SULLAIR

INDUSTRIAL AIR COMPRESSOR

10B Open 25, 30, 40HP STANDARD AND 24KT

OPERATOR'S MANUAL

Part Number 02250049-581

Effective 1/93

KEEP YOUR MACHINE IN TOP

OPERATING CONDITION

USE

GENUINE

SULLAIR®

SERVICE PARTS

CONTACT YOUR NEAREST SULLAIR

DISTRIBUTOR OR CALL 1-800-348-2722

TABLE OF CONTENTS

TABLE OF CONTENTS
(CONTINUED)

1.1 GENERAL

Sullair® Corporation and its subsidiaries design and manufacture all of their products so they can be operated safely. However, the responsibility for safe operation rests with those who use and maintain these products. The following safety precautions are offered as a guide which, if conscientiously followed, will minimize the possibility of accidents throughout the useful life of this equipment.

The compressor should be operated only by those who have been trained and delegated to do so, and who have read and understood this Operator's Manual. Failure to follow the instructions, procedures and safety precautions in this manual may result in accidents and injuries.

NEVER start the compressor unless it is safe to do so. **DO NOT** attempt to operate the compressor with a known unsafe condition. Tag the compressor and render it inoperative by disconnecting and locking out all power at source or otherwise disabling its prime mover, so others who may not know of the unsafe condition cannot attempt to operate it until the condition is corrected.

Install, use and operate the compressor only in full compliance with all pertinent OSHA regulations and all applicable Federal, State and Local codes, standards and regulations.

DO NOT modify the compressor and/or controls in any way except with written factory approval.

While not specifically applicable to all types of compressors with all types of prime movers, most of the precautionary statements contained herein are applicable to most compressors and the concepts behind these statements are generally applicable to all compressors.

1.2 PERSONAL PROTECTIVE EQUIPMENT

Prior to installing or operating the compressor, owners, employers and users should become familiar with, and comply with, all applicable OSHA regulations and any applicable Federal, State and Local codes, standards, and regulations relative to personal protective equipment, such as eye and face protective equipment, respiratory protective equipment, equipment intended to protect the extremities, protective clothing, protective shields and barriers and electrical protective equipment, as well as noise exposure administrative and/or engineering controls and/or personal hearing protective equipment.

1.3 PRESSURE RELEASE

A. Install an appropriate flow–limiting valve between the service air outlet and the shut–off (throttle) valve, either at the compressor or at any other point along the air line, when an air hose exceeding ½" (13mm) inside diameter is to be connected to the shut–off (throttle) valve, to reduce pressure in case of hose failure, per OSHA Standard 29 CFR 1926.302(b)(7).

B. When the hose is to be used to supply a manifold, install an additional appropriate flow–limiting valve between the manifold and each air hose exceeding ½" (13mm) inside diameter that is to be connected to the manifold to reduce pressure in case of hose failure.

C. Provide an appropriate flow–limiting valve at the beginning of each additional 75 feet (23m) of hose in runs of air hose exceeding ½" (13mm) inside diameter to reduce pressure in case of hose failure.

D. Flow–limiting valves are listed by pipe size and rated CFM. Select appropriate valves accordingly, in accordance with their manufacturer's recommendations.

E. DO NOT use air tools that are rated below the maximum rating of the compressor. Select air tools, air hoses, pipes, valves, filters, and other fittings accordingly. **DO NOT** exceed manufacturer's rated safe operating pressures for these items.

F. Secure all hose connections by wire, chain or other suitable retaining device to prevent tools or hose ends from being accidentally disconnected and expelled.

G. Open fluid filler cap only when compressor **is not running and is not pressurized.** Shut down the compressor and bleed the sump (receiver) to zero internal pressure before removing the cap.

H. Vent all internal pressure prior to opening any line, fitting, hose, valve, drain plug, connection or other component, such as filters and line oilers, and before attempting to refill optional air line anti–icer systems with antifreeze compound.

I. Keep personnel out of line with and away from the discharge opening of hoses or tools or other points of compressed air discharge.

J. Use air at pressures less than 30 PSIG (207kPa) for cleaning purposes, and then only with effective chip guarding and personal protective equipment per OSHA Standard 29 CFR 1910.242 (b).

K. DO NOT engage in horseplay with air hoses as death or serious injury may result.

1.4 FIRE AND EXPLOSION

A. Clean up spills of lubricant or other combustible substances immediately, if such spills occur.

B. Shut off the compressor and allow it to cool. Then keep sparks, flames and other sources of ignition away and **DO NOT** permit smoking in the vicinity when checking or adding lubricant or when refilling air line anti–icer systems with antifreeze compound.

C. DO NOT permit fluids, including air line anti-icer system antifreeze compound or fluid film to accumulate on, under, or around acoustical material, or on any external surfaces of the air compressor or on internal surfaces of the enclosure. Wipe down using an aqueous industrial cleaner or steam clean as required. If necessary, remove acoustical material, clean all surfaces and then replace acoustical material. Any acoustical material with a protective covering that has been torn or punctured should be replaced immediately to prevent accumulation of liquids or fluid film within the material. **DO NOT** use flammable solvents for cleaning purposes.

D. Disconnect and lock out all power at source prior to attempting any repairs or cleaning of the compressor or of the inside of the enclosure, if any.

E. Keep electrical wiring, including all terminals and pressure connectors in good condition. Replace any wiring that has cracked, cut, abraded or otherwise degraded insulation, or terminals that are worn, discolored or corroded. Keep all terminals and pressure connectors clean and tight.

F. Keep grounded and/or conductive objects such as tools away from exposed live electrical parts such as terminals to avoid arcing which might serve as a source of ignition.

G. Remove any acoustical material or other material that may be damaged by heat or that may support combustion and is in close proximity, prior to attempting weld repairs.

H. Keep suitable fully charged Class BC or ABC fire extinguisher or extinguishers nearby when servicing and operating the compressor.

I. Keep oily rags, trash, leaves, litter or other combustibles out of and away from the compressor.

J. DO NOT operate the compressor without proper flow of cooling air or water or with inadequate flow of lubricant or with degraded lubricant.

K. DO NOT attempt to operate the compressor in any classification of hazardous environment unless the compressor has been specially designed and manufactured for that duty.

1.5 MOVING PARTS

A. Keep hands, arms and other parts of the body and also clothing away from couplings, fans and other moving parts.

B. DO NOT attempt to operate the compressor with the fan, coupling or other guards removed.

C. Wear snug fitting clothing and confine long hair when working around this compressor, especially when exposed to hot or moving parts.

D. Keep access doors, if any, closed except when making repairs or adjustments.

E. Make sure all personnel are out of and/or clear of the compressor prior to attempting to start or operate it.

F. Disconnect and lock out all power at source and verify at the compressor that all circuits are de-energized to minimize the possibility of accidental start-up or operation, prior to attempting repairs or adjustments. This is especially important when compressors are remotely controlled.

G. Keep hands, feet, floors, controls and walking surfaces clean and free of fluid, water or other liquids to minimize the possibility of slips and falls.

1.6 HOT SURFACES, SHARP EDGES AND SHARP CORNERS

A. Avoid bodily contact with hot fluid, hot coolant, hot surfaces and sharp edges and corners.

B. Keep all parts of the body away from all points of air discharge.

C. Wear personal protective equipment including gloves and head covering when working in, on or around the compressor.

D. Keep a first aid kit handy. Seek medical assistance promptly in case of injury. **DO NOT** ignore small cuts and burns as they may lead to infection.

1.7 TOXIC AND IRRITATING SUBSTANCES

A. DO NOT use air from this compressor for respiration (breathing) except in full compliance with OSHA Standards 29 CFR 1910 and any other Federal, State or Local codes or regulations.

⚠ DANGER

Death or serious injury can result from inhaling compressed air without using proper safety equipment. See OSHA standards on safety equipment.

B. DO NOT use air line anti-icer systems in air lines supplying respirators or other breathing air utilization equipment and **DO NOT** discharge air from these systems in unventilated or other confined areas.

C. Operate the compressor only in open or adequately ventilated areas.

D. Locate the compressor or provide a remote inlet so that it is not likely to ingest exhaust fumes or other toxic, noxious or corrosive fumes or substances.

E. Coolants and lubricants used in this compressor are typical of the industry. Care should be taken to avoid accidental ingestion and/or skin contact. In the event of ingestion, seek medical

treatment promptly. Wash with soap and water in the event of skin contact.

F. Wear goggles or a full face shield when adding antifreeze compound to air line anti-icer systems.

G. If air line anti-icer system antifreeze compound enters the eyes or if fumes irritate the eyes, they should be washed with large quantities of clean water for 15 minutes. A physician, preferably an eye specialist, should be contacted immediately.

H. DO NOT store air line anti-icer system antifreeze compound in confined areas.

I. The antifreeze compound used in air line antifreeze systems contains methanol and is toxic, harmful, or fatal if swallowed. Avoid contact with the skin or eyes and avoid breathing the fumes. If swallowed, induce vomiting by administering a tablespoon of salt, in each glass of clean, warm water until vomit is clear, then administer two teaspoons of baking soda in a glass of clean water. Have patient lay down and cover eyes to exclude light. Call a physician immediately.

1.8 ELECTRICAL SHOCK

A. This compressor should be installed and maintained in full compliance with all applicable Federal, State and Local codes, standards and regulations, including those of the National Electrical Code, and also including those relative to equipment grounding conductors, and only by personnel that are trained, qualified and delegated to do so.

B. Keep all parts of the body and any hand-held tools or other conductive objects away from exposed live parts of electrical system. Maintain dry footing, stand on insulating surfaces and **DO NOT** contact any other portion of the compressor when making adjustments or repairs to exposed live parts of the electrical system. Make all such adjustments or repairs with one hand only, so as to minimize the possibility of creating a current path through the heart.

C. Attempt repairs in clean, dry and well lighted and ventilated areas only.

D. DO NOT leave the compressor unattended with open electrical enclosures. If necessary to do so, then disconnect, lock out and tag all power at source so others will not inadvertently restore power.

E. Disconnect, lock out, and tag all power at source prior to attempting repairs or adjustments to rotating machinery and prior to handling any ungrounded conductors.

1.9 LIFTING

A. If the compressor is provided with a lifting bail, then lift by the bail provided. If no bail is provided, then lift by sling. Compressors to be air lifted by helicopter must not be supported by the lifting bail but by slings instead. In any event, lift and/or handle only in full compliance with OSHA standards 29 CFR 1910 subpart N.

B. Inspect points of attachment for cracked welds and for cracked, bent, corroded or otherwise degraded members and for loose bolts or nuts prior to lifting.

C. Make sure entire lifting, rigging and supporting structure has been inspected, is in good condition and has a rated capacity of at least the weight of the compressor. If you are unsure of the weight, then weigh compressor before lifting.

D. Make sure lifting hook has a functional safety latch or equivalent and is fully engaged and latched on the bail or slings.

E. Use guide ropes or equivalent to prevent twisting or swinging of the compressor once it has been lifted clear of the ground.

F. DO NOT attempt to lift in high winds.

G. Keep all personnel out from under and away from the compressor whenever it is suspended.

H. Lift compressor no higher than necessary.

I. Keep lift operator in constant attendance whenever compressor is suspended.

J. Set compressor down only on a level surface capable of safely supporting at least its weight and its loading unit.

K. When moving compressors by forklift truck, utilize fork pockets if provided. Otherwise, utilize pallet if provided. If neither fork pockets or pallet are provided, then make sure compressor is secure and well balanced on forks before attempting to raise or transport it any significant distance.

L. Make sure forklift truck forks are fully engaged and tipped back prior to lifting or transporting the compressor.

M. Forklift no higher than necessary to clear obstacles at floor level and transport and corner at minimum practical speeds.

N. Make sure pallet-mounted compressors are firmly bolted or otherwise secured to the pallet prior to attempting to forklift or transport them. **NEVER** attempt to forklift a compressor that is not secured to its pallet, as uneven floors or sudden stops may cause the compressor to tumble off, possibly causing serious injury or property damage in the process.

O. DO NOT use the lifting eye bolt on the compressor motor, if supplied, to lift the entire compressor package.

Section 1
SAFETY

1.10 ENTRAPMENT

A. If the compressor enclosure, if any, is large enough to hold a man and if it is necessary to enter it to perform service adjustments, inform other personnel before doing so, or else secure and tag the access door in the open position to avoid the possibility of others closing and possibly latching the door with personnel inside.

B. Make sure all personnel are out of compressor before closing and latching enclosure doors.

2.1 INTRODUCTION

This Sullair rotary screw air compressor is designed and manufactured to provide the user/owner with superior performance and durability. Reduction of maintenance for this unit, like any other Sullair compressor, has been an objective of extreme importance.

In comparison to other compressors, the Sullair rotary screw is unique in that it is highly reliable; it lacks operational wear-down. Its internal parts do not require inspection at any time.

NOTE

Read Section 6 (Maintenance) to keep your compressor in top operating condition. Should any questions arise which cannot be answered in the following text, call your nearest Sullair representative or the Sullair Corporation Service Department.

