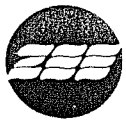

Zee Systems Inc.

AIRBORNE AIR CONDITIONING SYSTEMS & COMPONENTS

OPERATION
and
MAINTENANCE MANUAL

with
Illustrated Parts List

DoS/Dyncorp OV-10
AIR CONDITIONING SYSTEM
SZ97-000

MANUAL SZ97-000

ISSUE DATE
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Zee Systems Inc.

OPERATION and MAINTENANCE MANUAL

RECORD OF REVISIONS

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OPERATION and MAINTENANCE MANUAL

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Zee Systems Inc.

OPERATION and MAINTENANCE MANUAL

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continued

*INITIAL RELEASE DATE: May 1998

Zee Systems Inc.

OPERATION and MAINTENANCE MANUAL

1.0 INTRODUCTION

1.0.1 This manual contains operating instructions and maintenance and service instructions for the vapor cycle air conditioning systems installed on the DoS Aviation Rockwell OV-10D.

1.0.2 The air conditioning system is a vapor cycle type system. The refrigerant is R-134a (HFC-134) and use Castrol SW100 lubricant in the compressor reservoir.

1.1 BASIC COMPONENTS

1.1.1 The major air conditioning component sub-systems supplied by ZEE Systems, Inc. are:

1. 1 each Motor Compressor Condenser, P/N: SZ97-001-1A
2. 1 each Evaporator, P/N: SZ97-701-1 and
3. 1 each Controller, P/N: SZ96-035-1
4. Electrical Components
5. Plumbing Components

1.1.2 For a complete kit list of items supplied by Zee Systems, Inc. refer to Section 8, of this manual.

WARNING

THIS SYSTEM IS UNDER PRESSURE. INJURY COULD OCCUR IF PROPER SAFETY PRECAUTIONS ARE NOT TAKEN. THE SYSTEM PRESSURE MUST BE RELIEVED BEFORE ANY LINES ARE DISCONNECTED.

WARNING

AVOID PROLONGED SKIN CONTACT WITH REFRIGERANT HFC-134a. AVOID CONTACT WITH EYES. DO NOT BREATH THE FUMES. REFER TO THE MATERIAL SAFETY DATA SHEET FOR INFORMATION OR TREATMENT. WEAR PROTECTIVE CLOTHING, GLOVES AND GLASSES WHEN HANDLING REFRIGERANT OR OIL.

NOTE

IT IS AGAINST U.S. FEDERAL LAW TO INTENTIONALLY RELEASE ANY REFRIGERANT INTO THE ATMOSPHERE. USE APPROVED RECOVERY/RECYCLE EQUIPMENT TO CAPTURE REFRIGERANT. CONTACT LOCAL AGENCIES FOR REGULATIONS CONCERNING THE RECOVERY/RECLAIM/ RECYCLE AND DISPOSAL PROCEDURES IN YOUR AREA OR COUNTRY.

1.2 THEORY OF OPERATION

1.2.1 Refrigerant is compressed into a high pressure vapor in the electric motor driven compressor. The refrigerant moves to the condenser where air is forced over the coils. As the gas is cooled heat is released and the refrigerant condenses into a high pressure liquid and travels to the evaporators. At the evaporators the liquid passes through a thermostatic expansion valve and becomes a low pressure liquid which as it passes through the coil absorbs heat from the cabin and evaporates into a low pressure gas and returns to the compressor for the cycle to begin again.

1.2.2 The system is controlled by the P/N: SZ96-035-1 Controller. This unit is micro-processor based and controls all functions of the air conditioning components. Any time the "A/C Master Switch" is selected to ON or BLOWERS the blowers will run. The blowers can be operated on HIGH or LOW with or without the full air conditioning system. When "A/C" switch is selected ON at the Master Control Switch the blowers come ON and the processor reads the temperature sensor input signal and compares it to the temperature select setting input signal in the cockpit. If the selected temperature is within 3F degrees of the sensor the compressor will not engage. The processor will compare these two input signals every 15 seconds. When the sensor input is greater than the selected temperature by 2F degrees the controller will energize the compressor start up. The compressor will continue to run until the temperature sensor signal is 2F degrees below the selected temperature. The processor monitors the two input signals every 15 seconds any time the "A/C" switch is selected ON.

YEAR 2000 COMPLIANCE STATEMENT: ALL ZEE SYSTEMS, INC. EQUIPMENT IS CAPABLE OF CORRECTLY PROCESSING, PROVIDING AND RECEIVING DATA WITHIN AND BETWEEN THE TWENTIETH AND TWENTY FIRST CENTURIES WHEN USED IN ACCORDANCE WITH ITS ASSOCIATED DOCUMENTATION AND IN CONJUNCTION WITH OTHER YEAR 200 COMPLIANT PRODUCTS AND SYSTEMS WHICH EXCHANGE DATA WITH IT.

1.3 REFRIGERATION CIRCUIT COMPONENTS

1.3.1 RECEIVER-DRYER: The receiver-dryer is located in the liquid line after the condenser and before the expansion valve. It serves two purposes in the circuit: 1) as a refrigerant reservoir to maintain evaporator capacity, and 2) to hold desiccant which removes moisture from the system. Any receiver-dryer with XH-7 or XH-9 desiccant is compatible with both R-12 and R-134a refrigerant. However, to avoid cross contamination, once a receiver-dryer has been used with one refrigerant do not use it in a circuit with a different refrigerant. Anytime a circuit has had a major component

failure or has been opened to the atmosphere for an extended period of time or during periods of high humidity that the receiver-dryer be replaced. Keep the receiver-dryer capped until being installed as the last operation prior to evacuating the system.

1.3.2 COMPRESSOR: The compressor is piston type self lubricating compressor. The level of oil must be checked and maintained to insure proper lubrication throughout the system. See Section 3.2 for instructions. Some compressors are equipped with back seating valves. The valves must be in the proper position during operation or the compressor may be damaged and caused to fail.

1.3.3 CONDENSING COIL: This coil is part of the Motor Compressor Condenser Assy. This coil is of tube and fin construction. This is where heat is removed from the system. The fins should be kept clean and straight to allow for maximum air flow over the coil tubes. The inlet and outlet airflow over the condenser should be unrestricted.

1.3.4 EXPANSION VALVE: This is a device located on the inlet side of the evaporator coil. Its purpose is to regulate the flow of condensed refrigerant into the evaporator coil so it will evaporate at the proper rate.

1.3.5 EVAPORATOR COIL: This coil is of tube and fin construction. The coil is designed to allow for evaporation of low pressure liquid refrigerant and absorb the of heat from the cockpit area which is to be transferred to the condensing coil.

1.3.6 PLUMBING: The various components which route the refrigerant through its cycle are designed to be compatible with the refrigerant and oil and to function at the pressures and temperatures produced during the refrigeration cycle. These components include flex lines, tubes, fittings, adapters, unions and other special connections.

