressed air Replace if necessary.

2. Turn off power and clean dust and foreign material from entire unit

Monthly:

1. Test operation of safety valve by pulling the test link. Air from the tank should escape. If it does not, **replace the safety valve. This valve cannot be adjusted.**

   Note: In the event the unit ran over pressure, this safety valve would reduce tank pressure to a safe level. Be sure it will work properly. Never run the unit without this safely valve.

Every six months or after 1000 hours [max l of operation:

1. Change the lubricating oil

2. Check overall operation of unit. It should be as described in these instructions. A sudden change in performance indicates a problem developing, and should be investigated

Warning: Do not use petroleum based or other flammable solvents for cleaning.

5 Trouble shooting

Condition	Possible faults	Suggested remedy
1. Compressor does not start	a. No electrical power	a. Check or have electrical system checked
	b. Receiver pressure between starting and stopping pressures	b. Wait until pressure drops
	c. Coupling sleeve damaged	c. New sleeve
2. Compressor does not pump	a. Unloader jammed	a. Disassemble and clean unloader
	b. Solenoid valve not energized	b. Have electrician check wiring

Condition	Possible faults	Suggested remedy
3. Insufficient air receiver pressure	a. Air leak(s)	a. Check and correct as necessary
	b. Air intake filter clogged	b. Clean or replace
	c. Air consumption exceeds unit capability	c. Decrease demand or add unit
	d. Pressure gauge defective	d. Replace gauge
	e. Unloader jammed	e. Disassemble and clean
4. Insufficient pressure at point of use	a. Leaks or restrictions	a. Check hose and piping
	b. Air filter clogged	b. Clean or replace
	c. Service hose too small	c. Replace with larger hose
	d. Excessive air requirement	d. Decrease consumption or add unit
5. Fuses blow	Wrong fuse size	Replace with correct size
6. Fuses of proper size blow, reset kicks out	a. Motor overload	a. Check motor
	b. High ambient temperature	b. Provide ventilation
	c. Wiring wrong size	c. Have electrician check wire size
	d. Unit starting against a load	d. Check unloader mechanisms Repair or replace
7. Compressor does not speed up	a. Voltage drop at motor terminals due to ineffective mains or undersized supply cable	a. Consult power supplier Change to larger cross-section cable, if necessary
	b. Ambient temperature too low available. heat room	b. Install compressor in frost proof room If no other location
	c. Pressure relief valve of air pressure switch malfunctioning	c. Check operating mechanism of valve If out of order, replace air pressure switch as a unit
	d. Unloader plunger jammed	d. See 2a
	e. Solenoid valve out of order	e. Replace solenoid
8. Pressure in receiver rises above maximum and causes safety valve to blow	a. Air pressure switch incorrectly set or out of order	a. Set switch to stop compressor at rated maximum pressure Replace switch if It does not respond
	b. Solenoid valve defective out of order	b. Remove and test valve on outside mains supply line Replace, if
	c. Unloader piston jammed	c. Inspect unloader assembly Replace parts as necessary
9. Receiver does not hold pressure	Non-return valve leaks	Check for broken valve plate and springs
10. Too frequent starting and too short operating periods	a. Air pressure switch incorrectly set	a. Increase pressure
	b. Non-return valve leaks	b. See 9
	c. High condensate level in receiver	c. Drain condensate more frequently

Condition	Possible faults	Suggested remedy
11. High oil consumption	a. Oil level too high	a. Do not overfill crankcase Keep level within lower half of sight glass
	b. Breather valve malfunctioning	b. Check valve
	c. Piston ring(s) worn or broken	c. Have condition oft piston rings checked
	d. Intake filter clogged	d. Clean or replace
12. Loading periods too long	a. Excessive air consumption	a. Decrease consumption
	b. Compressor not in optimum condition	b. Have compressor inspected
	c. Sticking or damaged valves	c. Clean or replace
13. Thermal overload relay cuts out during starting	Overload relay incorrectly set	Check and adjust to correct setting Reset relay
14. Thermal overload relay cuts out during operation	a. Overload relay incorrectly set	a. See 13
	b. One phase of mains supply line interrupted	b. Check fuses and line terminals tightness Check voltage across motor line terminals
	c. Mains supply voltage variations exceed normal tolerances	c. Consult power supplier
	d. Ambient temperature too high and causes overload relay to trip	d. Improve ventilation of room
	e. Motor stops and starts too frequently	e. See 10 On units with motor starter, change to half-automatic operation
	f. Overcurrent due to motor-failure of compressor	f. Measure motor line current in the three phases If currents exceed rated motor current, have compressor inspected, if currents are not equal, have motor inspected
15. L P relief valve blows	a. Defective valve in H P cylinder head	a. Inspect and replace parts as necessary
	b. Defective relief valve	b. Replace valve

In case of motor failure. return to local authorized motor repair station.

6 Valve replacement procedure

Warning: Release the pressure from the air receiver and compressor before starting repair works Always switch off the current.

Valves

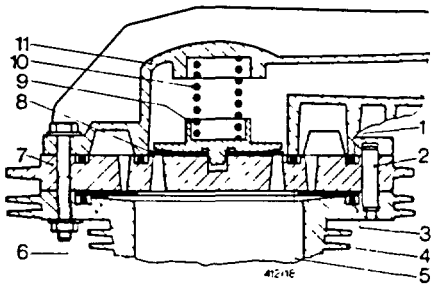
A faulty valve must be attended to immediately. Serious damage can result if a compressor Is operated with a broken valve disc. The instructions given must be faithfully followed when inspecting or replacing the valve discs.

Removal and assembly (See Drawings E and F)

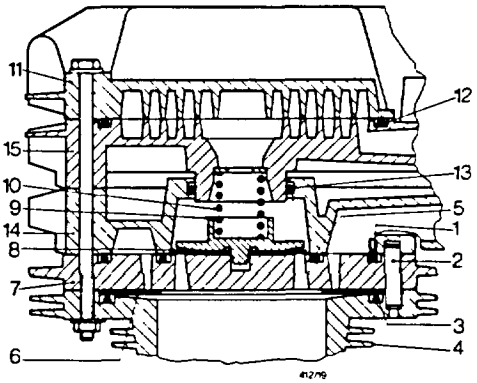
Cylinder(s) L5/11 LT5/11-low-pressure	LT12 LT5/11-high-pressure	Operation sequence
•	•	Remove the fan guard and the cover of the air intake silencer.
•		Disconnect cylinder head cover (11) from the in- and outlet pipe flanges Remove cover (11).
	•	Remove cylinder head cover (11) Disconnect outlet cap (15) from the temperature reducer and inlet cap (14) from the pulsation damper and the air intake silencer Remove outlet and inlet caps (15 and 14).

Cylinder(s) L5/11 LT5/11-low-pressure	LT12 LT5/11-high-pressure	Operation sequence
•	•	Remove spring (10), outlet valve guard (9) and outlet valve disc (8).
•	•	Lift off valve seat (7) and remove Inlet valve disc (6). Do not remove guide pins (2).
•	•	Remove and discard all the O-rings and rubber cord joints.
•	•	Remove the carbon deposits from the inlet valve guard at the cylinder top. Take care that no dirt drops Into the cylinder.
•	•	Clean and inspect all the parts. Discard any valve discs that are cracked or worn.
•	•	Fit new rubber cord joint (3). Do not stretch the rubber while Inserting it in Its groove the ends should meet. Lightly smear the cords, O-rings and their grooves with graphite grease.

Cylinder(s) 15/11 LT5/11-low pressure	LT12 LT5/11-high-pressure	Operating sequence
•	•	Put inlet valve disc (6) into place and install valve seat (7)
•	•	Fit O-ring (5) and cord joint (1).
•	•	Install outlet valve disc (8), guard (9) and spring (10).
•	•	Install cylinder head cover (11). Use new flange gaskets, it necessary. Fit the flange and cylinder head bolts and tighten them alternately
	•	Fit O-ring (13) and cord (12). Reinstall in- and outlet caps (14 and 15), reconnect outlet pipe coupling and flanges, reinstall cover (11) and clamp cylinder head assembly securely into place
•	•	Reinstall the fan guard and the cover of the air intake silencer



Drawing E L5 to 9 and low pressure side of LT5 to 11



Drawing F High pressure side of LT5 to 12 and low pressure side of L11 and LT12

1. Rubber cord joint
2. Guide pin (2 off)
3. Rubber cord joint
4. Cylinder
5. O-ring
6. Inlet valve disc
7. Valve seat
8. Outlet valve disc
9. Outlet valve guard
10. Spiral spring
11. Cylinder head cover
12. Rubber cord joint
13. O-ring
14. Inlet cap
15. Outlet cap

Figs. E and F - Cylinder head valve assemblies

Torque chart

Key number	Torque (ft -lb)	Unloader valve	Torque (ft.-lb)
6 mm	7.5	8 mm	11
8 mm	18.5		
10 mm	33		

7 Data

		L/LT5	L/LT6	L/LT7	L/LT8	L/LT 9	L/LT11	LT12
Crankcase oil capacities	l	1.40	1.40	3.00	3.00	5.40	5.40	5.40
	U.S. gal	0.37	0.37	0.79	0.79	1.43	1.43	1.43

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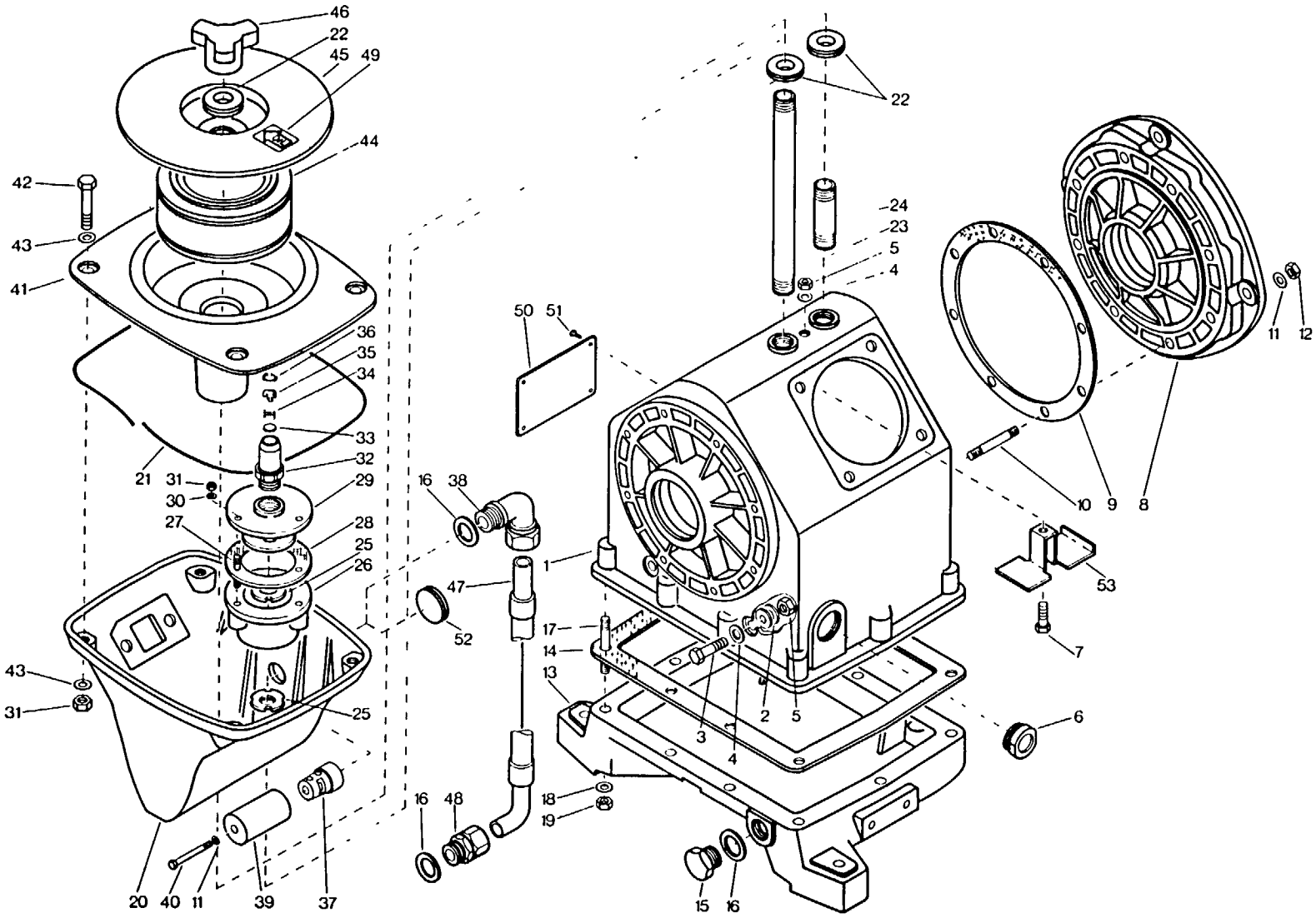
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FIG. 1. AIR INLET AND CRANKCASE

Key No.	Part number	Foot note	Qty Req'd	Key No.	Part number	Foot note	Qty Req'd	Key No.	Part number	Foot note	Qty Req'd	Key No.	Part number	Foot note	Qty Req'd	Description
2-3 HP				**5-7.5 HP**				**10-15 HP**				**25 HP**				
1	1503 0034 00		1	1	1503 0001 00		1	1	1503 0008 00		1	1	1503 0008 00		1	Crankcase
2	1503 0148 00		2	2	1503 0148 00		2	2	1503 0148 00		2	2	1503 0148 00		2	Steering
3	0147 1327 03		2	3	0147 1327 03		2	3	0147 1327 03		2	3	0147 1327 03		2	Bolt
4	1503 0210 00		3	4	1503 0210 00		3	4	1503 0210 00		2	4	1503 0210 00		3	Washer
5	0291 1110 00		3	5	0291 1110 00		3	5	0291 1110 00		3	5	0291 1110 00		3	Locknut
6	1503 0202 00		1	6	1503 0202 00		1	6	1503 0202 00		1	6	1503 0202 00		1	Sight plug
7	0147 1327 03		1	7	0147 1327 03		1	7	0147 1326 03		1	7	0147 1326 03		1	Bolt
8	1503 0085 00		1	8	1503 0003 00		1	8	1503 0004 00		1	8	1503 0004 00		1	Bearing housing
9	1503 0171 00		1	9	1503 0174 00		1	9	1503 0177 00		1	9	1503 0177 00		1	Gasket
10	0246 1201 02		4	10	0246 1202 02		8	10	0246 1202 02		8	10	0246 1202 02		8	Stud
11	0301 2335 00		4	11	0301 2335 00		8	11	0301 2335 00		8	11	0301 2335 00		9	Washer
12	0266 2110 00		4	12	0266 2110 00		8	12	0266 2110 00		8	12	0266 2110 00		8	Nut
13	1503 0105 00		1	13	1503 0037 00		1	13	1503 0009 00		1	13	1503 0009 00		1	Base
14	1503 0170 00		1	14	1503 0173 00		1	14	1503 0176 00		1	14	1503 0176 00		1	Gasket
15	0686 4704 00		1	15	0686 4704 00		1	15	0686 4704 00		1	15	0686 4704 00		1	Plug
16	0653 9098 00		1	16	0653 9098 00	1)	1	16	0653 9098 00	1)	1	16	0653 9098 00		3	Gasket
					0653 9098 00	2)	3		0653 9098 00	2)	3					Gasket
17	0246 1201 02		8	17	0246 1202 02		8	17	0246 1246 02		10	17	0246 1246 02		10	Stud
18	0301 2335 00		8	18	0301 2335 00		8	18	0301 2344 00		10	18	0301 2344 00		10	Washer
19	0266 2110 00		8	19	0266 2110 00		8	19	0266 2111 00		10	19	0266 2111 00		10	Nut
20	1503 0040 00		1	20	1503 0041 00		1	20	1503 0030 00		1	20	1503 0030 00		1	Silencer
21	1503 0250 00		1	21	1503 0251 00		1	21	1503 0252 00		1	21	1503 0252 00		1	Cord
22	1503 0234 00		3	22	1503 0234 00		3	22	1503 0234 00		3	22	1503 0234 00		3	Seal
23	1503 0193 00		1	23	1503 0194 00		1	23	1503 0195 00		1	23	1503 0195 00		1	Oil tube
												24	1503 1234 00		1	Connecting tube
												25	0295 3105 00		2	Lock nut
												26	1503 1127 00		1	Housing
												27	0246 1135 02		3	Stud
												28	1503 1153 00		1	Gasket
												29	1503 1128 00		1	Insert
												30	0301 2321 00		3	Washer
31	0291 1108 00		4	31	0291 1108 00		4	31	0291 110800		4	31	0291 1108 00		7	Lock nut
-	1503 0208 80		1	-	1503 0208 80		1	-	1503 0208 80		1	-	1503 1130 80		1	Vent valve, compl.
32	* * *		1	32	* * *		1	32	* * *		1	32	* * *		1	• Housing
33	* * *		1	33	* * *		1	33	* * *		1	33	* * *		1	• Valve plate
34	* * *		1	34	* * *		1	34	* * *		1	34	* * *		1	• Spring
35	* * *		1	35	* * *		1	35	* * *		1	35	* * *		1	• Valve guard
36	* * *		1	36	* * *		1	36	* * *		1	36	* * *		1	• Circlip
				37	1503 0014 00	2)	1	37	1503 0014 00	2)	1	37	1503 1261 00		1	Damper
				38	0580 2211 03	2)	1	38	0580 2214 03	2)	1	38	0580 2214 03		1	Elbow
				39	1503 0191 00	2)	1	39	1503 0191 00	2)	1	39	1503 1260 00		1	Cover
												40	0147 1320 03		1	Bolt
41	1503 0042 00		1	41	1503 0043 00		1	41	1503 0031 00		1	41	1503 1235 00		1	Cover
42	0147 1250 03		4	42	0147 1250 03		4	42	0147 1250 03		4	42	0147 1250 03		4	Bolt
43	1503 0209 00		8	43	1503 0209 00		8	43	1503 0209 00		8	43	1503 0209 00		8	Washer
44	1503 0188 00		1	44	1503 0189 00		1	44	1503 0190 00		1	44	1503 0190 00		1	Filter
45	1503 0101 00		1	45	1503 0101 00		1	45	1503 0102 00		1	45	1503 0102 00		1	Cover
46	1503 0192 00		1	46	1503 0192 00		1	46	1503 0192 00		1	46	1503 0192 00		1	Cover, oil
				47	1503 1397 00	2)	1	47	1503 0253 00	2)	1	47	1503 0253 00		1	Flexible
				48	0580 0210 03	2)	1	48	0580 0213 03	2)	1	48	0580 0213 03		1	Coupling
49	1503 0787 00		1	49	1503 0787 00		1	49	1503 0787 00		1	49	1503 0787 00		1	Label
50	1503 0785 00		1	50	1503 0785 00		1	50	1503 0785 00		1	50	1503 0785 00		1	Data plate
51	0226 3177 00		4	51	0226 3177 00		4	51	0226 3177 00		4	51	0226 3177 00		4	Drive screw
52	1503 0255 00		1	52	1503 0255 00	1)	1	52	1503 0255 00	1)	1					Plug
53	1503 0152 00		1	53	1503 0152 00		1	53	1503 0254 00		1					Cover plate

1) Single stage
2) Two stage

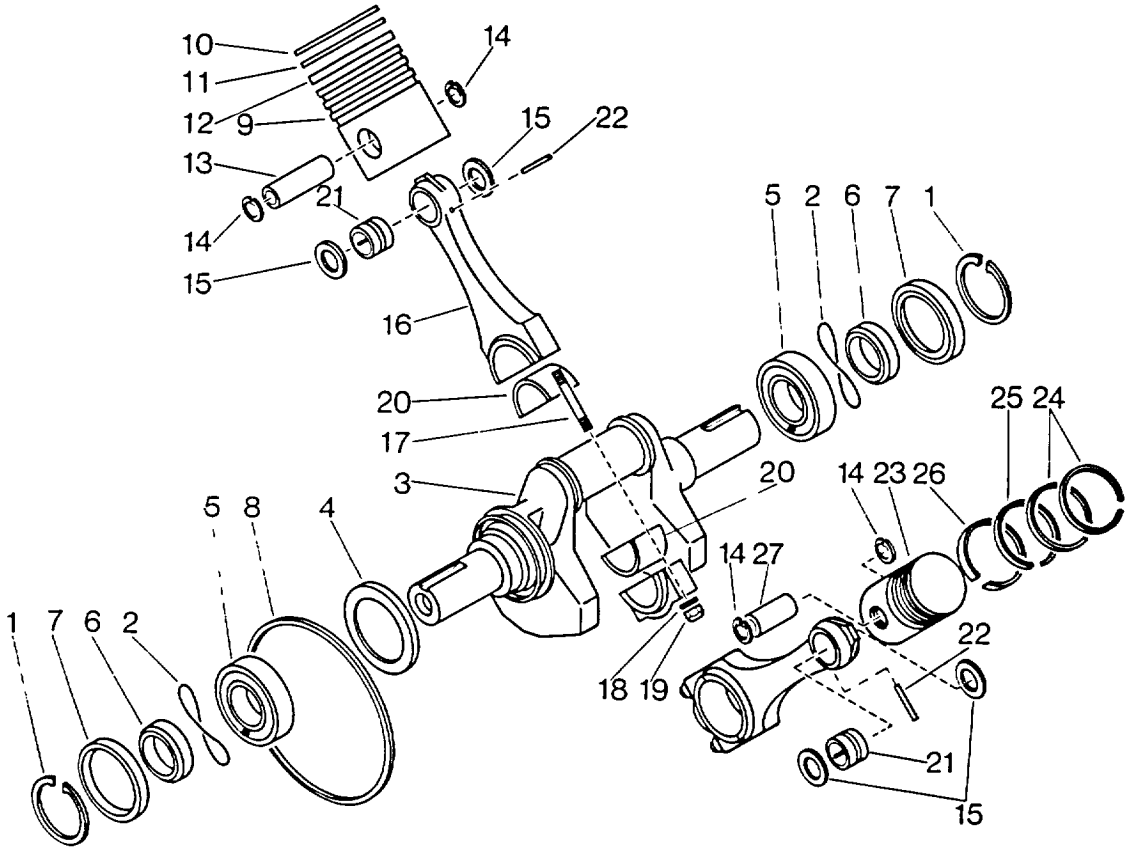
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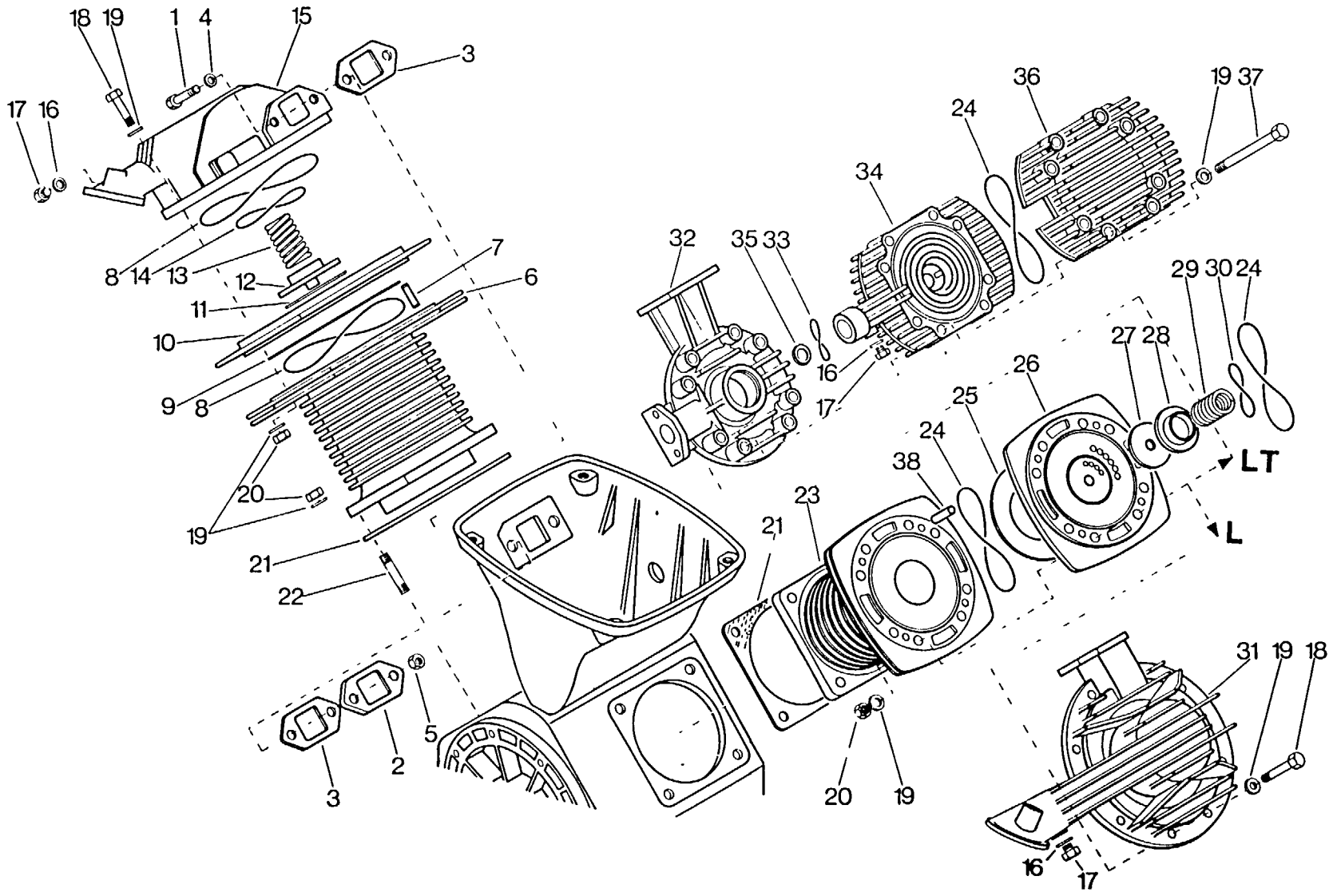
FIG. 2. CRANK ASSEMBLY