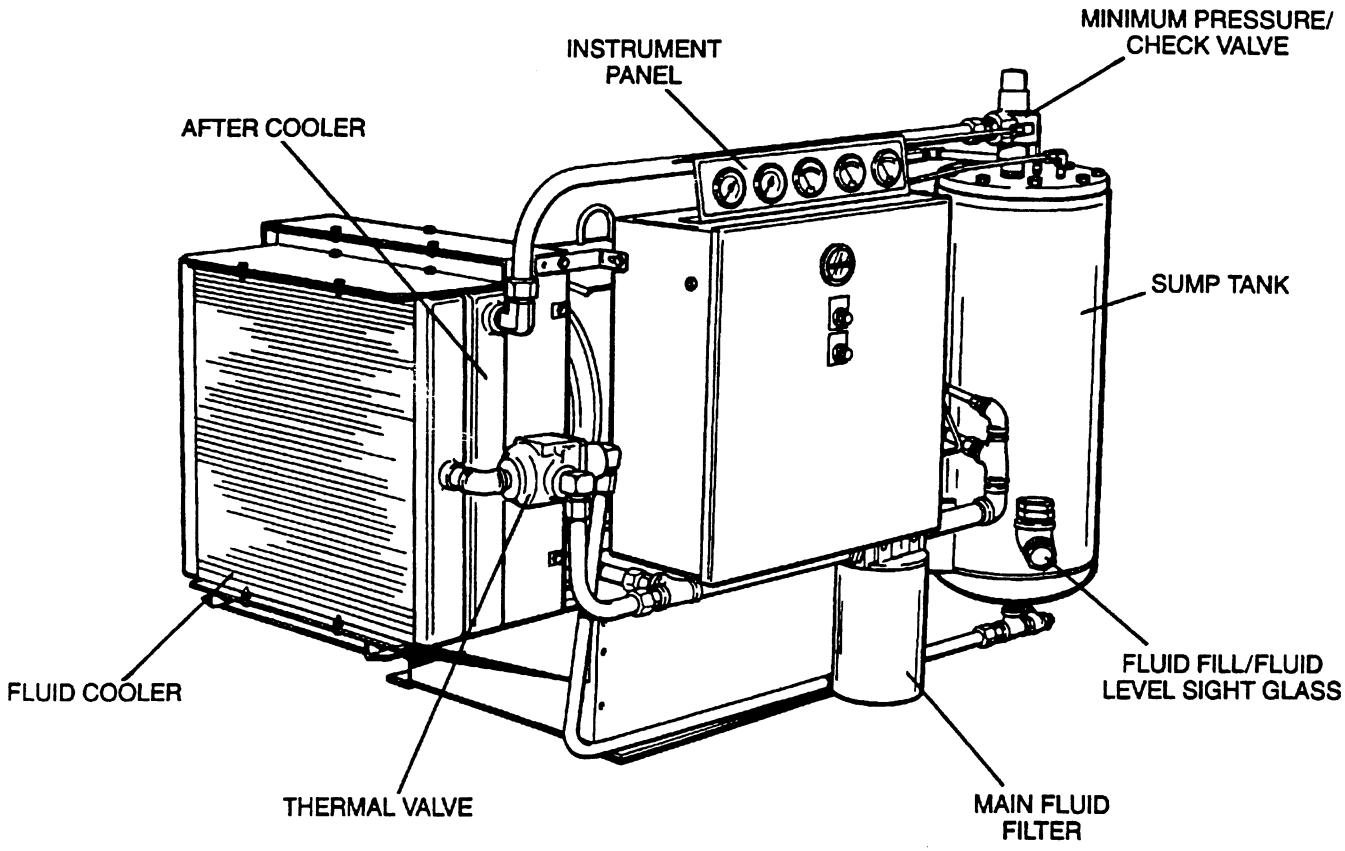
2.2 DESCRIPTION OF COMPONENTS

Refer to Figures 2-1 and 2-2. The components and assemblies of the Series 10B air compressor are clearly shown. The complete package includes **compressor, electric motor, starter, compressor inlet system, compressor discharge system, compressor lubrication and cooling system, capacity control system** and **instrumentation.** Optional accessories, such as **heavy duty filters** are also factory installed.

On Series 10B air-cooled models, a fan (mounted on a double-extended shaft motor), draws air over the motor and forces it out through the cooler (mounted at the end of the frame), thereby removing the compression heat from the cooling fluid.

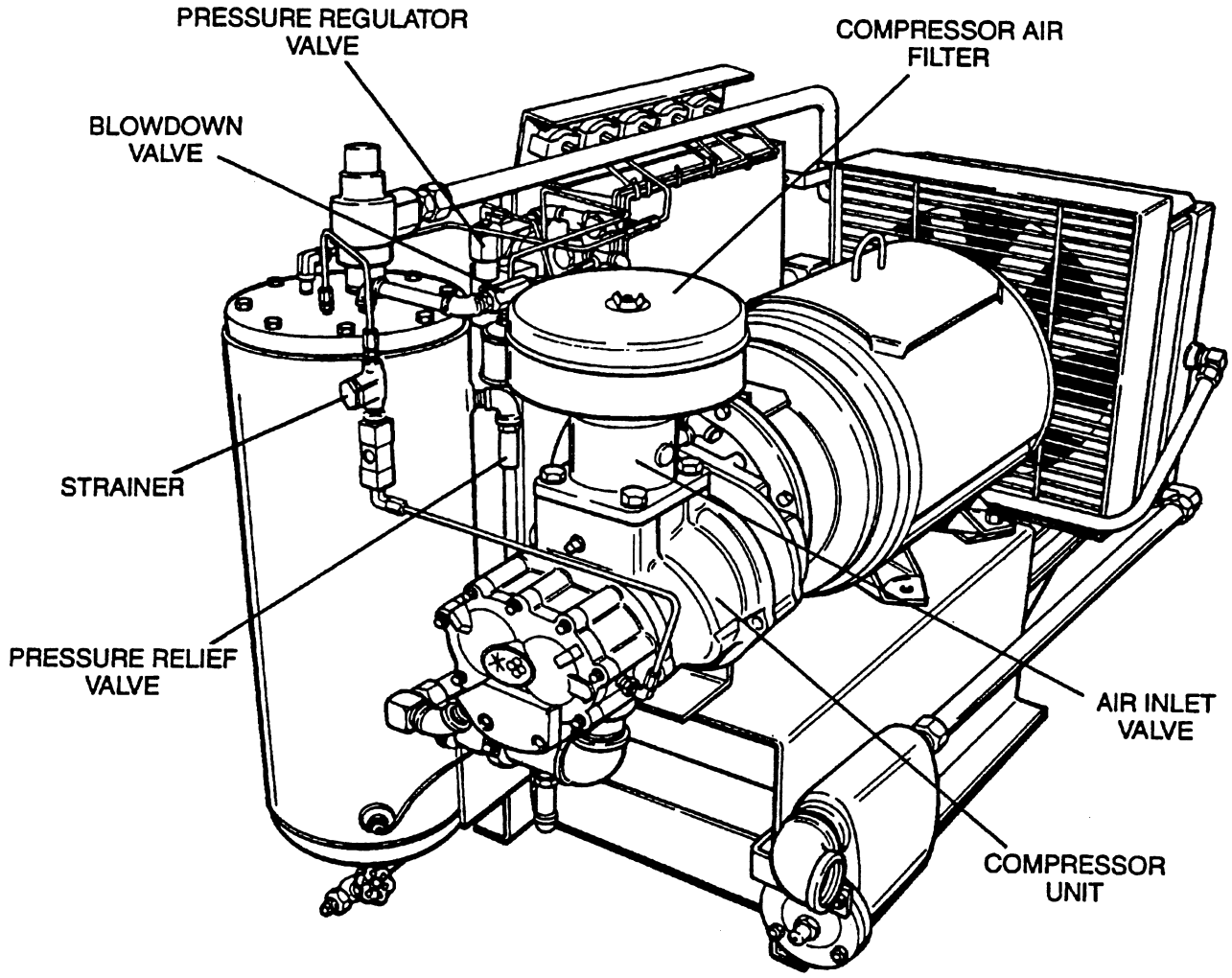
On water-cooled models (available with a shell and a tube heat exchanger mounted on the frame), fluid is piped into the four-pass heat ex-

Figure 2-1 Sullair Series 10B Rotary Screw Compressor



Section 2
DESCRIPTION

Figure 2-2 Sullair Series 10B Rotary Screw Compressor



changer where compression heat is removed from the fluid.

The "open" design of the Series 10B air compressor, (whether air-cooled or water-cooled), provides easy access to all components.

2.3 SULLAIR COMPRESSOR UNIT, FUNCTIONAL DESCRIPTION

Sullair air compressors feature the rotary screw, a single-stage, positive displacement, lubricated-type compressor. This unit provides continuous (pulse-free) compression to meet your needs.

NOTE

With a Sullair compressor, there is no maintenance or internal inspection of the compressor unit required.

Fluid is injected into the compressor unit in large quantities where it mixes directly with the air as the rotors turn, compressing the air. The fluid flow has three basic functions:

1. As coolant, it controls the rise of air temperature normally associated with the heat of compression.
2. It seals the leakage paths between the rotors and the stator and also between the rotors themselves.
3. It acts as a lubricating film between the rotors allowing one rotor to directly drive the other, which is an idler.

After the air/fluid mixture is discharged from the compressor unit, the fluid is separated from the air. At this time, the air flows through an aftercooler and separator then to your service line while the fluid is being cooled in preparation for reinjection.

2.4 COMPRESSOR COOLING AND LUBRICATION SYSTEM, FUNCTIONAL DESCRIPTION

Refer to Figures 2–3 and 2–4. The cooling and lubrication system (air–cooled version) consists of a **fan, radiator–type cooler, main line filter, cooler bypass valve** (air–cooled only), **inlet filter** and **interconnecting piping and tubing.**

Sullair 24KT compressors are filled with a fluid which rarely needs to be changed. In the event a change of fluid is required, use only Sullair 24KT fluid.

⚠ WARNING

Mixing of other lubricants within the compressor unit will void all warranties!

Sullair recommends that a 24KT sample be taken at the first filter change and sent to the factory for analysis. This is a free service. The sample kit with instruction and self addressed container is supplied with your compressor. The user will receive an analysis report with recommendations.

For the water–cooled models, a shell and tube heat exchanger and water–flow regulating valve are substituted for the radiator–type cooler and cooler bypass valve listed above.

The pressure in the receiver/sump causes fluid flow by forcing the fluid from the high pressure area of the sump to an area of lower pressure in the compressor unit.

On air–cooled models, the fluid flows from the bottom of the receiver/sump to the thermal valve. The thermal valve has a nominal temperature of 170°F (77°C). At low temperatures, the fluid passes through the thermal valve, the filter and directly to the compressor unit.

As the discharge temperature rises above 170°F (77°C), due to the heat of compression, the thermal valve begins to close and a portion of the fluid then flows through the cooler; from the cooler to the filter, and on to the compressor unit.

On water–cooled models, a water–flow regulating valve will regulate the amount of cooling necessary to maintain the proper operating temperature. When the fluid leaves the sump it is directed to the cooler. Depending on the temperature of the fluid, the water–flow regulating valve allows the proper amount of cool water to enter the cooler and remove the heat of compression from the fluid. From the cooler, the fluid then flows through the filter, and on to the compressor unit.

The water–flow regulating valve is also used to conserve water during periods of varying load on the compressor. The same valve also shuts off the water supply when the compressor is shutdown.

On both air–cooled and water–cooled compressors, a portion of the fluid is routed to the anti–friction bearings which support the rotors inside the compressor unit.

2.5 COMPRESSOR DISCHARGE SYSTEM, FUNCTIONAL DESCRIPTION

Refer to Figures 2–3 and 2–4. The compressor unit discharges the compressed air/fluid mixture into the combination receiver/sump. The receiver has three functions:

1. It acts as a primary fluid separator.
2. It serves as the compressor fluid sump.
3. It houses the final fluid separator.

The compressed air/fluid mixture enters the sump and is directed against the side of the tank. Its direction of movement is changed and its velocity significantly reduced, thus causing the large droplets of fluid to fall to the bottom of the sump. The fractional percentage of fluid remaining in the compressed air collects on the surface of the separator element as the compressed air flows through the separator. A return line (or scavenge tube) leads from the bottom of the separator element to the inlet region of the compressor unit. Fluid collecting on the bottom of the separator is returned to the compressor by a pressure differential between the receiver and the compressor inlet. A sight glass is located in the return line to observe this fluid flow. There is also an orifice in this return line (protected by a strainer) to assure proper flow. A gauge, located in the instrument panel indicates if abnormal pressure drop through the separator develops. At this time, separator element replacement is necessary.

The receiver is ASME code. A minimum pressure/check valve, located downstream from the separator, assures a minimum receiver pressure of 50 PSIG (345kPa) during all conditions. This pressure is necessary for proper air/fluid separation and to assure adequate fluid circulation.

A terminal check valve is also built into the minimum pressure/check valve to prevent compressed air in the service line from bleeding back into the receiver on shutdown and during operation of the compressor in an unloaded condition.

A pressure relief valve (located on the wet side of the separator) is set to open if the sump pressure exceeds 200 PSIG (1379kPa). A temperature switch will shut down the compressor if the discharge temperature reaches 240°F (116°C).

All compressor models are equipped with a high pressure shutdown switch to shut down the compressor at 135 PSIG (931kPa). This prevents the pressure relief valve from opening under routine conditions, thereby preventing fluid loss through the pressure relief valve.