1.3.7 DRIVE BELTS: The drive belt train is an efficient two stage reduction to provide the proper compressor speed ratio and compact design. The drive directly off the motor is the "primary" drive and the drive off the compressor is the "secondary" drive. The large diameter pulleys are aluminum with a hard anodizing (black or grey in color) on the tooth area.

1.4 CONTROLS, AIR CONDITIONING SYSTEM

1.4.1 Refer to aircraft manufacturer/Dyncorp/DoS Aviation for specific procedures for aircraft power up and electrical system on-line sequences.

1.4.2 Controls are located on the side panel to the left of the front seat at about the elbow armrest.

1.4.3 When electrical power is available: At master switch, from the center OFF position select ON. Blowers will come on.

1.4.4 If the MCC did not start turn Temp Select CCW until compressor start is accomplished.

1.4.5 Thermostatic control is as follows: Full CCW will provide the coldest setting. Full CW will provide warmest setting. Select a position between full CCW to full CW which meets flight crew comfort zone.

1.4.5.1 During operation when the cockpit cools and the controller senses the selected temperature has been achieved the compressor will shut down until more cooling is required. The blowers will continue to run.

1.4.6 The blowers can be operated to recirculate cockpit air without the compressor engaged. Select "BLOWERS". The thermostatic control will have no effect.

1.4.7 To deactivate the air conditioning move the master switch to the center OFF position. This deactivates the compressor drive motor through the controller and the blowers directly through the fan speed select switch.

1.5 MAINTENANCE AND SERVICE

1.4.1 After the air conditioning system is installed, serviced and fully charged the system is designed to require very little field maintenance. Most components are not field repairable. Refer to Sections 3, 4 and 5 of this manual for detailed instructions.

2.0 SPECIAL TOOLS AND EQUIPMENT

2.1 TOOLS: The following special tools are required to perform the maintenance described in this manual.

ITEM	SOURCE
Dip, Stick, Compressor Oil	Refer to 3.2.2.1.
Belt deflection gauge.	Commercially available.
Leak Detector, for HFC-134a	Commercially Available.
Comb Set, Fin.	Commercially Available.
Power Supply capable of 28VDC, 50 Amps	Commercially Available.
Refrigerant Recovery/Recycle equipment meeting SAE J1990 or J2209 specifications.	Commercially Available.
Manifold Gauge Set, R-134a, with automotive service connections.	Commercially Available.
Refrigeration Vacuum Pump.	Commercially Available.
Scale with 0.1 lb. increments.	Commercially Available.

2.1.2 Refer to applicable ZEE SYSTEMS Service Letter(s) for any additional special tools which may be required to service the air conditioning system.

2.2 MATERIALS: The following material may be required to perform maintenance described in this manual.

ITEM	SOURCE
MS20995C32 Lock Wire	Commercially Available.
Refrigerant, HFC-134a	Commercially Available.
Lubricant, Refrigeration, Castrol SW100, Icematic Alternate P/N:431756C any Poloyl Ester (P.O.E.) refrigerant oil with ISO of 100 or 150.	Commercially Available.
Liquid Detergent, water soluble	Commercially available.

Cloth, lint free	Commercially available.
Tape, Insulation,	Commercially available.
Armaflex 25/50 tube insulation. Various inside diameters with 3/8"wall	Commercially Available.

3.0 REPAIR AND REPLACEMENT OF COMPONENTS

NOTE: IT IS UNLAWFUL TO RELEASE R-12 OR OTHER REFRIGERANTS TO THE ATMOSPHERE. USE APPROVED RECOVERY/RECYCLE EQUIPMENT TO CAPTURE REFRIGERANTS. USE ONLY LAWFUL MEANS TO DISPOSE OF RECOVERED REFRIGERANTS. CHECK WITH LOCAL AGENCIES FOR APPROVED DISPOSAL PROCEDURES.

CAUTION: AIR CONDITIONING SYSTEM UNDER PRESSURE. APPROPRIATE SAFETY MEASURES SHOULD BE TAKEN WHEN SERVICING THIS EQUIPMENT. ONLY TRAINED PERSONNEL WITH APPROVED SAFETY EQUIPMENT SHOULD PERFORM SERVICING DUTIES.

NOTE: CAP ALL OPEN LINES TO PREVENT CONTAMINANTS AND MOISTURE FROM ENTERING THE SYSTEM.

NOTE: DUE TO THE TIGHT FIT OF THE MOTOR COMPRESSOR CONDENSER ASSY IT MAY BE NECESSARY TO REMOVE THE MOTOR COMPRESSOR CONDENSER ASSY AND THE EVAPORATOR TO PERFORM SOME OF THE MAINTENANCE DESCRIBED BELOW.

3.1 DRIVE BELT

3.1.1 REMOVAL. Extreme care should be taken during maintenance not to strike or use pullers directly against the hardened (black or grey) area of these pulleys as this may crack or chip the anodized surface.

3.1.2 Secondary Belt (1/2/3-7): To remove the belts start with the secondary belt. Loosen the four bolts (4-38) then loosen the secondary belt adjusting bolt (1/3/4-33). This slides the compressor toward the jack shaft assembly (2-43), remove the secondary belt from the compressor pulley first then the small pulley on the jack shaft assembly.

3.1.2 Primary Belt (1/2/4-8): Loosen the two locking bolts (3-34A). Put a 3/8" diameter pin in the hole in the jack shaft and lift upward. This will loosen the primary belt, remove the belt from the jack shaft pulley first then from the motor pulley.

3.1.2 INSPECTION: Inspect each belt for deterioration, damage and fraying. Replace defective belts.

3.1.2.1 Check the belt alignment before running the motor. Turn the compressor pulley by hand to see that belts are properly aligned. Slight striking of the belt against the rim on the small pulleys is normal but not to the point where chafing occurs. Readjust belts if necessary. Next run the motor and check for smooth operation. If a

belt hops or flutters it is too loose. If the belt is too tight against the pulley rim a discharge of fine dust like rubber particles will occur. Check the condition of the smaller pulley rim and readjust belts as necessary. Once the belts are adjusted and the hardware in properly tightened not further adjustments should be necessary if the components are not disturbed.

3.1.4 INSTALLATION: Always place the belt over the smaller diameter pulley first then carefully slide the belt over the larger diameter pulley. Care should be taken to not tear the edges of the belts. Place both belts loosely over the pulleys.

3.1.4.1 With the belts loosely in place, make sure that the jack shaft assembly (2-43) is centered axially in the frame assembly so the belts will track as close as possible to the center of each pulley and 3/8" pin hole is pointing upward. Tighten the four compressor mount bolts (4-38) to the point where the compressor slides but that compressor base plate (3-37) is fairly well seated. If this is not done the belt tension will change when the bolts (4-38) are tightened.