Key No.	Part number	Foot note	Qty Req'd	Key No.	Part number	Foot note	Qty Req'd	Key No.	Part number	Foot note	Qty Req'd	Key No.	Part number	Foot note	Qty Req'd	Description
2-3 HP				**5-7.5 HP**				**10-15 HP**				**25 HP**				
1	0335 2146 00		2	1	0335 2157 00		2	1	0335 2169 00		2	1	0335 2169 00		2	Circlip
2	0663 9072 00		2	2	0663 9073 00		2	2	0663 6144 00		2	2	0663 6144 00		2	0-ring
-	1503 0124 80	2HP	1	-	1503 0126 80	5 HP	1	-	1503 0128 80	10 HP	1	-	1503 1125 80		1	Crankshaft, compl.
	1503 0125 80	3HP	1		1503 0127 80	7.5 HP	1		1503 0129 80	15 HP	1					Crankshaft, compl.
3	* * *		1	3	* * *		1	3	* * *		1	3	* * *	1.		• Crankshaft
4	1503 0130 00		1	4	1503 0131 00		1	4	1503 0132 00		1	4	1503 0132 00		1	• Oil collector
5	0502 2105 00		2	5	0502 2107 00		2	5	0502 3109 00		2	5	0502 3109 00		2	• Bearing
6	1503 0149 00		2	6	1502 0150 00		2	6	1503 0151 00		2	6	1503 0151 00		2	• Collar
7	0666 6302 00		2	7	0666 6439 00		2	7	0666 6565 00		2	7	0666 6565 00		2	Oil seal
8	1503 0145 00		1	8	1503 0146 00		1	8	1503 0147 00		1	8	1503 0147 00		1	Ring lubricator
-	1503 0426 80	2 HP-3) 3 HP-1)3)	1	-	1503 0430 80	3)	1	-	1503 0432 80	3)	1	-	1503 0432 80	3)	1	Piston, compl.
	1503 0427 80	3 HP-2)3)	1													Piston, compl.
9	* * *		1	9	* * *		1	9	* * *		1	9	* * *		1	• Piston
10	1503 0611 00		1	10	1503 0612 00		1	10	1616 0376 00		1	10	1616 0376 00		1	• Compression ring
11	1503 0435 00		1	11	1503 0439 00		1	11	1503 0441 00		1	11	1503 0441 00		1	• Compression ring
12	1503 0442 00		1	12	1503 0444 00		1	12	1503 0445 00		1	12	1503 0445 00		1	• Scraper ring
13	1503 0116 00		1	13	1503 0113 00		1	13	1503 0114 00		1	13	1503 0114 00		1	Gudgeon pin
14	0335 2122 00		4	14	0335 2122 00		4	14	0335 2127 00		4	14	0335 2127 00		4	Circlip
15	1503 0153 00		4	15	1503 0153 00		4	15	1503 0154 00		4	15	1503 0154 00		4	Spacer
-	1503 0136 80	2 HP	2	-	1503 0138 80	5 HP	2	-	1503 0140 80	10 HP	2	-	1503 1126 80		2	Connecting rod, compl.
	1503 0137 80	3 HP	2		1503 0139 80	7.5 HP	2		1503 0141 80	15 HP	2					Connecting rod, compl
16	* * *		1	16	* * *		1	16	* * *		1	16	* * *		1	Connecting rod
17	* * *		2	17	* * *		2	17	* * *		2	17	* * *		2	Stud
18	0301 2321 00		2	18	0301 2335 00		2	18	0301 2344 00		2	18	0301 2344 00		2	Washer
19	0291 1108 00		2	19	0291 1110 00		2	19	0291 1111 00		2	19	0291 1111 00		2	Locknut
20	1503 0142 00		4	20	1503 0143 00		4	20	1502 0144 00		4	20	1503 0144 00		4	Journal bearing
21	0515 4130 00		2	21	0515 4130 00		2	21	0516 3204 01		2	21	0516 3204 01		2	Needle bearing
												22	0108 1202 00		2	Spring pin
-	1503 0426 80	1)3)	1	-	1503 0430 80	1)3)	1	-	1503 0432 80	1)3)	1	-	1503 0433 80		1	Piston, compl
	1503 0428 80	2 HP-2)3)	1		1503 0431 80	2)3)	1		1503 0433 80	2)3)	1					Piston, compl
	1503 0429 80	3 HP-2)3)	1													Piston, comp!
23	* * *		1	23	* * *		1	23	* * *		1	23	* * *		1	Piston
24	1503 0611 00	1)	1	24	1503 0612 00	1)	2	24	1616 0376 00	1)	1	24	1503 0611 00		2	• Compression ring
	1503 0610 00	2)	2		1503 0610 00	2)	2		1503 0611 00	2)	2					• Compression ring
25	1503 0435 00	1)	1	25	1503 0439 00	1)	1	25	1503 0441 00	1)	1	25	1503 0435 00		1	• Compression ring
	1503 0437 00	2)	1		1503 0437 00	2)	1		1503 0435 00	2)	1					• Compression ring
26	1503 0442 00	1)	1	26	1503 0444 00	1)	1	26	1503 0445 00	1)	1	26	1503 0442 00		1	• Scraper ring
	1503 0443 00	2)	1		1503 0443 00	2)	1		1503 0442 00	2)	1					• Scraper ring
27	1503 0116 00	1)	1	27	1503 0113 00	1)	1	27	1503 0114 00	1)	1	27	1503 0115 00		1	Gudgeon pin
	1503 0117 00	2)	1		1503 0117 00	2)	1		1503 0115 00	2)	1					Gudgeon pin

1) Single stage
2) Two stage
3) Part of "Cylinder, compl." see "Cylinders and valves"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8 14 13 12 11 10 9 8 7 6
19 20 21 22
3 2 5
32 35 33 34 36 24 19 37
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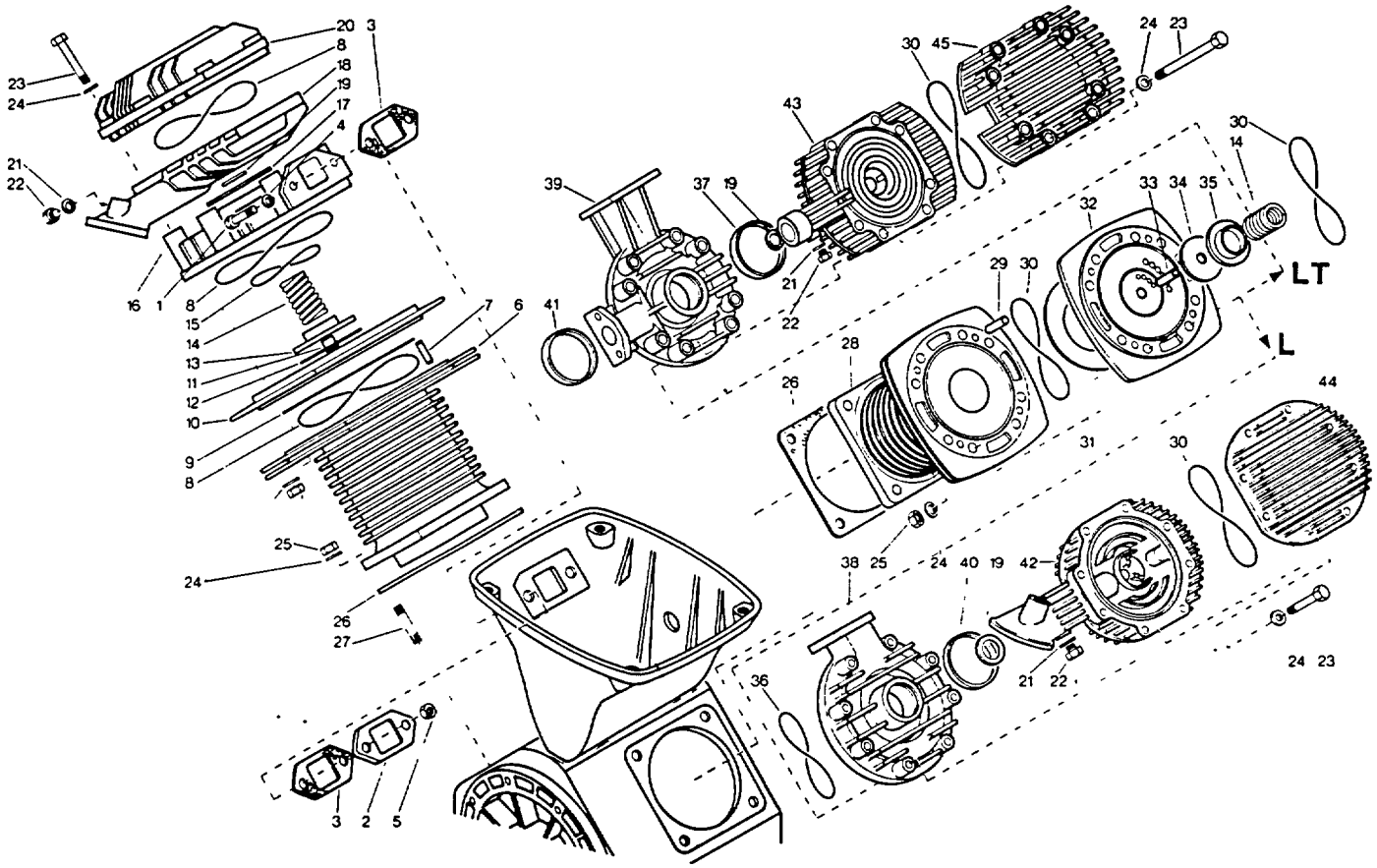
FIG. 3. CYLINDERS AND VALVES - 2-3-5-7.5- 10 HP - 15 HP TWO STAGE

Key No	2-3 HP Part number	Foot note	Qty Req'd	Key No	5-7.5 HP Part number	Foot note	Qty Req'd	Key No	10 HP SINGLE STAGE 10-15 HP TWO STAGE Part number	Foot note	Qty Req'd	Description
1	0147 1326 03		4	1	0147 1326 03		4	1	0147 1326 03		4	Bolt
2	1503 0185 00		2	2	1503 0186 00		2	2	1503 0187 00		2	Washer
3	1503 0196 00		4	3	1503 0197 00		4	3	1503 0198 00		4	Joint
4	1503 0210 00		4	4	1503 0210 00		4	4	1503 0210 00		4	Washer
5	0291 1110 00		4	5	0291 1110 00		4	5	0291 1110 00		4	Locknut
-	1503 0380 80	1) 2 HP-2)	1	-	1503 0378 80		1	-	1503 0376 80		1	Cylinder, compl
	1503038081	3 HP-2)	1									Cylinder, compl
6	* * *.....		1	6	* * *.....		1	6	* * *.....		1	•Cylinder
-	– – –.....	3)	1		– – –.....	3)	1		– – –.....	3)	1	•Piston, compl
7	0101 1362 00		4	7	0101 1364 00		4	7	0101 1366 00		4	Pin
8	1503 0247 00		2	8	1503 0248 00		2	8	1503 0249 00		2	Cord
9	1503 0155 00		1	9	1503 0157 00		1	9	1503 0159 00		1	Suction disc
10	1503 0029 00		1	10	1503 0028 00		1	10	1503 0017 00		1	Valve seat
11	1503 0156 00		1	11	1503 0158 00		1	11	1503 0160 00		1	Delivery disc
12	1503 0076 00		1	12	1503 0075 00		1	12	1503 1231 00		1	Valve guard
13	1503 0165 00		1	13	1503 0166 00		1	13	1503 0166 00		1	Spring
14	0663 9832 00		1	14	0663 9839 00		1	14	0663 9812 00		1	O-ring
15	1503 0092 00		1	15	1503 0045 00		1	15	1503 0015 00		1	Valve head
16	0653 9038 00		2	16	0653 9038 00		2	16	0653 9038 00		2	Gasket
17	0686 4201 03		2	17	0686 4201 03		2	17	0686 4201 03		2	Plug
18	0147 1330 03	1)	16	18	0147 1331 03	1)	16	18	0147 1370 03	1)	16	Bolt
	0147 1330 03	2)	8		0147 1331 03	2)	8		0147 1370 03	2)	8	Bolt
19	0301 2335 00		40	19	0301 2335 00		40	19	0301 2344 00		40	Washer
20	0266 2110 00		24	20	0266 2110 00		24	20	0266 2111 00		24	Nut
21	1503 0172 00		2	21	1503 0175 00		2	21	1503 0178 00		2	Gasket
22	0246 1201 02		8	22	0246 1202 02		8	22	0246 1246 02		8	Stud
-	1503 0380 80	1)	1	-	1503 0378 80	1)	1	-	1503 0376 80	1)	1	Cylinder, compl
	1503 0381 80	2 HP-2)	1		1503 0379 80	2)	1		1503 0377 80	2)	1	Cylinder, compl
	1503 0381 81	3 HP-2)	1									Cylinder, compl
23	* * *.....		1	23	* * *.....		1	23	* * *.....		1	•Cylinder
-	– – –.....	3)	1	-	– – –.....	3)	1	-	– – –.....	3)	1	•Piston, compl
24	1503 0247 00	1)	2	24	1503 0248 00	1)	2	24	1503 0249 00	1)	2	Cord
	1503 0247 00	2)	3		1503 0247 00	2)	3		1503 0248 00	2)	3	Cord
25	1503 0155 00		1	25	1503 0157 00	1)	1	25	1503 0159 00	1)	1	Suction disc
					1503 0155 00	2)	1		1503 0157 00	2)	1	Suction disc
26	1503 0029 00		1	26	1503 0028 00	1)	1	26	1503 0017 00	1)	1	Valve seat
					1503 0029 00	2)	1		1503 0028 00	2)	1	Valve seat
27	1503 0156 00		1	27	1503 0158 00	1)	1	27	1503 0160 00	1)	1	Delivery disc
					1503 0156 00	2)	1		1503 0158 00	2)	1	Delivery disc
28	1503 0076 00		1	28	1503 0075 00	1)	1	28	1503 1231 00	1)	1	Valve guard
					1503 0076 00	2)	1		1503 0075 00	2)	1	Valve guard
29	1503 0165 00		1	29	1503 0166 00	1)	1	29	1503 0166 00		1	Spring
					1503 0165 00	2)	1					Spring
30	0663 9832 00		1	30	0663 9839 00	1)	1	30	0663 9812 00	1)	1	O-ring
					0663 9832 00	2)	1		0663 9839 00	2)	1	O-ring
31	1503 0091 00	1)	1	31	1503 0044 00	1)	1	31	1503 0016 00	1)	1	Valve head
32	1503 0338 00	2)	1	32	1503 0337 00	2)	1	32	1503 0329 00	2)	1	Suction cap
33	0663 3133 00	2)	1	33	0663 3133 00	2)	1	33	0663 7136 00	2)	1	O-ring
34	1503 0339 00	2)	1	34	1503 0339 00	2)	1	34	1503 0330 00	2)	1	Outlet cap
35	1503 0232 00	2)	1	35	1503 0232 00	2)	1	35	1503 0233 00	2)	1	Washer
36	1503 0340 00	2)	1	36	1503 0340 00	2)	1	36	1503 0331 00	2)	1	Cover
37	0147 1350 03	2)	8	37	0147 1350 03	2)	8	37	0147 1388 03	2)	8	Bolt
38	0101 1362 00		4	38	0101 1364 00	1)	4	38	0101 1366 00	1)	4	Pin
					0101 1362 00	2)	4		0101 1364 00	2)	4	Pin

1) Single stage
2) Two stage
3) See Crank assembly"

FIG. 4. CYLINDERS AND VALVES - 15 HP SINGLE STAGE - 25 HP TWO STAGE



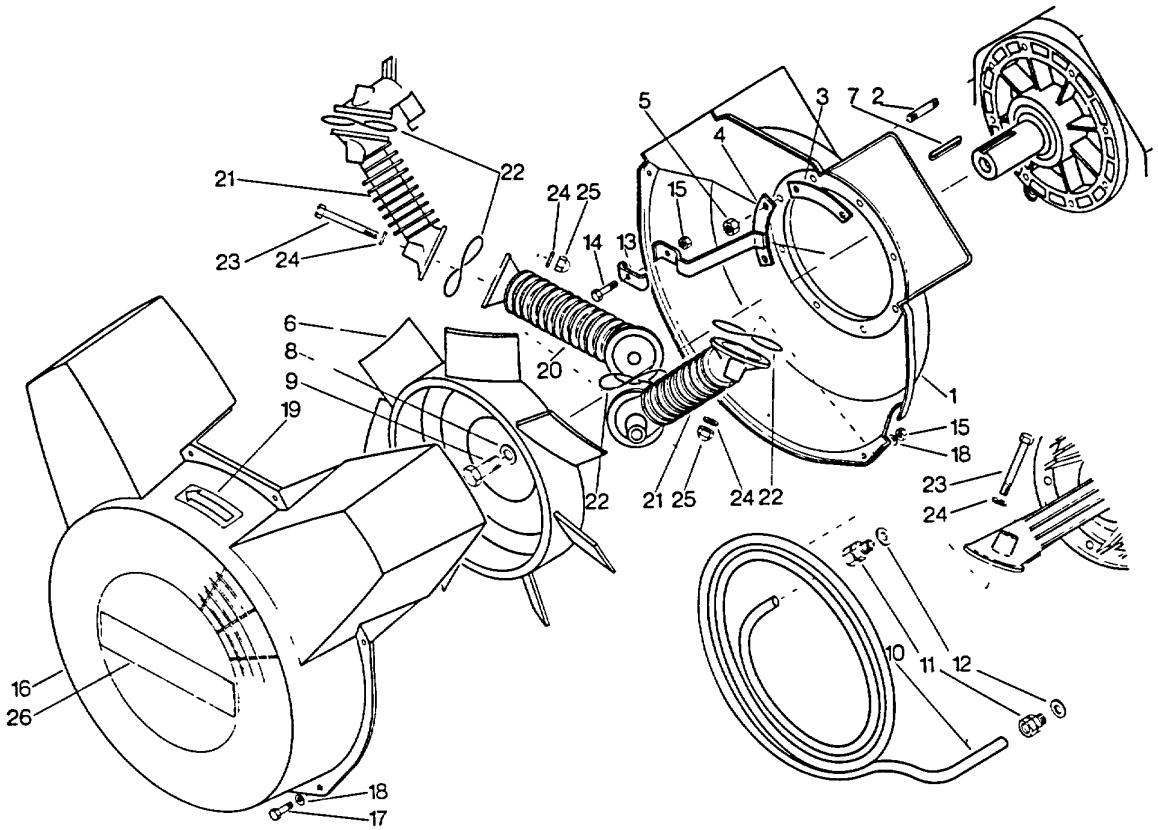
Key No.	Part number	Foot note	Qty Req'd	Description
1	0147 1326 03	.....	4.....	Bolt
2	1503 0187 00	.....	2.....	Washer
3	1503 0198 00	.....	4.....	Joint
4	1503 0210 00	.....	4.....	Washer
5	0291 1110 00	.....	4.....	Locknut
-	1503 0376 80	.....	1.....	Cylinder, compl.
6	* * *.....	.....	1.....	•Cylinder
--	– – –.....	3).....	1.....	•Piston, compl.
7	0101 1366 00	.....	4.....	Pin
8	1503 0249 00	.....	3.....	Cord
9	1503 0159 00	.....	1.....	Suction disc
10	1503 0017 00	.....	1.....	Valve seat
11	0101 4260 00	.....	1.....	Pin
12	1503 0160 00	.....	1.....	Delivery disc
13	1503 1231 00	.....	1.....	Valve guard
14	1503 0166 00	.....	2.....	Spring
15	0663 9812 00	.....	1.....	O-ring
16	1503 1226 00	.....	1.....	Suction cap
17	1503 1323 00	2).....	1.....	Radial seat
	0663 7140 00	1).....	1.....	O-ring
18	1503 1227 00	.....	1.....	Outlet cap
19	1503 0233 00	.....	2.....	Washer
20	1503 1229 00	.....	1.....	Cover
21	0653 9038 00	.....	2.....	Gasket
22	0686 4201 03	.....	2.....	Plug
23	0147 1388 03	.....	16.....	Bolt
24	0301 2344 00	.....	40.....	Washer
25	0266 2111 00	.....	24.....	Nut
26	1503 0178 00	.....	2.....	Gasket
27	0246 1246 02	.....	8.....	Stud
-	1503 0376 80	1).....	1.....	Cylinder compl.
	1503 0377 80	2).....	1.....	Cylinder, compl.
28	* * *.....	.....	1.....	•Cylinder
-	– – –.....	3).....	1.....	•Piston
29	0101 1366 00	1).....	4.....	Pin
	0101 1364 00	2).....	4.....	Pin
30	1503 0249 00	1).....	3.....	Cord
	1503 0248 00	2).....	3.....	Cord
31	1503 0159 00	1).....	1.....	Suction disc
	1503 0157 00	2).....	1.....	Suction disc
32	1503 0017 00	1).....	1.....	Valve seat
	1503 0028 00	2).....	1.....	Valve seat
33	0101 4260 00	1).....	1.....	Pin
34	1503 0160 00	1).....	1.....	Delivery disc
	1503 0158 00	2).....	1.....	Delivery disc
35	1503 1231 00	1).....	1.....	Valve guard
	1503 0075 00	2).....	1.....	Valve guard
36	0663 9812 00	1).....	1.....	O-ring
37	1503 1237 00	2).....	1.....	Radial seal
38	1503 1226 00	1).....	1.....	Suction cap
39	1503 0329 00	2).....	1.....	Suction cap
40	1503 1323 00	1).....	1.....	Radial seal
41	1503 1236 00	2).....	1.....	Axial seal
42	1503 1228 00	1).....	1.....	Outlet cap
43	1503 0330 00	2).....	1.....	Outlet cap
44	1503 1229 00	1).....	1.....	Cover
45	1503 0331 00	2).....	1.....	Cover

1) 15 HP single stage
2) 25 HP two stage
3) See 'Crank assembly'

.../...

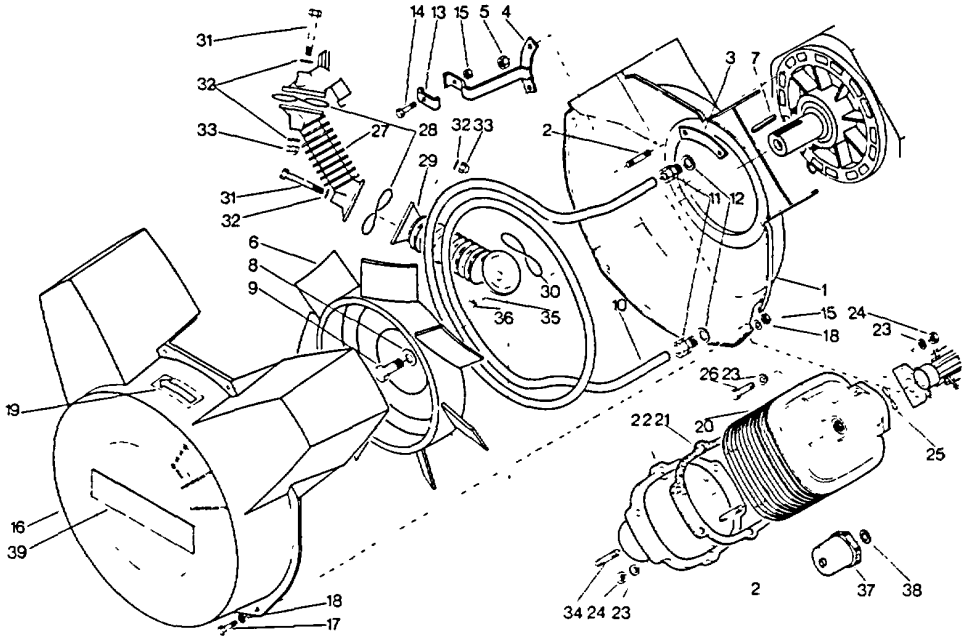
.../...

FIG. 5. SINGLE STAGE COOLING AND DELIVERY



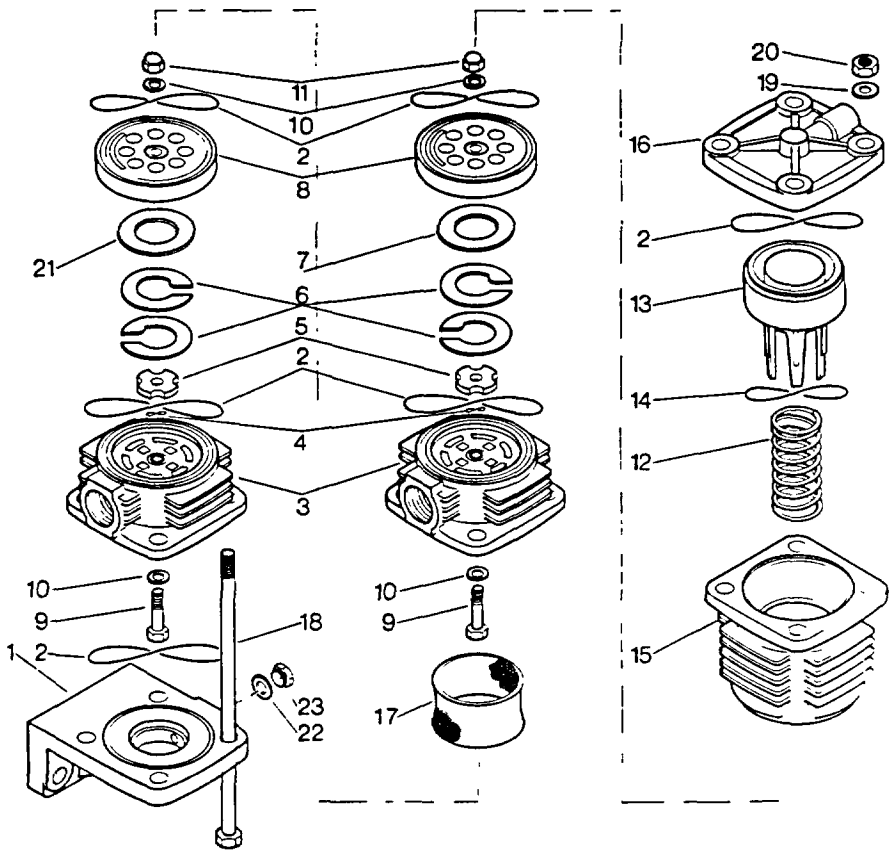
Key No	Part number	Foot note	Qty Req'd	Description
2-3 HP				
1	1503029400		1	Housing
2	0246120102		4	Stud
3	0301233500		4	Washer
4				
5	0291111000		4	
6	1503133000		1	Fan
7	0337510300		1	Key
8	1503020500		1	Washer
9	0147136703		1	Bolt
10	1503018200		1	Temperature reducer
11	0580021003		2	Coupling
12	0653909800		2	Gasket
13				
14				
15	0291110800		6	Lock nut
16	1503205400		1	Fan housing
17	0147124903		6	Bolt
18	0301232100		12	Washer
19	1503078600		1	Label
20	1503008600		1	Delivery pipe
21	1503008700		2	Connecting piece
22	0663313200		4	O-ring
23	0147133403		4	Bolt
24	1503021000		8	Washer
25	0277131000		4	Capnut
26	* * *		1	Label
5-7.5 HP				
1	1503029000		1	Housing
2	0246120202		8	Stud
3	1503034500		4	Washer
4				
5	02911111000		8	Locknut
6	1503207500		1	Fan
7	0337515500		1	Key
8	1503020600		1	Washer
9	0147148503		1	Bolt
10	1503034700		1	Temperature reducer
11	0580021003		2	Coupling
12	0653909800		2	Gasket
13				
14				
15	0291110800		6	Lock nut
16	1503028900		1	Fan housing
17	0147124903		6	Bolt
18	0301232100		12	Washer
19	1503078600		1	Label
20	1503004600		1	Delivery pipe
21	1503004700		2	Connecting piece
22	0663313500		4	O-ring
23	0147133603		4	Bolt
24	1503021000		8	Washer
25	0277131000		4	Capnut
26	* * *		1	Label
10-15 HP				
1	1503029800		1	Housing
2	0246120202		8	Stud
3	1503032700		3	Washer
4	1503032500		1	Support
5	0291111000		8	Locknut
6	1503051500		1	Fan
7	0337522900		1	Key
8	1503020700		1	Washer
9	0147148503		1	Bolt
10	1503032300		1	Temperature reducer
11	0580021303		2	Coupling
12	0653909800		2	Gasket
13	1503032800		1	Clamp
14	0147125003		1	Bolt
15	0291110800		7	Lock nut
16	1503029700	10HP	1	Fan housing
	1503115000	15HP	1	Fan housing
17	0147124903		6	Bolt
18	0301232100		12	Washer
19	1503078600		1	Label
20	15030013001		1	Delivery pipe
21	1503000200		2	Connecting piece
22	0663713500		4	O-ring
23	0147137503		4	Bolt
24	1503021100		8	Washer
25	0277131100		4	Capnut
26	* * *		1	Label