Figure 2–3 Compressor Discharge/Cooling and Lubrication System (Water–Cooled)

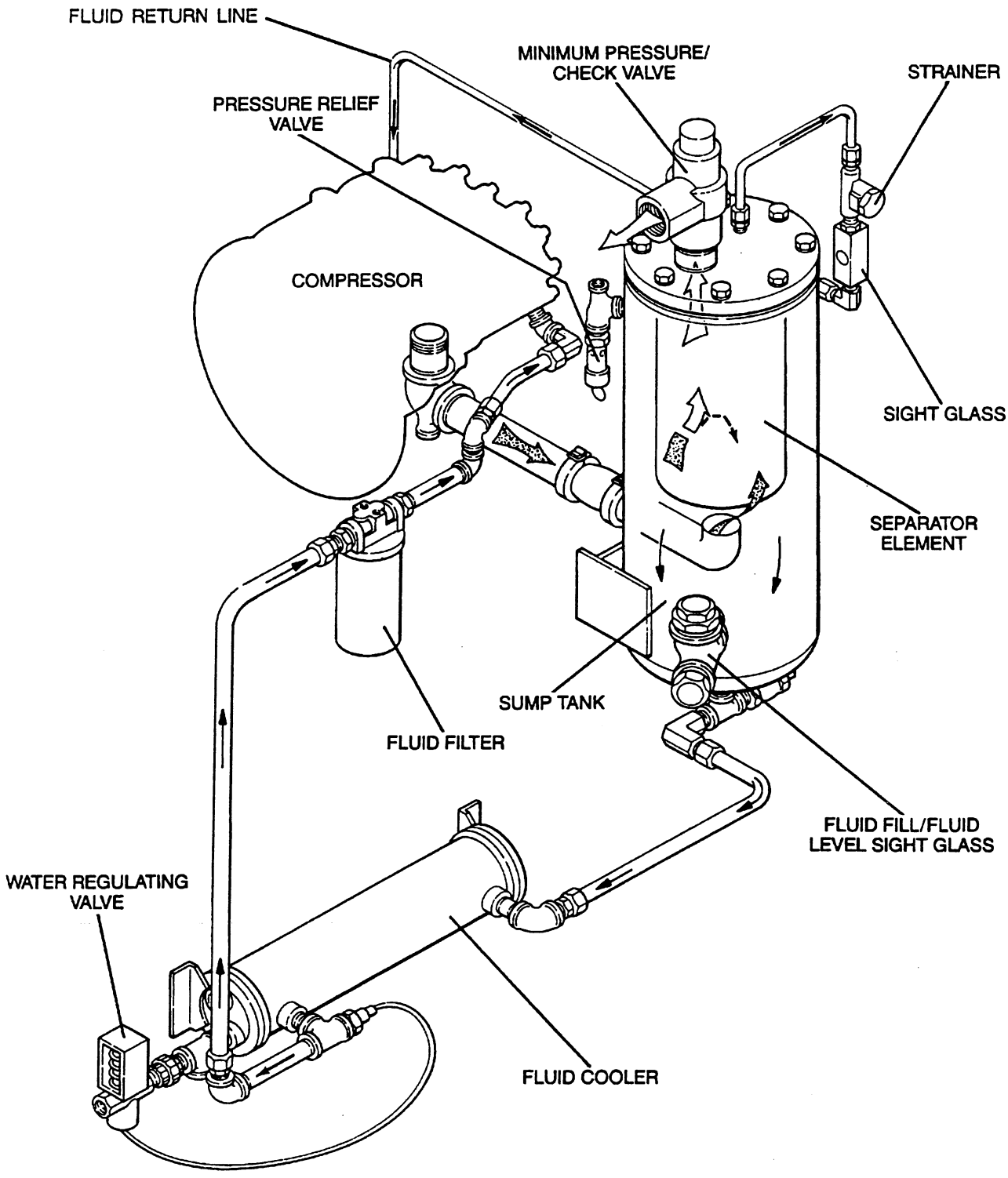
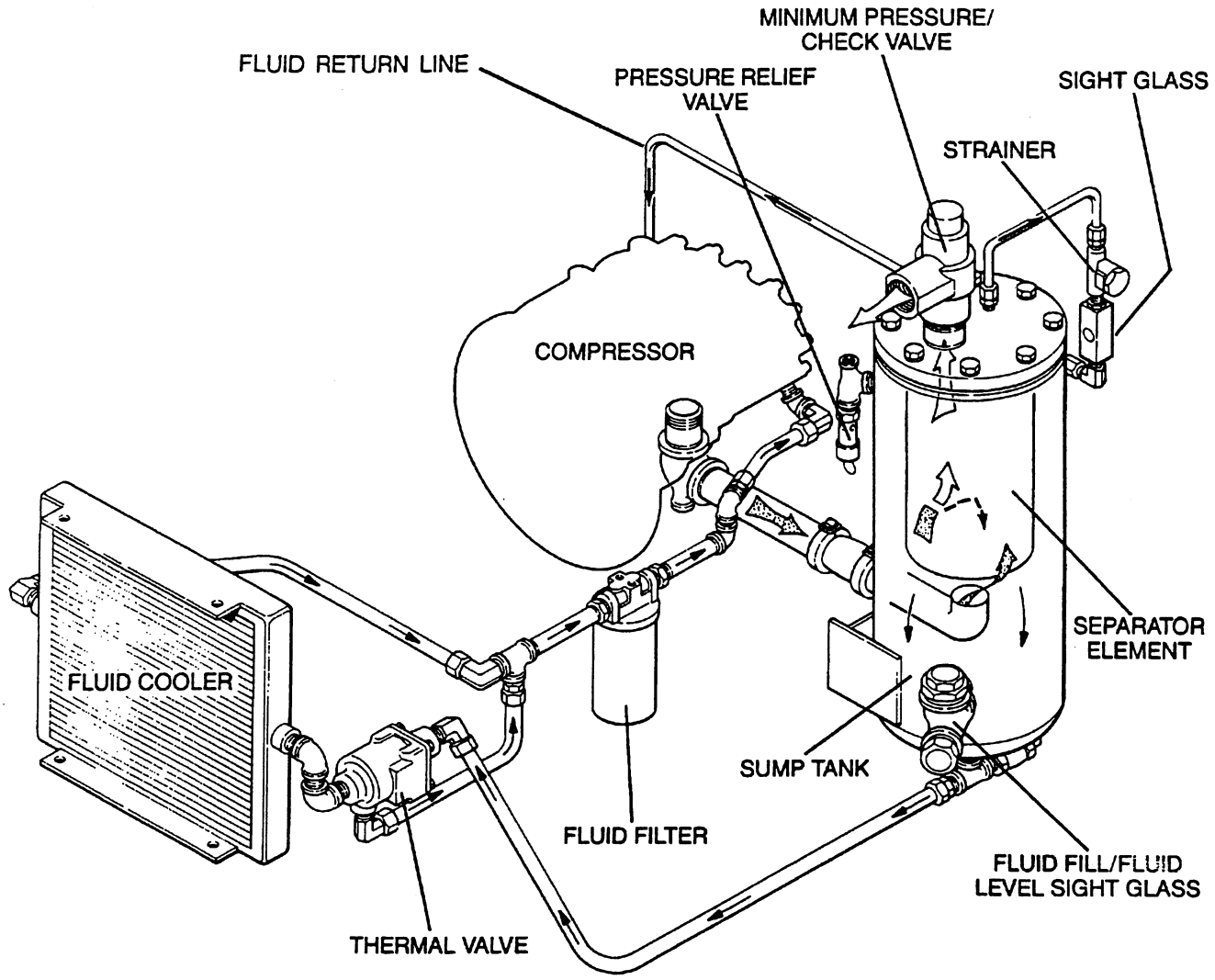


Figure 2–4 Compressor Discharge/Cooling and Lubrication System (Air–Cooled)



⚠ WARNING

DO NOT remove caps, plugs, and/or other components when compressor is running or pressurized.

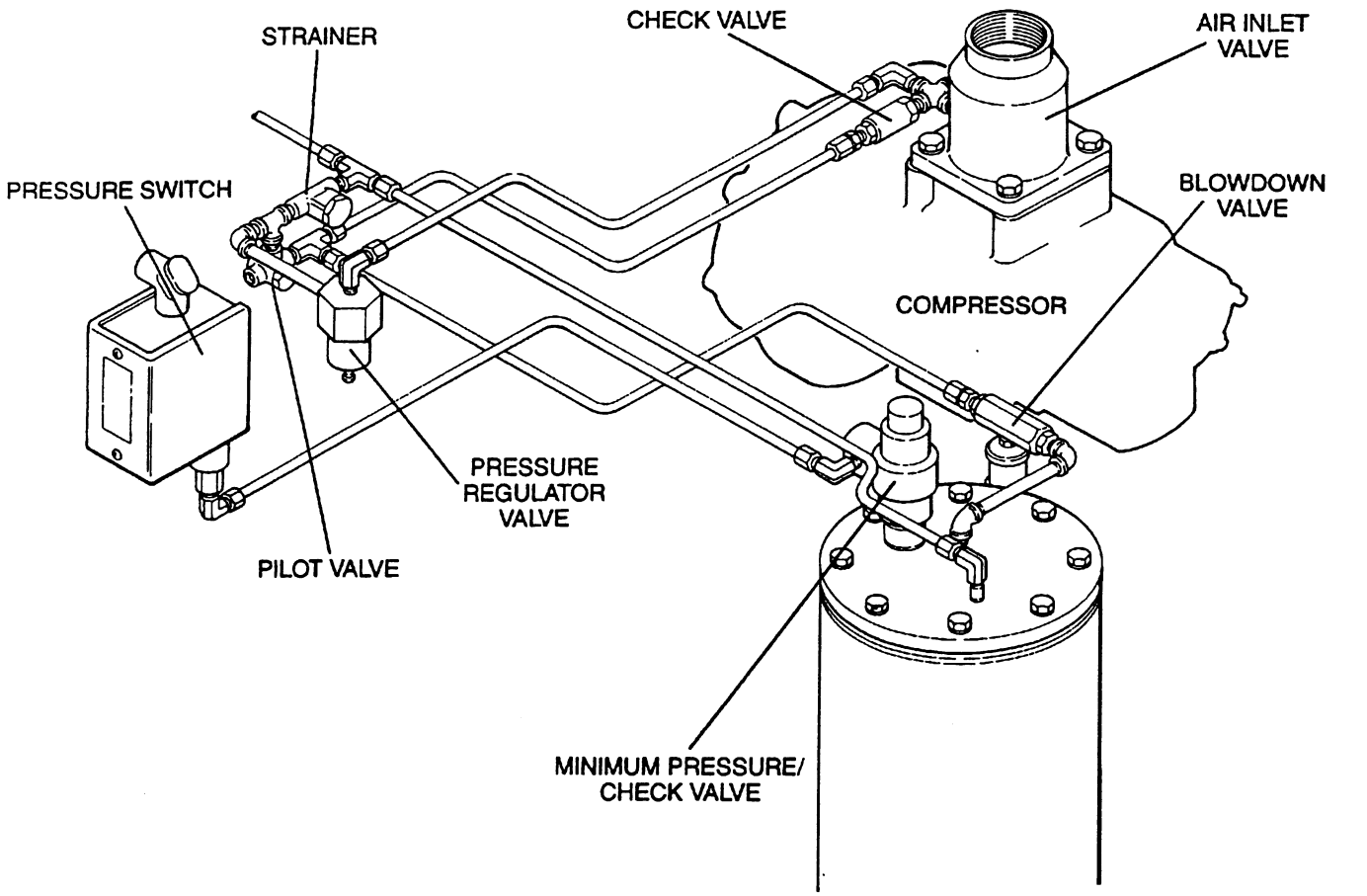
Stop compressor and relieve all internal pressure before doing so.

Fluid is added to the sump via a capped fluid fill opening, placed low on the tank to prevent overfilling of the sump. A sight glass enables the operator to visually monitor the sump fluid level.

2.6 CONTROL SYSTEM, FUNCTIONAL DESCRIPTION

Refer to Figure 2–5. The purpose of the compressor control system is to regulate the compressor

Figure 2-5 Pneumatic Control System



air intake to match the amount of compressed air being used. At a 0 to 10 percent air output, the control system will automatically blow down the compressor and greatly reduce the unload power consumption. The control system consists of an inlet valve, (located on the compressor air inlet), blowdown valve, solenoid valve, pressure switch, and a pressure regulator. The functional descriptions of the control system are given below in four distinct phases of compressor operation. The following guidelines apply to all Series 10B compressors. For explanation purposes this description will apply to a compressor with an operating pressure range of 115 to 125 PSIG (792 to 862kPa). A compressor with any other pressure range would operate in the same manner excepting stated pressures.

START - 0 TO 50 PSIG (0 TO 345kPa)
When the compressor START button is depressed, the sump pressure will quickly rise from 0 to 50 PSIG (0 to 345kPa). During this period both the pressure regulator and the solenoid valve are closed, the inlet valve is fully open due to inlet air flow, and the compressor pumps at full rated capacity. The rising compressor air pressure is isolated from the service line in this phase by the minimum pressure valve, set at approximately 50 PSIG (345kPa).

NORMAL OPERATING MODE - 50 TO 115 PSIG (345 TO 792kPa)
When the pressure air rises above 50 PSIG (345kPa), the minimum pressure/check valve opens and delivers compressed air to the service line. From this point on, the line air pressure is continually monitored by a line pressure gauge and a pressure switch usually set at 115 PSIG (792kPa). The pressure regulator and the solenoid valve remain closed during this phase. The inlet valve remains fully open for maximum capacity.

MODULATING MODE - 115 TO 125 PSIG (792 TO 862kPa)
If less than the rated capacity of compressed air is being used, the service line pressure will rise above 115 PSIG (792kPa). The pressure regulator valve gradually opens, applying air pressure

through the control line to the inlet valve piston. This causes the inlet valve to partially close reducing the amount of air entering the compressor until it matches the amount of air being used. The control system functions continually in this manner, between the limits of 115 to 125 PSIG (792 to 862kPa), in response to varying demands from the service line.

The pressure regulator has an orifice which vents a small amount of air to the atmosphere when the pressure regulator controls the inlet valve. The orifice also bleeds any accumulated moisture from the control lines.

UNLOAD - IN EXCESS OF 125 PSIG (862kPa) LINE PRESSURE
When no air is being used,the service line pressure rises to the setting (cut-out pressure) of the pressure switch. the pressure switch opens, interrupting the electrical power to the solenoid valve. At this time, the solenoid valve allows dry sump tank air pressure to be applied directly to the inlet valve piston and keep it closed. Simultaneously, the solenoid valve sends a pneumatic signal to the blowdown valve. The blowdown valve opens to the sump to the atmosphere reducing the sump pressure to approximately 30 to 35 PSIG (207 to 281kPa). The check valve in the air service line pressure prevents line pressure from returning to the sump.