3.1.5 BELT ADJUSTMENT: Anytime the primary belt has been loosened both belts must be loosened and readjusted. Always adjust the primary belt first.

3.1.5.1 Primary Belt (1/2/4-8) Adjustment: Insert the 3/8" pin in the jack shaft assembly (2-43) and push downward on the pin to tighten the primary belt until a tension of 1/8" deflection midway between pulleys with 2-3 pound pull is achieved. Tighten the two locking bolts (3-36) to torque of 30 foot-pounds.

3.1.5.2 Secondary Belt (1/2/3-7) Adjustment: Tighten the adjusting bolt (1/3/4-33) until a tension of 1/8" deflection midway between pulleys with a 4-5 pound pull is achieved. Tighten the four bolts (4-38) to a torque of 40 foot-pounds. Loosen the adjusting bolt (1/3/4-33) and tighten to a torque of 15 inch-pounds.

3.1.5.3 Once a drive is properly adjusted no further maintenance should be required unless the adjustment is disturbed by component replacement. It is recommended that belts be replaced in pairs.

3.2 COMPRESSOR

NOTE: IF YOUR COMPRESSOR HAS BACK SEATING VALVES, TO SAVE THE REFRIGERANT CHARGE, YOU MAY TURN THEM ALL THE WAY IN (TURN CW) UNTIL THEY ARE TIGHT AGAINST THE FRONT SEAT. THEN USING A TWELVE-POINT SOCKET REMOVE THE VALVE FROM THE COMPRESSOR. THIS WILL ISOLATE THE REFRIGERANT CHARGE. DO NOT OPERATE THE COMPRESSOR WITH THE VALVES IN THIS POSITION. TURN THE VALVES BACK OUT PRIOR TO OPERATION.

3.2.1 REMOVAL: Loosen the four bolts (4-38) then loosen the adjusting bolt (1/3/4-33) and remove the secondary belt. Remove the four bolts and washers (4-38,4-38A,) and adjusting bolt (1/3/4-33) and lift the compressor (1-21) and base plate (3-37) from the side frames. Separate the compressor from the base plate by loosening and removing the three bolts (1-17,1-17A,1-17B). To remove the pulley (3-39) loosen, but do not completely remove bolt (3-41) and washer (3-40). Evenly pry between the compressor boss and the pulley hub until the pulley is free. Now remove the bolt (3-41), washer (3-40) and pulley (3-39) and set aside to be installed on new compressor.

3.2.2 INSPECTION: Check for signs oil leakage around the fittings.

3.2.2.1 Check oil level. Fashion an oil dip stick from any soft metal bar or rod stock approximately 9-1/4" long. Bend metal as shown in Illustration 1 below. Remove the oil fill plug on top of the compressor, take care not damage the O-ring. Place the dip stick in the opening, make sure the dip stick goes in past the crankshaft and pistons. Minimum oil depth is 13/16" full is 1-5/8". Refer to TABLE 1 for correct oil for your system and add oil as necessary. Return and tighten oil fill plug.

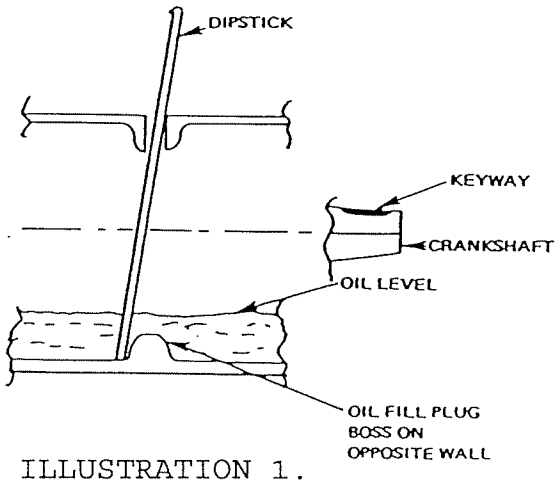


ILLUSTRATION 1.

3.2.3 PULLEY INSTALLATION: Place the pulley on the new compressor and align on the shaft key. Using a block of wood, lightly tap the pulley on the compressor shaft. Take care not to damage pulley or strike tooth rim area. Place washer (3-40) and bolt (3-41) in place and torque to 20 foot-pounds, secure with .032 diameter lock wire.

3.2.4 BASE PLATE REASSEMBLY: Attach the base plate (3-37) to the compressor using the three bolts (1-17,1-17A,1-17B), torque to 45 foot-pounds.

3.2.5 INSTALLATION: Set the assembled compressor and base plate (3.2.3 and 3.2.4) on the side frames 1/3-44,1/4-45) and reassemble using bolts and washers (4-38,4-38A). Tighten and torque to 40 foot-pounds, secure with .032 dia. lock wire. Install belts in accordance with Section 3.1.4.

3.3 MOTOR, COMPRESSOR DRIVE

3.3.1 REMOVAL: Disconnect the positive and negative leads to the motor. Remove and set aside the primary belt in accordance with paragraph 3.1.3.2. Hold the motor pulley with a spanner wrench and loosen (right hand thread) the fan shaft assembly (1-19) by turning the 1" hex nut. Do not completely remove the fan shaft assembly at this time.

3.3.1.1 Remove the safety bolts (5-47). Loosen the lock nuts (5-49A). Back out the motor mount locking bolts (5-49). It may be necessary to loosen bolt (5-48).

3.3.1.2 The motor may be slightly stuck to the support mounts (3/4-24,3/4-25), lightly pry with a screwdriver to break it loose. Slide the motor away from the condenser coil far enough to remove the fan shaft assembly (1-19) and spacer (2-20) from the motor shaft, set it aside. Now slide the motor completely out of the frame.

NOTE: New or ZEE SYSTEMS overhauled motors come with the motor pulley fitted on the shaft.

3.3.2 INSPECTION: Refer to Service Letter 58-001 for brush inspection information.

3.3.3 INSTALLATION: Slide the motor into the side frames (1/3-44,1/4-45) place the spacer (2-20) on the fan shaft assembly (1-19) and start it on the end of the motor shaft, tighten to finger tight. Hold the motor and line up the two supports (3/4-24) and extensions (3/4-25) and start the safety bolts (5-46).

3.3.3.1 Tighten the two mounting bolts (5-49) and torque to 20 inch-pounds then tighten the lock nuts (5-49A). Check to insure the three point mount (two supports and mounting bolts) is maintained. If bolt (5-48) was loosen, tighten it now. Tighten the two safety bolts (5-46).

3.3.3.2 Tighten the fan shaft assembly (1-19). Using a spanner wrench hold the motor pulley and tighten the 1" hex nut on fan shaft assembly.

3.3.3.3 Install and adjust the belts (3.1.4 and 3.1.5).

3.4 FAN SHAFT ASSEMBLY

3.4.1 REMOVAL: Remove and set aside the primary belt in accordance with paragraph 3.1.3. Hold the motor pulley with a spanner wrench and loosen (right hand thread) the fan shaft assembly (1-19) by turning the 1" hex nut.