FIG. 6. TWO STAGE COOLING AND PULSATION DAMPER



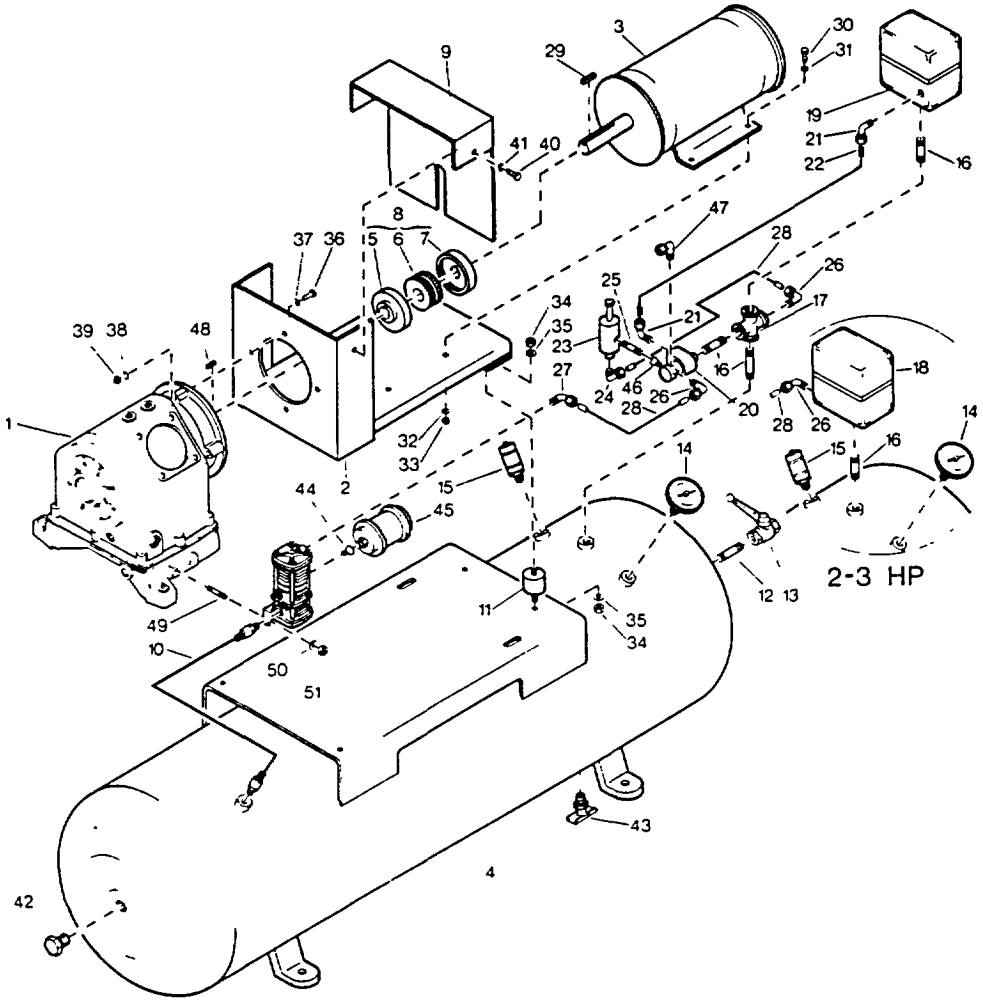
Key No	Part number	Foot note	Qty Req'd	Key No	Port number	Foot note	Qty Req'd	Key No	Port number	Foot note	Qty Req'd	Description
2-3 HP				**5-7.5 HP**				**10-15-25 HP**				
1	1503029600		1	1	1503029200		1	1	1503030000		1	Housing
2	0246120102		7	2	0246120202		12	2	0246120202		14	Stud
3	0301233500		4	3	1503034500		4	3	1503032700		3	Washer
								4	1503032500		1	Support
5	0291111000		4	5	0291111000		8	5	0291111000		8	Lock nut
6	1503133000		1	6	1503207500		1	6	1503051500		1	Fan
7	0337510300		1	7	0337515500		1	7	0337522900		1	Key
8	1503020500		1	8	1503020600		1	8	1503020700		1	Washer
9	0147136703		1	9	0147148503		1	9	0147148503		1.	Bolt
10	1503034900		1	10	1503034800		1	10	1503032400		1	Temperature reducer
11	0580021303		2	11	0580021003		2	11	0580021303		2	Coupling
12	0653909800		2	12	0653909800		2	12	0653909800		2	Gasket
								13	1503032800		1	Clamp
								14	0147125003		1	Bolt
15	0291110800		6	15	0291110800		6	15	0291110800		7	Lock nut
16	1503205400		1	16	1503028900		1	16	1503029700	10-15HP	1	Fan housing
									1503115000	25HP	1	Fan housing
17	0147124903		6	17	0147124903		6	17	0147124903		6	Bolt
18	0301232100		12	18	0301232100		12	18	0301232100		12	Washer
19	1503078600		1	19	1503078600		1	19	1503078600		1	Label
20	1503033500		1	20	1503033400		1	20	1503033200		1	Pulsation damper
21	1503016700		1	21	1503016800		1	21	1503016900		1	Gasket
22	1503008100		1	22	1503005000		1	22	1503001100		1	Cover
23	0301233500		7	23	0301233500		8	23	0301233500		10.	Washer
24	0266211000		3	24	0266211000		6	24	0266211000		8	Nut
25	0663312800		1	25	0663312800		1	25	0663313200		1.	O-ring
26	0147132603		2	26	0147132603		2	26	0147132603		2	Bolt
27	1503008700		1	27	1503004700		1	27	1503000200		1	Connecting pipe
28	0663313200		2	28	0663313500		2	28	0663713500		2	O-ring
29	1503008200		1	29	1503004800		1	29	1503001200		1	Connecting piece
30	0663313200		1	30	0663313200		1	30	0663313500		1	O-ring
31	0147133403		2	31	0147133603		2	31	0147137503		2	Bolt
32	1503021000		4	32	1503021000		4	32	1503021100		4	Washer
33	0277131000		2	33	0277131000		2	33	0277131100		2	Capnut
34	0246120702		1	34	0246120702		1	34	0246120802		1	Stud
35	1503021000		1	35	1503021000		1	35	1503021000		1	Washer
36	0277131000		1	36	0277131000		1	36	0277131000		1	Capnut
37	1503049400		1	37	1503049400		1	37	1503049400		1	Relief valve
38	0653907800		1	38	0653907800		1	38	0653907800		1	Gasket
39	* * *		1	39			1	39	* * *		1	Label

Fig. 7. CHECK VALVE - 2-3 HP
UNLOADING VALVE - 5-7.5-10-15-25 HP



Key No	2-3 HP Part number	Foot note	Qty Req'd	Key No	5-7.5-10-15-25 HP Port number	Foot note	Qty Req'd	Description
-	1503001981	.....	1			.....	1	Check valve, compl
				-	1503001980	.....	1	Unloading valve, compl
1	1503002200	.....	1	1	1503002200	.....	1	•Support
2	0663983200	.....	4	2	0663983200	.....	6	•0-ring
3	1503001900	.....	2	3	1503001900	.....	2	•Valve guard
4	0663711600	.....	1	4	0663711600	.....	2	•O-ring
5	1503028800	.....	1	5	1503028800	.....	2	•Centre
6	1000400900	.....	2	6	1000400900	.....	4	•Spring disc
				7	1000400700	.....	1	•Valve disc
8	1503001800	.....	1	8	1503001800	.....	2	•Valve seat
9	0147124903	.....	1	9	0147124903	.....	2	•Bolt
10	1503020900	.....	2	10	1503020900	.....	4	•Washer
11	0277130800	.....	1	11	0277130800	.....	2	•Capnut
				12	1503016400	.....	1	•Spring
				-	1503002080	.....	1	•Cylinder, compl
				-	* * *	.....	1	••Piston, compt
				13	* * *	.....	1	•••Piston
				-	2235104380	.....	1	•••Piston ring
				14	0663313500	.....	-1	••O-ring
				15	1503002000	.....	....	••Cylinder
16	1503002100	.....	1	16	1503002100	.....	1	•Cover
17	1503021200	.....	1	17	1503021200	.....	1	•Strainer
18	0147134103	.....	4	18	0147134903	.....	4	•Bolt
19	0301233500	.....	4	19	0301233500	.....	4	•Washer
20	0291111000	.....	4	20	0291111000	.....	4	•Locknut
21	1503127500	.....	1	21	1503127500	.....	1	•Valve disc
22	0653903800	.....	1			.....	....	•Gasket
23	0686420103	.....	1			.....	....	•Plug

FIG. 8. HORIZONTAL UNITS



Key No.	Part number	Hp	Foot note	Qty Req'd	Description
1	.....	.....	.....1.....		Pump
	8115101035	2.....	1)		
	8115102033	2.....	2)		
	8115111034	3.....	1)		
	8115112032	3.....	2)		
	8115131032	5.....	1)		
	8115132030	5.....	2)		
	8115151030	7.5.....	1)		
	8115152038	7.5.....	2)		
	8115171038	10.....	1)		
	8115172036	10.....	2)		
	8115181037	15.....	1)		
	8115182035	15.....	2)		
	8115192000	25.....	2)		
2	.....	.....	.....1.....		Motormount
	9710512100	2			
	9710512200	3			
	9710512300	5			
	9710512400	7.5			
	9710512500	10			
	9710512600	15			
	9710512800	25			

Key No.	Part number	Hp	Foot note	Qty Req'd	Description
3	.....	.....	.....1.....		Motor
	9710510101	.....	.....		2HP-1ph
	9710510201	.....	.....		2HP-3ph
	9710510401	.....	.....		3HP-1ph
	9710510300	.....	.....		3HP-3ph
	9710510500	.....	.....		5HP-1ph
	9710510600	.....	.....		5HP-3ph
	9710510700	.....	.....		75 HP
	9710510800	.....	.....		10 HP
	9710511000	.....	.....		20HP
	9710511100	.....	.....		25HP
4	9710121900	23.....	.....1.....		60Galtank
	9710122800	5,7.5.....	.....		80Gal tank
	9710123000	10,15,25....	.....		120 Gal tank
5	.....	.....	.....1.....		Flange (Pump)
	9710032301	2			
	9710032405	3			
	9710032401	5			
	9710032901	75			
	9710032601	10,15			
	9710032801	25			

Key No.	Part number	HP	Foot note	Qty Req'd	Description
6	.....	.....	.....	1.....	Sleeve
	9710 0323 03	2			
	9710 0324 03	3.5			
	9710 0329 03	7 5			
	9710 0326 03	10,15			
	9710 0328 03	25			
7	.....	.....	.....	1.....	Flange (motor)
	9710 0323 04	2			
	9710 0324 02	3,5			
	9710 0329 02	7 5			
	9710 0326 02	10			
	9710 0326 04	15			
	9710 0328 02	25			
8	.....	.....	.....	1.....	Coupling set
	9710 0322 00	2			
	9710 0323 00	3			
	9710 0324 00	5			
	9710 0325 00	7.5			
	9710 0326 00	10			
	9710 0327 00	15			
	9710 0328 00	25			
9	.....	.....	.....	1.....	Guard
	9710 5136 00	2			
	9710 5137 00	3			
	9710 5138 00	5			
	9710 5139 00	7.5			
	9710 5140 00	10			
	9710 5141 00	15			
	9710 5142 00	25			
10	.....	.....	.....	1.....	Discharge tube
	9710 5278 00	23			
	9710 5279 00	5,7 5			
	9710 5280 00	10,15,25			
11	9710 5193 00	.....	.....	4.....	Cushion connector
12	.....	.....	.....	1.....	Nipple
	9710 5630 02	2,3			
	9710 5630 03	5,7.5,10, 15,25			
13	.....	.....	.....	1.....	Gate value
	9710 5321 00	2,3			
	9710 5322 00	5,7.5,10, 15,25			
14	9710 1003 00	.....	.....	1.....	Gauge
15	.....	.....	.....	1.....	Safety valve
	9710 5332 00	.....	.....1)		
	9710 5333 00	.....	.....2)		
16	9710 5630 01	.....	.....1)	3.....	Nipple
	9710 5630 00	5,7.5,10, 15,25	.....2)	1.....	1/8" x Nipple
	9710567900.	.....	.....2)	1.....	1/8" x 1/4" Red bush
17	9710567800.	5,75,10, 15,25	.....	1.....	1/4" Tee
	9710 5632 00	5,7.5,10, 15,25	.....3)	1.....	Cross
18	.....	.....	.....	1.....	Pressure switch
	9710 1019 00	2.....	.....1)		
	9710 5303 01	3.....	.....1)		
	9710 5309 01	2,3.....	.....2)		
19	.....	.....	.....	1.....	Pressure switch
	9710 5302 00	5.7.5,10,15	.....1)		
	9710 5309 00	5,7.5,10, 15,25	.....2)		
20	.....	.....	.....	1.....	Solenoid
	9710 5298 00	5.7.5,10,15	1)		
	9710 5300 00	5.7.5,10,15	2)		
21	9710 5451 00	5,7.5,10,15	.....	2.....	90° Connector
22	9710 5454 00	5.7.5.10,15	.....	9.....	Flex conduit
23	9710 5340 00	5,7.5,10,15	3)...	1.....	Pilot valve
24	9710 5614 01	5,7.5,10,15	3)...	1.....	1/4 x 1/4" 90° Female legris
25	9710 5630 00	5,7.5,10,15	3)...	1.....	Nipple
26	9710 5613 02	5,7.5,10,15	1)3)	2.....	1/4 x 1/4" 90° Male legris
	9710 5613 00	5,7.5,10, 15,25	2)3)	1.....	Male legris
27	9710 5613 03	.....	1)...	1.....	1/8" x 1/4" Male legris
	9710 5613 03	2,3.....	2)...	1.....	1/8" x 1/4" 90° Male legris
	9710 5613 00	5,7.5,10, 15,25	2)...	1.....	Male legris
28	9710 5610 00	2,3.....	1)...	45"...	1/4" tubing
	9710 5610 00	5,7.5,10,15	1)...	70"...	1/4" tubing
	9710 5610 00	2,3.....	2)...	.....	1/4" tubing
	9710 5615 00	5,75,10, 15,25	2) ..	.....	1/4" tubing
29	.....	.....	.....	1.....	Key (motor)
	9710 5102 02	2			
	9710 5105 02	3,5			
	9710 5108 02	7.5,10			
	9710 5110 03	20			
	9710 5110 02	25			
30	.....	.....	.....	4.....	Bolt
	9710 5902 00	2,3,5,7 5, 10,			
	9710 5904 02	15,25			
31	.....	.....	.....	8.....	Washer
	9710 5902 07	2.3,5,7.5,10,			
	9710 5904 06	15,25			
32	.....	.....	.....	4.....	Lockwasher
	9710 5902 09	2,3,5,7.5,10,			
	9710 5904 08	15,25			
33	.....	.....	.....	4.....	Nut
	9710 5902 11	2,3,5,7.5,10,			
	9710 5904 10	15,25			
34	9710 5902 11	.....	.....	4.....	Nut
35	9710 5902 09	.....	.....	4.....	Lockwasher
36	.....	.....	.....	4.....	Bolt
	9710 5600 00	2,3			
	9710 5903 01	5,75			
	9710 5904 02	10,15,25			
37	.....	.....	.....	4.....	Lockwasher
	9710 5601 00	2,3			
	9710 5903 07	5,7 5			
	9710 5904 08	10,15,25			
38	.....	.....	.....	4.....	Washer
	9710 5903 05	5,7.....	.....	.....	Washer
	9710 5904 06	10,15,25			
39	.....	.....	.....	4.....	Nut
	9710 5903 09	5,7 5			
	9710 5904 10	10,15,25			
40	9710 5906 00	.....	.....	2.....	Screw
41	9710 5900 05	.....	.....	2.....	Washer
42	9710 5685 00	.....	.....	1.....	Plug
43	9710 5314 00	.....	.....	1.....	Drain cock
44	1503 2178 00	5,7.5,10,15	1)...	1.....	Coupler
45	1503 2175 00	5,7.5,10,15	1)...	1.....	Muffler
46	9710 5679 00	5,7.5,10,15	3)...	1.....	Reducer bushing
47	9710 5605 02	5,7.5,10,15	.....	1.....	Elbow
48	0337 5163 00	.....	.....	1.....	Key (pump)
	0337 5103 00	2,3			
	0337 5155 00	5,7 5			
	0337 5229 00	10.15,25			
49	0246 1201 02	.....	.....	2.....	Stud
50	0301 2335 00	.....	.....	2.....	Washer
51	0266 2110 00	.....	.....	2.....	Nut

1) Single stage
2) Two stage
3) Optional dual control

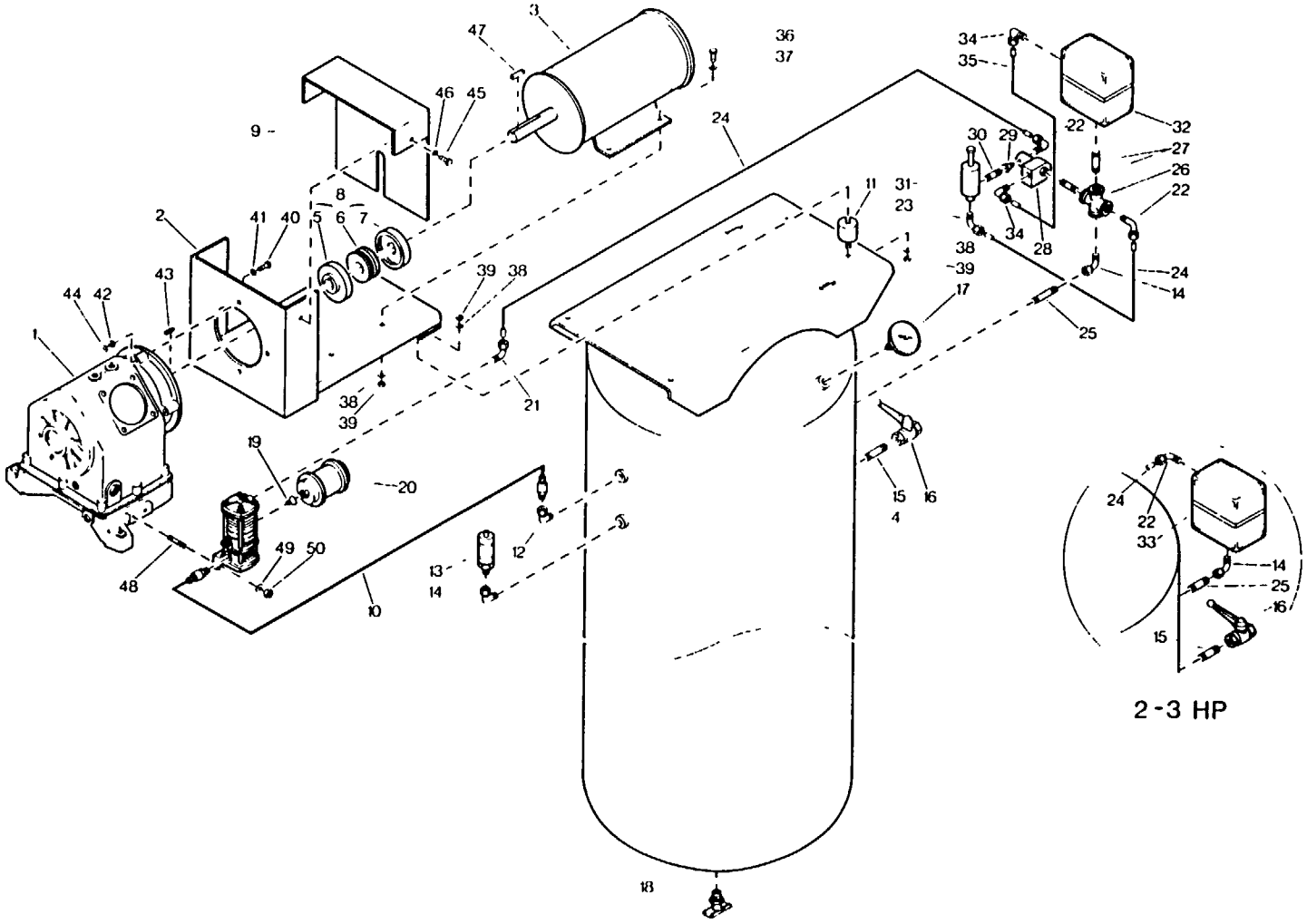

2-3 HP

FIG. 9. VERTICAL UNITS

Key No.	Part number	HP	Foot note	Qty Req'd	Description
1	.....	.....	.....	1.....	Pump
	8115 1010 35	2.....	1)		
	8115 1020 33	2.....	2)		
	8115 1110 34	3.....	1)		
	8115 1120 32	3.....	2)		
	8115 1310 32	5.....	1)		
	8115 1320 30	5.....	2)		
	8115 1510 30	7.5.....	1)		
	8115 1520 38	7.5.....	2)		
2	.....	.....		1	Motormount
	9710 5121 00	2			
	9710 5122 00	3			
	9710 5123 00	5			
	9710 5124 00	7.5			
3	.....	.....	.....	1.....	Motor
	9710 5101 01	.....	.....	.....	2 HP - 1 ph
	9710 5102 01	.....	.....	.....	2 HP - 3 ph
	9710 5104 01	.....	.....	.....	3 HP - 1 ph
	9710 5103 00	.....	.....	.....	3 HP - 3 ph
	9710 5105 00	.....	.....	.....	5 HP - 1 ph
	9710 5106 00	.....	.....	.....	5 HP - 3 ph
	9710 5107 00	.....	.....	.....	7.5 HP
4	9710 1219 01	2,3.....	.....	1.....	60 Gal tank
	9710 5252 00	5,7.5.....	.....	.....	80 Gal tank
5	.....	.....	.....	1.....	Flange (Pump)
	9710 0323 01	2			
	9710 0324 05	3			
	9710 0324 01	5			
	9710 0329 01	7.5			
6	¶.....	.....	.....	1.....	Sleeve
	9710 0323 03	2			
	9710 0324 03	3,5			
	9710 0329 03	7.5			
7	.....	.....	.....	1.....	Flange (motor)
	9710 0323 04	2			
	9710 0324 02	3.5			
	9710 0329 02	7.5			
8	.....	.....	.....	1.....	Coupling set
	9710 0322 00	2			
	9710 0323 00	3			
	9710 0324 00	5			
	9710 0325 00	7.5			
9	.....	.....	.....	1.....	Guard
	9710 5136 00	2			
	9710 5137 00	3			
	9710 5138 00	5			
	9710 5139 00	7.5			
10	9710 5280 00	.....	.....	1.....	Discharge tube
11	9710 5193 00	.....	.....	4.....	Cushion connector
12	9710 5691 00	.....	.....	1.....	Elbow
13	.....	.....	.....	1.....	Safety valve
	9710 5332 60	.....	1)		
	9710 5333 00	.....	2)		
14	9710 6011 49	.....	.....	2.....	Elbow
15	.....	.....	.....	.....	Nipple
	9710 5630 02	2,3.....	.....	1.....	
	9710 5630 03	5,7.5			
16	.....	.....	.....	1.....	Gate valve
	9710 5321 00	2,3.....	.....	.....	
	9710 5322 00	5,7.5			
17	9710 1003 00	.....	.....	1.....	Gauge
18	9710 5314 00	.....	.....	1.....	Drain cock
19	1503 2178 00	5,7.5.....	1)...	1.....	Coupler
20	1503 2175 00	5.7.5.....	1)...	1.....	Muffler
21	9710 5613 03	.....	1).....	1.....	1/8" x 1/4" 90° Male legris
	9710 5613 03	2,3.....	2).....	1.....	1/8" x 1/4" 90° Male legris
	9710 5613 00	5,7.5.....	2).....	1.....	Male legris
22	9710 5613 02	5,7.5	1)3) ..	2.....	1/4" x 1/4" 90° Male legris
	9710 5613 00	5,7.5.....	2)3) ..	1.....	Male legris
23	9710 5614 01	5,7.5.....	3).....	1.....	1/4" x 1/4" 90° Female legris
24	9710 5610 00	2,3.....	.....	4'	1/4" x legris tubing
	9710 5515 00	5,7.5.....	.....	4' 10"	1/4" legris tubing
25	9710 5628 00	.....	.....	1.....	Nipple
26	9710 5678 00	5,7.5,10, 15,25	.....	1.....	1/4" Tee
	9710 5632 00	5,7.5,10, 15,25	3).....	1.....	Cross
	9710 5678 00	5,7.5.....	2).....	1.....	1/8" x 1/4" Red bush
	9710 5630 00	5,7.5.....	2).....	1.....	1/8" Nipple
27	9710 5630 01	5,7.5	.....	2.....	Nipple
28	.....	.....	.....	1.....	Solenoid
	9710 5298 00	5,7.5.....	1)		
	9710 5300 00	5,7.5.....	2)		
29	9710 5679 00	5.7.5.....	.....	1.....	Bushing
30	9710 5630 00	5.7.5.....	.....	1.....	Nipple
31	6710 5340 00	5,7.5.....	3).....	1.....	Pilot valve
32	.....	.....	.....	1.....	Pressure switch
	9710 5302 00	5.7.5.....	1)		
	9710 5309 00	5,7.5.....	2)		
33	.....	.....	.....	1.....	Pressure switch
	9710 1019 00	2.....	1)		
	9710 5303 01	3.....	1)		
	9710 5309 01	2,3.....	2)		
34	9710 5451 00	5.7.5.....	.....	2.....	90° Connector
35	9710 5454 00	5,7.5.....	.....	9.....	Flex conduit
36	9710 5902 00	.....	.....	4.....	Bolt
37	9710 5902 01	.....	.....	8.....	Washer
38	9710 5902 09	.....	.....	10	Lockwasher
39	9710 5902 11	.....	.....	12	Nut
40	.....	.....	.....	4.....	Bolt
	9710 5600 00	2,3			
	9710 5903 01	5,7.5			
41	.....	.....	.....	4.....	Lockwasher
	9710 5601 00	2.3			
	9710 5903 07	5,7.5			
42	9710 5903 05	5,7.5.....	.....	4.....	Washer
43	.....	.....	.....	1.....	Key (Pump)
	0337 5103 00	2,3			
	0337 5155 00	5,7.5			
44	9710 5903 09	5,7.5.....	.....	4.....	Nut
45	9710 5906 00	.....	.....	2.....	Screw
46	9710 5900 05	.....	.....	2.....	Washer
47	.....	.....	.....	1.....	Key(motor)
	9710 5102 02	2			
	9710 5105 02	3,5			
	9710 5108 02	7.5			
48	0246 1201 02	.....	.....	2.....	Stud
49	0301 2335 00	.....	.....	2.....	Washer
50	0266 2110 00	.....	.....	2.....	Nut

1) Single stage
2) Two stage
3) Optional dual control

70785

Atlas Copco

Atlas Copco Standard Pneumatic
4070 W. 150th street
Cleveland, Ohio 44135

Toll-free number 1-800-321-6098
284

INSTALLATION GUIDE & PARTS LIST
HORIZONTAL AIR COMPRESSORS
MODELS, 1Z785D, 1Z786D, 1Z936D, 1Z937D & 3Z271A

FORM
5S1566
11122

DAYTON ELECTRIC MANUFACTURING CO. CHICAGO 60648

0577/295/5M
2

ATTENTION: READ CAREFULLY AND REFER TO OPERATING MANUAL & SERVICE GUIDE, FORM 5S1408, BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE YOUR SPEEDAIRE PORTABLE AIR COMPRESSOR. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN FOR FUTURE REFERENCE.

Description

Your Speedaire, Two Stage, Air Compressor is designed to produce compressed air up to 175 psi. These units will give long life expectancy when used in industrial/commercial applications with a typical duty cycle of intermittent use, 24 hrs/days, 6-7 days per week. These compressors feature start-stop operation: centrifugal unloaders for loadless starts; 4 cylinder heavy duty compressor pumps; ASME, National Board, air receivers: and integral frame, electric motors, built to meet or exceed NEMA specifications.

General Safety. Information

CAUTION: Unit Is automatically pressure switch controlled and may start unexpectedly. Keep hands and clothing away from belts, pulleys and hot surfaces. A belt guard Is furnished as standard equipment Do riot remove the belt guard unless power Is turned off at the source.

LIMITED WARRANTY

Speedaire Air Compressors are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use (rental use excluded), for one year after date of purchase. Any part which is determined to be defective in material or workmanship and returned to an authorized service location as Dayton designers. Shipping costs prepaid will be repaired or replaced at Dayton's option. For warranty claim procedures, see "Prompt Disposition" below. This warranty gives purchasers specific legal rights and purchasers may also have other rights which vary from state to state.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions.

Except as provided below, no warranty or affirmation of fact express or implied other than as stated in "LIMITED WARRANTY" above is made or authorized by Dayton and Dayton's liability in all events is limited to the purchase price paid.

Certain aspects of disclaimers are not applicable to consumer products; e.g. (a) some states do not allow the exclusion or limitation of incidental or consequential damages sot the above limitation or exclusion may not apply to you; (b) also some states do not allow limitations on how long an implied warranty lasts consequently the above limitation may not apply to you; and (c) by law, during the period of this Limited Warranty, any implied warranties of merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within warranty For any product believed to be defective within warranty first write or call dealer from whom product was purchased. Dealer will give additional directions It unable to resolve satisfactorily, write to Dayton at address below giving dealer's name, address, date and number of dealer's invoice and describing the nature of the defect. If product was damaged in transit to you title claim with carrier

DAYTON ELECTRIC MFG. CO., 5959 W. HOWARD STREET, CHICAGO, ILLINOIS 60648

Specifications and Performance

COMPRESSOR PERFORMANCE AND DIMENSION DATA

		ASME	--Motor--		Pump		Free Air CFM* at Tank PSI				--Pump--			Overall Dimensions in Inches		
	Stock	Tank		Volts	RPM @	Displ.										
HP	No.	Gal.	Phase	60 HZ	175 PSI	CFM	100	125	150	175	Cyl.	Bore	Stroke	Height	Width	Depth
7 1/2	1Z785D	80	3	230/460	574	33.5	24.8	24.2	23.8	23.5	4	4 5/8 x 2 1/2	3	52	23	70
7 1/2	1Z935D	120	3	230/460	574	33.5	24.6	24.2	23.8	23.5	4	4 5/8 x 2 1/2	3	57	26	72
10	1Z786D	80	3	230/460	783	45.7	32.5	32.0	31.8	31.4	4	4 5/8 x 2 1/2	3	52	23	70
10	1Z937D	120	3	230/460	783	45.7	32.5	32.0	31.8	31.4	4	4 5/8 x 2 1/2	3	57	26	72
10	3Z271A	120	3	200/208	783	45.7	32.5	32.0	31.8	31.4	4	4 5/8 x 2 1/2	3	57	26	72

(*) Flow rate data determined In accordance with ASME power test codes.