When the line pressure drops to the low setting (cut-in pressure) of the pressure switch (usually 115 PSIG [792kPa]), the pressure switch closes, re-energizing the 3-way solenoid valve and allowing the blowdown valve to close. The re-energized solenoid valve again prevents pressure from reaching the inlet valve. The inlet valve is fully open and the compressor delivers full rated capacity. Should the pressure begin to rise, the pressure regulator will resume its normal function as previously described.

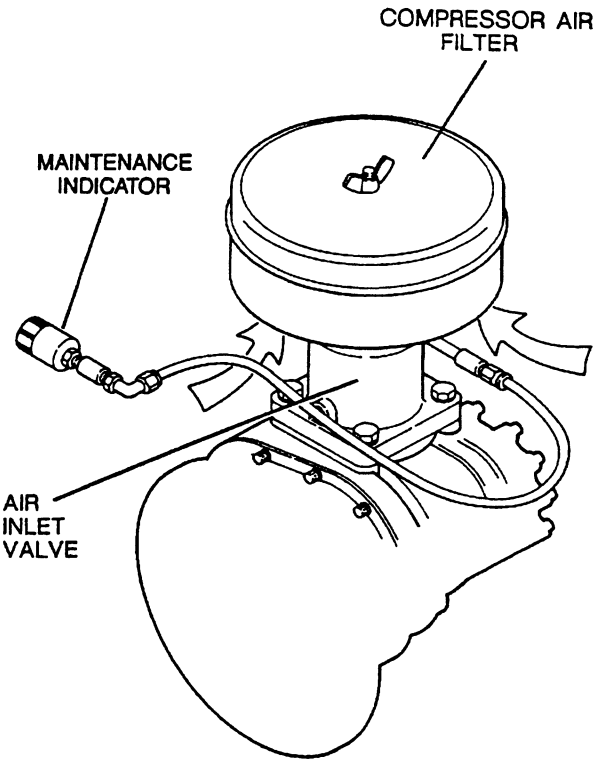
For a compressor with varied periods of time when there are not any air requirements, a "Dual-Control" option is available. This option allows you to set the compressor in an automatic position whereby the compressor will shut down when no compressed air requirement is present and restart as compressed air is needed.

2.7 AIR INLET SYSTEM, FUNCTIONAL DESCRIPTION

Refer to Figure 2-6. The compressor inlet systems consists of a dry-type air filter, a restriction gauge and an air inlet valve.

The restriction gauge (located on the compressor inlet pipe), indicates the condition of the air filter by showing red when filter maintenance is required. This indicator must be manually reset after the air filter has been serviced.

Figure 2-6 Air Inlet System



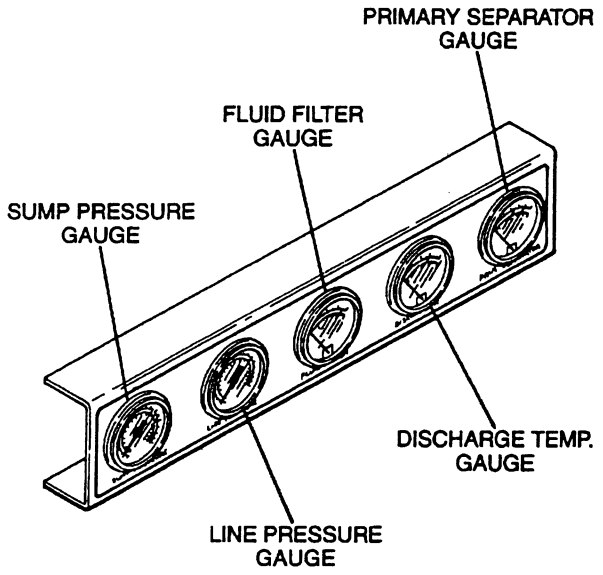
The poppet-type modulating air inlet valve directly controls the amount of air intake to the compressor in response to the operation of the pressure regulator (see Modulating Mode, Section 2.6). The inlet valve also acts as a check valve, thus preventing reverse rotation when the compressor is shut down.

2.8 INSTRUMENT PANEL GROUP, FUNCTIONAL DESCRIPTION

Refer to Figure 2-7. The instrumentation for the 25, 30 and 40HP air compressors consists of a panel group which continually monitors the operating condition of the compressor. The panel group has the following gauges: a **sump pressure gauge, line pressure gauge, compressor fluid temperature gauge, hourmeter, air filter restriction indicator, separator maintenance gauge** and a **fluid filter maintenance gauge.**

- The **sump pressure gauge** continually monitors the sump pressure at the various load and/or unload conditions.

Figure 2–7 Instrument Panel Group



- The **line (terminal) pressure gauge** is connected to the dry side of the receiver downstream from the check valve. It continually monitors the air pressure.
- The **fluid temperature gauge** monitors the temperature of the fluid in the sump. The normal reading should be approximately 170°F (77°C) with 70°F (21°C) ambient.
- The **hourmeter** records the cumulative hours of operation for the compressor. It is useful for planning and logging service operations. The hourmeter is located in the door of the control box.
- The **air filter restriction indicator** monitors the condition of the air filter and shows red when the element restriction is excessive, which is manually reset after the element has been changed.
- The **separator maintenance gauge** monitors the condition of the separator element. It indicates when the element restriction is excessive.
- The **fluid filter maintenance gauge** monitors the condition of the fluid filter element. It indicates when the element should be changed.
- When the compressor is tank-mounted on either a 120 or a 200 gallon auxiliary air receiver, an additional **pressure gauge** is supplied to monitor tank and line pressures.

SULLAIR SERIES 10B SPECIFICATIONS

Type	Cooling	Mounting	HP	DIMENSIONS Length in	Length mm	Width in	Width mm	Height in	Height mm	Weight lb	Weight kg
Std & 24KT	Air	Base	25	53	1346	33	838	38	965	750	340
			30	53	1346	33	838	38	965	760	345
			40	56	1423	34	864	38	965	885	401
		Tank (120 gal.)	25	67	1702	31	787	68	1727	1000	454
			30	67	1702	31	787	68	1727	1010	458
		Tank (200 gal.)	25	69	1753	34	864	74	1880	1140	517
			30	69	1753	34	864	74	1880	1150	522
			40	69	1753	35	889	74	1880	1275	578
Std & 24KT	Water	Base	25	49	1245	33	838	38	965	750	340
			30	49	1245	33	838	38	965	790	358
			40	56	1422	34	864	38	965	940	426
		Tank (120 gal.)	25	67	1702	31	787	68	1727	1000	454
			30	67	1702	31	787	68	1727	1040	472
		Tank (200 gal.)	25	69	1753	34	864	74	1880	1140	517
			30	69	1753	34	864	74	1880	1180	535
			40	69	1753	36	915	74	1880	1330	603

Bills of Material	Standard	24KT
	25HP Air-cooled - 251332-004	25HP Air-cooled - 251335-003
	25HP Water-cooled - 251326-004	25HP Water-cooled - 251329-003
	30HP Air-cooled - 251333-004	30HP Air-cooled - 251336-003
	30HP Water-cooled - 251327-004	30HP Water-cooled - 251330-003
	40HP Air-cooled - 251334-004	40HP Air-cooled - 251325-003
	40HP Water-cooled - 251328-004	40HP Water-cooled - 251331-003

COMPRESSOR:	24KT MODELS	STANDARD MODELS
Type	Lubricated Rotary Screw	Lubricated Rotary Screw
Standard Operating Pressure (I)	100 to 125 PSIG (758 to 862kPa)	100 to 125 PSIG (758 to 862kPa)
Bearing Type	Anti-Friction	Anti-Friction
Maximum Ambient Operating Temperature (II)	105°F (41°C)	105°F (41°C)
Cooling	Pressurized Fluid	Pressurized Fluid
Lubricant	24KT Fluid	SRF 1/4000
Sump Capacity	3 U.S. Gallons (11 liters)	3 U.S. Gallons (11 liters)
Control	Electro-Pneumatic	Electro-Pneumatic

(I) Special compressors are available for operating at higher pressures.
(II) Special compressors are available for operation in higher ambient temperature.

MOTOR: (24KT AND STANDARD COMPRESSORS)

Type	25HP
Size	60Hz, 3 Phase, ODP, 460V, A.C. 40°C Maximum Ambient Temperature Options: 200V to 230V and 575V TEFC Also Available
Speed	1800RPM
Starter	460V Magnetic Full Voltage Options: 200V to 230V and 575V
Shaft Diameter	1⅝" (41.3mm)

Section 3
SPECIFICATIONS

MOTOR: (24KT AND STANDARD COMPRESSORS)

Type	30HP
Size	60Hz, 3 Phase, ODP, 460V, A.C. 40°C Maximum Ambient Temperature Options: 200V to 230V and 575V TEFC Also Available
Speed	1800RPM
Starter	460V Magnetic Full Voltage Options: 200V to 230V and 575V
Shaft Diameter	1⅝" (41.3mm)
Type	40HP
Size	60Hz, 3 Phase, ODP, 460V, A.C. 40°C Maximum Ambient Temperature Options: 200V to 230V and 575V TEFC Also Available
Speed	1770RPM
Starter	460V Magnetic Full Voltage Options: 200V to 230V and 575V
Shaft Diameter	1⅞" (47.6mm)

FOR 50 HZ COMPRESSORS

Type	25HP
Size	60Hz, 3 Phase, ODP, 380V, A.C. 40°C Maximum Ambient Temperature
Speed	1500RPM
Starter	380V Magnetic Full Voltage Options: 415V
Shaft Diameter	1⅝" (41.3mm)
Type	30HP
Size	60Hz, 3 Phase, ODP, 380V, A.C. 40°C Maximum Ambient Temperature
Speed	1500RPM
Starter	380V Magnetic Full Voltage Options: 415V
Shaft Diameter	1⅝" (41.3mm)
Type	40HP
Size	50Hz, 3 Phase, ODP, 380V, A.C. 40°C Maximum Ambient Temperature Options: 415V TEFC Also Available
Speed	3000RPM
Starter	380V Magnetic Full Voltage
Shaft Diameter	1⅝" (41.3mm)

LUBRICATION GUIDE–STANDARD COMPRESSORS

Sullair standard compressors are filled with SRF 1/4000 fluid as factory fill.

⚠ WARNING

Mixing of other fluids within the compressor will void all warranties.

SRF 1/4000 fluid should be changed every 4000 hours or once a year, whichever comes first. The fluid should be changed more frequently under severe operating conditions, such as high ambient temperatures coupled with high humidity, or when high particulate level, corrosive gases or strong oxidizing gases are present in the air.

For extended life synthetic lubricants contact the nearest Sullair representative.

Maintenance of all other components is still recommended as indicated in the Operator's Manual.

LUBRICATION GUIDE–24KT COMPRESSORS

Sullair 24KT compressors are filled with a lubricant which normally does not need to be changed. In the event a change of fluid is required, use only Sullair 24KT fluid.

⚠ WARNING

Mixing of other lubricants within the compressor unit will void all warranties!

Sullair recommends that a 24KT sample be taken at the first filter change and sent to the factory for

analysis. This is a free service. A sample kit with instructions and self-addressed container is to be supplied with your compressor. The user will receive an analysis report with recommendations.

APPLICATION GUIDE
Sullair encourages the user to participate in a fluid analysis program with the fluid suppliers. This could result in a fluid change interval differing from that stated in the manual. Contact your Sullair representative for details.

Section 4
INSTALLATION

4.1 MOUNTING OF COMPRESSOR

A foundation or mounting capable of supporting the weight of the compressor, and rigid enough to maintain the compressor frame level and the compressor in alignment is required. The compressor frame must be leveled and secured with foundation bolts, and full uniform contact must be maintained between the frame and foundation. No piping loads shall be transmitted to the compressor at the external connections.

4.2 VENTILATION AND COOLING

For air–cooled compressors, select a location to permit sufficient unobstructed air flowing in and out to the compressor to keep the operating temperature stable. The minimum distance that the compressor should be from surrounding walls is three (3) feet (.91m) and preferable six (6) feet (1.83m) or more from the fan air discharge end of the compressor.

For water–cooled compressors, it is necessary to check the cooling water supply. The proper water flow should be as follows:

WATER TEMP. (°F)	WATER FLOW (GPM)		
	25HP	30HP	40HP
70	3.75	4.50	5.75
80	5.00	6.00	7.50

Table One below indicates the ventilation requirements necessary to keep the compressor running at a normal operating temperature. The fan air requirement is the volume of air which must flow through the compressor for proper ventilation. The specified heat rejection requirement is the amount of heat that is radiated by the compressor. This heat must be removed to assure a normal operating temperature. It is possible to use this heat for space heating, providing no additional pressure drop is created across the fan. Consult a Sullair office for assistance in utilizing this heat.

DO NOT install a water–cooled or an air–cooled/aftercooled compressor where it will be exposed to temperature less than 32°F(0°C).

4.3 SERVICE AIR PIPING

Service air piping should be installed with a shut–off valve installed to isolate the compressor from the service line if required. The service line should be equipped with water legs and condensate drains throughout the system. Both air–cooled and water–cooled aftercoolers are available as standard equipment.

4.4 COUPLING ALIGNMENT CHECK

With the compressor unit directly flange–mounted to its drive, the coupling supplied with the compressor is always properly aligned for operation. However, we recommend that you re–check the coupling gap before start–up or when handling the unit. A 3/32 to 1/8" axial clearance should be maintained for the coupling gap.