3.4.2 INSPECTION. Check for broken or damaged blades (1-19A). Replace as necessary. Inspect the blades are evenly spaced. Blades should be spaced every 40 degrees. Correct blade position as required.

3.4.2 INSTALLATION: Place the spacer (2-20) on the fan shaft assembly (1-19) Attach the fan shaft assembly (A-20) and start it on the end of the motor shaft, tighten spacer to finger tight. Adjust belt(s) in accordance with paragraph 2.1.5.

3.5 JACK SHAFT ASSEMBLY

3.5.1 REMOVAL: First remove the belts in accordance with 3.1.3. Take care not to nick or damage the hard anodized (black/grey) tooth area of the pulley.

3.5.1.1 Remove bolts (4-30) from the Browning taper lock bushing (4-29). Place the bolts (4-30) in the threaded holes in the bushing flange. Remove the pulley by alternately tightening the bolts into the bushing. Tap bushing from shaft and remove pulley. Loosen bolts (3-34A) and slide jack shaft assembly from frame. It may be necessary to wedge open the clamp (2-34,2-35) if the jack shaft does not readily slide out.

3.5.2 INSPECTION: Inspect the pulley (4-28) for wear. Check for damaged or rounded teeth. Excessive wear will show as shinny areas on the teeth. Replace if damaged.

3.5.2.1 Inspect the small pulley (2-43A) damaged or rounded teeth. Replace if damaged.

3.5.2.2 Inspect the jack shaft housing (2-43) for cracks or other damage. Turn the shaft in the housing it should turn free and true, there should not be any end play in the bearings. Replace assembly as required. NOTE: New or overhauled Jack Shaft Assembly from ZEE SYSTEMS will come with the small pulley fitted to the shaft.

3.5.3 INSTALLATION: Slide jack shaft assembly into clamps (2-34,2-35) and align it so the belt will ride centered on the compressor pulley and the small pulley on the jack shaft, and tighten bolts (3-34A) to hold the assembly while attaching the other (4-28) jack

shaft (large) pulley. Slip the pulley (4-28) over the shaft,using a rawhide mallet tap bushing into the pulley until approximately 1/8" of the shaft shows.

NOTE: If bushing is tight DO NOT PRY the slot open, this will disturb the machined alignment of the bushing.

3.5.3.1 Install the two bolts and washers (4-30,4-30A) and evenly tighten this will move the pulley toward the bushing, continue tightening until the outer edge of the pulley is even with the outer flange of the motor pulley so the belt will ride centered. Turn shaft and check the pulley is square on shaft, realign as necessary. This takes patience and will become a quick and easy procedure with practice.

3.5.3.2 Install and align belt(s) in accordance with paragraphs 3.1.4 and 3.1.5. The belt (4-8) should ride in the middle of the (large) pulley (4-28). Run the motor and check the belt does not walk on the pulley, then secure (4-30) bolts with .025 diameter lock wire.

3.6 EVAPORATOR FILTER

3.6.1. REMOVAL. Slide the filter (8-26) from the evaporator and then pull up to remove it from the evaporator.

3.6.2 INSPECTION. Check for clogging or other obstructions to airflow. Check that the foam border is not torn or damaged, replace as necessary. Clean the filter with a solution of water and liquid detergent, rinse with clear water. Dry the filter with light compressed air. Care should be taken not to damage the element.

3.6.3 INSTALLATION. Place the filter on the clips (8-25) and slide the filter into place.

3.7 BLOWER MOTOR

3.7.1 REMOVAL. This motor is replaced on condition only. There is no field repair for motor (6-7A), this sealed motor. Refer to Wiring Diagram DWG OV-10WD. To replace the motor, unsolder the wire to the resistor (9-18) on the blower housing and disconnect the appropriate fuse terminal. Remove the three screws and washers (10-2,10-3,10-4) and spacers (10-5) between the motor and the blower housing. Note the spacing of the wheel (10-10) on the motor shaft. Loosen the set screw on the wheel (10-10) and remove from the defective motor and attach to the new motor with the same alignment spacing.

3.7.2 INSPECTION. There is no field repair for this item. Replace defective components. After installation of new components check the clearance of the wheel. Activate the blower switch. Select both HIGH and LOW. Check for smooth operation and adequate air flow at the duct outlet and a noticeable change in airflow volume between the High and Low settings.

3.7.3 INSTALLATION. Place the wheel (10-10) on the new motor (10-1) shaft tighten set screw. Place motor (10-1) on housing (10-9). Align spacers (10-5) and attach and tighten screws and washers (10-2,10-3,10-4). Solder the positive wire the resistor (10-14).

3.8 BLOWER MOTOR HOUSING ASSEMBLY

3.8.1 REMOVAL. The Blower Motor Housing Assy is removed on condition only. Note the position of the outlet discharge. To remove the Blower Motor Housing Assy the Blower Motor (6-7A) must be removed to gain access to the four screws (10-11) which hold the Housing Assy (10-9) to the plate (6-4). Remove the motor as described in 3.7.1. Remove the four screws (10-11), lock washers (10-12) and flat washers (10-13), take care to retain the spacers (10-5), now remove the Housing Assy (10-9) from the evaporator plate (6-4).

3.8.2 INSPECTION. There is no field repair. Replace defective assemblies. After installation of new components check the clearance of the wheel. Activate the blower switch. Select both HIGH and LOW. Check for smooth operation and adequate air flow at the duct outlet and a noticeable change in airflow volume between the High and Low settings.

3.8.2 INSTALLATION. Align the housing so the outlet discharge is in the proper position. Secure the housing (10-9) to the evaporator plate (6-4) by attaching and tightening the screws and washers (10-11,10-12,10-13). Attach motor as described in 3.7.3.
3.9 EXPANSION VALVE

3.9 EXPANSION VALVE

3.9.1 REMOVAL. WARNING: SYSTEM IS UNDER PRESSURE AND MUST BE RELIEVED BEFORE ANY SERVICE TO THE EXPANSION VALVE CAN BE ACCOMPLISHED. Expose the Thermostatic Bulb on the Suction Line on the evaporator by removing the insulating tape (7-11). Care should be taken not to puncture or damage the bulb or any of the coils on the evaporator. Next, carefully remove the clip (7-12) holding the bulb to the Suction Line, retain it for reinstallation.

3.9.1.1 Disconnect and remove the Inlet Hose (NS) from the receiver

dryer. Plug the hose end to prevent any contamination of the system. Hold the expansion valve (7-13) with a wrench and loosen the B-Nut on the Pressure Line (Inlet) on the evaporator. Remove the Expansion Valve (7-13) including the bulb. Plug the Pressure Line to prevent Contamination to the system. Remove the adapter (7-13A) from the defective valve and retain it for installation on the new valve.