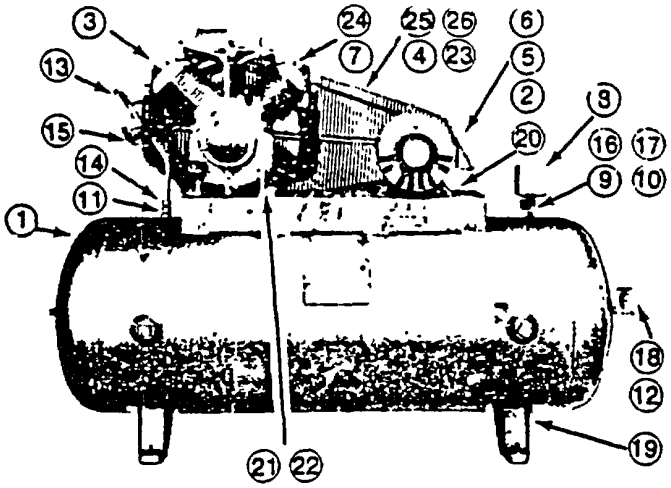
PUMP INFORMATION
MODEL: 3Z182C, 4 5/8 & 2 1/2" Bore x 3" Stroke, 4 Cylinder, Cast-Iron Flywheel, 19.0 O.D. Counterclockwise Rotation.

PRESSURE SWITCH ADJUSTMENT
WORKING RANGE (Large Spring) - Switches are set at the factory to operate at the pressure indicated on the nameplate. To raise operating pressure, turn the range spring nut down, which compresses the range spring. Loosen the range spring nut to lower the operating pressure.

DIFFERENTIAL (Small Spring) Pounds pressure between "Open", and "Close" is referred to as the differential. To increase the differential, turn down the differential spring. By loosening this nut, differential will be narrowed. (Differential adjustments affect cut-out point only).

Wiring diagram for pressure switch is included with the switch. Wiring diagram for the motor is found either on the motor nameplate, or on the terminal board of the motor.

When making electrical connections, unit should be grounded by means of a grounding conductor, or by connection to a grounded, metallic raceway electrical system.



HOW TO ORDER REPLACEMENT PARTS

Please provide following information:

- Model Number
- Serial Number (if any)
- Part Description and Number as shown in Parts List

Address order to:

Dayton Electric Mfg. Co.
CUSTOMER SERVICE DEPT.
5959 W. Howard St
Chicago, Illinois 60648

Replacement Parts List

REF. NO.	DESCRIPTION	PART NO.	QUANTITY FOR MODEL 1Z785D	1Z785D	1Z936D	1Z937D	3Z271A
1	AIR RECEIVER 80 GAL.	1Z989	1	1	-	-	-
	120 GAL	1Z990	-	-	1	1	1
2	MOTOR 7 1/2 HP 230/460V	3N230	1	-	1	-	-
	10 HP 230/4604	3N23111	-	1	-	1	-
	200/208V	91A013266-001	-	-	-	-	1
3	COMPRESSOR PUMP	3Z182	1	1	1	1	
4	BELT GUARD	91C009192-001	1	1	1	1	1
5	MOTOR PULLEY 6.0 P.D. x 1 3/8B	91A027171-001	1	-	1	-	-
	*8.4 P.D.	3X56611	-	1	-	1	-
6	V-BELT B81	3X645	2	-	2	-	-
	B-85	3X647	-	2	-	2	2
7	BELT GUARD BRACKET	91A001251-001	1	1	1	1	1
8	PRESSURE SWITCH	4X678	1	1	1	1	1
9	SAFETY VALVE 1/4 NPT	91A033175-001	1	1	1	1	1
10	PRESSURE GAUGE 300 PSI	4X514	1	1	1	1	
11	CHECK VALVE 3/4 NPT	6X215	1	1	1	1	1
12	TANK SHUT-OFF VALVE 3/4 NPT	6X405	1	1	1	1	1
13	COPPER TUBING 3/4" O.D.	91A031016-001	38"	38"	38"	38"	38"
14	COMPRESSION NUT & SLEEVE FOR 3/4" O.D. TUBING	91A033178-001	1	1	1	1	1
15	3/4" x 314" PIPE TO TUBE MALE CONNECTOR	91A033143-001	1	1	1	1	1
16	1/4" NPT CLOSE NIPPLE	1	1	1	1	1	1
17	1/4" NPT CROSS	1	1	1	1	1	1
18	3/4" NPT CLOSE NIPPLE	1	1	1	1	1	1
19	1/2" NPT DRAIN COCK	91A033151-001	1	1	1	1	1
20	MOTOR BOLTS - 3/8-24x 1" HHCS	-	4	4	4	4	4
21	PUMP BOLTS-3/8-24x 1/2" HHCS	-	4	4	4	4	
22	SPINLOCK NUTS 3/8-24	-	8	8	8	8	
23	GUARD BOLTS-1/4-20x 1" HHCS	-	2	2	2	2	2
24	GUARD BOLT-1/4-20x1/2" HHCS	-	1	1	1	1	1
25	SPINLOCK NUT 1/4-20	-	2	2	2	2	2
26	FLAT WASHER - 1/4"	-	2	2	2	2	2
*5A	PULLEY BUSHING 1-3/8" BORE	3X580	-	1	-	1	1

*STANDARD HARDWARE ITEMS

AIR COMPRESSOR

OPERATING MANUAL & SERVICE GUIDE | **Mfg. 11-007**

(FOR ALL DAYTON SPEEDAIRE & SPEEDAIRE MODELS) | **FORM 5S140**

DAYTON ELECTRIC MANUFACTURING CO. CHICAGO 50548

0779/334/750

ATTENTION: READ CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE YOUR DAYTON SPEEDAIRE OR SPEEDAIRE AIR COMPRESSOR. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN FOR FUTURE REFERENCE.

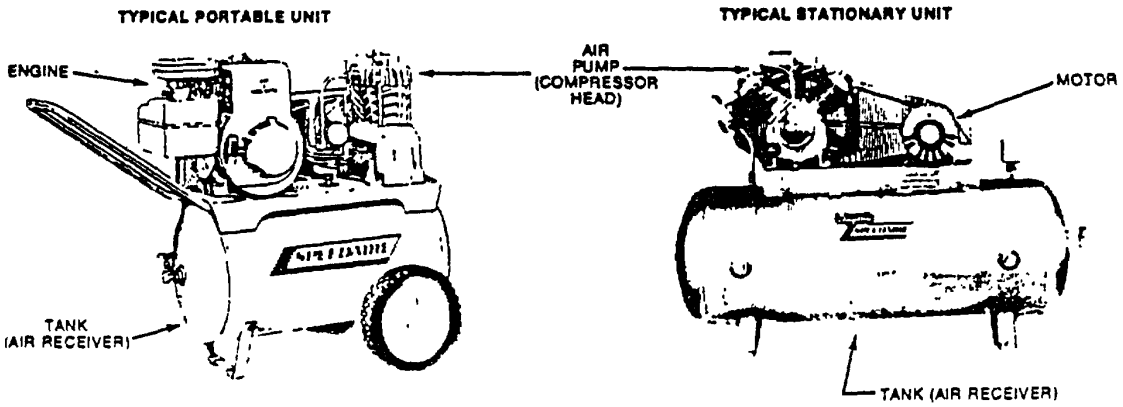


Figure 1 - Basic Air Compressor Nomenclature

General Safety Information

Air compressors are utilized in a variety of air system applications. Because the air compressor and other components (material pump, spray gun, filters, lubricators, hoses, etc.) used make up a high pressure pumping system, the following safety precautions should be observed at all times:

1. Read the instruction manuals for each component carefully before attempting to assemble, disassemble or operate your particular system.
2. Do not exceed the pressure rating of any component in the system.
3. Protect material lines and air lines from damage or puncture.
4. Never point a spray gun at oneself or any other person. Accidental discharge may result in serious injury.
5. Check hoses for weak or worn condition before each use, making certain that all connections are secure.
6. Release all pressures within the system before attempting to service any component.
7. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
8. On engine driven units, check engine oil and fuel levels before starting. DO NOT ADD GASOLINE TO A HOT ENGINE!
9. Electric motors must be securely and adequately grounded. This can be accomplished by wiring with a grounded, metal-clad raceway system, by using a separate ground wire connected to the bare metal of the motor frame, or other suitable means.
10. Always disconnect power source before working on or near a motor or its connected load. If the power disconnect point is out-of-sight, lock it in the open or off position and tag to prevent unexpected application of power.
11. All moving parts should be guarded.
12. Be careful when touching the exterior of an operating motor or pump - it may be hot enough to be painful or cause injury. With modern motors this condition is normal if operated at rated load and voltage-modern motors are built to operate at higher temperatures.
13. Protect the power cable from coming in contact with sharp objects.
14. Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.
15. Make certain that the power source conforms to the requirements of your equipment.
16. Wiping or cleaning rags and other flammable waste materials must be placed in a tightly closed metal container and disposed of later in the proper fashion.

COMPRESSED AIR SYSTEM TERMINOLOGY

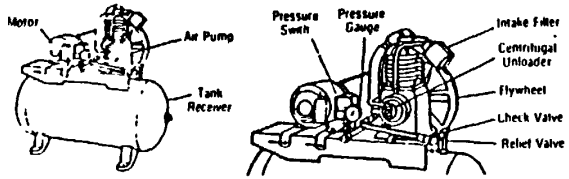


Fig. 2

CFM- Cubic Ft. per Min. A measure of a compressor's capacity, and of the air flow requirement of air-driven devices. Compressors have two ratings: Displacement CFM and Free Air CFM. Air-driven devices are rated in Free Air CFM.

Displacement CFM is calculated by multiplying the volume of the pump cylinders (low-pressure cylinders only on two-stage pumps) by the pump speed in RPM. This rating does not consider the efficiency of the air pump.

Free Air CFM is the actual air delivery of a pump to tank. compressor, as measured when discharged to atmospheric pressure.

Pressure (PSI) - The force exerted by the compressed air. Measured in lbs. per square inch (PSI).

Air Pump (Compressor Head) - The part of the compressor that compresses the air.

Single-Stage type, for applications requiring air at 100 PSI or less. Has one or more cylinders, all discharging directly into the tank.

Two-Stage type, for applications requiring air at 100-175 PSI. Has two or more cylinders in series. The first cylinder compresses air into the second cylinder, which compresses it further, and then pumps it into the tank.

Intercooler - A length of tubing, often with fins, connecting the low and high pressure cylinders of a two-stage compressor stage compressor pump. It is used to dissipate some of the heat generated in compressor, improving pump performance and life.

Intake Filter - A foam pad or other filtering material mounted on the pump air intake, to prevent airborne contaminants from entering the pump and reducing piston and cylinder life. Must be serviced regularly for best pump efficiency.

Air Tank (Receiver) - Stores air compressed by pump for peak loads or intermittent use. Isolates pump pressure pulsation. 3 types are available:

ASME Standard (UM Type) Tanks. Made and tested in accordance with American Society of Mechanical Engineers standards. ASME certificate of compliance is furnished with each unit.

ASME National Board (U Type) Tanks. Made, tested, inspected and registered to meet standards of ASME. A certificate is supplied with each tank to show compliance and registry number. The ASME certificate is required by law in many cities and states to pass safety codes. It assures that (1) Code approved materials are used, (2) Steel plate is without defects and is the specified thickness, (3) Proper welding techniques are employed by experienced operators, (4) Openings and supports are the correct size, and (5) Tank has passed rigid tests. ASME tanks must be used where OSHA and similar standards is not required.

Non-Code tanks do not meet ASME standards. They are widely used on small compressors in locations where compliance with OSHA and similar standards is not required.

Tank Pressure Controls - three types used:

Pressure Switch Control starts and stops the compressor as pressure falls and rises in the tank. Generally used on compressors for intermittent duty and where maximum air usage is less than 50'. of the compressor's capacity.

Constant Speed Control releases (unloads) excess pressure, while compressor operates continuously. Used in applications where air usage is continuous, or maximum air usage exceeds 50' of the compressor's capacity. See Unloaders.

Dual Control allows the selection of either constant speed or start-stop operation to fit varying air demands. Allows compressors to be used efficiently in all applications.
ently in all applications.

Check Valve. Allows air to flow one way only, from pump to tank. When compressor stops, this valve closes, preventing loss of air from tank or damage to pump valves.

Safety or Relief Valve vents the tank if excess pressure builds up. For safety, a relief valve must be used on all compressors. ASME stamped and sealed safety valve must be used on all ASME tanks.

Unloaders - There are two basic types:

Head Unloaders open the air discharge line between pump and tank, whenever the pump stops, relieving pressure, to make restarting easier. A check valve prevents loss of air from the tank. There are 3 types of head unloaders:

Centrifugal: a speed-activated valve that closes as compressor comes up to speed and opens when compressor stops.

Pressure Switch Unloader works together with pressure switch. Opens a valve to vent air whenever switch stops compressor. Closes valve when switch restarts unit.

Combination Unloader and Check Valve (e.g., Load Genie, Nos. 4X996 to 4X999). As pump stops, valve senses lack of air flow and relieves pressure in discharge line. As pump starts, vent closes and check valve reopens.

Constant Speed Unloaders allow pump to operate unloaded operate unloaded (running, but not compressing air) when tank reaches pre-set level. Used on continuous run compressors. 2 types:

Pilot Valve Unloader hold pump intake valve open when pre-set pressure is reached.

Load Genie Continuous Run Unloader (Nos. 5X709 to 5X994) vents pump discharge line to the open air whenever tank pressure reaches pre-set level. Also acts as a check valve.

AIR COMPRESSOR ACCESSORIES

Magnetic Starter. An electrically operated switch used to control the compressor motor and provide thermal protection. Activated by the pressure switch.

Automatic Tank Drain Valve (No. 2Z166). Installed at bottom of tank; opens briefly during each pumping cycle to release moisture condensed from the air.

Belt Guard Metal or plastic shield around pump flywheel, belt and motor sheave to prevent hands or clothing from from getting caught in moving parts. Recommended for all installations. Necessary to comply with OSHA requirements.

Low Oil Level Shutdown Switch. Installed in compressor crankcase and wired to magnetic motor starter.

AIR SYSTEM COMPONENTS TERMINOLOGY

Filters. A device connected into the air line to trap solid or liquid particles that can damage tools, contaminate sprays.

Pressure Regulator. An adjustable valve used to reduce air pressure from tank level to that required by air-using equipment, and maintains it automatically. May be installed at the tank or at the connection for the air-operated equipment.

Lubricator. A device for constant feeding of oil mist into the air powered equipment or tools. Not used for spraying applications.

Air Cleaning Equipment. Air taken from the atmosphere by the compressor also contains many impurities including water vapor, dust, oil and smoke. These contaminants can cause rapid water, clogging and malfunctioning of air tools, cylinders and valves. The following types of air cleaning equipment will help insure the efficient performance of air-operated equipment.

Aftercoolers remove water vapor from the compressed air by lowering the temperature of the air and causing the water vapor to condense into droplets for easy removal. They can be piped between the pump and tank on the air compressor. There are two types:

Watercooled uses water to cool the compressed air.

Aircooled uses the ambient air to cool the compressed air.

Refrigerated Air Dryers reduces the compressed air temperature as low as 35°F to remove greater amounts of water than aftercoolers. Inlet air temperature should not exceed 120°F. Piping dryers closer to the work allows for cooling only that portion of air needed to do a specific function. Total system air need not be cooled if dry air is not needed. Air or water cooled aftercoolers may be used to precool compressed air before it enters the dryer.

GUIDE TO PLACEMENT OF AIR SYSTEM COMPONENTS

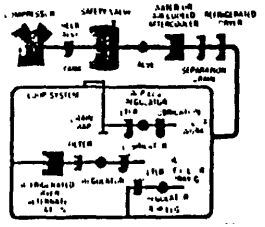


Fig. 3

Proper equipment placement in a compressed air system assures maximum efficiency and long life. For example, a compressed air filter works best when located as near as possible to point at which air is working. This minimizes the chances of air picking up additional contaminants, such as pipe scale.

Loop System (see diagram) allows best supply of air to work stations as air can approach from two directions and not be drawn off by prior work stations, as often happens on straight line systems that dead-end.

Log (see diagram) is the piping from main line to work station. Take-off should be from top of pipe down to work station, which should have a tee with drain valve or trap extending below tee to take away contaminant.

PIPING REQUIREMENTS FOR AIR DISTRIBUTION SYSTEMS

Pipe size used should be large enough to keep the pressure drop between the tank and the point of use to a minimum. All piping should slope to an accessible moisture drain point.

The main air line should not be smaller than the compressor outlet size. For long lines, sizes shown at right are recommended.

Outlets should be taken from the top of the main line (tees facing up) to keep moisture out.

Check all piping and fittings regularly to avoid leaks in the system. Filters, regulators and other accessories described above should also be properly maintained.

PIPE SIZES FOR COMPRESSED AIR LINES

Air	Length of Pipe Lines in Feet							
CFM	25	50	75	100	150	200	250	300
1-5	¾	¾	¾	¾	¾	¾	¾	¾
6-10	¾	¾	¾	¾	¾	¾	¾	¾
11-15	¾	¾	¾	¾	¾	¾	¾	¾
16-20	¾	¾	¾	¾	¾	¾	¾	¾
21-25	¾	¾	¾	¾	¾	¾	¾	¾
26-30	¾	¾	¾	¾	1	1	1	1
31-35	¾	¾	¾	¾	1	1	1	1
36-40	¾	1	1	1	1	1	1	1
41-50	1	1	1	1	1¼	1	1	1
60-70	1	1	1	1¼	1¼	1¼	1¼	1¼
80-100	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼

VOLUME OF AIR FOR CYLINDERS

In cubic feet for single acting. For double acting, multipy by 2. Multiply by cycles/minute to get CFM.

Cyl. Bore	Stroke (Inches)					
	4	6	8	10	12
2	.0027	.0040	.0054	.0067	.0081
2½	.0042	.0063	.0085	.0106	.0127
3	.0060	.0091	.0121	.0152	.0182
3½	.0082	.0123	.0165	.0206	.0247
4	.0107	.0161	.0215	.0269	.0322
5	.0170	.0254	.0339	.0424	.0508
6	.0245	.0367	.0490	.0612	.0735

AIR FLOW (CFM) THROUGH ORIFICE OR JET

PSI	Orifice or Jet Size				
	1/64	1/32	1/16	1/8	1/4
10	.084	1.26	5.15	21.0	84.0
25	.133	2.16	8.6	34.5	138.0
50	.223	3.44	13.5	54.2	216.0
80	.330	4.92	21.2	85.0	340.0
100	.400	6.45	25.8	103.0	412.0
150	.470	7.36	30.2	121.0	484.0
150	.570	10.20	36.7	147.0	588.0
200	.700	12.30	48.7	194.0	776.0

GUIDE TO COMPRESSOR SELECTION

Under normal conditions, this information should provide a satisfactory compressor selection guide. Unusual operating conditions can require a larger unit than calculated. When in doubt, select a larger unit to insure adequate initial capacity and provide for the future.

Determine air requirement: Add up the Free Air CFM requirements for all of the air powered devices that the compressor will be required to operate at the same time. If manufacturers' data is not available, the tables below may be used as an approximate guide. To this total, add 25% or more for system variables and provide capacity for future needs.

Determine pressure requirement: The PSI requirement of the highest pressure device to be operated is the level at which the compressor must operate. If this pressure exceeds 100 PSI, a two-stage unit must be used. If not, a single-stage unit is preferable. Do not operate at a higher pressure than necessary to do the higher pressure than necessary to do the job.

Determine type of operation control (Constant speed unloader or pressure switch control). If air usage is continuous and relatively heavy, constant speed control operation is preferable. Also, if air usage for short periods will exceed 50', of the compressor's Free Air CFM capacity, constant speed control should be used. Where duty is light or intermittent, pressure switch control saves power and reduces wear.

Power source: Select model with three-phase motor in preference to single-phase unit, if three phase power is available. Three phase motors are more reliable and efficient. If remote operation is involved, select a gasoline engine powered unit.

EQUIPMENT AIR REQUIREMENT AVERAGES

Always use free air (CFM) and pressure (PSI) specifications from nameplate on the device, or from the manufacturer. CFM free air figures below are averages and should not be considered accurate for any specific brand.

INDUSTRIAL AIR REQUIREMENT AVERAGES

CFM requirements based on industrial tools being used 25% of the time.

Miscellaneous Portable Tools at 70 to 90 PSI Range	CFM	Miscellaneous Portable Tools at 70 to 90 PSI Range	CFM
Drill, 1/16 to 3/8"	6.3	Burring Tool, Small	3.8
Drill, 3/8 to 5/16"	8.8	Burring Tool, Large	6.0
Screwdriver, 2 to .6 Screw	3.0	Hammer, Small	3.3
Screwdriver, .6 to 5/16" Screw	6.0	Hammer, Medium	8.5
Tapper, to 3/8"	5.0	Hammer, Large	10.0
Nutsetter, to 3/8"	6.0	Backfill Tamper	6.3
Nutsetter, to 3/4"	7.5	Compression Riveter	.2 cu. ft.
Impact Wrench, 1/4"	3.8		per ??
Impact Wrench, 3/8"	5.0	Air Motor, 1 HP	6.3
Impact Wrench, 1/2"	7.5	Air Motor, 2 HP	12.5
Impact Wrench, 3/4"	8.8	Air Motor, 3 HP	18.8
Impact Wrench, 1 1/4"	13.8	Air Motor Hotsl	1 cu. ft.
Die Grinder, Small	3.8		per ft. of lift
Die Grinder, Medium	6.0	Paint Spray Gun	5.0
Horizontal Grinder, 2"	5.0	Scaling Hammer	3.0
Horizontal Grinder, 4"	15.0	Chipping Hammer	7.5
Horizontal Grinder, 6"	15.0	Riveting Hammer	7.5
Horizontal Grinder, 8"	20.0	Circular Saw, 8"	11.3
Vertical Grinders and Sanders, 5" Pad	8.8	Circular Saw, 12"	16.3
Vertical Grinders and Sanders, 7" Pad	15.0	Lightweight Chainsaw	7.0
Vertical Grinders and Sanders, 9" Pad	17.5	Heavy Duty Chainsaw	21.8

AUTOMOTIVE EQUIPMENT AIR REQUIREMENT AVERAGES

CFM requirements based on normal usage In automotive applications

Equipment PSI Range	Portable Tools	CFM	Equipment PSI Range	Portable Tools	CFM
70-100	Air Filter Cleaner	3.0*	125-150	Tire Inflation Liner	1.5
70-100	Body Polisher	2.0*	125-150	Tire Spreader	1.0
70-100	Body Sander, Orbital	5.0*	90-100	Air Hammer	4.0*
70-100	Brake Tester	3.5*	90-100	Tire Hammer	12.0
70-100	Carbon Remover	3.0*	125-150	Bead Breaker	12.0
70-100	Dusting Blow Gun	2.5	90-100	Spring Oiler	4.0
70-90	Drill, 1/16" to 3/8"	4.0*	90-100	Spray Gun Engine Cleaner	5.0*
70-90	Impact Wrench, 3/8" sq. dr.	2.0*	90-100	Production Paint Spray Gun	8.5*
70-90	Impact Wrench, 1/2" sq. dr.	3.5*	90-100	Touch-up Paint Spray Gun	3.5*
70-90	Impact Wrench, 3/4" sq. dr.	7.5*	90-100	Undercoat Paint Spray Gun	19.0*
70-90	Impact Wrench, 1" sq. dr.	10.0*	120-150	Grease Gun	3.0*
70-90	Die Grinder	5.0*	145-175	Hydraulic Lift	6.0
90-100	Vertical Disc Sander	10.0*	125-150	Hydraulic Floor Jack	6.0
90-100	Filing/Sawing Machine, Small	3.0*	120-150	Pneumatic Garage Door	3.0
90-100	Filing/Sawing Machine, Large	5.0*	90-100	Radiator Tester	1.0
90-100	Burring Tool	5.0*	70-100	Transmission/Differential Flusher	3.0
125-150	Tire Rim Stripper	6.0	70-100	Fender Hammer	9.0*
125-150	Tire Changer	1.0	70-100	Medium Duty Sander	10.0*

(*) These sources are considered continuously operating.
(†) This 000 lbs. each additional 1,000 lbs. add .65 CFM.

LIMITED WARRANTY

Dayton/Speedaire & Speedaire air compressors are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use (rental use excluded), for one year after date of purchase. Any part which is determined to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be repaired or replaced at Dayton's option. For warranty claim procedures, see "Prompt Disposition" below. This warranty gives purchasers specific legal rights, and purchasers may also have other rights which vary from state to state.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to illustrate and describe the products m this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions.

Except as provided below, no warranty or affirmation of fact, express or implied, other than as stated in "LIMITED WARRANTY" above is made or authorized by Dayton, and Dayton's liability in all events is limited to the purchase price paid.

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some states do not allow limitations on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of this Limited Warranty, any implied warranties of merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within warranty. For any product believed to be defective within warranty, first write or call dealer from whom product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date and number of dealer's invoice, and describing the nature of the detect. If product was damaged in transit to you, file claim with carrier.

DAYTON ELECTRIC MFG. CO., 5959 W. HOWARD ST.
CHICAGO, ILLINOIS 60648

These air compressors are built to rigid specifications for long, trouble-free life. Both A.S.M.E. code and non-code tank models are engineered to perform all air compressing jobs within their stated ratings and capacities. A correct Installation (Figures 2 & 3) is made when the following conditions are met:

LOCATION

Portable air compressors can be located, anywhere; however, if possible, select a clean, cool, dry place. Permanently installed compressors MUST BE located in a clean, well ventilated .room. 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. Rotation must be in the direction such that pump flywheel fan, where used, blows air toward the cylinder.

Place portable or stationary compressors on firm level ground or flooring. Permanent installations seldom require bolting to floor; however, bolt holes in tank or base feet are provided. Before bolting or lagging down, shim compressor level.

IMPORTANT: Avoid putting a stress on a tank foot by pulling it down to floor. This will only result in abnormal vibration.

DISCHARGE PIPING

The compressed air distribution system should be constructed of pipe large enough so that the pressure drop between the air receiver (tank) and the point of use will not exceed 10% of the initial receiver pressure. Fittings offering least resistance to flow, such as long radius elbows, should be selected. Provision should be made not only for present requirements, but for reasonable future growth as well. Refer to page 8, PIPING REQUIREMENTS FOR AIR DISTRIBUTION SYSTEMS, for additional information.

All main line piping should be sloped away from the compressor at approximately 1/4" per foot to a drop leg at the lowest part of the system. This makes it possible to drain the overnight accumulation of moisture from the lines and prevent moisture from draining back into the receiver. Outlets from the main line should be taken from the top of the main by using a tee and two elbows to get the necessary "U-shaped" connection as illustrated in Figure 2.

NOTE: Do not place a shut-off valve in the discharge line between the compressor head and the air receiver. However, he use of a check valve to prevent back pressure damage to the compressor head is essential.

AIR INTAKE

A clean, cool, dry air supply is essential to satisfactory operation. The standard air filter supplied with the compressor is of sufficient size and design to meet normal filtering requirements if properly serviced. Paper-type filter elements SHOULD NOT BE washed in solvent: instead, they should be blown out with compressed air and replaced periodically. Foam-type filter elements should be washed periodically with a household detergent and blown dry. DO NOT OIL! Felt-pad filters should be periodically blown out with an air jet. Replace filters if filled with dirt or paint. Do not wash out or oil. If the compressor is to be installed where considerable dust, dirt and other contaminants are prevalent, it is suggested that an oil bath filter be substituted for the standard filter. (If this filter is used, be sure to replace oil when dirty.)

If long runs of Intake pipe are necessary to supply the compressor with cool air, the intake should be Increased by one pipe size for each eight feet of added length beyond the intake port of the compressor head. If the intake is piped to the outside, a hood should be Installed over the filter to prevent the entrance of rain and snow into the air intake.