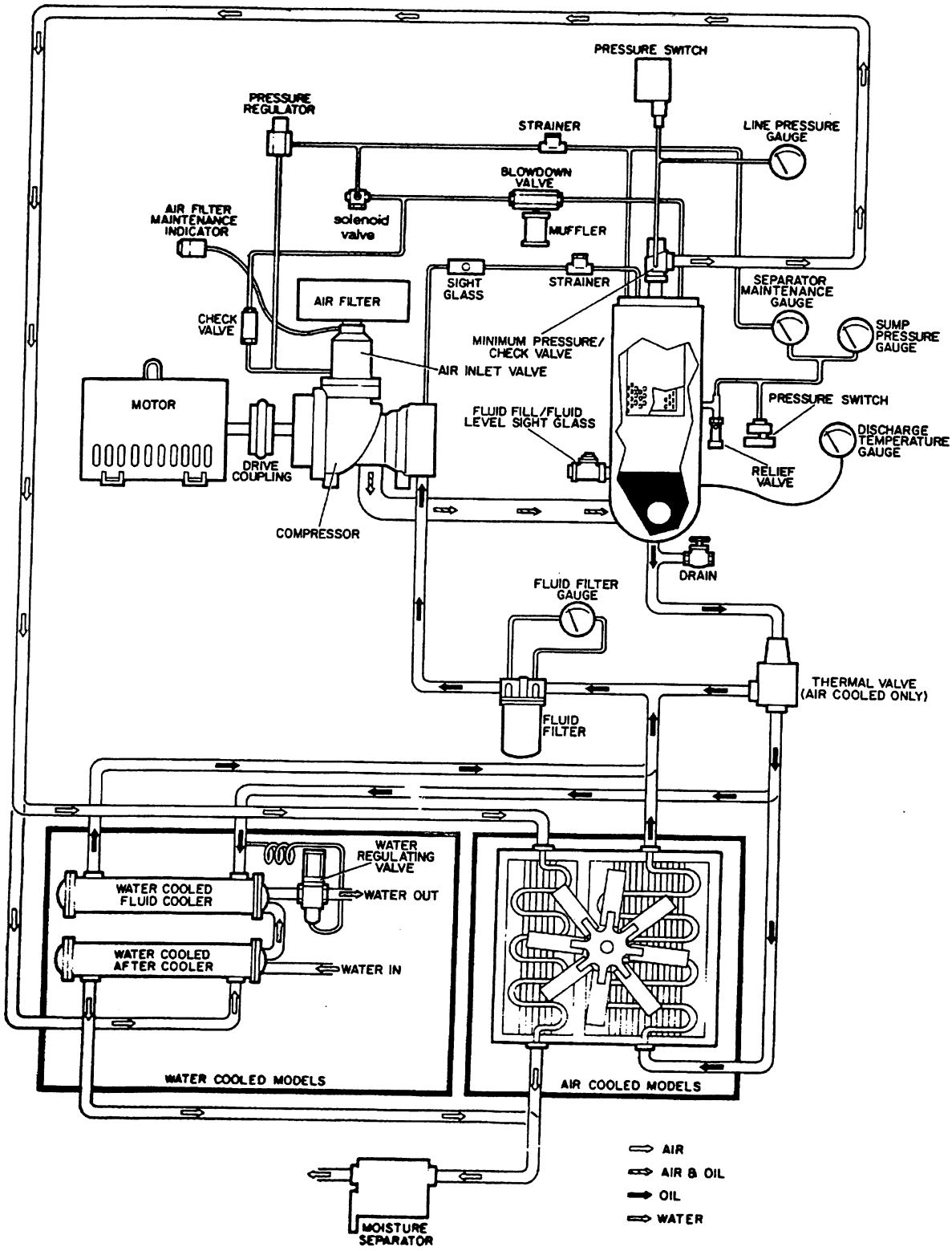
4.5 FLUID LEVEL CHECK

The air compressor is also supplied with the proper amount of fluid. However, it is necessary to check the fluid level at installation. The level is checked by looking at the sight glass located on the sump. If the sump is properly filled, the fluid level should not fall below the center of the sight glass when the compressor is shutdown.

TABLE ONE – VENTILATION REQUIREMENTS

	AIR–COOLED		
MOTOR HP	25	30	40
FAN AIR CFM	2000	2000	2600
HEAT REJECTION BTU/HR.	59,400	71,400	91,800
	AIR–COOLED W/AFTERCOOLER		
MOTOR HP	25	30	40
FAN AIR CFM	2000	2000	2600
HEAT REJECTION BTU/HR.	68,400	82,200	106,200
	WATER–COOLED		
MOTOR HP	25	30	40
FAN AIR CFM	720	720	720
HEAT REJECTION BTU/HR.	8400	10,000	13,000

Figure 4–1 Piping and Instruments



4.6 MOTOR ROTATION DIRECTION CHECK

After the electrical wiring has been done, it is necessary to check the direction of the motor rotation. This can be done by jogging the START and STOP buttons on the control box door. When looking at the motor from the end opposite the compressor unit, the shaft should be turning clockwise. If the motor shaft is not turning clockwise, disconnect the power to the starter and exchange any two of the three power input leads, then re-check rotation. A "Direction of Rotation" decal is located on the adapter between the motor and compressor to show proper motor/compressor rotation.

4.7 ELECTRICAL PREPARATION

Interior electrical wiring is performed at the factory. Required customer wiring is minimal, but should be done by a qualified electrician in compliance with OSHA, National Electrical Code, and any other applicable local electrical code concerning isolation switches, fused disconnects, etc. Sullair provides a wiring diagram for use by the installer.

An electrical check should be made to help assure that the first start-up will be trouble free.

⚠ DANGER

Lethal shock hazard inside.

Disconnect all power at source, before opening or servicing.

1. Check incoming voltage. Be sure that the incoming voltage is the same voltage that the compressor was wired for.
2. Check starter and overload heater sizes (see control box assembly in Section 7, Parts Manual).
3. Check all electrical connections for tightness.
4. "DRY RUN" the electrical controls by disconnecting the three (3) motor leads from the starter. Energize the control circuits by pushing the START button and check all protective devices to be sure that they will de-energize the starter coil when activated.
5. Reconnect the three (3) motor leads and jog the motor for a direction of rotation check, as explained in Section 4.6.

5.1 GENERAL

While Sullair has built into this compressor a comprehensive array of controls and indicators to assure you that it is operating properly, you will want to recognize and interpret the reading which will call for service or indicate the beginning of a malfunction. Before starting your Sullair compressor, read this section thoroughly and familiarize yourself with the controls and indicators – their purpose, location and use.

5.2 PURPOSE OF CONTROLS

CONTROL OR INDICATOR	PURPOSE
START PUSHBUTTON	Depress to turn the compressor ON.
STOP PUSHBUTTON	Depress to turn the compressor OFF.
HOURMETER	Records cumulative hours of compressor operation; useful for planning and logging service schedules.
LINE PRESSURE GAUGE	Continually monitors service line air pressure. (Located on the optional auxiliary air tank if supplied).
SUMP PRESSURE GAUGE	Continually monitors receiver/sump pressure at various load and/or unloaded conditions.
FLUID TEMPERATURE GAUGE	Monitors temperature of fluid in the sump. for air-cooled and water-cooled compressors, normal reading is approximately 170°F (77°C) with a 70°F (21°C) ambient temperature.
FLUID FILTER MAINTENANCE GAUGE	Indicates when a filter element change is required.
SEPARATOR MAINTENANCE GAUGE	Indicates when separator element change is required.
AIR FILTER MAINTENANCE INDICATOR	Shows red when air filter element servicing is required. This indicator must be manually reset after servicing filter.
FLUID LEVEL SIGHT GLASS	Indicates fluid level in the sump. Proper level is not to fall below the center of the sight glass. Check level when compressor is shut down. **DO NOT OVERFILL.**
SEPARATOR RETURN LINE SIGHT GLASS	Used to indicate fluid flow in the return line. When the compressor is running at full load, fluid flow should be visible in this sight glass. There may be little or no flow when the compressor is running unloaded, but a sluggish flow at full load indicates a need to clean the return line strainer.
COOLER BYPASS VALVE (air-cooled only)	Regulates flow of fluid to and around the cooler. Designed to maintain a minimum operating temperature of 170°F (77°C); used for fast warm-up on start-up.
MINIMUM PRESSURE/CHECK VALVE	Maintains minimum of 50 PSIG (345kPa) in the compressor sump. Valve piston restricts receiver air discharge from receiver/sump when pressure falls to 50 PSIG (345kPa). Also incorporated in this valve is a terminal check valve which prevents line pressure backflow into the sump during unload conditions and after shutdown.
DISCHARGE TEMPERATURE SWITCH	Shuts the compressor down when the discharge temperature exceeds 240°F (116°C).

Section 5
OPERATION

5.2 PURPOSE OF CONTROLS

CONTROL OR INDICATOR	PURPOSE
HIGH PRESSURE SHUTDOWN SWITCH	An added protective device designed to shut down the compressor when the pressure inside the sump becomes too high (135 PSIG [931kPa]). Operation of this valve indicates that the high pressure protection switch is either faulty or out of adjustment.
MODULATING INLET VALVE	Regulates the amount of air allowed to enter the air compressor. This regulation is determined by the amount of air being used at the service line. Also acts as a check valve to prevent reverse compressor rotation at shut down.
PRESSURE REGULATOR	Opens a pressure line between the sump and air inlet valve allowing the inlet valve to regulate air delivery according to demand.
SOLENOID VALVE	Bypasses the pressure regulator valve causing the inlet valve to close when the compressor reaches maximum operating pressure. Also activates blowdown valve.
PRESSURE SWITCH	Senses service line pressure. When line pressure reaches maximum setting the pressure switch signals the solenoid valve to unload the compressor.
BLOWDOWN VALVE	Vents sump pressure to the atmosphere during unload conditions and shutdown.
WATER REGULATING VALVE (water-cooled only)	Regulates the amount of cooling water used in the cooler to keep the compressor running at a normal operating temperature of 170°F (77°C).

5.3 INITIAL START-UP PROCEDURE

The following procedure should be used to make the initial start-up of the compressor:

1. Read the preceding pages of this manual thoroughly.
2. Be sure that all preparations and checks described in the Installation section have been made.
3. Crack open the shut off valve to the service line.
4. Start the compressor by pushing the START button.
5. Check for possible leaks in piping.
6. Slowly close the shut-off valve and check that the setting on the pressure switch in set correctly. If set correctly, the compressor will unload at the desired unload pressure. If adjustments are necessary, see Control System Adjustments in the Maintenance Section of the manual.
7. Observe the operating temperature. If the operating temperature exceeds 200°F (93°C), the cooling system or installation environment should be checked.
8. Observe return line sight glass and maintenance indicators.
9. Open shut-off valve to service line.
10. Re-inspect the compressor for temperature and leaks the following day.

5.4 SUBSEQUENT START-UP PROCEDURE

On subsequent start-ups, check that the proper level is visible in the fluid sight glass and simply press the START button. When the compressor is running, observe the instrument panel and maintenance indicators.

5.5 SHUTDOWN PROCEDURE

To shut the compressor down, simply press the STOP button.

6.1 GENERAL

As you proceed in reading this section, it will be easy to see that the Maintenance Program for the air compressor is quite minimal. The use of the service indicators provided for the bearing filter, air filter and fluid separator will alert you when service maintenance is required. See instructions for each item in Section 6.6, Parts Replacement and Adjustment procedures.

⚠ WARNING

DO NOT remove caps, plugs, and/or other components when compressor is running or pressurized.

Stop compressor and relieve all internal pressure before doing so.

6.2 DAILY OPERATION

Prior to starting the compressor, it is necessary to check the fluid level in the sump. Should the level be low, simply add the necessary amount. If the addition of fluid becomes too frequent, a simple problem has developed which is causing this excessive loss. See the Troubleshooting Section (6.7) under Excessive Fluid Consumption for a probable cause and remedy.

After a routine start has been made, observe the gauges and indicators to be sure they monitor the correct readings for that particular phase of operation. After the compressor has warmed up, it is recommended that a general check on the overall compressor and gauges be made to assure that the compressor is running properly.

6.3 MAINTENANCE AFTER INITIAL 50 HOURS OF OPERATION

After the initial 50 hours of operation, a few maintenance requirements are needed to rid the system of any foreign materials. Perform the following maintenance operations to prevent unnecessary problems.

1. Clean the return line strainer.
2. Clean the return line orifice.

6.4 MAINTENANCE EVERY 1000 HOURS

After 1000 hours of operation, it will be necessary to perform the following:

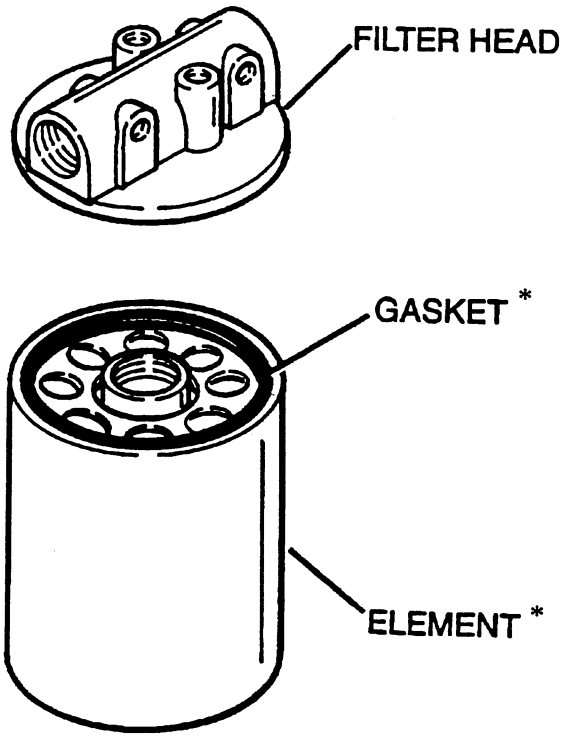
1. Clean the return line strainer.
2. Replace the fluid filter element.

6.5 FILTER MAINTENANCE

Replace your fluid filter element and the gasket under any of the following conditions, whichever occur first.