3.9.2 INSPECTION. There is no field repair for this item. Replace defective valves. Inspect the line screen (7-13B) for contamination. Clean and remove all debris from the line screen.

3.9.2.1 Cleaning of the Line Screen (1-12A) (Refer to 6.3) is the only service to the expansion. Defective Expansion Valves must be replaced.

3.9.2.2 The system must be recharged to check the evaporator or expansion valve for leaks. With a static charge on the system use a leak detector to check for leaks at fitting connections.

3.9.3 INSTALLATION. Insert the screen (7-13B) into the expansion valve (7-13). New replacement expansion valves come with screen.

3.9.3.1 Attach adapter (7-13A). Connect the expansion valve to the Pressure Line on the evaporator coil (7-17). Use Backup Wrench.

3.9.3.2 Next use clip (7-12) to attach the Thermostatic Bulb to the Suction Line on the evaporator. The closed end of the bulb must be on the bottom. The Thermostatic Bulb must have FULL contact with the line. Thoroughly secure the bulb to the line by wrapping with insulating tape (7-11).

3.9.3.3 Attach the hose (NS) from the receiver dryer.

3.10 EVAPORATOR DRAIN PAN AND DRAIN LINE

3.10.1 REMOVAL. WARNING: SYSTEM IS UNDER PRESSURE AND MUST BE RELIEVED BEFORE REMOVAL OF EVAPORATOR ASSEMBLY CAN BE ACCOMPLISHED. To replace drain pan the evaporator SZ97-701-1 must me remove from the aircraft. Refer to Dyncorp evaporator installation and removal instruction to remove evaporator from aircraft.

3.10.1.1 After removal of the evaporator assembly loosen and remove the six screws and washers (6/7-9,-9A,-9B). Take care to note the location and retain the five rubber pads (7-10) for installation on the new drain pan.

3.10.2 INSPECTION. The drain tube extending from the bottom of the

pan is welded in place. If tube is damaged it is not recommended the tube be rewelded because of plating of the pan. If drain tube is damaged replace pan (6-1).

3.10.2.1 Evaporator Drain Line (NS). Check that drain line is clear to Drain Pan (6-1). Using an Air Supply, apply 10 PSI (max.) to drain outlet. Clear any obstructions as required.

3.10.3 INSTALLATION. Using RTV-732 adhesive attach the pads (7-10) to the new pan (6-1) so that there is a pad under the four corners of the coil (7-17) and the lower blower assembly. Place the pan so the drain tube is opposite the air inlet (filter). Secure the pan to the evaporator using the screws and washers (6/7-9,-9A,-9B).

3.10.3.1 Refer to Dyncorp installation procedures to attach the evaporator assembly to the aircraft.

4.0 SERVICING - REFRIGERANT CHARGE

NOTE: IT IS UNLAWFUL TO RELEASE R-12 OR OTHER REFRIGERANTS TO THE ATMOSPHERE. USE APPROVED RECOVERY/RECYCLE EQUIPMENT TO CAPTURE REFRIGERANTS. USE ONLY LAWFUL MEANS TO DISPOSE OF RECOVERED REFRIGERANTS. CHECK WITH LOCAL AGENCIES FOR APPROVED DISPOSAL PROCEDURES.

CAUTION: AIR CONDITIONING SYSTEM UNDER PRESSURE. APPROPRIATE SAFETY MEASURES SHOULD BE TAKEN WHEN SERVICING THIS EQUIPMENT. ONLY TRAINED PERSONNEL WITH APPROVED SAFETY EQUIPMENT SHOULD PERFORM SERVICING DUTIES.

NOTE: CAP ALL OPEN LINES TO PREVENT CONTAMINANTS AND MOISTURE FROM ENTERING THE SYSTEM.

4.1 CHARGING INSTRUCTIONS. are basically the same for R-12 (Freon) and CFC-free R-134a refrigerant. However, a sight glass is not used to determine adequate refrigerant charge for R-134a. R-134a systems are charged to a predetermined amount (by weight) of refrigerant. See Section 2.1 and 2.2 for required equipment and materials to service the air conditioning system.

4.1.1 On new installations or whenever the refrigerant has been evacuated from the air conditioning system the oil in the compressor must be checked and replenished as necessary. Check the oil at 100 hours of system operation. Thereafter, check the oil every 500 hours of operation. DO NOT add oil to the refrigerant.

NOTE: REFER TO SERVICE EQUIPMENT MANUFACTURERS INSTRUCTIONS. SOME EQUIPMENT MAY COMBINE FUNCTIONS.

4.1.2 Evacuate the system for a minimum of four hours ***anytime*** the system has been opened to atmosphere. If the system has been opened for component replacement or in high humidity the receiver-dryer should be replaced and the system evacuated for a minimum of 8 hours.

4.1.3 Weight the refrigerant bottle.

CAUTION: NEVER INVERT THE REFRIGERANT BOTTLE SO THE DISCHARGE VALVE IS ON THE BOTTOM. THE REFRIGERANT BOTTLE MUST BE KEPT UPRIGHT TO PERMIT OF GAS ONLY INTO THE COMPRESSOR. INVERTING THE BOTTLE WILL PERMIT LIQUID TO ENTER THE COMPRESSOR RESULTING POSSIBLE COMPRESSOR DAMAGE. THIS PRACTICE WILL VOID COMPRESSOR WARRANTY.

4.1.4 Static Charge: Shut OFF valve in the manifold set. Attach the

manifold line to the refrigerant bottle. Attach the High side manifold line to the Pressure side Service Port and the Low side manifold line to the Suction side of the system. Open the back seating valves on the compressor to the neutral position (see Attachment 1).

4.1.5 With motor OFF, OPEN the High Pressure and Low Pressure manifold valve. Allow the system to take a static charge. When the pressure equalize or if the maximum charge weight is achieved CLOSE both the High and Low pressure valves at the manifold.

4.1.6 Using a leak detector check for leaks. Correct any problems. Perform 4.1.4 and 4.1.5 until a tight system with no leaks is achieved.

4.1.7 With the High and Low pressure manifold valves OFF, turn ON the compressor motor and evaporator blowers. OPEN the Low pressure manifold valve until the Manifold gauge reads 30-40 pounds pressure.

4.1.7.1 Keep close watch on the scale and when for the target weight is reached immediately CLOSE the Low pressure manifold valve.

4.1.8 Disconnect the servicing equipment. Replace the High side (red), Low side (blue) service port caps and back seat valve caps.

4.2 TOPPING OFF: To top off the charge check the refrigerant charge by running the system with an ambient air temperature of at least 80F.

4.2.1 Place a temperature measuring device to read the air temperature entering the condenser.

4.2.2 Connect the High side manifold line to the Discharge pressure port. Connect the Low side manifold line to the Suction port.