RELIEF VALVE

The relief valve (safety valve) vents the tank if excess pressure builds up. It has been adjusted for maximum pressure allowable according to tank specifications and the working pressure of the unit on which it is installed.

CAUTION: Do not readjust or modify for any reason!

CHECK VALVE

This is an automatic valve placed in the line between pump and tank to prevent reverse pressure being applied to the valves of the pump. Failure of valve will cause difficulty in starting the unit. Often, noise problems and pump valve failures are caused by a faulty check valve. On some models, a combination relief/unload valve is used. Where such a valve is used, proper operation is indicated by a brief spurt of air, when the pump stops, from the small vent hole in the side. Continuous air flow, or no air flow at all, indicates a defective valve.

TANK DRAIN VALVE

The drain is located at the bottom of the tank, which should be drained at least once weekly. A strainer installed ahead of the valve will help prevent solid particles such as carbon, rust or pipe scale from fouling the tank drain valve.

PRESSURE SWITCH CONTROL

On pressure switch-controlled models, the pressure switch is automatic and will start the compressor at the low pressure, stop it when maximum pressure is reached.

PRESSURE SWITCH ADJUSTMENT:

WORKING RANGE (Large Spring) - Switches are set at the factory to operate at the pressure indicated on the nameplate. To raise operating pressure, turn the range spring nut down, which compresses the range spring. Loosen the range spring nut to lower the operating pressure.

DIFFERENTIAL (Small Spring) - Pounds pressure between "Open", and "Close" is referred to as the differential. To increase the differential, turn down the differential spring. By loosening this nut, differential will be narrowed. (Differential adjustments affect cut-out point only).

IMPORTANT: If the operating pressure is to be adjusted, the following guide-lines MUST BE observed:

SINGLE STAGE UNITS - 100 psi maximum continuous running pressure. Maximum intermittent duty pressure is 125 psi.

TWO STAGE UNITS - Maximum continuous running pressure and intermittent duty pressure is 175 psi.

CAUTION: Keep hands away from moving parts, as the unit may start unexpectedly.

Installation (continued)

COMPRESSOR HEAD (AIR PUMP)

Make certain that the compressor head is fastened securely to the mounting saddle or deck.

NOTE: The flywheel should be assembled to the unit with the set screw (or fastening bolt) and the arrow on the outside of the crankshaft. Tighten set screw on the key.

BELTS

Drive belts must be kept tight enough to prevent slipping. If belts slip or squeak, the motor should be adjusted for proper tension. If belts are too tight, overload will be put on motor and compressor bearings. Belt tension is correct when normal thumb pressure depresses belt 1/4 to 1/2". Pulleys should be properly and carefully aligned.

IMPORTANT: Whenever possible, belt guards should be used!

ELECTRICAL

Have all electrical connections made by a competent electrician.

All wiring and electrical connections must comply with the National Electrical Code, and local electrical codes in effect. In particular, refer to Article 430 (Motors, Motor Circuits and Controllers) of the NEC.

For Proper motor connections, refer to the connection diagram located on the nameplate or inside the terminal box. Make sure connections are correct for the voltage being supplied the motor.

Motor should be grounded by use of a separate grounding conductor, connected to the motor frame. Verify that the ground wire runs to a good electrical ground such as a grounded conduit or water system Insure that a good ground is provided at the supply end of the line. Connections should be made with flexible conduit to minimize vibration transmission.

Avoid use of extension cords on portable units. If an extension cord must be used, keep length as short as possible. Use heaviest wire size cord available, and do not use less than size and gauge indicated, below.

WIRE SIZE CHART

MINIMUM WIRE SIZES FOR EXTENSION CORDS AND PERMANENT WIRING

	25 Ft.		50 Ft.		100 Ft.	
HP	115V	230V	115V	230V	115V	230V
1/2	14	16*	12	16*	8	14
3/4	12	16*	10	16*	8	14
1	12	16*	10	14	6	12
1 1/2	10	14	8	14	6	12
2	10	14	6	12	4	10

* Use only #14 AWG or larger wire for permanent installations.

Operation

The crankcase of this compressor was drained before shipping. Before operating compressor, with a good grade of unused, clean oil. See chart below.

RECOMMENDED COMPRESSOR OILS

1. American Oil Company: A. Amoco Industrial Oil No. 53
   B. Amokon No. 35
2. Texaco, Inc. - Texas Regal C-R&O
3. Exxon Company: A. Teresstic 52
   B. Esstic 50
   C. Nuto 53
4. Fiske Brothers Refining Co. - Lubriplate Non-Detergent Motor Oil SAE 20
5. Clark Oil & Chemical Co. - Co Chem #228
6. Phillips Petroleum Co. - Baltic Grade 315
7. Gulf Oil Corp. - Gulf Harmony Oil C
8. Continental Oil Co. - Conoco Dectol Medium

Except for Fiske, these are all non-detergent, rust and oxidation inhibited industrial oils with the viscosity equivalent to a SAE Grade 20 weight motor oil. These oils will work satisfactorily for temperature ranges between 20° and 90° F. This should take care of most installations. For applications where the ambient temperature is consistently above 90° F., the next higher viscosity oil in these same oil families should be used.

NOTE: DURING BREAK IN, CAREFUL AND REGULAR CHECK OF OIL LEVEL SHOULD BE EXERCISED. MAINTAIN OIL AT FULL LEVEL. REFER TO THE MAINTENANCE SECTION FOR ADDITIONAL LUBRICATION INFORMATION.

Fill engine crankcase (if gasoline engine operated in accordance with engine manufacturers recommendations found in engine manual.

WARNING: NEVER ADD GASOLINE TO A HOT ENGINE!

IMPORTANT: Before proceeding with work operations, make certain that you are thoroughly familiarized with the function and operation of each component in your system. READ ALL INSTRUCTION MANUALS PERTINENT TO YOUR PARTICULAR SYSTEM!

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Low discharge pressure.	1. Air leaks.	1. Listen for escaping air. Apply soap solution to all fittings and connections. Bubbles will appear at points of leakage. Tighten or replace leaking fittings or connections.
	2. Leaking valves.	2. Remove valve assemblies or-plates from the head, disassemble and inspect for valve breakage, weak valve springs or plates, scored valve seats, etc. Replace defective parts and reassemble. **CAUTION: Be sure that old valve assembly or head gaskets are removed and are replaced with new ones each time the valve assemblies are removed from the head.**
	3. Restricted air intake.	3. Clean the air filter element. Check for unnecessary elbows in the intake line, and remove if they are materially restricting the flow of intake air to the compressor.
	4. Slipping belts.	4. Loosen motor clamping bolts and move the motor in a direction away from the compressor, being sure that the motor shaft is perfectly parallel to the scribed line. Tighten motor clamping bolts. Normal thumb pressure should deflect belts 1/4” to 1/2”. Do not "roll" belts over pulleys.
	5. Blown Gaskets.	5. Replace any gaskets proven faulty on inspection.
	6. Low compression.	6. Low pressure can be due to worn rings and cylinder walls. Correction is made by replacing the rings, cylinders, and pistons as required.
Over-heating	1. Poor ventilation.	1. Relocate the compressor to an area where an ample supply; of cool, clean, dry and well circulated air Is available. **CAUTION: Avoid locations near boilers or other areas where there is a high ambient temperature**
	2. Dirty cooling surfaces.	2. Clean the cooling surfaces of the cylinder, intercooler and aftercooler.
	3. Incorrect pulley rotation.	3. Check the arrow on the pulley for correct rotation. If incorrect, have a competent electrician reverse the motor rotation. Air flow should always be toward the cylinders (on units with fan-type flywheel).
Unit stalls	1. Overloaded motor	1. Have competent electrician examine the motor and wiring, then proceed with his recommendations. Check motor voltage connection.
	2. Low or unbalanced voltage.	2. Same as No. 1 above.
	3. Improper lubrication.	3. See lubrication section on following page.
	4. Excessively long or undersized extension cord.	4. Avoid use of extension cords wherever possible. If extension cord used, minimize length. Use largest size cable available.
Excessive belt wear	1. Pulley out of alignment.	1. Realign motor pulley with compressor pulley.
	2. Belt too loose or too tight.	2. Adjust tension.
	3. Belt slipping.	3. Adjust tension
	4. Pulley wobble	4. Check for worn crankshaft, keyway or pulley bore resulting from running the compressor or motor with loose pulleys. Check for bent pulleys or bent crankshaft.

SYMPTOM	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
Excessive noise (Knocking).	1. Loose motor or compressor pulley.	1. Loose motor or compressor pulleys are a very common cause of compressors knocking. Tighten pulley clamp bolt and set screws.
	2. Lack of oil in crankcase.	2. Check for proper oil level; if low, check for possible damage, to bearings. Dirty oil can cause excessive wear.
	3. Worn connecting rod inserts.	3. Remove connecting rod cap and inspect bearings; if worn or damaged, replace.
	4. Worn piston pin bushing. .	4. Remove rod and piston assemblies from the compressor and inspect for excess wear. Replace excessively worn piston pin or pistons, as required.
	5. Burned out bearings.	5. Replace worn or burned out bearings and remedy cause of failure, (usually insufficient or dirty oil).
	6. Excessive crankshaft end play.	6. Remove the cylinder and head assemblies from the running gear and check crankshaft for end play. If end play can be felt, remove one thin bearing adjustment shim (where used) at a time, and recheck end play after each removal. The bearing, when properly adjusted, should have a very slight drag when turned over by hand. This adjustment should never be made while the rods are still connected to the crankshaft.
	7. Loose valve assembly.	7. Remove valve assembly and valve assembly gasket from the head, replace valve assembly gasket with a new one, and reinstall valve assembly after examining the valve pockets in the head and the valve assemblies for possible damage. Carefully tighten valve assembly holddown screws sufficiently to hold the valve solidly in place.
	8. Piston hitting the head.	8. Remove the compressor head and inspect for carbon deposits or other foreign matter on top of the piston. Replace head with new head gasket and intercooler gaskets if necessary.
	9. Noisy check valve:	9. Replace.
Oil in the discharge air.	1. Worn piston rings.	1. Replace with new rings.
	2. Compressor air intake restricted.	2. Clean filter. Check for other restrictions in the intake system,
	3. Restricted breather.	3. Clean and check breather valve for free operation.
	4. Excessive oil in compressor.	4. Drain down to full level.
	5. Wrong oil viscosity.	5. Check lubrication section of this manual for correct viscosity.
	6. Connecting rod out of alignment.	6. Have rod with piston attached checked and realigned. Most automotive engine rebuilding houses have equipment available to make this test.

CAUTION: ALWAYS DISCONNECT THE POWER SOURCE AND DE-PRESSURIZE THE ENTIRE SYSTEM BEFORE ATTEMPTING TO SERVICE THE AIR COMPRESSOR OR ANY COMPONENT UTILIZED IN THE SYSTEM. If the power disconnect is out-of-sight, lock It In the open position and tag to prevent unexpected application of power.

Periodic inspection of the air compressor should be a mandatory part of normal in-plant inspection tours of your system. Occasionally it will be necessary to replace worn or damaged parts. Damaged or worn parts are a potential threat to personal safety and property; under no circumstances should damaged or worn parts be re-used.

If compressor fails to pump air or seems slow in filling, remove valves and seats and clean thoroughly. After cleaning; exceptional care must be taken to replace al parts in exactly the same positions. All joints must be tight or the compressor will not function properly. When valves are replaced and connections tight, unit should fill to 80 PSI within 10 minutes (discharge line shut off).

CLEANING

As with all systems, it may become necessary clean them periodically to keep them in peak operating condition. Any cleaning methods used should be suitable with the air compressor and components which make up the system.

LUBRICATION

NEVER ALLOW OIL LEVEL TO FALL MORE THAN 1/8" BELOW THE FULL LEVEL. The type of oil user depends on operating conditions and surrounding temperature at the point of installation. For proper oil viscosity, refer to the chart under Operation page 5.

OIL CHANGE: Check oil level daily. In normal or intermittent duty installations where unit does not operate extensively, change oil every 200 hours or 60 days, whichever occurs first. Under extensive, or continuous operation, or where hot humid, or dusty/dirty conditions exist, oil change interval should be sharply reduced to 100 hours or 30 days (or less), whichever occurs first.

Maintenance Time-Check Chart

Procedure	Daily	Weekly	Monthly	Yearly
CHECK OIL LEVEL - SEE LUBRICATION ABOVE. CAUTION! DO NOT OVERFILL	X			
GIVE COMPRESSOR OVERALL VISUAL CHECK	X			
DRAIN MOISTURE ACCUMULATION FROM THE AIR RECEIVER		X		
CHECK THE AIR DISTRIBUTION SYSTEM FOR AIR LEAKS		X		
CLEAN COOLING SURFACES OF COMPRESSOR INTER-COOLER AND AFTERCOOLER		X		
OPERATE SAFETY VALVES			X	
REPLACE OR CLEAN INTAKE FILTER ELEMENT			X	
INSPECT OIL FOR CONTAMINATION AND CHANGE IF NECESSARY			X	
CHECK BELTS FOR CORRECT TENSION AND ALIGNMENT			X	
CHECK PULLEY CLAMP BOLTS AND SET SCREWS FOR TIGHTNESS			X	
INSPECT VALVE ASSEMBLIES				XX
INSPECT CUSHION CHAMBER AND DISCHARGE LINE FOR EXCESSIVE CARBON ACCUMULATIONS				X
INSPECT PRESSURE SWITCH DIAPHRAGM AND CONTACT POINTS				X
INSPECT CONTACT POINTS IN MOTOR STARTER				X
SERVICE ELECTRIC MOTOR	▲	▲	▲	▲
SERVICE GASOLINE ENGINE	▲	▲	▲	▲

X CHECK MORE OFTEN IF EXTREMELY DIRTY CONDITIONS EXIST. XX EVERY 6 MONTHS

▲ PER MANUFACTURER'S RECOMMENDATIONS

SPECIFICATIONS, PERFORMANCE & PARTS MANUAL

COMPRESSOR HEADS

MODELS 3Z182B and 3Z183B

Mfg 4206
FORM 5S17

DAYTON ELECTRIC MANUFACTURER CO. CHICAGO 60648

1175/262 2

ATTENTION: READ CAREFULLY AND REFER TO OPERATING MANUAL & SERVICE GUIDE, FORM 5S1408, BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE YOUR SPEEDAIRE COMPRESSOR HEAD AIR PUMP). FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN FOR FUTURE REFERENCE.

Description

Your Speedaire Compressor Head (air pump) is a two-stage, heavy-duty, industrial unit. Each unit is equipped with a centrifugal unloader for loadless starting, counter-balanced, ductile, Iron crankshaft, Timken tapered roller bearings and Die-cast aluminum cylinders. The Compressor Head also features Swedish steel disc-type valves, finned intercooler, splash lubrication system, visual oil-level gauge and balanced, fan-type flywheel (rotates CCW facing flywheel).

MODEL 3Z182B utilizes pressure switch control for intermittent duty applications (start-stop operations).

MODEL 3Z183B uses constant speed control for continuous duty applications.

For additional information on the Compressor Head, see Specification and Performance Charts.

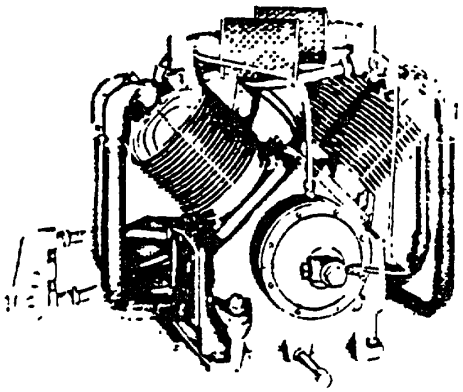


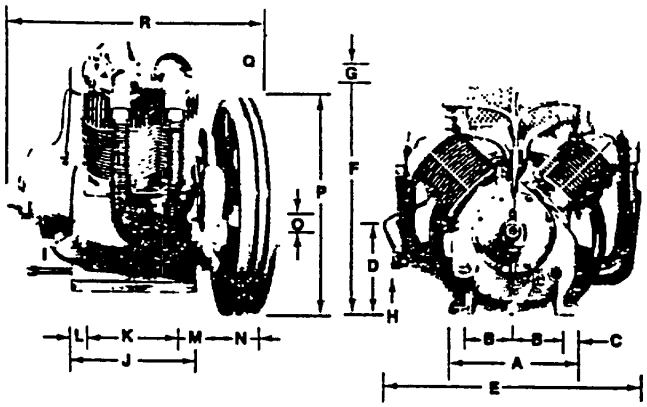
Figure 1 - Compressor Head (Air Pump)

General Safety Information

Because the Compressor Head (Air Pump) is an integral part of the air compressor system, the following safety precautions should be observed at all times:

1. Read the instruction manuals for each component carefully before attempting to assemble, disassemble or operate your particular system.
2. Do not exceed the pressure rating of any component in the system.
3. Protect material lines and air lines from damage or puncture.
4. Never point a spray gun at oneself or any other person. Accidental discharge may result in serious injury.
5. Check hoses for weak or worn condition before each use, making certain that all connections are secure.
6. Release all pressures within the system before attempting to service any component.
7. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
8. On engine driven units, check engine oil and fuel levels before starting. DO NOT ADD GASOLINE TO A HOT ENGINE!
9. Electric motors must be securely and adequately grounded. This can be accomplished by wiring with a grounded, metal-clad raceway system, by using a separate ground wire connected to the bare metal of the motor frame, or other suitable means.
10. Always disconnect power source before working on or near a motor or its connected load. If the power disconnect point is out-of-sight, lock it in the open position and tag to prevent unexpected application of power.
11. All moving parts should be guarded.
12. Be careful when touching the exterior of an operating motor - it may be hot enough to be painful or cause injury. With modern motors this condition is normal if operated at rated load and voltage - modern motors are built to operate at higher temperatures.
13. Protect the power cable from coming in contact with sharp objects.
14. Do not kink power cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.
15. Make certain that the power source conforms to the requirements of your equipment.
16. When cleaning electrical or electronic equipment, always use an approved cleaning agent such as dry cleaning solvent.
17. Wiping or cleaning rags and other, flammable waste materials must be placed in a tightly closed metal container and disposed of later in the proper fashion.

Figure 2 - Dimensions



Dimension Chart

A	Base - Width	11-1/8
B	Bolt Down - Width	4-13/16
C	Bolt Down To Edge	3/4
D	Base To Crank Center	
E	Overall Width	
F	Overall Height	20-1/2
G	Add For Head Unloaders	1
H	HP Exhaust At Opening	3/4 NPT
I	Bolt Down Hole Diameter	
J	Base - Depth	
K	Bolt Down - Depth	
L	Bolt Down To Edge	27/32
M	Bolt Down To Wheel (Max)	3-1/16
N	Flywheel Width	2-23/32
O	Crank Diameter	1-3/4
P	Flywheel Diameter	19-1/4
Q	Flywheel Grooves	2VB
R	Overall Depth	21-1/8

Flywheel Rotation: Clockwise When Viewed From Front - Flywheel To Rear

Specifications and Performance

SPECIFICATIONS			
Motor HP	Cylinder Bore & Stoke	No. Cyl.	Dimensions
7 1/2 & 10	4 5/8 & 2 1/2 x 3	4	See Figure 2

PERFORMANCE

	7 1/2 HP				10 HP			
PSI	Disp. CFM	Free Air CFM	Pump RMP	1725* Motor Sheave	Disp. CFM	Free Air CFM	Pump RPM	1725* Motor Sheave
100	43.08	36.00	738	8 3/16*	50.30	41.85	853	9 7/16*
125	39.66	33.32	682	7 5/8	47.95	39.45	823	9 1/8
150	38.03	31.75	652	7 1/4	44.95	36.45	772	8 9/16
175	33.40	27.75	573	6 3/8	42.90	34.85	736	8 1/8

(*) Recommended motor speed is 725 RPM Sheave Sizes and performance figures are based on 1725 RPM motor speed. Unit has two 5/8" grooves, 3/4" OC for SL belts.

HOW TO ORDER REPLACEMENT PARTS

Please provide following information:

- Model Number
- Serial Number (if any)
- Part Description and Number as shown in Parts List.

address order to:
Dayton Electric Mfg. Co.
CUSTOMER SERVICE DEPT.
5959 W. Howard St.
Chicago, Illinois 60648

LIMITED WARRANTY

Speedaire Compressor Heads (air pumps) are warranted against defects in workmanship or materials under normal use (rental service excluded) for one year from date of purchase to the original user. Liability in all events is limited to the purchase price paid and liability under the aforesaid warranty is limited to replacing or repairing any parts which are defective in materials or workmanship and returned to an authorized service station, as we designate, shipping costs prepaid.

DISCLAIMER: Dayton Electric Mfg. Co. (Dayton) has made a diligent effort to illustrate and describe the products in this manual accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that product will necessarily conform to the illustrations or descriptions. No warranty or affirmation of fact, expressed implied, other than the aforesaid is made or authorized by Dayton.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt disposition regarding any product which proves to be defective within warranty. Before returning any product, write or call Dayton Electric Mfg. Co. or dealer from whom product was purchased, giving date and number of original invoice and describing nature of defect if product was damaged in transit to you, file claim with carrier.

DAYTON ELECTRIC MFG. CO., 5959 W. HOWARD ST.
CHICAGO, ILLINOIS 60648

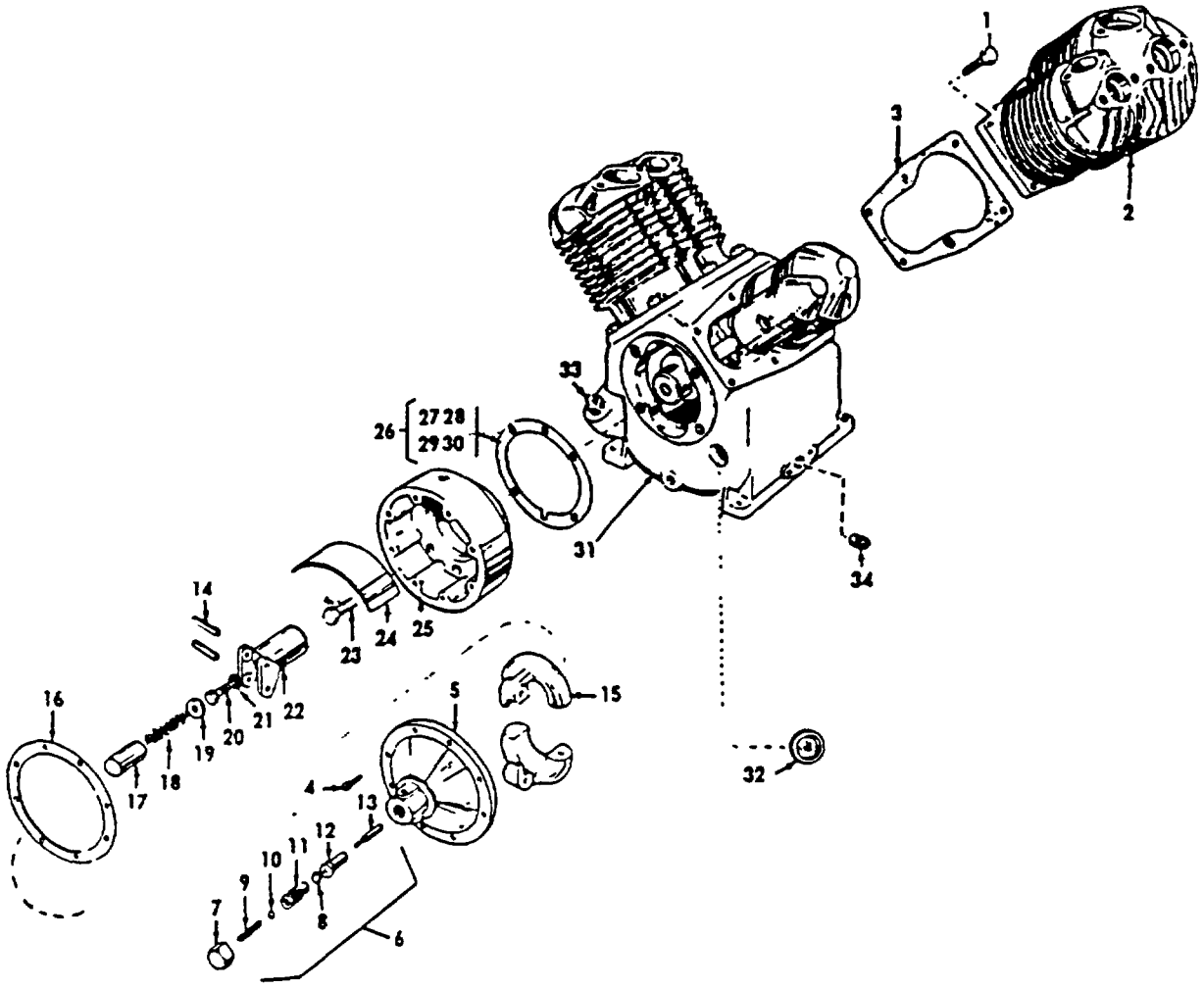


Figure 3 - Replacement Parts Illustration

Replacement Parts List (Models 3Z1828 & 3Z1838)

Ref.	Part No.	Description	Qty.		Ref.	Part No.	Description	Qty
1	M-817	Screw, Hex Steel Cap	12		19	SE-5-88	Washer, Flat Steel	1
2	NR-14-6A	Cylinder	2		20	RE-14-94	Screw, Hex Steel Cap	1
3	NR-29-A	Gasket, Cylinder Flange	2		21	M-466	Washer, Spring Lock	1
4	SE-14-84	Screw, Fillister Head Machine	8		22	SE-5-83C	Spindle, Govenor Weight	1
5	SE-30-100	Cover, Gov. Housing	1		23	RE-20-106	Screw Hex Steel Cap (Upper Govenor	
8	Z-124	KIT, RELEASE VALVE ASSEMBLY					Housing)	4
		(Includes Items 10-11-12-13-14-15-16)	1		24	NR-36-104	Plate, Gov. Baffle	1
7	SE-S-85	Cap, Release Valve	1		25	NR-36-113	Housing Govenor	1
8	H-122	Gasket, Release Valve Body	1		26	Z-30-30	GASKET SET, GOV. HOUSING	
9	SE-5-91	Spring, Release Valve	1				(Includes items 27-28-29-30)	1
10	SE 5-95	Ball, Release Valve	1		27	SE-30-30	Gasket, Gov. Housing 1/32 Thick)	1
11	SE-30-101	Body, Release Valve	1		28	SE-30-30A	Gasket, Gov. Housing .005 Thick) NSS	1
12	SE-5-97	Sleeve, Plunger	1		29	SE-30-309	Gasket, Gov. Housing .010 Thick)	1
13	SE-5-66B	Plunger, Release Valve	1		30	SE-30-30C	Gasket, Gov. Housing .015 Thick)	1
14	SE 5-92A	Pin, Govenor Weight	2		31	M-1898	Crankcase	1
15	SE-5-82A	Weight, Govenor	2		32	RE-7-14	Gauge, Visible Oil Sight	1
16	SE-30-89	Gasket, Govenor Cover	1		33	M-459	Plug, Pipe (Oil Filler)	1
17	SE-5-87	Sleeve, Spring	1		34	M-484	Plug, Pipe	1
18	SE-5-90	Spring, Govenor Main	1		35	Z-765	GASKET SET, COMPLETE PUMP	1

NOTE: NSS means Not Sold Separately.