1. As indicated by the maintenance gauge.
2. Every 1000 hours.
3. Every 6 months.
4. Every fluid change.

Figure 6-1 Filter Element Replacement (P/N 250025-521)



* Repair Kit P/N 250025-525

6.6 PARTS REPLACEMENT AND ADJUSTMENT PROCEDURES

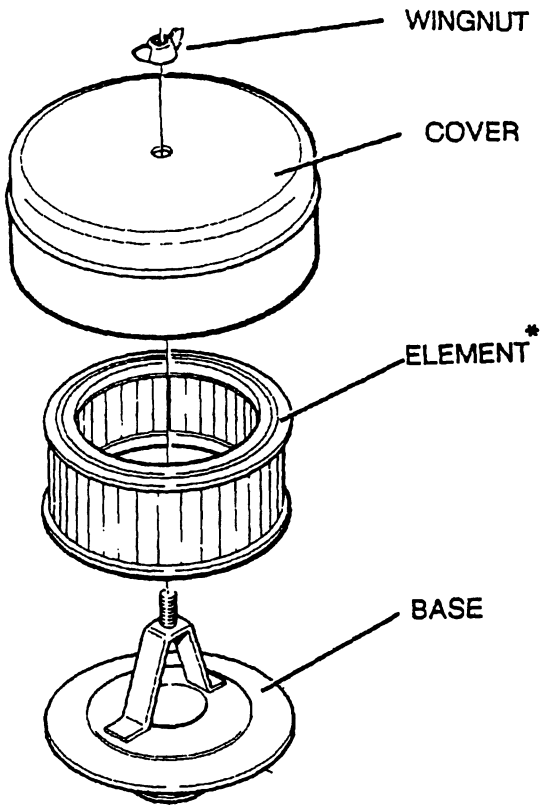
FLUID FILTER ELEMENT REPLACEMENT
Refer to Figure 6-1.

1. Using a strap wrench, remove the old element and gasket.
2. Clean gasket seating surface.
3. Apply a light film of fluid to the new gasket.
4. Hand tighten new element until new gasket is seated in the gasket groove.
5. Continue tightening element by hand an additional ½ to ¾ turn.
6. Restart compressor and check for leaks.

⚠ CAUTION

To minimize the possibility of filter element rupture, it is important that ONLY replacement elements identified with the Sullair name, logo and appropriate part number be used and that substituted elements NOT be used, due to the fact that such filters may have inadequate or questionable working pressure ratings.

Figure 6-2 Air Filter Element Replacement (P/N 410036)



* Replacement Element P/N 042445

AIR FILTER MAINTENANCE
Refer to Figure 6-2. Air filter (P/N 410036) maintenance should be performed under any of the following conditions, whichever comes first:

1. As indicated by the filter maintenance indicator.
2. Every 6 months.

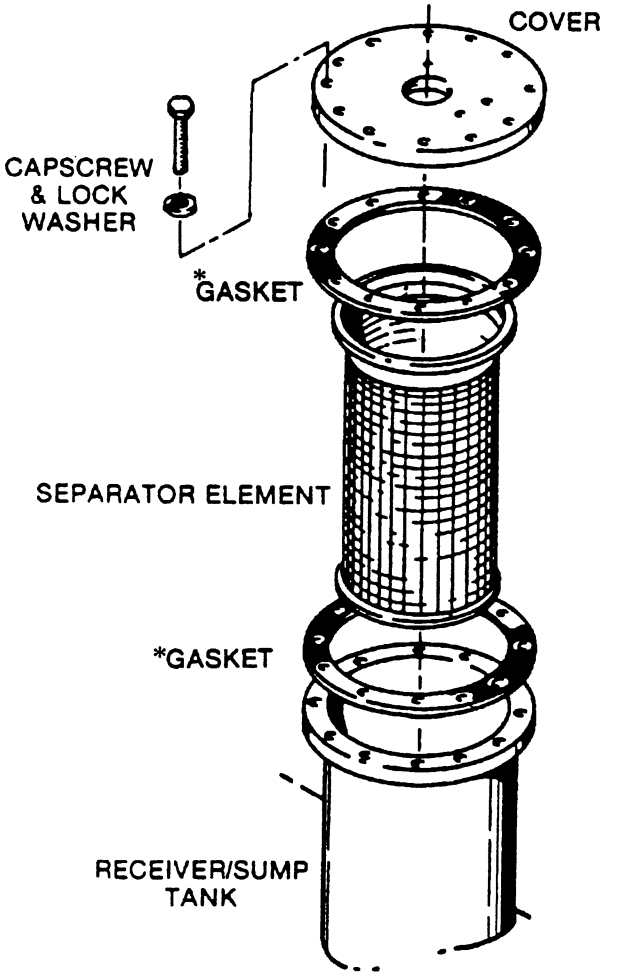
Below you will find procedures on how to replace the air filter element.

AIR FILTER ELEMENT REPLACEMENT
1. Clean exterior of air filter housing.
2. Remove the air filter cover by loosening the wingnut securing the cover.
3. Remove element and clean interior of housing using a damp cloth. **DO NOT** blow dirt out with compressed air.
4. At this time clean or replace the element.
5. Replace cover.
6. Reset the filter maintenance indicator.

ELEMENT INSPECTION
1. Place a bright light inside the element to inspect for damage or leak holes. Concentrated light will shine through the element and disclose any holes.
2. Inspect all gaskets and gasket contact surfaces of the housing. Should faulty gaskets be evident, correct the condition immediately.
3. If the clean element is to be stored for later use, it must be stored in a clean container.
4. After the element has been installed, inspect and tighten all air inlet connections prior to resuming operation.

SEPARATOR REPLACEMENT
Refer to Figure 6-3. The separator must be changed when indicated by the maintenance gauge, or once a year whichever occurs first. Or-

Figure 6-3 Separator Element Maintenance



* Repair Kit P/N 250034-112 (25&30HP) and 250034-114 (40HP)

der separator element repair kit number 250034-112 for 25 and 30HP compressors and repair kit number 250034-114 for 40HP compressors. Follow the procedure explained below for separator element replacement.

1. Relieve all pressure from the sump tank and all compressor lines.
2. Disconnect all piping connected to the sump cover to allow removal (return lines, service lines, etc.).
3. Loosen and remove the hex head capscrews from the cover plate.
4. Lift the cover plate from the sump.
5. Remove the separator element.
6. Scrape the old gasket material from the cover and flange on the sump. Be careful not to let the scraps fall in the sump.
7. Install the new gaskets; one on the sump tank the other on top of the element.
8. Reinsert the separator element into the sump taking care not to dent it against the tank opening.
9. Clean the cover plate, washers and capscrews. Torque to 55 ft.-lbs. (75 Nm).
10. Reconnect all piping making sure return line tube extends ¼" (6mm) above the bottom of the separator element. This will assure proper fluid return flow to the compressor.
11. Clean the return line strainer before restarting the compressor.

INLET VALVE MAINTENANCE

Refer to Figure 6-4. The inlet valve (P/N 250025-654) maintenance may require the replacement of the piston spring, piston o-ring, seal ring, and check valve spring. Use repair kit number 250019-451 and follow the procedure below for proper installation.

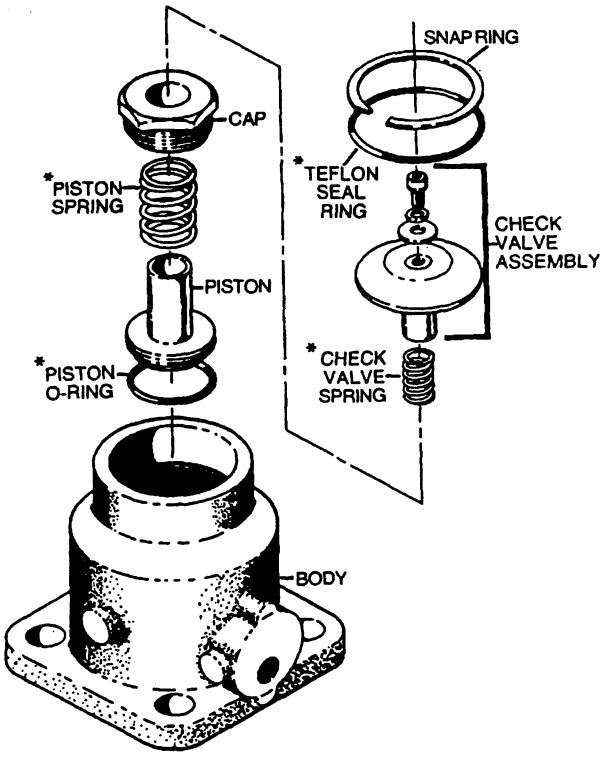
1. Remove all piping connected to inlet valve assembly.
2. Remove the four (4) capscrews and lockwashers that attach the valve body to the compressor unit and remove from compressor.
3. Remove snap ring and Teflon o-ring inside valve body.
4. Lift and remove check valve assembly and spring from valve body.
5. Remove piston cap, piston spring, and piston.
6. Clean valve body as needed, making sure all air passages are clear and old seal ring is removed from the inlet body flange.
7. The next step is to reassemble the inlet valve using the new parts supplied in the repair kit.
8. Install o-ring on piston, lightly oil piston, and install in valve body.
9. Install new piston spring and replace piston cap.
10. Place new check valve spring into piston and install check valve assembly

CONTROL SYSTEM ADJUSTMENT

Refer to Figure 6-5. Prior to adjusting the Control System, it is necessary to determine the desired operating pressure range and also the maximum pressure at which your compressor is to operate. The pressure must not exceed the maximum operating pressure which is stamped on the compressor serial number nameplate. The following explanation applies to a typical installation with a desired operating range of 115 to 125 PSIG (792 to 862kPa). This information will apply to a compressor with any other operating range excepting the stated pressures.

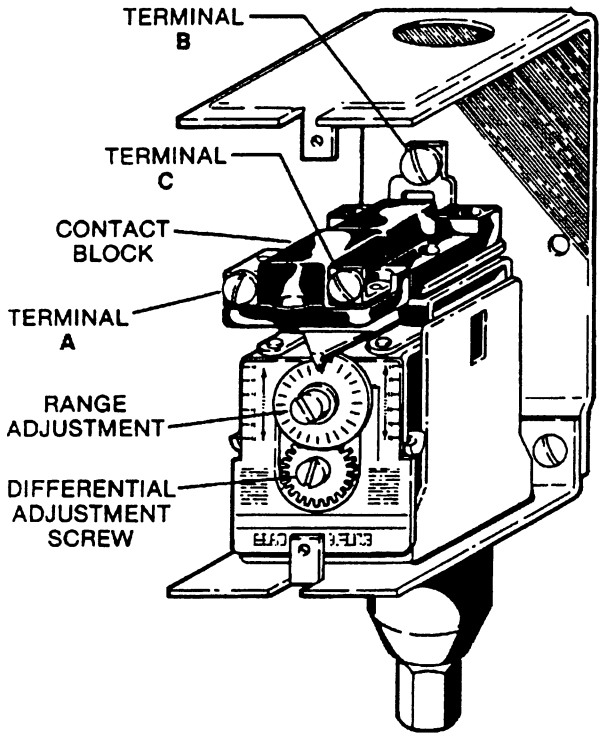
Remove the cover of the pressure switch, pressure regulator and inlet valve as required. With the shut-off valve closed (or slightly cracked open) start the compressor. Observe the line pressure gauge and pressure switch contacts. When the line pressure reaches 125 PSIG (862kPa), the pressure switch contacts should open. If the pressure switch contacts do not open or they open prior to the desired pressure, the

Figure 6-4 Inlet Valve (250025-654)



* Repair Kit P/N 250019-451

Figure 6-5 Pressure Switch (P/N 040694)



pressure switch setting will require adjustment (refer to Figure 6-5).

FOR PRESSURE RANGE ADJUSTMENT:

1. Remove cover to pressure switch.
2. Turn the range adjusting screw to the high pressure setting. Turning the screw counterclockwise lowers both the high and low pressure equally.

FOR DIFFERENTIAL ADJUSTMENT:

Differential is the difference between the high and low pressure settings. 10 PSIG (7kPa) is typical.

1. Turn the differential adjusting screw to the lower (reset) setting. Turning the screw counterclockwise widens the differential by lowering the reset (lower) setting only.
2. When the pressure switch adjustment is complete, the pressure regulator should be adjusted for the pressure at which modulation of air delivery should begin. In this case that pressure will be 118 PSIG (824kPa). The regulator is adjusted by loosening the jam nut on the end of the cone shaped cover of the pressure regulator. When the jam nut is loose, turn the adjusting screw clockwise to increase or counterclockwise to decrease the setting.
3. To set the regulator, continue closing the service valve, until the line pressure is 118 PSIG (824kPa). At this point regulator should pass a signal to the inlet valve to start closing it. If the line pressure keeps on rising or if the modulation does not begin, adjust the regulator valve as described above. After adjustment line pressure should be approximately 118 PSIG (824kPa) and 1.00 in. Hg vacuum below the inlet.
4. Now close the service valve, line pressure will start rising. When line pressure reaches 125 lbs., the inlet valve will be closed to its maximum position. The inlet vacuum at this point will be around 25 in. Hg. The machine should unload at this point.
5. Open the service valve so the line pressure is 115 PSIG (792kPa). Machine is now set for operation. Recheck the unload pressure by closing of the service valve. Machine should unload via the pressure switch at 125 PSIG (862kPa).

After the control pressures have been adjusted, the "unloaded" sump pressure should be checked. It will be necessary to shut the compressor down, remove the pressure switch cover and disconnect one of the two lead wires that are connected to the micro-switch (contact block). After disconnecting the lead, tape the exposed wire with electricians tape to make sure that it does not come in contact with any metallic surface.

⚠ DANGER

DO NOT touch the electrical contacts, terminal or leads with any metallic object. Severe electrical shock may occur.