4.2.3 Using the TEMPERATURE-PRESSURE CHART, ILLUSTRATION 2. convert the High side pressure reading into temperature.

4.2.4 Calculate the Temperature Difference (TD) by subtracting the air inlet temperature from the temperature determined in 4.3.3. The TD should be less than 30F. If the TD is higher than 30F the system is overcharged or there is an obstructed air flow over the condenser.

4.2.4.1 If the system is overcharged remove refrigerant using recovery equipment by approved methods.

4.2.4.1 If the TD is less than 20F open the Low side manifold until the gauge reads 30-40 PSIG. Continue to charge until the TD is between 20F and 25F.

4.2.5 When service is complete disconnect the service hoses and replace the High side (red), Low side (blue) service port caps and back seat valve caps.

4.3 INSPECTION: With the system running check for leaks, proper belt alignments, vibration, and high current draw.

TEMP F	R-134a PRESSURE	TEMP F	R-134a PRESSURE
50	45.5	100	124.3
52	47.7	102	128.5
54	50.1	104	132.9
56	52.3	106	137.3
58	55.0	108	142.8
60	57.5	110	146.5
62	60.1	112	151.3
64	62.7	114	156.1
66	65.5	116	161.1
68	68.6	118	166.1
70	71.2	120	171.3
72	74.2	122	176.6
74	77.2	124	182.0
76	80.3	126	187.5
78	83.5	128	193.1
80	86.8	130	198.9
82	90.2	132	204.7
84	93.6	134	210.7
86	97.1	136	216.8
88	100.7	138	223.0
90	104.4	140	229.4
92	108.2	142	235.8
94	112.1	144	242.4
96	116.1	146	249.2
98	120.1	148	256.0
		150	263.0

ILLUSTRATION 2.

5.0 SERVICE SCHEDULES

MAINTENANCE SCHEDULE

ITEM DESCRIPTION	INSPECTION INTERVAL *	R&R/T.B.O. HRS
SZ97-001 M-C-C	FIRST 100 HRS* AFTER OH OR NEW - CHECK OIL LEVEL, REPLENISH AS NECESSARY.	1500
	EVERY 250 HRS* - INSPECT FOR LOOSE, DAMAGED ITEMS. CHECK FOR AND REMOVE ANY DEBRIS OR OBSTRUCT-IONS TO THE CONDENSER COILS. CHECK FOR SIGNS OF OIL LEAKS. BELT CONDITION AND ALIGNMENT OF PULLEYS.	
DRIVE BELTS**	EVERY 250 HRS* - INSPECT AS PER SECTION 3.1.2	800
MOTOR **	EVERY 1000 HRS* - INSPECT AS PER SECTION 3.3.2 AND SERVICE LETTER 58-001.	1500
JACK SHAFT**	EVERY 1000 HRS* - INSPECT AS PER SECTION 3.5.2	1500
COMPRESSOR**	AFTER THE FIRST 100 HOURS - INSPECT AS PER SECTION 3.2.2.1	
	EVERY 500 HRS - INSPECT AS PER SECTION 3.2.2	1500
EVAPORATOR*	EVERY 100 HRS - INSPECT & CLEAN FILTER AS PER SECTION 3.6.2	ON CONDITION
	EVERY 100 HRS - INSPECT & CLEAN DRAIN AS PER SECTION 3.10.2	ON CONDITION

* UNIT OPERATING TIME

** COMPONENT IS PART OF THE M-C-C

6.0 TOLERANCES

6.1 COMPRESSOR OIL. The minimum compressor oil depth is 13/16" (20mm). Replenish as necessary.

6.2 REFRIGERANT CHARGE. Refrigerant charge is 3.75 lbs of R-134a into a dry system.

6.3 BRUSH LENGTH, COMPRESSOR DRIVE MOTOR. The minimum brush length on the drive motor is 0.750" (19mm). Refer to SIL 58-001.

6.4 TORQUE VALUES. Use standard torque values for bolts. Refer to Manual SZ206 for torque values and torque sequence for the compressor.

7.0 TROUBLE SHOOTING

TROUBLE	POSSIBLE CAUSE	REMEDY
Evaporator Blowers low flow	Obstructed blower Inlet.	Remove obstruction.
	Obstructed duct.	Remove obstruction.
	Obstructed Outlet.	Remove obstruction.
Evaporator Blowers Inoperative.	Motor open. Motor brushes worn beyond limits.	Replace Motor Blower Housing Assy.
		Check fuse on fuse block, REPLACE. Check wiring to motor. Check speed select switch Check motor for shorts. Repair or replace faulty system or component.
Condenser Power Motor Inoperative.	Motor open. Motor Brushes worn beyond limits.	Replace Motor.
	Faulty circuit breaker.	Replace bad component.
Compressor Motor trips circuit breaker.	Motor shorted. Motor brushes worn beyond limits.	Replace Motor.
Compressor Motor trips circuit breaker.	Short in wiring.	Check wiring to motor, repair as required.
	Faulty circuit breaker.	Replace bad component.
Compressor Motor inoperative.	Motor open. Motor brushes worn beyond limits.	Replace Motor.
	Short in wiring.	Check wiring to motor, repair as required.

continued

TROUBLE	PROBABLE CAUSE	REMEDY
	Faulty circuit breaker.	Replace bad component.
System not cooling. Adequate airflow over evaporator.	Low refrigerant.	Service system.
	Overcharge of refrigerant.	Service system.
	Faulty Compressor	Replace Compressor.
High Discharge Pressure	Overcharge of refrigerant.	Service system.
	Obstruction in plumbing.	Locate and remove obstruction and service system.
	Little or no air-flow through Condenser coils.	Check Condenser Power Motor, replace as necessary. Check for obstruction, remove. Coil dirty, CLEAN.
	Rec.-Dryer improp-erly installed.	Check direction of FLOW. Replace R-D with correct flow and service system.
	Obstruction in Receiver-Dryer.	Replace defective component and service system
	Obstructed Expan-sion Valve and/or Line Screen.	Clean Line Screen. Replace Expansion Valve and service system
Low Discharge Pressure.	Low refrigerant.	Service system
	Faulty Compressor.	Replace bad component and service system
	Incorrect back seat valve position.	Correct back seat valve position.

continued.

TROUBLE	PROBABLE CAUSE	REMEDY
Excessive vibration at Motor/Compressor.	Improper belt tension.	Adjust belt to correct tension.
	Worn, damaged or loose or over tightened mounts.	Adjust or replace mounts.
Quick refrigerant loss.	Open in system.	Check compressor head gasket. Check Hoses or tubing for holes. Check conical washers. Replace defective component. Service system
	Defective O-Ring.	Replace defective O-Ring. Service system
	Loose connections.	Tighten connections. Service system
Slow refrigerant loss.	Loose connections.	Tighten connections. Service system
Motor Comp starts but only runs for 3 sec.	INOP Controller SZ96-035	Replace Controller.
With power ON, relays cycle but compressor does not come on.	Temperature selection.	Turn selector to cooler position. (CCW).