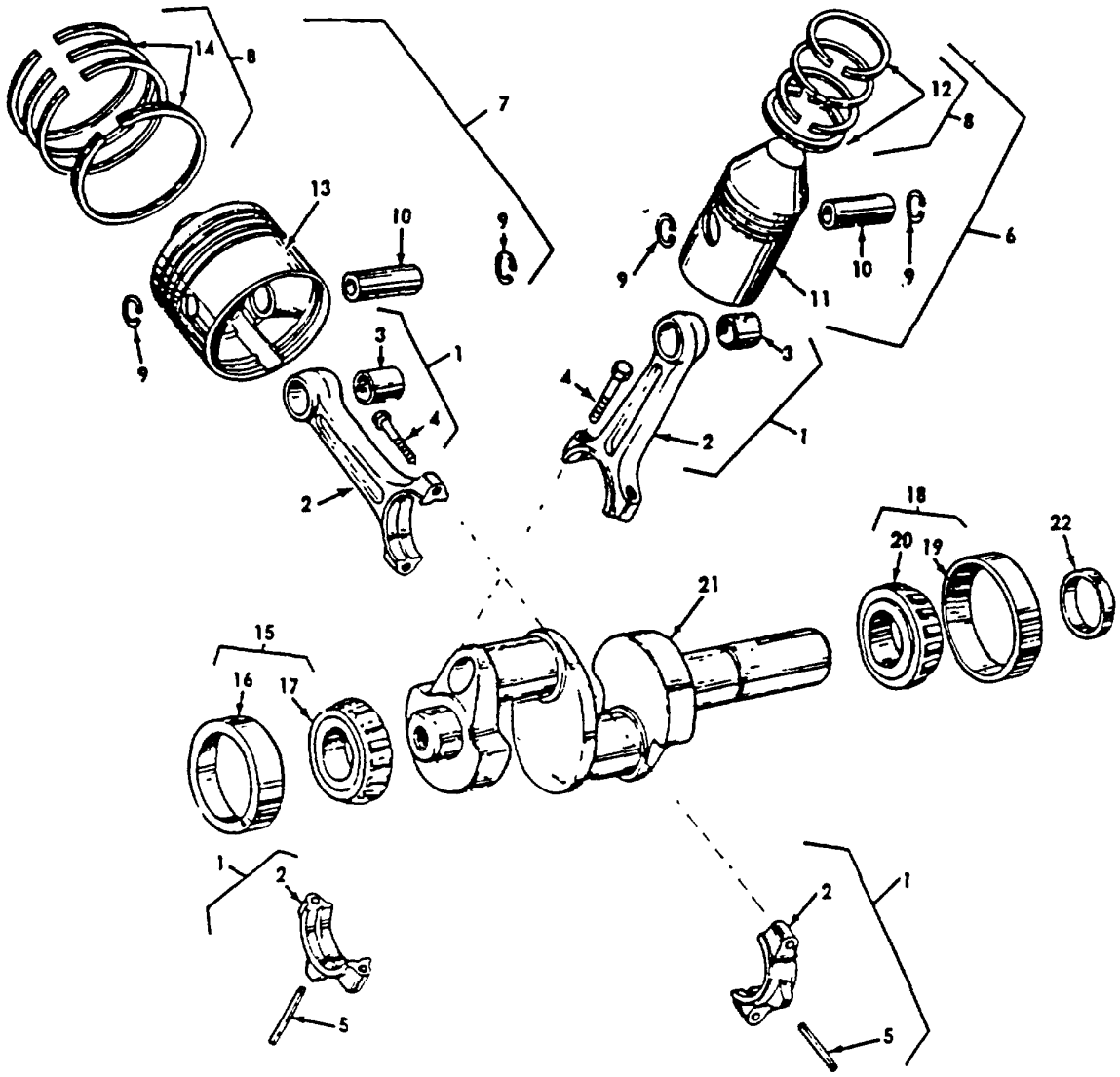


Figure 4 -
Replacement Parts Illustration

Replacement Parts List (Models 3Z182B & 3Z183B)

Ref.	Part No	Description	Qty		Ref.	Part No	Description	Qty
1	Z-752	KIT, ROD ASS'Y, CONNECTING (Includes 2-3-4-5)	4		12	Z-1898	Ring Set, High Pressure Piston	2
2	M-1584	Rod, Connecting w/bolt) NSS	4		13	R-15-4	Piston, Low Pressure	2
3	R-10-37	Bearing, Piston Pin) NSS	4		14	Z-179C	Ring Set, Low Pressure Piston	2
4	M-1583	Bolt, Connecting Rod	8		15	ZNR-36-15	ASS'Y, MAIN BEARING (GOV. END) (Includes Items 16-17)	1
5	R-10-24	Dipper, Oil	4		16	NR-36-16	Cup, Main Bearing) NSS	
6	ZR-10-4	KIT, PISTON ASSEMBLY, H.P. (Includes Items 9-10-11-12)	2		17	NR-36-16A	Cone & Roller, Main Bearing) NSS	1
7	ZR-15-4	KIT, PISTON ASSEMBLY L.P. (Includes Items 9-10-13-14)	2		18	ZNR-20-16	Assembly, Main Bearing (Flywheel End) (Includes Items 19-20)	1
8	ZR-30	KIT, RING SET, COMPLETE PUMP	1		19	NR-20-16	Cup, Main Bearing) NSS	1
9	R-10-102	Ring, Piston Pin Retaining	8		20	NR-20-16A	Cone & Roller, Main Bearing) NSS	1
10	R-10-21	Pin, Piston	4		21	R-30-5	Crankshaft	1
11	R-10-4	Piston, High Pressure	2		22	OS-N36A	Seal, Oil	1

NOTE: NSS means Not Sold Separately

VALVE ASSEMBLY & TUBING

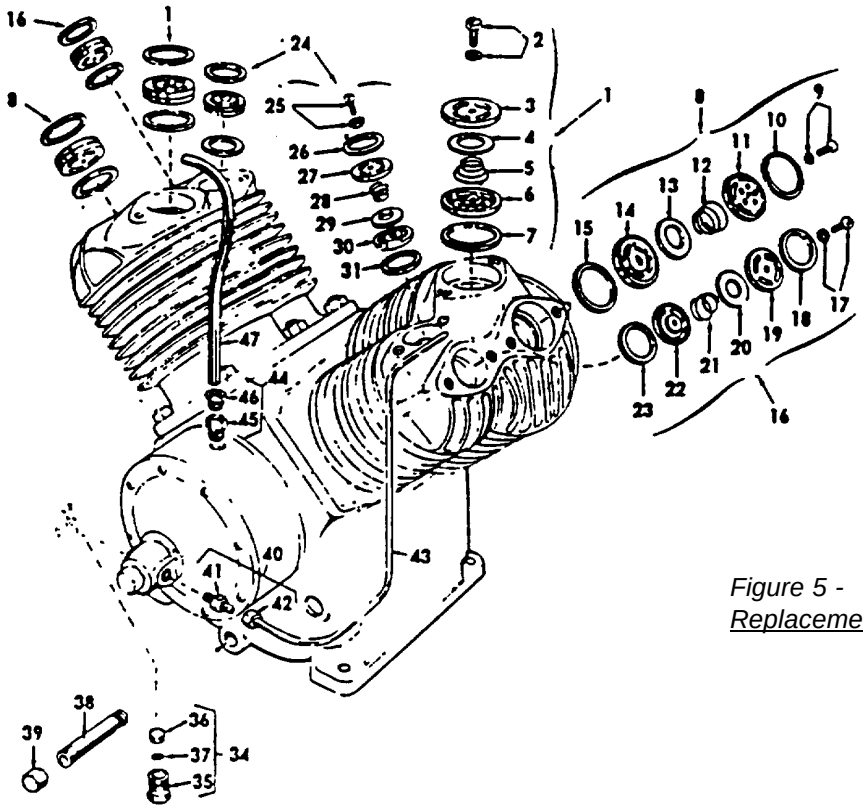


Figure 5 -
Replacement Parts Illustration

Replacement Parts List (Models 3Z182B & 3Z183B)

Ret	Part No	Description	Qty.		Ref.	Part No	Description	Qty
1	Z-118	VALVE ASS'Y, LOW PRESS INTAKE (Includes Items 2-3-4-5-6-7)	2		25	RE-7-81	Screw, Fillister Hd, Steel Machine*	2
					26	P-4137A	Gasket, Valve*	2
2	RE-14-81	Screw, Fillister Head Steel Machine w/Washer*	2		27	RE-7-53A	Cage, Exhaust Valve*	2
					28	RE-7-60	Spring, Valve*	2
3	RE-14-71	Seat, Intake Valve*	2		29	RE-10-62	Disc, Valve*	2
4	RE-14-70	Disc, Valve*	2		30	RE-7-57A	Seat, Exhaust Valve*	2
5	RE-14-58	Spring, Valve*	2		31	P-4136A	Gasket, Valve	2
6	RE-14-72	Cage, Intake Valve*	2		32	Z-104	KIT, COMPLETE VALVE SET w/Gaskets (Includes Items 1-8-16-24)	1
7	P-4134A	Gasket, Valve*	2					
8	Z-117	VALVE ASSEMBLY, L.P. EXHAUST (Includes Items 9-10-11-12-13-14-15)	2		33	Z104G	KIT, COMPLETE VALVE GASKET SET (Includes Items 7-10-15-18-23-26-31)	1
9	RE-7-81	Screw, Fillister Hd., Steel Machine*	2		34	Z-60A	MUFFLER ASS'Y. UNLOADER (Includes Items 35, 36 & 37)	1
10	P-4135A	Gasket, Valve*	2					
11	RE-10-51A	Cage, Exhaust Valve*	2		35	M-1046	Body, Unloader Muffler) NSS	1
12	RE-10-59	Spring, Valve*	2		36	M-97A	Felt) NSS	1
13	RE-10-61	Disc, Valve*	2		37	M-98A	Screen) NSS	1
14	RE-10-65A	Seat, Exhaust Valve*	2		38	M-460	Pipe, Oil Drain	1
15	P-4135A	Gasket, Valve*	2		39	M-461	Cap, Oil Drain	1
16	Z113	VALVE ASSEMBLY, H.P. INTAKE (Includes Items 17-18-19-20-21-22-23)	2		40	Z-508	STRAIGHT COUPLING (includes Items 42-43)	1
17	RE-7-81	Screw, Fillister Hd., Steel Machine*	2		41	M-508	Body Compression) NSS	1
18	P-4137A	Gasket, Valve*	2		42	M-27	Nut Compression) NSS	1
19	RE-7-56A	Seat, Intake Valve*	2		43	SB-250B	Tube, Release Valve	1
20	RE-10-62	Disc, Valve*	2		44	Z-509	STRAIGHT COUPLING (includes Items 46-47)	1
21	RE-7-60	Spring, Valve*	2					
22	RE-7-52A	Cage, Intake Valve*	2		45	M-509	Body, Straight Compression) NSS	1
23	P-4136A	Gasket, Valve*	2		46	NRS-48	Nut Compression) NSS	1
24	Z-115	VALVE ASSEMBLY, H P. EXHAUST (Includes Items 25-31)	2		47	UB-375B	Tube, Breather	1

*'Individual valve parts not sold separately

NOTE: NSS means Not Sold Separately

MANIFOLD, TUBING & FLYWHEEL

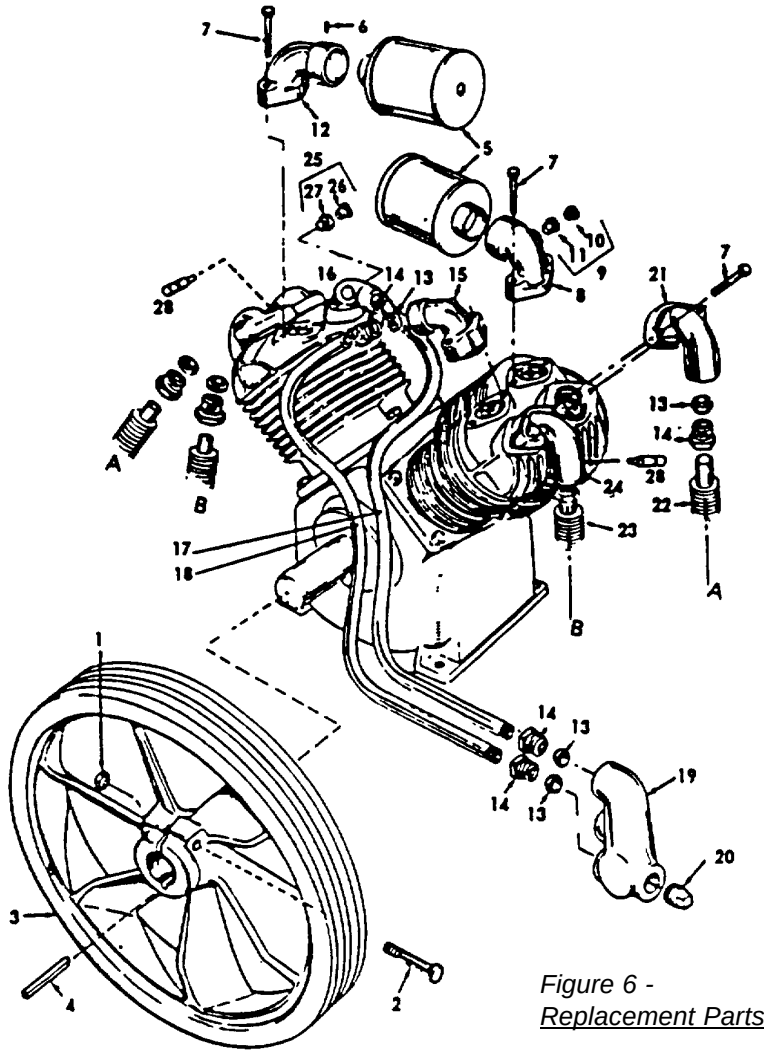


Figure 6 -
Replacement Parts Illustration

Replacement Parts List (Models 3Z182B & 3Z183B)

Ref.	Part No.	Description	Qty.		Ref.	Part No.	Description	Qty.
1	M-465	Nut, Hex Steel (Flywheel)	1		16	SE-5-2B	Manifold, Exhaust (Release Valve	
2	RE-20-105	Bolt Machine, Square Head	1				Tube)	1
3	NR-36-7B	Flywheel	1		17	M-1591	Tube, Aftercooler (Right)	1
4	RE-20-8	Key, Square Machine	1		18	M-1592	Tube, Aftercooler (Left)	1
S	Z-66A	Muffler Assembly, Intake	2		19	NR-36-44	Manifold, Aftercooler	1
6	M-432	Screw, Slotted Set	2		20	M-459	Plug, Pipe (Aftercooler M'fld)	1
7	M-1737	Screw, Hex Steel Cap (All Manifolds)	16		21	RE-10-2E	Manifold, Exhaust	
8*	R-108-2	Manifold, L P. Intake (Left Bank)	1		22	M-1480	Tube, Intercooler	
9	Z-509	STRAIGHT COUPLING (BREATHER			23	M-1481	Tube, Intercooler	
		TUBE) (Includes Items 10-11)	1		24*	NR-2B	Manifold, Intake	
10	NRS-48	Nut, Compression) NSS	1		25	Z-441	STRAIGHT COUPLING	
11	M-509	Body, Compression)	1				(Includes Items 26-27)	1
12*	R-30-2	Manifold, L P. Intake (Right Bank)	1		26	M-27	Nut, Compression) NSS	1
13	SE-5-42	Ferrule	12		27	M-441	Body, Compression)	1
14	SE-5-41	Nut, Compression	12		28	Z-67-75	Safety Valve	
15	SE-5-2A	Manifold, Exhaust	1					

NOTE: NSS means Not Sold Separately

*For Model 3Z182 only. See Page 7 for Model 3Z183B component-

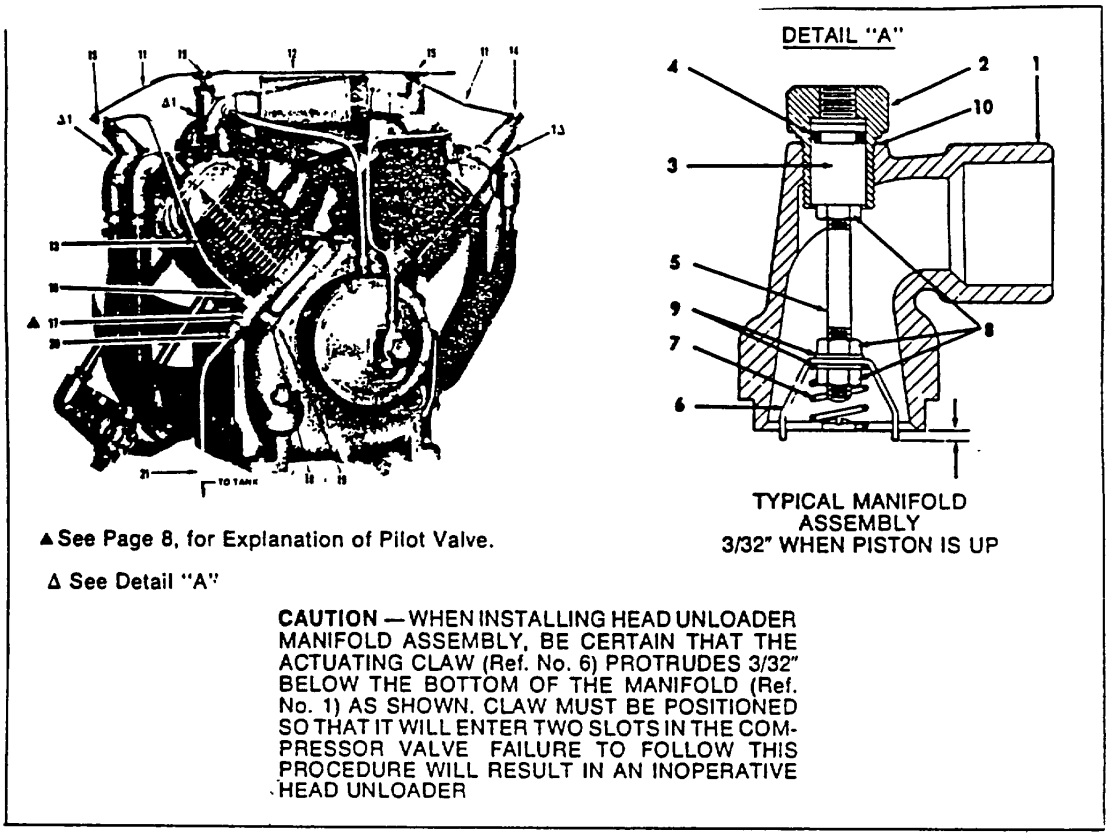


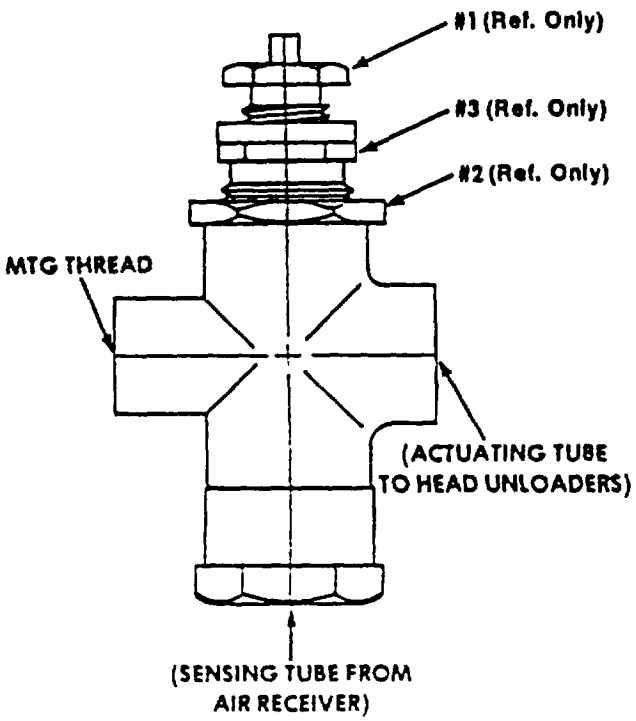
Figure 7 - Replacement Parts Illustration, Model 3Z183 only.

Replacement Parts List (Model 3Z183B only)

Ref.	Part No	Description	Qty
	R-10HUB-2	LP Intake Manifold (Left Bank) (Replaces Item 8, Page 6)	1
1	R-30HU-2	LP Intake Manifold (Right Bank) (Replaces Item 12, Page 6)	1
	NV-15-2	HP Intake Manifold (Replaces Item 24. Page 6)	2
2	NI-15-6	Cylinder	4
3	NI-15-4	Piston	4
4	OR-111	O-Ring	4
5	NI-15-3	Piston Rod	4
6	NI-21-13	Claw - LP	2
	NI-15-13	Claw - HP	2
7	TD-8	Spring	4
8	M-926A	Nut, Hex 1/4-28	12
9	M-919A	Lockwasher 1/4"	8
10	N-34	Gasket - HP Only	2
11	M-666A	Manifold Tube	2
12	M-667A	Intermediate Tube	1
13	M-665A	Actuating Tube	1
14	Z-513	Compression Fitting 1/4" x 1/8"	1
15	M-535	Compression Tee 1/4" x 1/4" x 1/8"	3
16	Z-508	Compression Fitting 1/4" x 1/8"	1
17	Z-180	Pilot Valve (See Page 8)	1
18	M-807	Mounting Bracket	1
19	M-695	Cap Screw 3/8 - 16x3/4	1
20	Z-441	Compression Fitting 1/4" x 1/4"	1
21	---	Sensing Tube, 1/4" O.D	1
	Z-596	L P Assembly (Items 2-9)	
	Z-597	H P Assembly (Items 2-10)	

EXPLANATION OF PILOT VALVE

Figure 8 - Pilot Valve (Ref. No. 17, page 7)



NOTE: Pilot valve (Z-180) pressure range is 140 to 170 psi.

Optional Pilot Valves

Part No.	Pressure Range
Z-180A	120-140 psi
Z-180B	80-100 psi
Z-180C	35- 40 psi

The Pilot Valve is designed to act as an automatic "on" and "off" air switch. When in the "on'" position, it allows air to flow from the tank thru the tube to some device such as a compressor head unloader mechanism, thus actuating it. In the "off" position, this valve stops the flow of air thru the valve and releases the pressure in the line to the device.

The pilot Valve works as follows: Tank air pressure acts on the bottom of the valve. When pressure is great enough to overcome spring force holding valve down on lower seat, it lifts off seat and allows air to flow around valve and out through side opening in Pilot Valve. When valve lifts off lower seat it moves up and seats on upper seat where it is held by tank air pressure. When pressure in tank and on valve drops, spring forces valve back down on lower seat. Air in line to device being actuated can then escape through upper seat and out vent hole. The pressure at which the Pilot Valve is "on" or "off" is controlled by the spring, which has been installed at the factory. A small adjustment can be made in the field by changing the spring force by compressing the spring more or less with the adjusting screw provided on the Pilot Valve.

ADJUSTING PRESSURE

The unload pressure is adjusted by turning the pressure adjusting nut #1 clockwise to increase, and counter-clockwise to decrease, pressure.

Changing the differential (difference there is between load and unload pressure) is accomplished by holding the lock nut closest to the body of the valve #2 so it does not move, then turning the large nut #3 next to it very slightly clockwise to increase the differential, and counter-clockwise to decrease it.

IMPORTANT: REFER TO OPERATING MANUAL & SERVICE GUIDE, FORM 5S1408, FOR COMPREHENSIVE AIR COMPRESSOR INSTRUCTIONS.

Subject: Compressor Lubricating Oil

The lubricating oil used in new compressor units shipped from the factory is a premium quality non-detergent industrial lubricating oil containing rust and oxidation inhibitors. This type of oil is generally recommended for air compressor service by the oil companies, has good water separating ability and is resistant to sludging.

The following list of specific brand name oils represents the lubrication recommendations for this reciprocating compressor. These have the viscosity equivalent of a SAE Grade 20 W motor oil.

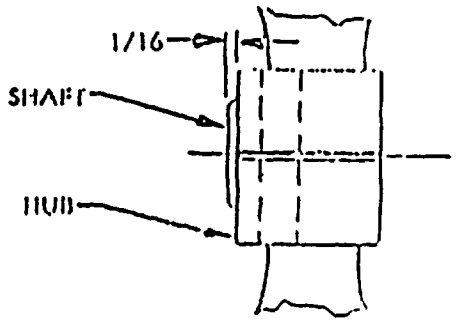
1. American Oil Company
   a) Amoco Industrial Oil No. 31
   b) Amokon No. 35
2. Clark Oil and Chemical Co. - Co Chem No. 228
3. Continental Oil Co. - Conoco Dectol Medium
4. Exxon Company
   a) Teresstic 52
   b) Esstic 50
   c) Nuto 53
5. Gulf Oil Corp. - Gulf Harmony Oil 61
6. Phillips Petroleum Co. - Baltic Grade-315
7. Texaco, Inc. -Regal Oil R & O No. 68

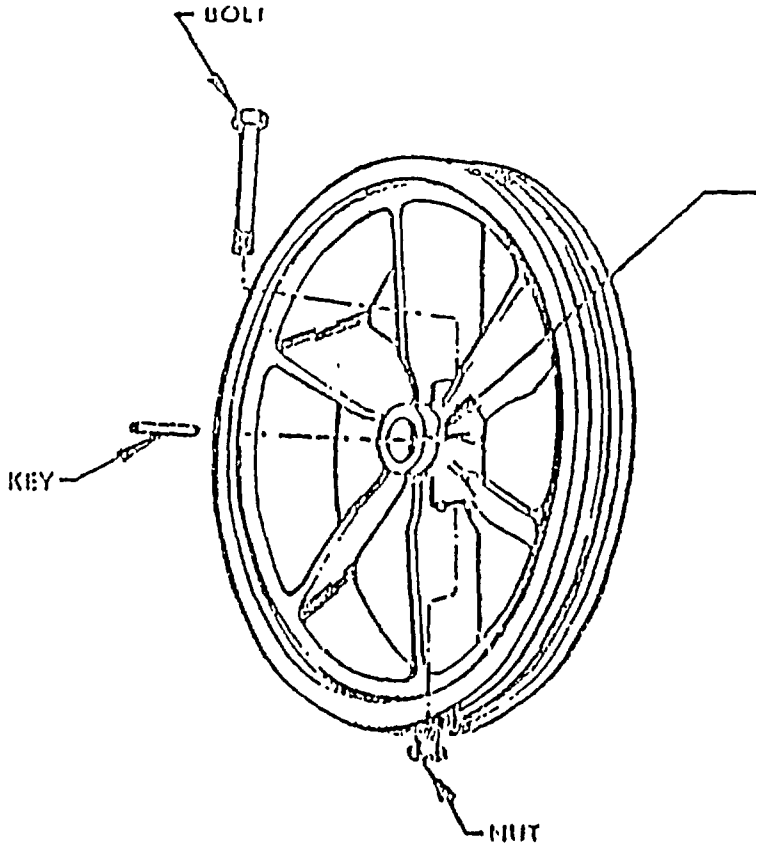
The oils listed above will operate satisfactorily for ambient temperature ranges between 20^{o} and 90^{o}F. This range should be appropriate for most installations. Applications where the ambient temperature is consistently above 90^{o}F. should use the next higher viscosity oil in these same lubrication oil families.

Of the synthetic lubricants, the three types most commonly used today are the phosphate ester base, diester base and fluorosilicones. Synthetic oil of the phosphate ester base has been tested and found to be unsatisfactory. It caused premature wearing of the load bearing components. No recommendation can be made on the diester base or fluorosilicone synthetic oils because these have not been tested as of this date.

WARNING: Use of synthetic lubricants may cause failure in down-stream components and result in safety hazards. Check with manufacturer of lubricant and downstream component.

MOUNTING COMPRESSOR PULLEY





NOTE:

DRIVE WEDGE (E.G. METAL WORKING CHISEL) IN THE SLOT TO SPREAD HUB SHOULD BE SPREAD ONLY END TO SLIDE OVER CRANKSHAFT. (CAUTION: EXCESSIVE SPREADING OF HUB COULD CAUSE FRACTURE.)

FLYWHEEL MUST BE MOUNTED WITH SPLIT HUB BOLT HOLE AWAY FROM PUMP. FLYWHEEL SHOULD BE POSITIONED WITH HUB 1/16 IN FROM SHAFT END (SEE SKETCH).

ALIGN KEYWAYS ON SHAFT AND FLYWHEEL HUB AND INSERT KEY. REMOVE WEDGE.

INSTALL NUT AND BOLT; THEN TIGHTEN FLYWHEEL HUB TO SHAFT. TORQUE BOLT TO APPROXIMATELY 500 IN LB.

FILTER INSTRUCTION SHEET

AIR LINE FILTERS-SERIES 3100

Bowl	Max Pressure	Temperature Range
Plastic	150 PSI	40°F to 125°F
Metal	250 PSI	40°F to 200°F
w/Arrow Sight	250 PSI	40°F to 175°F
w/Auto Drain	30 PSI to 175 PSI	40°F to 120°F

WARNING: for compressed air service only. Never use these polycarbonate plastic bowls on air supplied by a compressor lubricated with synthetic oils or oils containing phosphate eaters or chlorinated hydrocarbons. They can carry-over into the air distribution system and chemically attack and possibly rupture the bowls. On these applications use a metal bowl. Also, do not expose these polycarbonate plastic bowls to materials such as carbon tetrachloride, trichlorethylene, acetone, paint thinner, cleaning fluid, or other harmful materials, for they too will craze and/or rupture the bowl. If materials harmful to polycarbonate are present either outside or inside the bowl, use a metal bowl. Metal bowl sight glass will crack exposed to alcohol or alcohol based fluids. not to be used on life support systems.