With the lead taped, you may start the compressor again. Allow the sump pressure to stabilize.

The sump pressure should read 30 to 35 PSIG (207 to 281kPa).

Once this is checked, shut the compressor down once again and reconnect the taped lead and replace the pressure switch cover. At this time, start the compressor and cycle the Control System several times and re-check all pressure settings and adjustments.

⚠ DANGER

DO NOT touch the pressure switch, electrical contacts, terminal board or leads with any part of the body or any uninsulated metallic object. Severe electrical shock may occur.

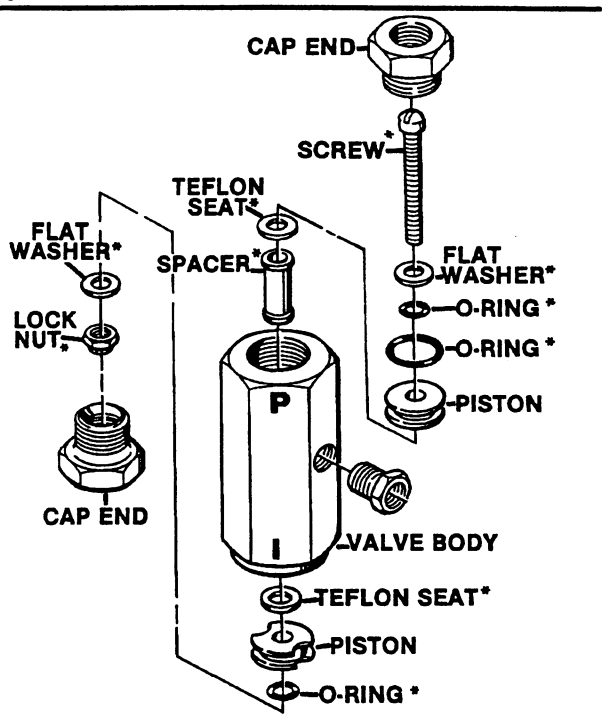
Cycle the Control System several times and recheck all pressure settings.

BLOWDOWN VALVE MAINTENANCE
Refer to Figure 6-6. Blowdown valve no. 250025-655 maintenance is limited to replacement o-rings and the teflon seat. Use repair kit no. 250031-772 and follow the instructions below for proper installation.

1. Unscrew end caps from the valve body and remove.
2. Hold nut with an appropriate socket wrench and turn screw until loose.
3. Next, remove all internal parts mounted on the machine screw. Remove the old o-rings and teflon seat and discard.
4. Replace with the new o-rings and teflon seat provided in the repair kit. Apply appropriate lubricant to o-rings and valve body bore.
5. Pre-assemble the internal parts for pilot (P) side of the valve onto the screw and install into the body.
6. Assemble remaining internal parts for inlet (I) side to the screw as illustrated. Once assembled, install the locknut and torque to 25 in.-lbs. (2.82Nm).
7. Screw end caps into the valve body until tight.

DRIVE COUPLING INSTALLATION
Refer to Figure 6-7. For coupling installation the tools required will be one set of Allen wrenches.

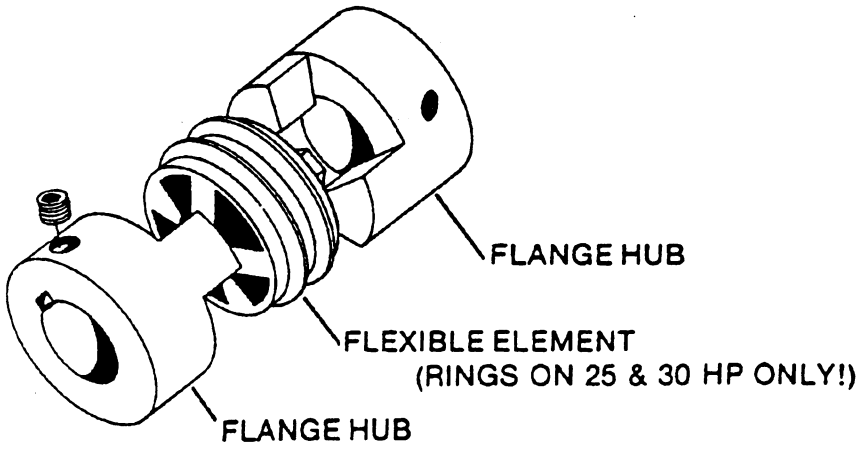
Figure 6-6 Blowdown Valve P/N 250025-655



* Repair Kit P/N 250031-772

Figure 6-7 Drive Coupling

HUB SEPARATION



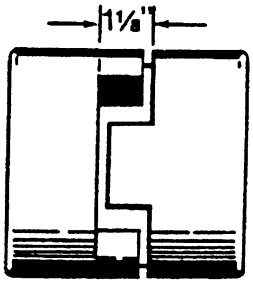
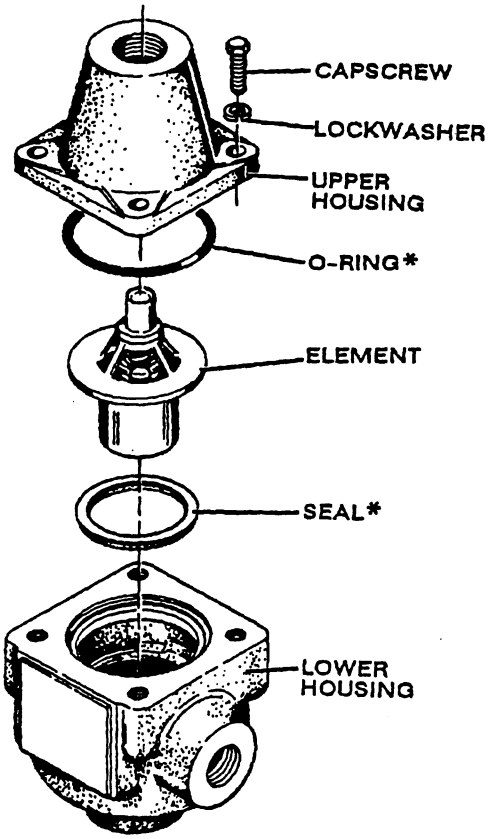


Figure 6-8 Thermal Valve (P/N 250025-620)



* Repair Kit P/N 250025-621

All 10B compressors are flange-mounted to the motor making them self-aligning, eliminating the need for alignment procedures. Proper hub separation is shown in Figure 6-7.

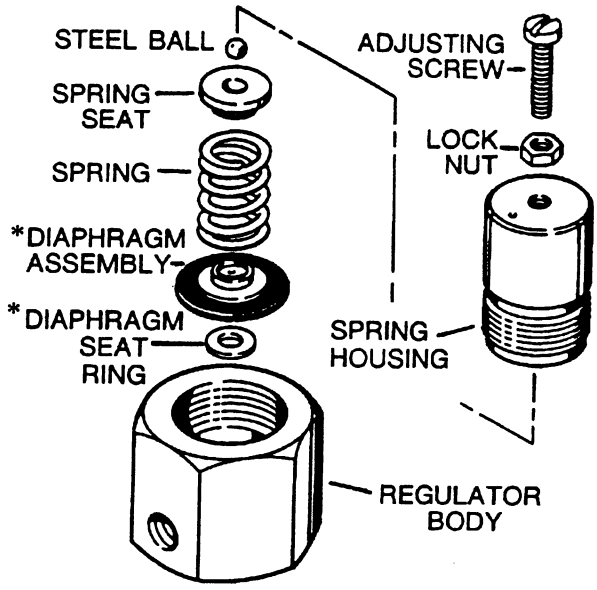
THERMAL VALVE MAINTENANCE
Refer to Figure 6-8. For thermal valve (P/N 250025-620) maintenance, order repair kit number 250025-621 and follow the procedure explained below for installation.

1. Remove the appropriate piping from the thermal valve housing.
2. Remove the four (4) capscrews holding the housing together and separate the upper housing from the lower housing.
3. Remove element.
4. Remove and replace the element seal in the upper housing.
5. Remove and replace the o-ring between the upper and lower housings.
6. Replace element.
7. Re-assemble the housing.

PRESSURE REGULATOR VALVE MAINTENANCE
Refer to Figure 6-9. Pressure regulator (P/N 250017-280) maintenance normally requires the replacement of the internal diaphragm. Use repair kit number 250019-453 and follow the procedure below for proper installation.

1. Loosen the locknut and turn the adjusting screw counterclockwise until the inner spring tension is relieved. The adjusting screw should turn freely when the spring tension is relieved.
2. Remove the spring chamber from the body to allow access to internal parts.
3. Next, remove the spring button and the spring. The dampener will stay inside the spring as it is removed. Leave the dampener inside the spring as there is no need to remove it.
4. After removing the spring, remove the gasket stop and brass gasket.
5. At this time, remove the pressure plate nut and disassemble the pressure plate, diaphragm, diaphragm gasket (rubberized asbestos), seat disc and seat gasket.
6. Remove and discard the seat ring.

Figure 6-9 Pressure Regulator Valve (P/N 250017-280)



* Repair Kit P/N 250019-453

Figure 6-10 Flexible Coupling

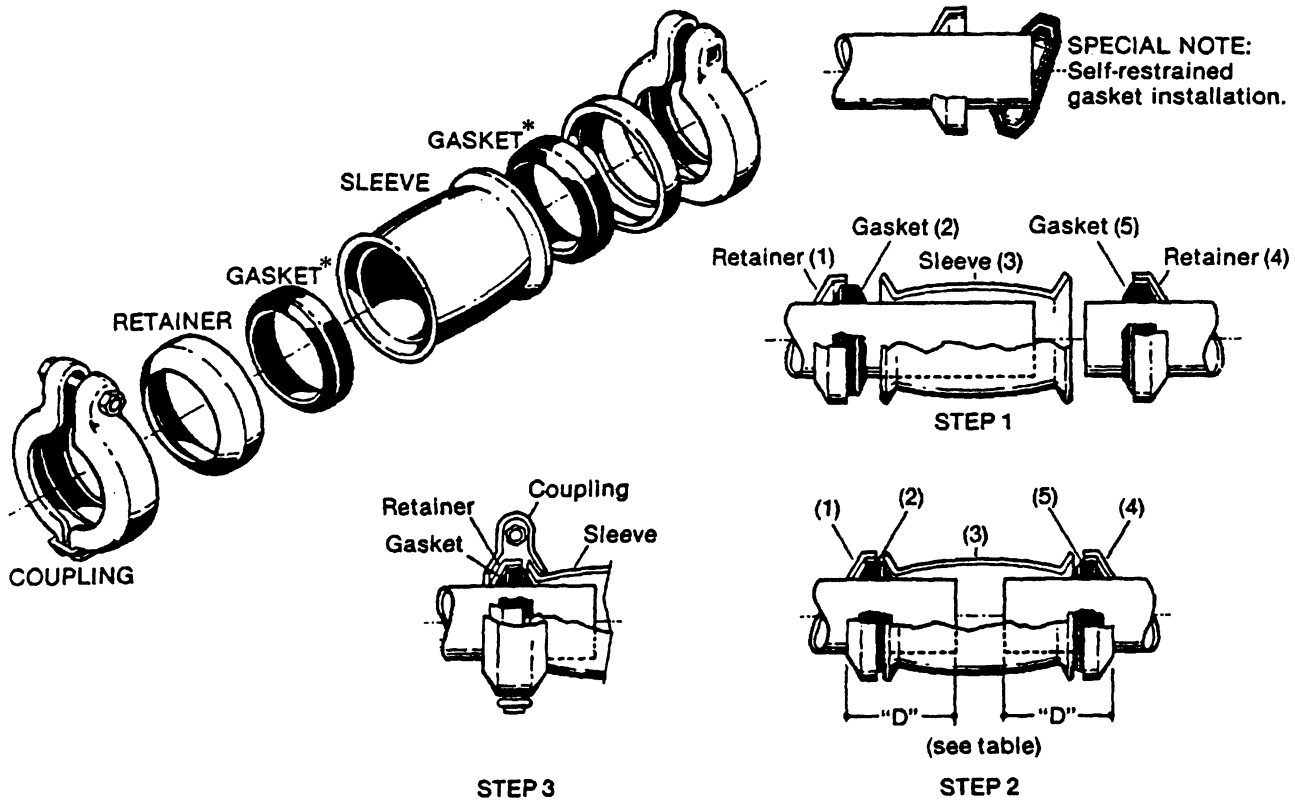


TABLE 1 INSERTION DEPTH

Pipe Size	"D" Min.	"D" Max.
1½" (38.1mm)	1.16" (29.5mm)	1.62" (41.2mm)

TABLE 2 ASSEMBLY TORQUE

Size	Standard
1½" (38.1mm)	90 to 110 in.-lbs. (10.14 to 12.4Nm)

(I) Tighten as shown in chart or a minimum of 1/16" (1.5mm) clearance between coupling lugs, whichever comes first.

TABLE 3 GASKET RING SELECTION

Size	Part Number	Part Number
1½" (38.1mm)	(Buna N) 040517	(24KT) 250007-559

7. The next step is to reassemble the regulator using the new parts provided in the repair kit.
8. Reassemble the diaphragm, pressure plate, gasket, seat disc, and seat disc gasket and tighten the nut. All of these parts with the exception of the pressure plate are provided in the repair kit.
9. Replace the seat ring with the new seat ring provided.
10. Replace the existing brass gasket and diaphragm gasket stop.
11. Next, place these parts in their proper place on the body and replace the spring as it was prior to disassembly.
12. Place the spring button, over the spring as shown.
13. With all parts in order, replace the spring chamber and tighten.
14. Tighten the adjusting screw until tension is realized.
15. At this time, refer to Control System Adjustment procedure and readjust.