8.0 KIT LIST

8.0.1 The following components are supplied by Zee Systems, Inc. as part of Air Conditioning Kit P/N: SZ97-000. Individual items may be purchased by part number. Refer to Section 9 for illustrated parts break down of the SZ97-001-1A, Motor Compressor Condenser Assy and SZ97-701-1, Evaporator Assy.

8.1 SZ97-000 Kit List

QTY	PART NUMBER	NOMENCLATURE	S/N (YES)
1	SZ97-001-1A	Motor Compressor Condenser Assy	Y
1	SZ97-701-1	Evaporator Assy	Y
1	SZ97-035-1	Wire Harness	
1	SZ97-070-1	Manifold Duct	
1	SZ97-397-1	Tube, Drain	
2	SZ97-398-1	Outlet Duct	
1	SZ96-035-1	Controller	Y
1	SZ96-036-1*	Temperature Sensor	
192"	HF6B-18	Wire M22759/16-18	
192"	HF10A-18	Wire M22759/16-18	
192"	HF11A-18	Wire M22759/16-18	
60"	HF15A-18N	Wire M22759/16-18	
60"	HF16A-18N	Wire M22759/16-18	
60"	HF17A-20N	Wire M22759/16-20	
24"	HF6C-20	Wire M22759/16-20	
1	MS24524-21	Switch, Master (S1)	
1	MS24523-23	Switch, Blower Speed (S2)	
5	MS35489-20	Grommet	
5	MS35489-23	Grommet	
1	6041H275	Relay (K1)	
25	MS3367-2-9	Tie Wrap	
25	MS3367-5-9	Tie Wrap	
25	MS3367-6-9	Tie Wrap	
1	ANL125***	Current Limiter Fuse (F6)	
2	CEET-8	Transition Duct	
1	RV4NAYSD103A	Potentiometer (R1)	
1	1N4007**	Diode (CR1)	
4	200-32S	Clamp	
1	207-101B	Reciever-Dryer (SS P/N: 207-101A)	Y
35'	235-6	Hose	
35'	235-10	Hose	
1	25920-6-6	Fitting w/O-Ring	
2	25920-10-10	Fitting w/O-Ring	
1	25120-6-6	Fitting w/O-Ring	

QTY	PART NUMBER	NOMENCLATURE	S/N(YES)
3'	3/8"I.D. X 1/2 O.D.	Tube, Tygon	
2	3604	Clamp	
1	4164***	Base Assy (TB3)	
2	7/8I.D. X 3/8WALL	Armaflex Insulation (6 ft. ea.)	

* Part of SZ97-701-1 Evaporator
** Part of 6041H275 Relay
*** Part of SZ97-001-1A MCC

REVISED: 9 JUNE 98

9.0 ILLUSTRATED PARTS LIST

EXPLANATION OF SYMBOLS:
ALT.P/N - The Part Number shown is an approved alternate, either part number may be used.
MOD "X" Refers to modification information of this part as applicable to this assembly.
NP - Not Procurable individually, see next higher assembly.
NS - Not Shown
OBS - Obsolete
USAGE/QTY - This identifies parts used on specific applications (not common to all units).
.. - Part of higher assembly.
*/# - See explanation at end of parts list.

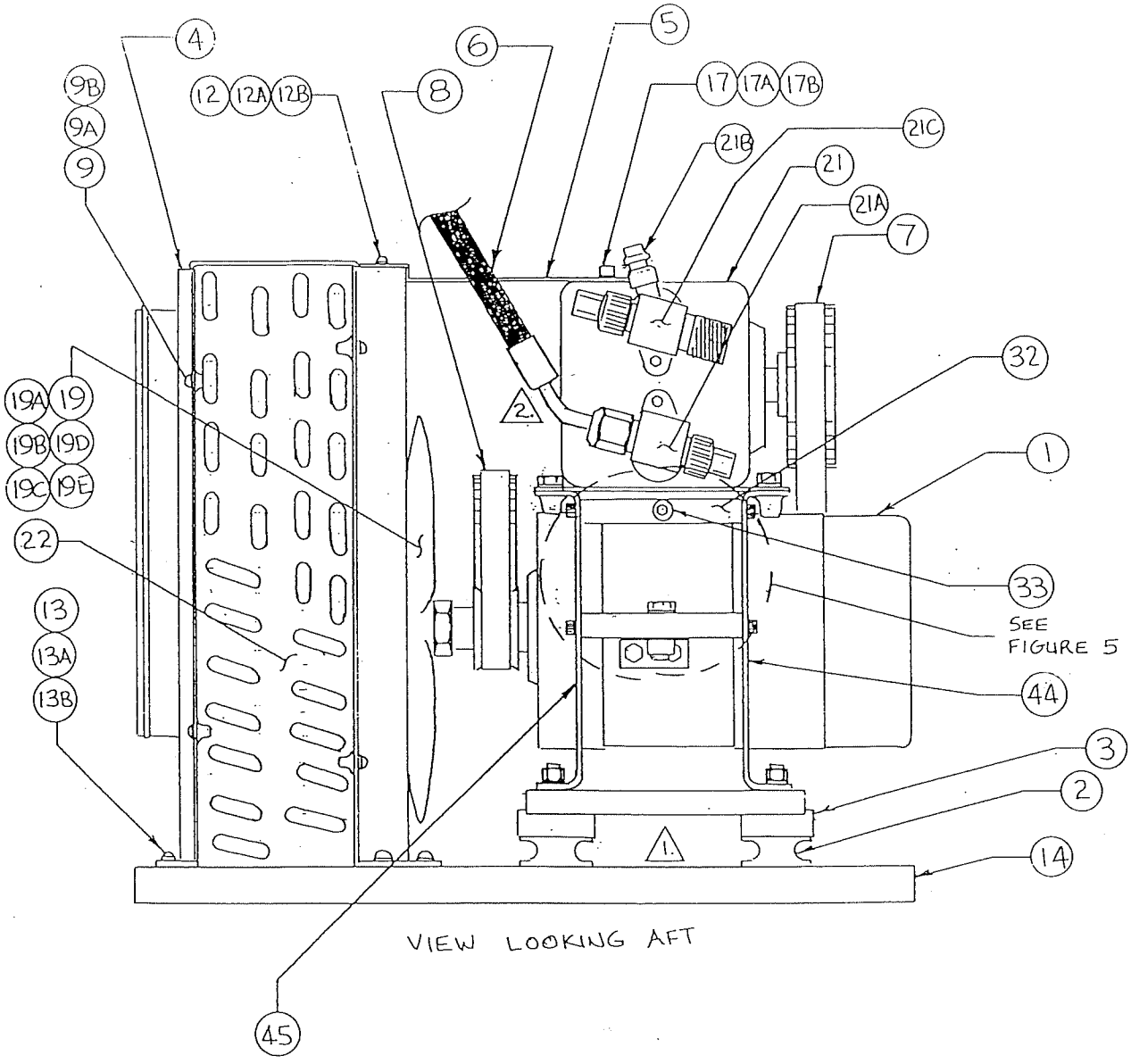
9.1 MOTOR COMPRESSOR CONDENSER (MCC)