INSTALLATION - Install filter units so the airflow is in the direction "IN-OUT" as indicated on the head of all units. Filters should be installed upstream of regulators or lubricators and as close as possible to the pneumatic tools or appliances being serviced. Normal operating maximums for plastic bowls are 150 P.S.I. or 125°F. Do not install filters with polycarbonate bowls in the presence of materials harmful to polycarbonate. A metal bowl must be used under these conditions. The use of bowl guard is recommended under all conditions.

WARNING - Units are die cast aluminum, do not over torque when installing.

OPERATION ADJUSTMENTS - Filtering out of dirt, foreign particles and moisture separation is automatic with airflow. There are no moving parts and no adjustments are necessary.

MAINTENANCE - Accumulated sludge and moisture should be drained off by the petcock regularly. An internal float drain will automatically eject moisture at regular intervals. transparent bowls show the amount of collected sediment. This sediment should not be permitted to fill above the lower baffle. For units above 2" NPT use an external float drain.

Wash filter elements at intervals with a cleaning solvent to maintain filtering efficiency. Unscrew ring nut by hand - DO NOT USE WRENCH. Remove bowl and filter element screw. Then remove element to clean. Dry filter element thoroughly before reassembling. Filter bowls are to be cleaned only with kerosene or soapy water. Inspect gaskets and "O" ring, replacing any which are damaged or distorted. Tighten ring nut by hand, making sure "O" ring seal is in filter head groove.

5200 INTERNAL AUTOMATIC DRAIN AVAILABLE

INTERNAL FLOAT DRAIN
Model 5200
Note: 1. for filter with 5200 float drain assembled, add suffix "F" to filter model no.
2. Filter float drain cannot be used with cotton elements in 4.7 oz. bowl size. For use with 9 oz. bowls, cotton element used must be No. 32041.

NOTE; FLOAT DRAINS ARE TO BE USED FOR PRESSURES from 30 PSI up to 175 PSI and from 40°F to 120°F.

ID#	Kit Description	Kit Part Number			Contents
		3102 3203	3202 3103 3104	3106 3108	
1, 9, 10 11,12	Bowl Kit	BK3102BG	BK3104BG	BK3106BG	Plastic Bowl, bowl Gasket, Guard, Drain Valve, Ring
Not Shown		BK3102M	BK3104M	BK3106M	Metal Bowl, Bowl Gasket, Drain Valve, Bowl Ring, Adapter
		BK3102MS	BK3104MS	BK3106MS	Metal Bowl, Sight Glass and Ball, Gaskets, Drain Valve, Bowl Ring, Adapter
4, 5, 6	Element Kit	EK3102-40 EK3102-5 EK3102-20 EK3102-90 EK3102-C	EK3104-40 EK3104-5 EK3104-20 EK3104-90 EK3104-C	EK3106-40 EK3106-5 EK3106-20 EK3106-90 EK3106-C	40 Micron Element and Gaskets 5 Micron Element and Gaskets 20 Micron Element and Gaskets 90 Micron Element and Gaskets Cotton Element and Gaskets
2, 3, 7,8	Repair Kit	RK3102	RK3104	RK3106	Upper Baffle, Shroud, Lower Baffle, Screw, Nut
Not Shown	Bowl Sight Glass Repair Kit	BS3102	BS3102	BS3102	Bowl Sight Glass, Ball Retainer, Gaskets

SERIES 3300 "OILescer" OIL REMOVAL FILTER
PARTS LIST AND INSTRUCTION SHEET

INSTALLATION - Install filter units so the airflow is in the direction "IN-OUT" as indicated on the head of all units. Filters should be installed up-stream of regulators. If air dryer is being used, install the filter down stream from the dryer. In most cases a pre-filter with a 10 micron sintered bronze element or a cotton absorbent filter element is recommended to greatly extend the life of the oilescer element. When the oilescer element becomes clogged with dirt, it must be replaced. If it is kept free from dirt, it will coalesce oil definitely. A pre-filter will remove water and dirt before it reaches the oilescer and is less costly to maintain. The oilescer filter is then free to remove oil, oil vapors, and sub-micron sized particles without prematurely clogging with large particles of dirt and scale. Normal operating maximums for plastic bowls are 150 P.S.I. or 150°F. Do not install filters with polycarbonate bowls in the presence of materials on the list in these instructions. A metal bowl must be used under these conditions. The use of a bowl guard is recommended under all conditions.
Metal bowls are available for pressures up to 250 P.S.I.
WARNING - Units are die cast aluminum, do not over torque when installing. Also, pressurize unit slowly after installation of unit or new element to avoid damage to element.
MAINTENANCE - Accumulated oil and moisture should be drained off by the petcock regularly. The Arrow model 5200 Float Drain can be assembled in place of drain cock to automatically eject moisture and oil at regular intervals. Collected oil should not be permitted to fill above the lower baffle.
To replace element unscrew ringnut by hand - DO NOT USE WRENCH. Remove bowl, and filter element wingnut. Then remove baffle and expended element. Filter element should be replaced when pressure drop exceeds 10 P.S.I. Filter bowls are to be cleaned only with kerosene or soapy water. Inspect gaskets and "O" ring, replacing any which are damaged or distorted. Tighten ringnut by hand, making sure "O" ring seal is in filter head groove.

OPERATION ADJUSTMENTS - If the filter is installed properly, it should give long trouble-free serviceable pressure drop across the filter should not excess 10 P.S.I. If the pressure drop exceeds 10 P.S.I., either the filter element needs to be replace, or the unit is being operated beyond its capacity, and a larger size unit is required. Operating the filter at a pressure drop excess of 10 P.S.I. will greatly reduce the efficiency of the filter.
If oil appears downstream; 1) check downstream air lines to be sure that they are free of residual oil; 2) check to see that the filter element gasket and "O" ring are in good condition and installed properly.

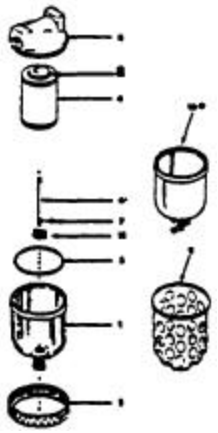
THE FOLLOWING MATERIALS
WILL HARM A POLYCARBONATE BOWL:

Acetaidhyde
Acetic acid (conc.)
Acetone
Acrytonitrile
Ammonium fluoride
Ammonium sulfide
Benzene
Benzoic acid
Benzyl alcohol
Bromobenzene
Butyric acid
Carbolic acid
Carbon disulfide
carbon tetrachloride
Caustic potash solution (5%)
Caustic soda solution (5%)
Chlorobenzene
Chloroform
Cresol
Cyclohexanol
Cyclohexanone
Cyclohexene
Dimethyl formamide
Dioxene
Ethane tetrachloride
Ethyl ether
Ethylamine
Ethylene chlorohydride
Ethylene dichloride
Formic acid (conc.)
Freon (refrigerant & propellant)
Gasoline (high aromatic)
Hydrochloric acid (conc.)
Methyl alcohol
Methylene chloride
Milk of lime (CaOH)
Nitric acid (conc.)
Nitrobenzene
Nitrocellulose lacquer
Phenol
Phosphorous hydroxy chloride
Phosphorous trichloride
Propionic acid
Pyridine
Sodium sulfide
Styrene
Sulfuric acid (conc.)
Sulphural chloride
Tannergas
Tetrahydronaphthalene
Thiophene
Toluene
Xylene

Never use a polycarbonate bowl on an application where:

1. Pressure exceeds 150 P.S.I.
2. The temperature range does not fall between 40°F to 120°F.
3. Air is supplied by a compressor that is lubricated with synthetic oils or oils containing phosphate eaters or chlorinated hydrocarbons.
4. Polycarbonate plastic bowls are exposed to materials such as carbon tetrachloride, trichlorethylene, acetone, paint thinner, cleaning fluids, or other harmful materials.
5. Do not use with synthetic compressor oils or oils containing aromatic hydrocarbons. A straight mineral bases oil is recommended for the line lubricator.

- If materials harmful to polycarbonate are present either outside or inside the bowl or you do not meet its pressure or temperature range, use either a metal bowl with sight glass or metal bowl.



ITEM NO.	FILTER PARTS NAME	PART NO. FOR MODEL-PIPE SIZE				
		2302-1/4"	3302-1/4"	3364-1/2"	3306-3/4"	3308-1"
1	Polycarbonate bowl & Drain Cock	32017	33017	33017	36017	36178
2	Ring Nut (Bowl)	32023	32023	32023	36023	36023
3	Filter Head	32037	32038	34038	36038	38038
4	Filter Element Kit	23050	33050	33050	36050	38050
5	"O" Ring (Bowl)	2260	3340	3340	3460	3460
6	Rod/Element Screw	32060	33070	33070	36055	36055
7	"O" Ring (Rod)/Gasket	0070	32090	32090	0080	0080
8	Gasket/"O" Ring	0160	32080	32080	1300	1300
9	Metal Bowl Guard	32190	34190	34190	36190	-----
10*	Metal Bowl Adapter & Drain Cock	32174	33174	33174	36174	36174
11	Hex nut	-----	-----	-----	39043	39043

* Optional
** Metal Bowl

ARROW PNEUMATICS, INC.
Fluid Power Division
P.O. Box 739 Mundelein, Illinois 60060
Phone: (312) 566-9100

ARROW Pneumatics
P.O. Box 729 • Mundelein, Illinois 60060 • 312/566-8100

REGULATOR
INSTRUCTION SHEET

AIR LINE REGULATORS-SERIES 1500

Standard Units-Relieving
"NR" Designates-Non Relieving
Maximum Supply Pressure-300 PSI
Operating Temperature Range-40°F to 120°F

INSTALLATION - Install regulators so the airflow is in the direction “IN-OUT” as indicated on the head of all units. Regulators should be installed downstream from filters or upstream from lubricators, but as close as possible to the pneumatic tools or appliances being serviced. The regulator will accurately control secondary pressure between 2 and 125 P.S.I., maximum primary pressure 300 P.S.I. The selfbleed feature permits use on dead-end applications.

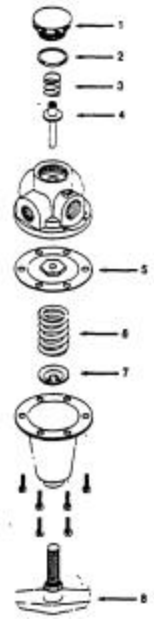
WARNING - Units are die cast aluminum, do not over torque when installing regulator or gauge. Use of Teflon tape is not recommended.

OPERATION ADJUSTMENTS - After the regulator is installed, back off pressure adjusting screw before the air is turned on. This will relieve compression on the regulating spring. Turn on the air supply and regulate the adjusting screw until the pressure gauge shows the desired pressure.

MAINTENANCE - On detection of air leaks, pressure fluctuation, or 'creep"; depressurize system and remove back cap. Inspect valve seat for damage or wear. Inspect seat In head casting for foreign material or damage. Clean with kerosene and blow out with air. Replace any damaged parts.

If leaks persist; remove bonnet, Inspect diaphragm and diaphragm seat for wear or foreign material. Replace damaged or worn pats.

WARNING! For compressed air service only. Not to be used on life support systems.



NR-Non Relieving

ID#	Kit Description	Kit Part Number			Contents
		1/4,3/8	1/2	3/4,1	
8	Adjusting Screw	AK1582S	AK1584S	AK1586S	Adjusting Screw and Nut, Std. Handle
		AK1582P	AK1584P	AK1586P	Adjusting Screw and Nut, Panel Handle
1, 2, 3, 4, 5	Repair Kit	RK1582R	RK1584R	RK1586R	Relieving Diaphragm, Disc Ass'y, Bottom Plug “O" Ring. Bottom Spring
		RK1582NR	RK1584NR	RK1586NR	Non-Relieving Diaphragm Ass'y, Disc Ass'y, Bottom Plug “O" Ring, Bottom Spring
5, 6, 7	Adjusting Spring	SK1582S	SK1584S	SK1586S	2-125 PSI Adjusting Spring, Spring Button.
		SK1582LP	SK1584LP	SK1586LP	2-50 PSI Adjusting Spring and Spring Button
		SK1582HP	SK1584HP	SK1586HP	10-200 PSI Adjusting Spring and Spring Button

ARROW Pneumatics
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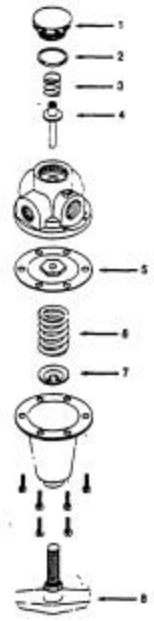
WARNING - Units are die cast aluminum, do not over torque when installing regulator or gauge. Use of Teflon tape is not recommended.

OPERATION ADJUSTMENTS - After the regulator is installed, back off pressure adjusting screw before the air is turned on. This will relieve compression on the regulating spring. Turn on the air supply and regulate the adjusting screw until the pressure gauge shows the desired pressure.

MAINTENANCE - On detection of air leaks, pressure fluctuation, or 'creep"; depressurize system and remove back cap. Inspect valve seat for damage or wear. Inspect seat In head casting for foreign material or damage. Clean with kerosene and blow out with air. Replace any damaged parts.

If leaks persist; remove bonnet, Inspect diaphragm and diaphragm seat for wear or foreign material. Replace damaged or worn pats.

WARNING! For compressed air service only. Not to be used on life support systems.



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ID#	Kit Description	Kit Part Number			Contents
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8	Adjusting Screw	AK1582S	AK1584S	AK1586S	Adjusting Screw and Nut, Std. Handle
		AK1582P	AK1584P	AK1586P	Adjusting Screw and Nut, Panel Handle
1, 2, 3, 4, 5	Repair Kit	RK1582R	RK1584R	RK1586R	Relieving Diaphragm, Disc Ass'y, Bottom Plug “O" Ring. Bottom Spring
		RK1582NR	RK1584NR	RK1586NR	Non-Relieving Diaphragm Ass'y, Disc Ass'y, Bottom Plug “O" Ring, Bottom Spring
5, 6, 7	Adjusting Spring	SK1582S	SK1584S	SK1586S	2-125 PSI Adjusting Spring, Spring Button.
		SK1582LP	SK1584LP	SK1586LP	2-50 PSI Adjusting Spring and Spring Button
		SK1582HP	SK1584HP	SK1586HP	10-200 PSI Adjusting Spring and Spring Button

OPERATING INSTRUCTIONS & PARTS MANUAL

AIR IMPACT WRENCH

MODEL 2Z853C

FORM 5S1138 06942

DAYTON ELECTRIC MANUFACTURING CO. CHICAGO 60648

0682/288/1M

READ INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO ASSEMBLE, INSTALL, OPERATE OR SERVICE THE DAYTON AIR IMPACT WRENCH. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

Description

The Dayton air impact wrench is designed for light-weight automotive, agricultural, manufacturing and maintenance applications such as general assembly, transmission teardown, engine repair, tapping & reaming, etc. The unit features built-in power regulator for convenient torque output adjustment and quick-change ring-socket retainer.

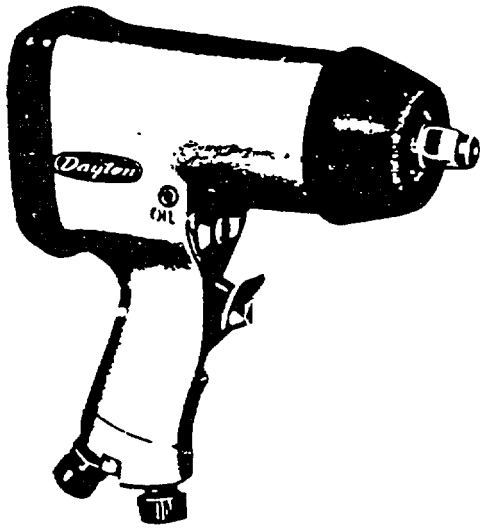

Figure 1 - Model 2Z853C

Specifications

Drive	1/2"
Air Inlet	1/4" NPT
Maximum Operating Pressure	90 psi
Free Speed (no load)	9000 RPM
Torque	20 to 175 ft.-lbs. @ 90 psi
Reversible Delivery	1300 impacts per min.
Average Air Consumption	4 CFM
Overall Length	6-3/4"
Weight (approximate)	5 lbs.
Bolt Capacity	1/2"'

General Safety Information

1. Keep Work Area Clean
   Cluttered areas and benches invite accidents Keep work area well lit.
2. Keep Visitors Away
   All visitors should be kept a safe distance from work area.
3. Store Idle Tools
   When not in use, tools should be stored in dry, high or locked-up place out of reach of children.
4. Don't Force Tool
   It will do the job better and safer at the rate for which it was designed.
5. Use Right Tool
   Don't force a tool or attachment to do a job that it was not designed for. DON'T USE HAND SOCKETS!! USE ONLY IMPACT WRENCH SOCKETS.
6. Wear Proper Apparel
   No loose clothing or jewelry to get caught in moving parts. Rubber gloves and footwear are recommended when working outdoors
7. Use Safety Glasses
   Always use safety glasses with this tool. Also use face or dust mask if cutting operation is dusty.
8. Don't Abuse Hoses or Connectors
   Never carry tool by the hose or yank it to disconnect from power supply. Keep hoses from heat, oil, and sharp edges. Check hoses for weak or worn condition before each use, making certain that all connections are secure.
9. Pressure Rating
   Do not exceed maximum operating pressure.
10. Don't Overreach Keep proper footing and balance at all times
11. Maintain Tools With Care
    Keep tools clean and oiled for best and safest performance. Follow instructions for lubricating and changing accessories. Wiping or cleaning rags and other flammable waste materials must be placed In a tightly closed metal container and disposed of later In the proper fashion.
12. Disconnect Tools
    When not in use; before servicing: when changing accessories

Operation

IMPORTANT: FOR MAXIMUM EFFICIENCY. THIS AIR-WRENCH SHOULD BE OPERATED WITH 90 PSI OF CLEAN, DRY AIR WHILE RUNNING FREE.

CAUTION: Never use higher air pressure to increase the output of the Air-Wrench. Overloading will drastically shorten the life of all Internal parts. DO NOT use hand sockets!! Use Only Impact wrench sockets.

WARNING: ALWAYS USE EYE PROTECTION WHEN OPERATING THIS TOOL.

Before each shift, drain water out of air tank and blow condensation from air lines. Blow down compressor more frequently in hot, humid weather. After clearing air compressor of moisture and lubricating wrench, connect to a proper size air hose and select a socket which fits tool shank and nut closely.

Loose, worn or cracked sockets reduce impact power. Where possible, use deep sockets in place of long, springy extension bars which absorb impact. Always use the simplest hook-up possible, as each connection reduces available power.

To set Air-Wrench to desired power, select a nut or screw of known tightness of the same size, thread pitch and thread condition as those on the job. Turn power regulator to low position, apply wrench to nut and gradually increase power (turn regulator to admit more air) until nut moves slightly In the direction it was originally set. The wrench is now set to duplicate that tightness, note regulator setting for future use. When tightening nuts not requiring critical torque values, run nut up flush and then tighten an additional one quarter to one half turn (slight additional turning is necessary if gaskets are being clamped). For additional power needed on disassembly work, turn regulator to Its fully open position. This Air-Wrench is rated at 112" USS bolt size. Rating must be down graded for spring U bolts, tie bolts, long cap screws, double depth nuts, badly rusted conditions and spring fasteners as they absorb much of the impact power. When possible, clamp or wedge the bolt to prevent springback.

Soak rusted nuts in penetrating oil and break rust seal before running off with Air-Wrench. If nut does not start to move in three to five seconds, use a larger size Air-Wrench. Do not use Air-Wrench beyond rated capacity as this will drastically reduce tool life.

Installation

An air compressor of at least one horsepower with four CFM delivery at 100 psi, with an air tank of at least 40 gallons capacity is required.

Pipe and fittings between compressor and air hose should be at least 1/2” nominal size (5/8” I.D.). Be sure piping is free of dips or sags where moisture can collect.

Air hose should be at least 3/8” I.D. When two or more lengths of hose are connected together, all except the short leader hose should be 1/2” I.D.

Couplers may be used. Do not connect couplers directly to the air inlet. They increase the overall bulk of the tool, put an unnecessary strain on the tool inlet threads and deteriorate rapidly due to vibration.

The use of air filters and air line lubricators is recommended. Clean air strainer frequently to remove accumulations of foreign matter which restrict air flow. Never omit strainer from the Air-Wrench.

Trouble Shooting

Factors outside the tool may cause loss of power or erratic action. Reduced compressor output, excessive drain on the air line, moisture or restrictions in air pipes or the use of hose connections of improper size or poor condition may reduce air supply. Grit t gum deposits in the tool may cut power and may be corrected by cleaning the air strainer and flushing out the tool with gum solvent oil or an equal mixture of SAE #10 oil and kerosene. The use of worn or cracked sockets may prevent the wrench from delivering full power to the work. If outside conditions are in order, disassemble tool, replace worn or damaged parts, clean, reassemble and relubricate.

Maintenance

CAUTION: Disconnect wrench from power air supply before servicing.

DISASSEMBLY/ASSEMBLY SPECIFICATIONS

1. If necessary, heat motor housing (Ref. No. 1) to, no more than, 250°F to aid removal of motor and clutch assemblies.
2. Coat O.D. of oil seal (Ref. No. 16) with a good grade rubber cement and press into motor housing (Ref. No. 1) with lips of oil seal pointing toward chuck chamber.
3. Press new reverse valve bushing (Ref. No. 28) in motor housing flush with face of motor housing, match narrow slot in reverse valve bushing with trigger slot. Using a #19 drill, drill through stop pin hole to allow stop pin to pass through wall of reverse valve bushing. Ream reverse valve bushing (Ref. No. 5) with a standard 7/16" reamer.
4. Tighten Allen Set Screw (Ref. No 27) In motor housing to 30-35 inch lbs.
5. Tighten throttle cap (Ref. No. 24) in valve block to 230-250 inch lbs.
6. Coat O. D of oil seal (Ref. No. 35) with a good grade rubber cement and press into front end plate (Ref. No 37) with lips of oil seal toward bearing relief in end plate.
7. Tighten four Allen Cap Screws (Ref. No. 26) to 55-60 inch lbs.

LUBRICATION

Daily before using and before putting tool into service, pour about one tablespoonful of recommended oil into air inlet. An Air Line Lubricator installed at the end of the air pipe leading to this pneumatic tool is necessary to assure a constant and adequate supply of lubricant to the motor.

At each inspection period, drain oil from motor housing and add ¾4 oz. of recommended clutch oil.

At each inspection period, clean open bearings and repack 25% of free space within bearing with recommended grease.

At each inspection period, clean clutch parts and lubricate splines of shank, hammer cam, and rotor with a molybdenum disulphide lubricant.

RECOMMENDED LUBRICANTS

Use a turbine or spindle grade oil with a viscosity of 100-150 S.U.S. at 1000F which contains a rust inhibitor.

A good grade clutch oil with a viscosity equivalent to SAE #30 motor oil is recommended for use in the motor housing.

Bearing Grease is recommended for use in open bearings.

Use a good grade bearing grease such as Humble Oil Co's. Andok C grease or equivalent.

Bel-Ray Company's Anti-Seize or equivalent is recommended for use on splines of rotor, cam, and shank.

Notes

ORDER REPLACEMENT PARTS THROUGH DEALER FROM WHOM PRODUCT WAS PURCHASED

Please provide following information:

- Model Number
- Serial Number (if any)
- Part Description and Number as shown in Parts List.

If dealer cannot supply order from:
Dayton Electric Mfg. Co.
Parts Department
5959 W. Howard St.
Chicago, Illinois 60648

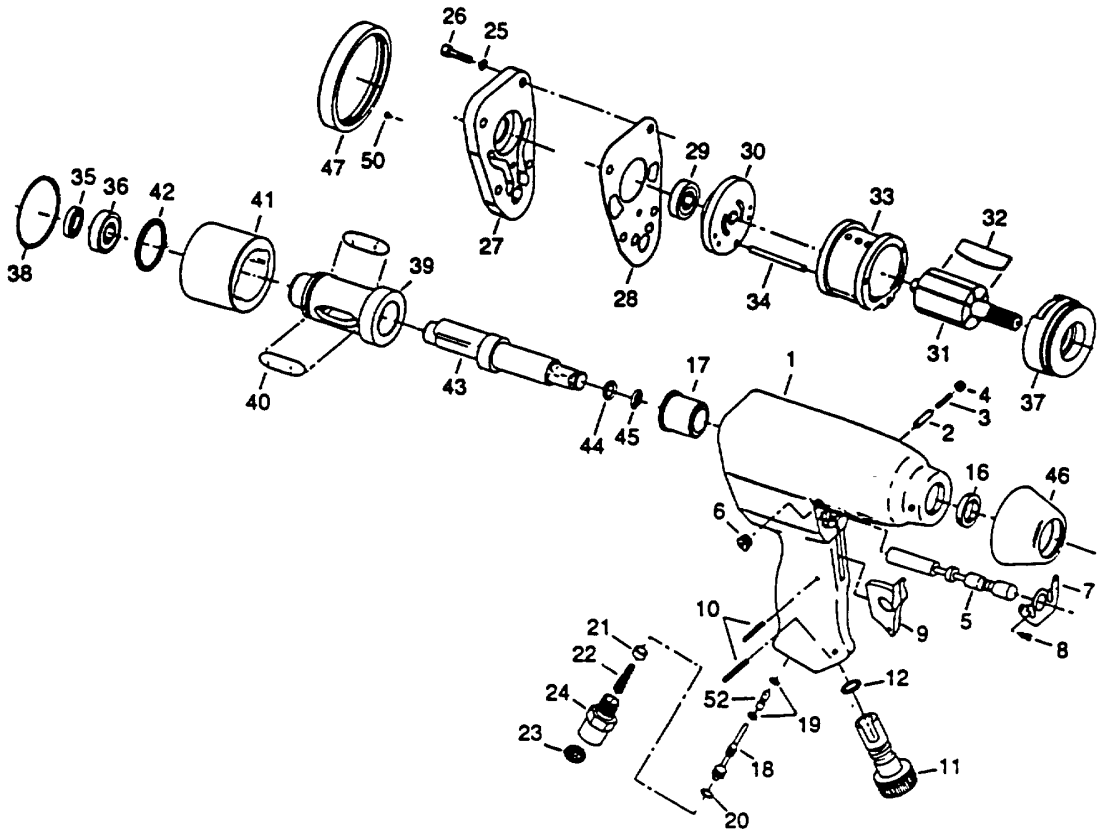

Figure 2 - Replacement Parts Illustration

Replacement Parts List

REF NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
1	730042	Motor housing, incl: ref. #17	27	730028	End cap
2	729435	Rev. valve stop pin	28	730030	Gasket
3	729434	Stop pin spring	29	1005062	Ball bearing
4	729433	Retainer plug	30	730031	Rear plate
5	729436	Reversing valve	31	730045	Rotor
6	729739	Oil fill plug	32	729913	(6) Rotor blade
7	729437	Exhaust deflector	33	730044	Cylinder
8	729438	(2) Exh. deflector screw	34	730032	Motor pin
9	729430	Trigger	35	729477	Oil seal
10	729006	Pin	36	729478	Ball bearing
11	730043	Air regulator, Assembly	37	730035	Front plate
12	1008695	"O" ring	38	730036	"O" ring
16	730022	Oil seal	39	730038	Cage
17	730021	Housing bushing (included in #1)	40	730018	(2)Pin
18	730026	Push rod	41	730068	Hammer
19	729448	(2) "O" ring	42	729426	"O" ring
20	1008127	"O" ring	43	730039	Anvil (standard 1/2" sq. dr.)
21	729749	"O" ring retainer	44	1008695	"O" ring
22	729748	Valve spring	45	1013129	Socket retaining ring
23	1005726	Screen	46	730046	Rubber nose guard
24	729747	Hose adapter	47	729445	Housing band
25	729035	(4) Lock washer	50	729343	(2) Spec. plate screw
26	7.9,462	(4) Soc. head cap screw	52	729449	Plunger

APPENDIX C

Preventive maintenance checks and services (PMCS) for the Compressed Air System

C-1 Introduction to PMCS

NOTE

TM 55-1930-209-14&P-19 contains PMCS for all systems on the ROWPU Barge. This appendix contains only PMCS for the Compressed Air System

a. General.