FLEXIBLE COUPLING MAINTENANCE
Refer to Figure 6–10. Flexible coupling maintenance normally requires the replacement of the (two) 2 gasket rings on the coupling. Select appropriate gasket rings from Table 3 and follow the procedure below for proper installation.

PIPE END PREPARATION
1. Deburr and clean the pipe ends.
2. The pipe ends should be free of all deep scratches, gouges, dents, etc. A special finish is not required.

JOINT INSTALLATION
1. Install the retainer (1), gasket (2), and sleeve (3) on one side of the pipe as shown in Step 1.
2. Install the remaining retainer (4) and gasket (5) on the other pipe end.
3. Position the retainer (4) and gasket to proper pipe insertion depth ("D") as shown in Table 1.
4. Slide the sleeve (3) to the gasket (5) and move gasket (2) and retainer (1) into position as shown in Step 2. The pipe **MUST** be inserted to the proper depth ("D") into both gaskets.

COUPLER INSTALLATION
1. Install both V couplings as shown in Step 3, encompassing the retainer, gasket and sleeve. **DO NOT** tighten either coupling until the entire joint has been assembled.
2. Tighten the nuts to the torque valve shown in Table 2. **RECOMMENDED ASSEMBLY TORQUE MUST BE MAINTAINED.** Re–tightening of the coupler will be necessary if leakage occurs.

SPECIAL NOTES
1. Assembly of the gaskets can be made easier by dipping the gaskets in water or the oil to be sealed. **DO NOT USE THE RUBBER LUBRICANTS.**
2. Flexible joints are not intended to support end loads caused by internal pressure or other forces causing pipe separation.

MINIMUM PRESSURE/CHECK VALVE MAINTENANCE
Refer to Figure 6–11. Minimum pressure/check valve (P/N 241581) maintenance is quite minimal. The only part which normally requires replacement is the o–ring on the piston. To replace this ring, order seal repair kit no. 250020–344 and follow the procedure explained below.

⚠ WARNING

Before performing maintenance on the valve, be sure that all pressure has been relieved in the compressor sump, and all downstream pressure has been vented to the atmosphere. Also be sure that the components of the compressor are cool to the touch.

1. Unscrew the minimum pressure/check valve (P/N 241581) from the receiver cover.
2. Remove the hexagonal retaining cap from the main body.
3. Remove the flat washer and heavy spring from the main body.
4. Tap the piston assembly (with a screwdriver) from the bottom of the main body and remove. The o–ring will now be seen easily.
5. Remove the seal ring and discard.
6. Clean piston assembly and valve thoroughly.
7. Replace seal ring and coat the piston and seal with Parker Super "O" Ring Seal or an equivalent quality grease.

⚠ WARNING

Extreme caution should be used when removing the cap from the body because there is spring tension on the cap.

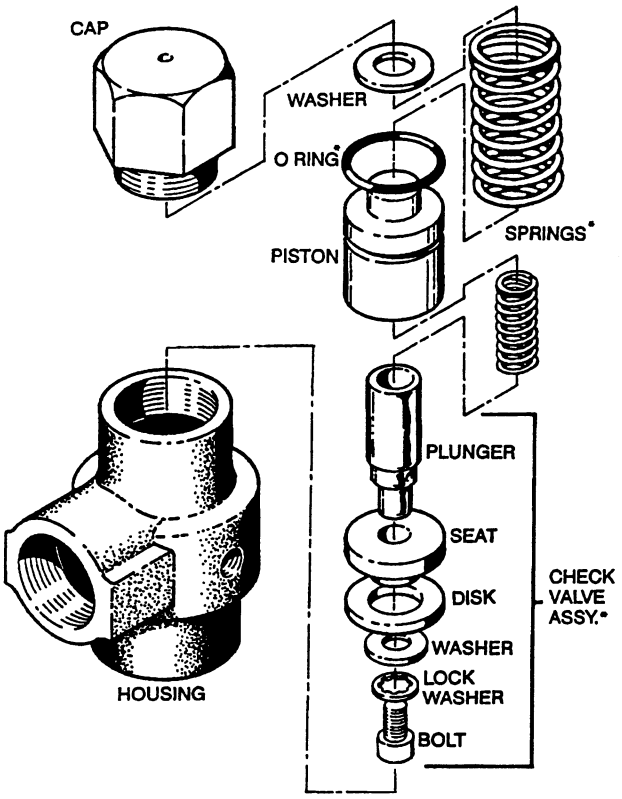
8. Reset piston assembly into the main body and reposition spring and flat washer.
9. Replace retaining cap.
10. Reattach valve to receiver cover and reconnect all piping.

SOLENOID VALVE MAINTENANCE
Refer to Figure 6–12. Solenoid valve (P/N 250017–993) maintenance is quite minimal but a periodic cleaning is desirable. The time between cleanings will vary depending on operating conditions. In general, if the voltage to the coils is correct, sluggish valve operation or excessive leakage will indicate that cleaning is required. If parts replacement is required, order repair kit number 250018–970 or number 250018–971 and follow the procedure explained below:

⚠ WARNING

Turn off all power, relieve line pressure, and disconnect coil lead wires to the valve before making repairs.

Figure 6-11 Minimum Pressure / Check Valve (P/N 241581)



* Repair Kit P/N 250026-758

It is not necessary to remove the valve from the pipe line for repairs.

DISASSEMBLY AND REASSEMBLY

1. Remove the retaining cap and slip the entire solenoid off the solenoid base subassembly.
2. Unscrew the solenoid base assembly. Remove the core assembly, core spring and body gasket.
3. Next, remove the end cap, body gasket, disc spring, and disc holder assembly.
4. All parts are now accessible for cleaning or replacement. Replace worn or damaged parts with repair kit number 250018-970 for best results.
5. Reassemble in reverse order of disassembly.

COIL REPLACEMENT KIT (P/N 250018-971)

1. Remove the retaining clip.
2. Slip the yoke containing the coil and sleeves off the solenoid base sub-assembly.
3. Reassemble in reverse order of disassembly.

6.7 TROUBLESHOOTING

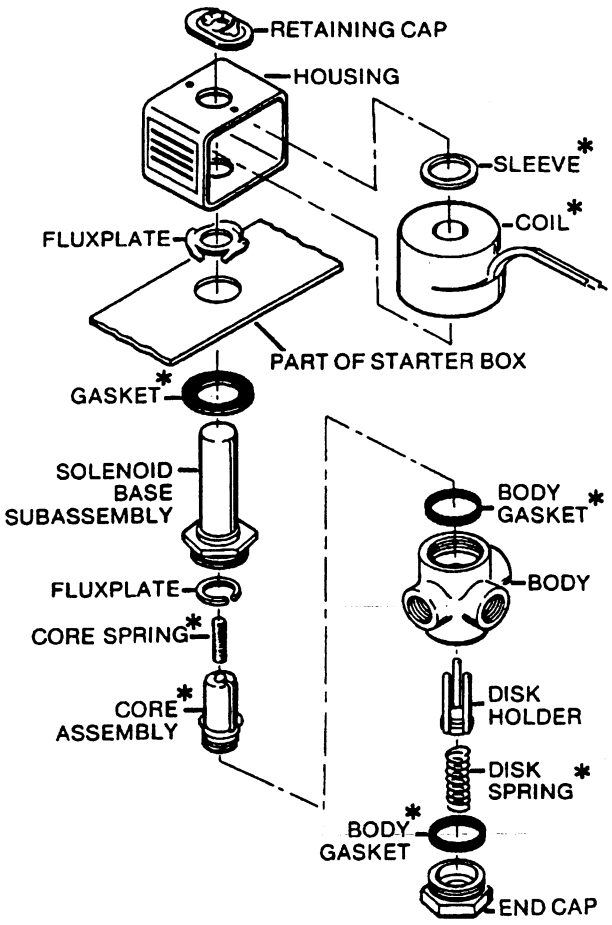
The information contained in the Troubleshooting chart is based upon both the reports about actual field applications, and extensive testing done at the factory. It contains symptoms and usual causes for the described problems. However **DO NOT** assume that these are the only problems that may occur. All available data concerning the trouble should be systematically analyzed before undertaking any repairs or component replacement procedures.

A detailed visual inspection is worth performing for almost all problems. Doing so can prevent unnecessary damage. Always remember to:

a. Check for loose wiring.
b. Check for damaged piping.
c. Check for parts damaged by heat or an electrical short circuit, usually apparent by discoloration or a burnt order.

Should your problem persist after making the recommended check, consult your nearest Sullair representative or the Sullair Corporation factory toll free at 1-800-348-2722.

Figure 6-12 Solenoid Valve (P/N 250017-993)



* Repair Kit P/N 250018-970
** Replacement Kit P/N 250018-971 (coil)

TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSE	REMEDY
COMPRESSOR WILL NOT START	Main Disconnect Switch Open	Close switch.
	Line Fuse Blown	Replace fuse.
	Control Transformer Fuse Blown	Replace fuse.
	Motor Starter Overloads Tripped	Reset. Should trouble persist, check whether motor starter contacts are functioning properly.
	Low Incoming Line Voltage	Check voltage. Should voltage check low, consult power company.
COMPRESSOR SHUTS DOWN WITH AIR DEMAND PRESENT	Loss of Control Voltage	Reset; if trouble persists, check that line pressure does not exceed maximum operating pressure of the compressor (specified on nameplate).
	Low Incoming Voltage	Consult power company.
	Excessive Operating Pressure	Defect in line pressure switch; check pressure at which contact points open.
		Separator requires maintenance; check maintenance gauge under full load conditions.
		High pressure shut-down switch is adjusted too low; readjust to 135 PSIG (931kPa).
		Defective solenoid valve; solenoid valve should cause control lever to move to unload stop when the pressure switch contacts open. Repair if defective.
		Defective blowdown valve; blowdown valve should exhaust sump pressure to 30 to 35 PSIG (207 to 241kPa) when maximum operating pressure is reached. Repair if defective.
	Discharge Temperature Switch Open	Cooling water temperature too high; increase water flow (water-cooled only).
		Cooling water flow insufficient; check water lines and valves (water-cooled only).
		Cooler plugged; clean tubes. If plugging persists, install water conditioner (water-cooled only).
		Cooling air flow restricted; clean cooler and check for proper ventilation.
		Ambient temperature is too high; provide sufficient ventilation.
		Low fluid level; add fluid.
		Clogged filter; change the fluid filter element if indicated by the maintenance gauge.
		Thermal valve not functioning properly; replace element (air-cooled only).
		Water flow regulating valve not functioning properly; change (water-cooled only).
		Defective discharge temperature switch; check for a short or open circuit to probe and correct wiring.

TROUBLESHOOTING (continued)

SYMPTOM	PROBABLE CAUSE	REMEDY
COMPRESSOR WILL NOT BUILD UP FULL DISCHARGE PRESSURE	Air Demand Is Too Great	Check service lines for leaks or open valves.
	Dirty Air Filter	Check the filter indicator and change if required.
	Pressure Regulator Out of Adjustment	Adjust regulator according to control adjustment instructions in the Maintenance section.
	Defective Pressure Regulator	Check diaphragm and replace if necessary (kit available).
	Defective or Dirty Inlet Valve	Check that valve fully opens when full air demand is present. Repair or clean as necessary.
LINE PRESSURE RISES ABOVE CUT-OUT PRESSURE SETTING ON PRESSURE SWITCH	Leak in Control System Causing Loss of Pressure Signals	Check for leaks.
	Defective Pressure Switch	Check that diaphragm and contacts are not damaged. Replace if necessary.
	Defective Solenoid Valve	Repair kit available.
	Defective Blowdown Valve	Check that sump pressure is exhausted to the atmosphere when the pressure switch contacts open or repair or replace if necessary (kit available).
	High Pressure Shutdown Switch is Defective or Adjustment is Incorrect	Readjust or replace.
EXCESSIVE COMPRESSOR FLUID CONSUMPTION	Clogged Return Line or Orifice	Clean strainer (screen and o-ring replacement kit available). Clean orifice.
	Separator Element Damaged or Not Functioning Properly	Change element.
	Leak in the Lubrication System	Check all pipes, connections and components.
	Excess Fluid Foaming	Drain and change.
	Fluid Level Too High	Drain to correct level.
PRESSURE RELIEF VALVE OPEN REPEATEDLY	High Pressure Shutdown Switch is Defective or Out of Adjustment (135 PSIG [932kPa]).	Readjust below pressure relief valve setting (200 PSIG [1379kPa]) or replace.
	Defective Pressure Relief Valve	Replace pressure relief valve.
	Check Separator Differential (plugged)	

6.8 MAINTENANCE RECORD

MODEL NO. _____ SERIAL NO. _____

DATE	HOURMETER	MAINTENANCE PERFORMED	WORK PERFORMED BY	AUTHORIZED BY

6.8 MAINTENANCE RECORD

MODEL NO. _____ SERIAL NO. _____

DATE	HOURMETER	MAINTENANCE PERFORMED	WORK PERFORMED BY	AUTHORIZED BY

NOTES

WORLDWIDE SALES AND SERVICE

SULLAIR ASIA, LTD.
Chiwan Supply Base
Bldg A5–1 Chiwan
Shenzhen, Guangdong PRV.
PRC POST CODE 518068
Telephone: 755–6853477
Fax: 755–6853473

SULLAIR EUROPE, S.A.
Zone Des Granges BP 82
42602 Montbrison Cedex, France
Telephone: 33–477968470
Fax: 33–477968499

SULLAIR CORPORATION
Subsidiary of Sundstrand Corporation
3700 East Michigan Boulevard
Michigan City, Indiana 46360 U.S.A.
Telephone: 1–800–SULLAIR (U.S.A. Only) or
1–219–879–5451
Fax: (219) 874–1273
Fax: (219) 874–1835 (Parts)
Fax: (219) 874–1805 (Service)

Part Number
02250049-581

CE

Printed in U.S.A.

Specifications Subject To
Change Without Prior Notice

E97