(1) Systematic (B) before, (D) during, (A) after, and scheduled periodic PMCS are essential to ensure that the Reverse Osmosis Water Purification Barge is in operational readiness at all times. The purpose of the PMCS program is to discover and correct deficiencies and malfunctions before they cause serious damage or failure of the barges and their support systems. An effective PMCS program requires that operators report all unusual conditions noticed before, during and after operation as well as while performing periodic PMCS. All deficiencies and malfunctions discovered during maintenance inspections must be recorded, together with the corrective action taken, on DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

(2) A schedule for preventive maintenance inspections and service should be established and adhered to. When operating under unusual conditions, such as extreme heat or cold, it may be necessary to perform PMCS more frequently.

(3) The PMCS items have been arranged and numbered in a logical sequence to provide for greater efficiency and the least amount of downtime required for maintenance.

b. PMCS columnar entries.

(1) Item Number Column. Checks and services are numbered in chronological order regardless of interval This column is used as a source of item numbers for the "Item Number" column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, in recording results of PMCS.

(2) Interval Column. The interval columns tell you when to do a certain check or service: before, during, or after operation. Sometimes a dot may be placed in more than one interval column which would mean you should do the check or service at each of those intervals.

(3) Item to Be Inspected Column. This column lists the common name of the item to be inspected such as "Air Filters."

(4) Procedures Column. This column tells you how to do the required checks and services. Carefully follow these instructions.

(5) Equipment is Not Ready/Available if Column. This column tells you when and why your equipment cannot be used.

NOTE

The terms "Ready/Available" and "Mission Capable" refer to the same status: equipment is on hand and is able to perform its combat missions. (See DA PAM 738-750).

(6) Increased Inspections. Perform weekly as well as Before Operations PMCS if:

(a) You are the assigned operator and have not operated the item since the last weekly PMCS.

(b) You are operating the item for the first time.

(7) Leakage definitions. In checking for fluid leaks, the following leakage definitions apply to all ROWPU barges and barge equipment, product water, and seawater leakage by class type.

(a) Class I Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

(b) Class II Leakage of fluid great enough to form drops, but not enough to cause drops to drip from the item being checked/inspected.

(c) Class III Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

Equipment operation is allowable with minor leakages (Class I or II). However, the fluid level or operating pressure of the Item being checked/inspected must be considered. When In doubt, notify the shift leader or bargemaster.

When operating with Class I or Class II leaks, continue to check fluid levels as required by PMCS and operating instructions.

(8) The following fuel and hazardous material leakage procedures apply for any fuel, chemical, or bilge system.

WARNING

Class I, II or III leaks or seepage occurring In a fuel, chemical, or bilge container, tank, line, piping, or valve can cause fire or health hazards.

(a) If any leaks or seepage from a fuel, chemical, or bilge container, tank or fluid line is detected, it must be immediately reported to the shift leader or bargemaster for corrective action.

(b) To prevent combustible or toxic fumes from collecting or contaminated material from spilling, exercise extreme caution after detecting leaks or seepage of flammable or hazardous material.

c. Continuous operation. When equipment must be kept in continuous operation for extended periods of time, check and service only those items that can be checked and serviced without disturbing operations. Perform complete checks and services when the equipment can be shut down.

d. Maintenance log. Always record the time and date of PMCS, any deficiencies noted, and corrective action taken in the PMCS log book.

C-2 Major components. Major components, their basic functions and location on the barges are listed in Chapter 1.

C-3 Compressed air system description. The compressed air system provides compressed air to five air stations in the ROWPU space, one in the workshop, and one on stem weatherdeck. It also provides compressed air to two air stations for blowdown of seachests in void 2 starboard and void 4 port. These outlets, with other major components, valves, and piping are shown schematically in Figure NO TAG for Barge 1 and in Figure NO TAG for Barges 2 and 3.

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System

B - Before
D - During
A - After
D - Daily
W- Weekly
M - Monthly
Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL B	D	A	D	W	M	Q	S	A	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
										COMPRESSED AIR SYSTEM	**WARNING** **Be sure electrical power is OFF before performing maintenance or repair on this system. Open circuit breakers. Redtag circuit breakers or motor controller with "WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE." Observe all safety precautions listed at the beginning of this manual.**	
1	•		•							All Components	a. Wipe components clean, especially gauges and control panels.	
	•		•								b. Check for leaks, paying special attention to joints, valves, fittings, and piping Report leaks to shift leader or bargemaster.	Any leaks.
	•		•								c. Check for loose or missing securements or fasteners. Tighten or replace as necessary.	Securements or fasteners loose or missing.
	•		•								d. Check for damage, especially to pressure gauges, filters, and control panels. Notify shift leader or bargemaster so repairs can be made.	Pressure gauges, filters and/or control panels damaged
			•								e. Remove rust and corrosion. Touch-up or paint in accordance with TB 43-0144 as necessary. Do not paint threads or labels.	
2	•		•							Receiver	Drain receiver by Turning drain cock clockwise (small T-handle) on bottom of tank When receiver is completely drained, close valve.	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
A - After

D - Daily
W- Weekly
M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
3	•		•	•						Oil Level	a. Check oil in sight glass on compressor: 1) Barge 1 - If oil cannot be seen in sight glass, remove oil cover nut in center of air intake assembly. Pour oil, one pint at a time, until level is at halfway mark on sight glass. DO NOT overfill. Use nondetergent, rust, and oxidation inhibiting industrial oil with viscosity equivalent to SAE 20, 20-90°F or SAE 10, 90°+. **CAUTION** **On barges 2 and 3 air compressors, NEVER allow oil level to fall more than 1/8 in. below full level mark on sight glass.** 2) Barges 2 and 3 - Oil level should be up to full mark on sight glass. To add oil,' unscrew oil plug to left of sight glass and add nondetergent, rust, and oxidation inhibiting industrial oil with a viscosity equivalent to an SAE grade 20 weight motor oil. Add oil to full level mark on sight glass. DO NOT overfill. Replace oil filter plug. **NOTE** **EXTENDED SHUTDOWN** Follow procedures e through k for extended shutdown of 12 hours or more.	Oil level low.
			•								b. Turn AUTO-MANUAL switch on electric controller to MANUAL.	
			•								c. Push electric controller STOP button.	
			•								d. Close main supply valve on forward end of receiver by turning handle at right angle to pipe.	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
A - After

D - Daily
W- Weekly
M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
											WARNING **When bleeding receiver drain cock, ALWAYS use protection shield to protect eyes and face from flying particles. Wear gloves and avoid skin damage by rolling down shirt sleeves on clothing and closing buttons and collars.**	
			•								e. Open drain cock on bottom of receiver to drain air and water. Turn small handle clockwise. When receiver pressure reads 0 psi, dose drain cock.	
			•								f. Open drain valves on bottom of air filters 1 and 2.	
			•								g. Open air station valves 1 through 5 and 7 by turning counter-clockwise until they stop. Leave them open	
			•								h. Make sure air station valves 6, 8 and 9 are closed.	
		•									i. Check that receiver pressure gauge indicates no more than 155 psi when compressor set for AUTO. If pressure greater, pull test link on air safety valve. If air does not escape, replace safety valve. Valve cannot be adjusted or repaired. To replace valve: 1) Shut down air compressor system. 2) Redtag power panel 1 circuit breaker 3P5 to indicate, 'WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE." 3) Unscrew safety valve. 4) Screw in new safety valve (Barge 1 - P/N 9710-5332-00) (Barges 2 and 3 - P/N 91A033175-001) wrench tight. 5) Start air compressor system.	Pressure gauge indicates more than 155 psi.

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
A - After

D - Daily
W- Weekly
M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL B	D	A	D	W	M	Q	S	A	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
		•									6) When receiver pressure gauge reads at least 100 psi, check receiver safety valve by puling safety link If air does not escape from receiver valve repeat above procedures to install another new safety valve.	Air does not escape from receiver valve.
											7) Remove redtag from power panel 1 circuit breaker 3P5.	
		•									j. Check that air pressure gauges on air pressure regulators 1 and 2 Indicate 40 psi. If not, set pressure regulators 1 and 2 by turning adjusting screw on bottom of regulator clockwise to decrease and counterclockwise to increase air pressure beyond regulator.	
		•									k. Check for normal operation -when set on AUTO, compressor cycles on and off to maintain proper air pressure. If not normal, shut down using extended shutdown procedures and troubleshoot Make repairs/adjustments as required.	Air pressure does not maintain normal level.
											WARNINGS **DO NOT use compressed air to clean clothing or work space. High pressure (HP) air turns small particles Into dangerous projectiles that may cause bodily Injury.** **When using compressed air to clean equipmerit, ALWAYS use protective shield to protect eyes and face from flying particles. Wear gloves and avoid skin damage by closing buttons and collars and rolling down sleeves on clothing.**	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before D - Daily Q - Quarterly
D - During W- Weekly S - Semiannually
A - After M - Monthly A - Annually

ITEM NO.	INTERVAL B	D	A	D	W	M	Q	S	A	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
		•									I. Check air station 6 outlet PIG launcher controls as follows: **CAUTION** **Shore discharge hose must remain free from oil and dirt. Use only designated 25-ft air hose on compressed air station 6 for supplying compressed air to power PIG through shore discharge hose.** 1) Hold clean, white, dry cloth in front of air station 6 outlet and turn valve counterclockwise to open. Blow compressed air through cloth. Smell air coming out of air valve. If air smells oily or specks of dirt, oil or grease show on cloth, check oil level in air compressor. 2) If oil is overfilled, drain to authorized level Change air filter and repeat air quality check with white cloth. Continue until air station 6 is free of oil smell and stain.	Oil is present in line.
4										Air Impact Wrench	**WARNINGS** **Always wear safety glasses when operating air impact wrench.** **Use only Impact wrench sockets. DO NOT use sockets from a hand wrench set.**	
	•										a. Make sure compressed air system has been purged of moisture within last 4 hours If not, open drain cock on bottom of air filter 1 until all moisture has been drained from system.	
	•										b. Check all air station valves and quick-disconnect fittings for damage or improper operation. Notify shift leader or bargemaster of any problem.	Valves and/or quick disconnect fittings damaged or inoperable.

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
A - After

D - Daily
W- Weekly
M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL B	D	A	D	W	M	Q	S	A	ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	•										c. Check for loose, worn, or cracked sockets which reduce wrench impact power and may create a hazard for the operator.	Sockets loose, cracked or worn.
	•										d. Inspect air hoses for damage or wear. Replace as required.	Air hoses damaged or worn.
	•										e. Each day, before using wrench, pour one tablespoon of oil into air inlet (turbine or spindle grade oil with 100-150 Saybalt Universal Seconds viscosity - contains rust inhibitor). **NOTE** **Oil is in the air inlet lubricator where hose is connected to assure constant supply of lubricant to the motor. DO NOT put oil in the oil hole on the side of the wrench body.**	
	•										f. Check to be sure air inlet screen is clean and properly installed in hose adapter. **WARNING** **DO NOT operate system without an operating safety valve.** **WARNING** **When bleeding pressure from air compressor drain cock, ALWAYS use protective shield to protect eyes and face from flying particles. Wear gloves, close buttons and collars and roll down sleeves on clothing.**	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
A - After

D - Daily
W- Weekly
M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
											NOTE **AFTER OPERATION**	
	•										• For less than 12 hour shutdown: 1. Turn CHECK AUTO-MANUAL switch on electric controller to MANUAL. 2. Push electric controller STOP button. 3. Close main supply valve on forward end of receiver by turning handle at right angle to pipe. 4. Follow procedures a through d below. • For extended shutdown -12 hours or more follow procedures e through on below.	
5	•		•							Compressor	a. Drain filters 1 and 2 by opening drain valves on bottom of filters	
	•		•								b. Close drain valves when water and moisture have drained	
											NOTE **Weekly or after every 40 hours of equipment operation (whichever occurs first).**	
					•						c. Barge 1. Clean compressor air filter by the following procedures. 1) Redtag power panel 1 circuit breaker 3P5 indicating. WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE.' 2) Shut down air compressor system. 3) Unscrew by turning clockwise oil cover nut on top of air intake assembly on top of compressor. 4) Remove oil seal and oil cover.	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
A - After

D - Daily
W- Weekly
M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
					•						5) Lift out air filter and blow out with compressed air, blowing from inside towards outside of filter. If filter still shows signs of dirt, lint and/or oil in the mesh, wash in soapy water and dry with compressed air. If still dirty, replace with new filter (P/N1503-0189-00). 6) Carefully wipe out inside of air filter assembly, being very careful not to get dirt or lint into air intakes on each side. 7) Place clean or new filter into assembly, making sure it seats properly in bottom. 8) Place oil cover on top of air filter, install gasket and screw on oil cover nut. 9) Start air compressor system and check for leaks or other operating discrepancies. Correct as necessary. 10) Remove red tag from power panel 1 circuit breaker 3P5.	
					•						d. Barges 2 and 3. Clean cooling surfaces of compressor intercooler and aftercooler by wiping with a cloth soaked in solvent and then wipe dry. Clean other components as necessary. Clean electrical components. **NOTE** **Monthly or after every 160 hours of equipment operation (whichever occurs first).**	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before D - Daily Q - Quarterly
D - During W- Weekly S - Semiannually
A - After M - Monthly A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
					•						e. Check receiver safety valve on all compressors (Barges 1, 2, and 3). 1) Pull up on safety link on safety valve on top of receiver. Air should escape from valve, **WARNING** **System MUST NOT be operated without an operating receiver safety valve. In the event that the compressor continues to run beyond factory set pressure, this valve reduces receiver pressure to a safe level.** 2) If air does not escape, replace receiver safety valve. This valve can not be adjusted or repaired. Replace as follows (a) Shut down air compressor system. (b) Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE." (c) Unscrew safety valve. (d) Screw in new safety valve (Barge 1 - P/N 9710-5332-00) (Barges 2 and 3 - P/N 91A033175-001) wrench tight. (e) Start air compressor system. (f) When receiver pressure gauge reads at least 100 psi, check receiver safety valve by pulling safety link. Air should escape from receiver thru valve. If not, repeat above procedures and install another new safety valve. This valve is NOT adjustable or repairable. (g) Remove red tag from power panel 1 circuit breaker 3P5.	Air does not escape from valve.

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
A - After

D - Daily
W- Weekly
M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
						•					f. Barges 2 and 3. Remove two compressor intake air cleaners on top of compressor and replace with two clean air dean ers. (If air cleaners are not dirty after 1 month of use, time between changing these cleaners may be extended to every other month.) Replace as follows: 1) Shutdown air compressor system. 2) Redtag power panel 1 circuit breaker 3P5 indicating, “WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE." 3) On top of compressor on each of two air intake filters, loosen setscrews holding air filters to intake manifold. Remove assembly by pulling away from intake manifold. 4) Place cleaned, used air filters onto air intake manifolds by sliding over end of manifold and tightening setscrews. 5) Start air compressor system. 6) Remove red tag from power panel 1 circuit breaker 3P5. **WARNING** **When using compressed air for cleaning components, ALWAYS use protective shield to protect eyes and face from flying particles. Wear gloves and avoid skin damage by closing buttons, collars, and rolling down shirt sleeves on work clothing.** 7) Clean replaced air filters by using compressed air blowing from inside towards outside. Clean thoroughly until no more dust or particles are blown out of assembly. Return cleaned air filters to stock for use at next scheduled maintenance.	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
A - After

D - Daily
W- Weekly
M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
						•					**NOTE** **Semiannually, replace both air filters with new assemblies (FSCM 16327, P/N Z66A, muffler assembly, Intake).** g. Check Barges 2 and 3 pulley clamp bolts and setscrews for tightness and drive belts for correct tension, condition, and alignment as follows: 1) Drive belt replacement (a) Shut down air compressor system. (b) Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE." (c) Remove belt guard from compressor by unscrewing three bolts (two have spinlock nuts). Place bolts, washers, and nuts with guard and place where it will not be damaged. (d) With two V-belts exposed, check appearance for frayed, worn, or extra hard and shiny edges or breaks in underneath side of belts. If belts show these signs, belts must be replaced in pairs (FSCM 16327, P/N 3X645). (e) Loosen four belts holding electric motor to base plate, slide motor towards compressor until belts can be slipped off pulleys. Discard old belts. (f) With belts off, and using a torque wrench, check tightness of bolt holding compressor pulley on compressor shaft. Torque to 500 in-lb. With normal wrench, check tightness of setscrew holding pulley on electric motor shaft. Setscrew must be wrench tight.	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before D - Daily Q - Quarterly
D - During W- Weekly S - Semiannually
A - After M - Monthly A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
						•					(g) Place two new belts on compressor pulley and then on motor pulley. (h) Pull motor away from compressor until belts are as tight as possible and while another crew member holds motor in this position, tighten four bolts holding motor to base plate. **NOTE** **When Installing new pulley belts, make sure belt tension Is as tight as possible. Pulley belts stretch with use and must be checked for proper tension at next monthly maintenance service.** (i) With a straight edge, check that pulleys are at right angles to their shafts and that belts in their grooves are running straight. If not, slightly loosen bolts holding electric motor and move motor until pulleys and belts are running straight in their grooves and are square with compressor and motor shafts. Tighten motor bolts. Again, check alignment with straight edge. If not properly lined up, loosen motor bolts and try again. When belts are straight, tighten four motor bolts wrench tight. 2) Belt alignment/tension check: (a) Shut down air compressor system. (b) Redtag power panel 1 circuit breaker 3P5 indicating, “WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE."	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
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D - Daily
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M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
						•					(c) Remove belt guard from compressor by unscrewing three bolts (two have spinlock nuts). Place bolts, washers and nuts with guard and place where it will not be damaged. (d) With two V-belts exposed, check appearance for frayed, worn, or extra hard and shiny edges or breaks In underneath side of belts. If belts show these signs, belts must be replaced in pairs in accordance with procedures in paragraph 1, above. If belts are in acceptable condition, proceed with belt alignment/tension check. (e) With torque wrench, check tightness of bolt holding compressor shaft. Torque to 500 in-lb. (f) With normal wrench, check tightness of setscrew holding pulley on electric motor shaft. Setscrew must be wrench tight. (g) Lay a straight edge across top of belts from compressor pulley to electric motor pulley and press down on belts with a thumb. Belts should depress between 1/4 and 1/2 in. if belts depress more than this, loosen four bolts holding motor to base plate and move motor away from compressor until belts are within tolerances. Tighten motor bolts, check belt tension, and then check belt alignment. If all are acceptable, tighten motor bolts wrench tight. (h) Install belt guard using three bolts, spinnuts, and washers.	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
A - After

D - Daily
W- Weekly
M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
						•					3) Start air compressor system. Check for any deficiencies and correct. 4) Remove red tag from power panel 1 circuit breaker 3P5. **NOTE** **Quarterly or after every 250 hours of equipment operation (whichever occurs first).** h. Compressor oil change. 1) Shut down air compressor system. 2) Redtag power panel 1 circuit breaker 3P5 indicating, “WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE." 3) Unscrew oil drain plug and gasket and drain oil into container. 4) While oil is draining, remove oil filler plug. 5) Upon completion of draining, install oil drain plug with new gasket. 6) Add oil in oil filler hole until oil level in sight glass is within 1/8 in of full level mark on glass. Do NOT overfill. 7) Install oil filler plug and wrench tighten. 8) Start air compressor system. 9) Check oil level in sight glass. It must not be above halfway mark in glass or lower than 1/8 in below mark. If not within these markings, add more oil, or drain oil to bring it within these markings. 10) When compressor is operating, check drain plug and oil filler plug for leaks. Tighten as necessary. 11) Remove red tag from power panel 1 circuit breaker 3P5.	
							•					

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
A - After

D - Daily
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Q - Quarterly
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A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
							•				i. Barges 2 and 3 compressor air intake filters. Clean and replace as described in paragraph 3-7.3 b if the time between cleaning has been extended to every other month	
							•				j. Compressor oil change (Barge 1). When oil change is required as part of semiannual maintenance services, perform these procedures: 1) Shut down air compressor system. 2) Redtag power panel 1 circuit breaker 3P5 indicating, “WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE." 3) Unscrew oil drain plug and gasket and drain oil into container 4) While oil is draining, remove oil covet nut, seal, and oil cover. 5) Upon completion of draining, install oil drain plug with new gasket. 6) Add oil down oil tube until level can be seen in lower half of sight glass 7) Install oil cover, seal, and oil cover nut. Tighten nut hand tight. 8) Start air compressor system. 9) When compressor is operating, check drain plug and oil cover for leaks (see paragraph 2-1.4). Tighten as necessary. 10) Remove red tag from power panel 1 circuit breaker 3P5.	
							•				k. Check overall operation of system by going thru prestart, start, and operating procedures. Shut down system and repair or replace components as necessary. Notify shift leader or bargemaster of operating discrepancies.	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
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Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
								•			I. Air filter 1. When pressure regulators indicate dirt and grit in the system and for semiannual PMCS, perform the following: 1) Shut down air compressor system. 2) Redtag power panel 1 circuit breaker 3P5 indicating: “WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE." 3) Manually, without using a wrench, unscrew ring nut attaching bowl guard and plastic filter bowl to filter head and remove guard, bowl, and bowl gasket. 4) Unscrew filter element screw and carefully remove lower baffle, gasket, filter element, gasket, shroud, and upper baffle. Place them on clean cloth in the sequence shown. 5) Wash filter element in soap and water, rinse, and allow to dry. Replace element (NSN 4330-00-803-1028) if cracked, chipped, or deformed or if unable to clean to original color. 6) Wash filter bowl and all other parts with soapy water. Rinse and dry with lint-free cloth. 7) Inspect each part and replace any damaged or worn parts using bowl kit (CAGEC 04049, P/N 36017-BKF-329). 8) Assemble parts in sequence on the filter element screw. Screw filter element screw into filter head. 9) Carefully install plastic filter bowl, guard, and gasket. Then secure to filter head with ring nut. Tighten hand-tight without using a wrench. 10) Start air compression system. Check for and correct any deficiencies. 11) Remove red tag from power panel 1 circuit breaker 3P5.	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before D - Daily Q - Quarterly
D - During W- Weekly S - Semiannually
A - After M - Monthly A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
								•			m. Air filter 2 (oil removal filter). if air station 6 fails air quality check and for semiannual maintenance services, perform these procedures: 1) Shut down air compressor system 2) Redtag power panel 1 circuit breaker 3P5 indicating, “WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE.” 3) Without using a wrench, manually unscrew oil removal filter bowl ring nut attaching metal bowl to filter head. Remove bowl ring nut, metal bowl, and bowl O-ring. 4) Unscrew hex nut and remove rod O-ring gasket, filter element, and gasket O-ring. Rod/element screw should remain attached to filter head. If rod/element screw unscrews from filter head, screw it back into filter head. 5) Replace filter element (CAGEC 31408, P/N CKF-507). If gasket O-ring and rod O-ring gasket are worn or damaged, replace them. 6) Place gasket O-ring on top of new filter element and slide element over rod/element screw. Hold In place by hand and install rod O-ring gasket over rod/element screw. Screw on hex nut. Before tightening nut, check that filter element is squarely set against filter head. Then tighten hex nut hand tight. 7) Clean metal bowl with warm soapy water, rinse, and dry with lint-free cloth. **NOTE** **Bowl O-ring must be replaced dry, without any silicone lubricant**	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
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D - Daily
W- Weekly
M - Monthly

Q - Quarterly
S - Semiannually
A - Annually

ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
								•			8) Replace bowl O-ring if damaged or worn. 9) Carefully install bowl O-ring and metal bowl. Hold in place by hand and screw bowl ring nut onto threads on filter head. Make sure O-ring is properly seated and then tighten hand-tight. 10) Start air compressor system. 11) Remove red tag from power panel 1 circuit breaker 3P5.	
										Air Pressure Regulator	**NOTE** **Semiannually or after 1000 hours of equipment operation (whichever occurs first).**	
								•			Air pressure regulators 1 and 2. Upon detection of leaks, pressure fluctuation, pressure creep, or for semiannual maintenance services, perform these procedures: 1) Shut down air compressor system. 2) Redtag power panel 1 circuit breaker 3P5 indicating, "WARNING - DO NOT ACTIVATE. REPAIRS BEING MADE." 3) On air pressure regulator, unscrew bottom plug (or pressure gauge if installed in this manner) and remove bottom plug O-ring, bottom spring and disc assembly. Inspect valve seat for damage or wear. 4) Inspect valve seat in head casting for foreign material or damage. Clean with soapy water, rinse, and dry with lint-free cloth.	

Table C-1. Preventive Maintenance Checks and Services for Compressed Air System (Continued)

B - Before
D - During
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ITEM NO.	INTERVAL									ITEM TO BE INSPECTED	PROCEDURES CHECK FOR AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	EQUIPMENT IS NOT READY AVAILABLE IF
	B	D	A	D	W	M	Q	S	A			
								•			5) Replace any damaged parts using repair kit (CAGEC 04049, Part No. 1586R) parts (bottom plug O-ring, bottom spring, and/or disc assembly). 6) Assemble pressure regulator in sequence. 7) Start air compressor system. 8) Check for proper operation. If still malfunctioning, shut down air compressor system and perform steps 10 thru 17. 9) f working properly, proceed to step 17. 10) Remove six screws attaching bonnet to head casting and remove bonnet 11) Remove spring button, adjusting spring, and relieving diaphragm 12) Inspect diaphragm and diaphragm seat in head casting for tears, wear, or foreign material. 13) Replace damaged or worn parts using adjusting spring hit parts (relieving diaphragm, adjusting spring, and/or spring button). 14) Assemble parts in sequence. Install bonnet and secure with six screws. 15) Back off adjusting screw until it turns freely. 16) Start air compressor system. 17) Adjust pressure regulator to required setting of 40 psi. Turn adjusting screw clockwise to increase pressure reading and counterclockwise to decrease pressure reading. 18) Remove red tag from power panel 1 circuit breaker 3P5.	

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff

Official:

MILTON H. HAMILTON
Administrative Assistant to the
Secretary of the Army
06891

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)
PFC JOHN DOE
COA, 3d ENGINEER BN
FT. LEONARDWOOD, MO 63108

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 55-1930-209-14&P-7	15 OCTOBER 1992	Water Purification Barges, Compressed Air System

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO
6	2-1 a		
B1		4-3	
125	line 20		

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

In line 6 of paragraph 2-1a the manual states the engine has 6 Cylenders. The engine on my set only has 4 Cylenders. Change the manual to show 4 Cylenders.

Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the other.

I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got what I ordered, so the NSN is wrong. Please give me a good NSN

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER
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SIGN HERE John Doe
JOHN DOE

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RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

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DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
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PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

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FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

COMMANDER
U.S. ARMY TROOP SUPPORT COMMAND
ATTN: AMSTR-MMTS
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter= 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 Meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = 0.35 ounce
1 dekegram = 10 Grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fluid ounce
1 deciliter = 10 centiliters = 3.38 fluid ounces
1 liter = 10 deciliters = 33.81 fluid ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 27.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq millimeters = .155 sq. inch
1 sq. decimeter= 100 sq centimeters = 125.5 sq. inches
1 sq. meter (centare) = 100 sq decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. decimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540			
feet	meters	.305	ounce-inches	newton-meters	.007062
yards	meters	.914	centimeters	inches	.394
miles	kilometers	1.609	meters	feet	3.280
square inches	square centimeters	6.451	meters	yards	1.094
square feet	square meters	.093	kilometers	miles	.621
square yards	square meters	.836	square centimeters	square inches	.155
square miles	square kilometers	2.590	square meters	square feet	10.764
acres	square hectometers	.405	square meters	square yards	1.196
cubic feet	cubic meters	.028	square kilometers	square miles	.386
cubic yards	cubic meters	.765	square hectometers	acres	2.471
fluid ounces	milliliters	29.573	cubic meters	cubic feet	35.315
pints	liters	.473	cubic meters	cubic yards	1.308
quarts	liters	.946	milliliters	fluid ounces	.034
gallons	liters	3.785	liters	pints	2.113
ounces	grams	28.349	liters	quarts	1.057
pounds	kilograms	.454	liters	gallons	.264
short tons	metric tons	.907	grams	ounces	.035
pound-feet	newton-meters	1.356	kilograms	pounds	2.205
pounds-inches	newton-meters	.11296	metric tons	short tons	1.102

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C