FIG-ITEM	PART NUMBER	NOMENCLATURE	QTY	NOTES
1/				
2/				
3/				
4/				
5	SZ97-001-1A	MOTOR COMPRESSOR CONDENSER ASSY		
ALL -1	SZ58-002-1	MOTOR COMPRESSOR ASSY	1	MOD A
1/2 -1A	SZ58-003-1	MOTOR	1	MOD B
4 -1B	SZ43-008-3	PULLEY	1	
1/2 -2	SZ65-006-3	SPACER	1	
1 -3	SZ58-019-3	MOUNT, RUBBER	4	
1 -4	SZ97-6300-1	DUCT ASSY, EXHAUST	1	
1/2 -4A	SZ97-6301-1	DUCT ASSY, INLET	1	
1/2 -5	SZ97-6302-1	BRACKET	1	
1/2 -6	Z2008260BC090X176	HOSE ASSY	1	
1/2/3-7	187L100	BELT, SECONDARY	1	
1/2/4-8	187L075	BELT, PRIMARY	1	
1 -9	MS35206-245	SCREW	8	
1 -9A	AN935-8	WASHER, LOCK	8	
1 -9B	AN960-8L	WASHER, FLAT	8	
2 -10	MS35649-3282	NUT	4	
2 -10A	AN935-616L	WASHER, LOCK	4	
2 -10B	MS35649-3282	NUT	4	
2 -10A	AN935-616L	WASHER, LOCK	4	
2/3/4-11	MS35649-2382	NUT	4	
2/3/4-11A	AN960-616L	WASHER, FLAT	4	
5 -11B	MS35649-3282	NUT	4	
5 -11C	AN935-616L	WASHER, LOCK	4	
5 -11D	AN960-616L	WASHER, FLAT	4	
1 -12	MS35206-245	SCREW	8	
1 -12A	AN935-8	WASHER, LOCK	8	

FIG-ITEM	PART NUMBER	NOMENCLATURE	QTY	NOTES
1 -12B	AN960-8L	WASHER, FLAT	8	
1 -13	MS35206-245	SCREW	8	
1 -13A	AN935-8	WASHER, LOCK	8	
1 -13B	AN960-8L	WASHER, FLAT	8	
1/2 -14	SZ97-6400-1	BASE PLATE ASSY	1	
2 -15	4164	BASE, CURRENT LIMITER	1	
2 -16	ANL125	CURRENT LIMITER	1	
1 -17	3/8-16 X 7/8M	SCREW, SOCKET CAP	4*	
1 -17A	AN935-616	WASHER, LOCK	4*	
1 -17B	AN960-616	WASHER, FLAT	4*	
2 -18	Z2006000AA266	HOSE ASSY	1	
1 -19	SZ97-034-3T	.FAN SHAFT ASSY	1	
1 -19A	10-6T	..BLADE, FAN	3	
1 -19B	AN364-624A	..NUT	1	
1 -19C	R80	..WASHER	1	
1 -19D	MS28775-114	..O-RING	1	
1 -19E	SZ41-018-5	..SHAFT	1	
2 -20	SZ41-019-5	SPACER	1	
ALL -21	SZ84-913NO-1	COMPRESSOR	1	
1/2 -22	SZ97-601-2M	COIL	1	
4 -23	AN4-57A	BOLT	2	
4 -23A	AN960-416	WASHER, FLAT	2	
4 -23B	AN365-428	NUT	2	
3/4 -24	SZ58-010-3	.SUPPORT, MTR	2	
3/4 -24A	SZ44-009-5	..PAD	2	MOD A
3/4 -25	SZ58-011-3	.SUPPORT EXTENSION, MTR	2	
3/4 -25A	SZ44-009-7	..PAD	2	MOD A
1/3/4/5-26	SZ44-008-7	BAR	1	
1/5 -27	SZ58-013-3	SAFETY CLIP	1	
4 -28	SZ43-018-3	PULLEY	1	
4 -29	G X 5/8M	BUSHING	1	
4 -30	NAS1352-4H16P	BOLT	2	
3 -31	605	KEY, WOODRUFF	2	
1/3/4-32	SZ44-008-5	BAR, ADJUSTMENT	1	
1/3/4-33	1/4-28 X 2.25	BOLT , ADJUSTMENT	1	
3/4 -33A	AN935-416L	WASHER, LOCK	1	
3/4 -33B	AN960-416L	WASHER FLAT	1	
2/3 -34	SZ44-007-3	CLAMP	1	
2 -35	SZ44-007-4	CLAMP	1	
3 -36	AN4-10A	BOLT	4	
3 -36A	AN365-428A	NUT	4	
3 -36B	AN960-416	WASHER, FLAT	4	
3 -37	SZ58-009-3	PLATE, COMPRESSOR	1	
4 -38	AN5-5A	BOLT	4	
4 -38A	5/16 X 3/4	WASHER, FLAT	4	
3 -39	SZ43-017-3	PULLEY, COMPRESSOR	1	
3 -40	SZ37-017-3	WASHER	1	

FIG-ITEM	PART NUMBER	NOMENCLATURE	QTY	NOTES
3 -41	AN5H5A	NUT	1	
3 -42	AN501A10-6	SCREW	1	
2 -43	SZ43-004-1B	.JACK SHAFT ASSY	1	
2 -43A	SZ43-009-3	..PULLEY	1	
2 -43B	SZ43-011-3	..SHAFT	1	NS
1/3 -44	SZ58-012-4	SIDE FRAME	1	
1/4 -45	SZ58-012-3	SIDE FRAME	1	
5 -46	AN5-24A	SAFETY BOLT, MOTOR	2	
5 -46A	AN935-516L	WASHER, LOCK	2	
5 -46B	AN960-516L	WASHER, FLAT	2	
5 -46C	AN315-5R	NUT	2	
5 -47	SZ43-020-3	SAFETY BOLT, MC	2	
5 -48	AN4-11A	BOLT	1	
5 -48A	AN960-416	WASHER, FLAT	2	
5 -48B	AN365-428	NUT	1	
5 -49	1/4-20UNC-2A X 1.25	BOLT	2	
5 -49A	1/4-20UNC-2B	BOLT	2	
5 -49B	AN935-416L	WASHER, LOCK	2	
5 -49C	AN960-416L	WASHER, FLAT	2	
5 -50	NAS1352-4H16P	BOLT	2	
5 -50A	AN935-416L	WASHER, LOCK	2	
5 -50B	AN960-416L	WASHER, FLAT	2	

* 3ea used to attach Compressor to Compressor Plate.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9B
9A
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21C
21B
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32
19A
19
19B
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SEE FIGURE 5
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13A
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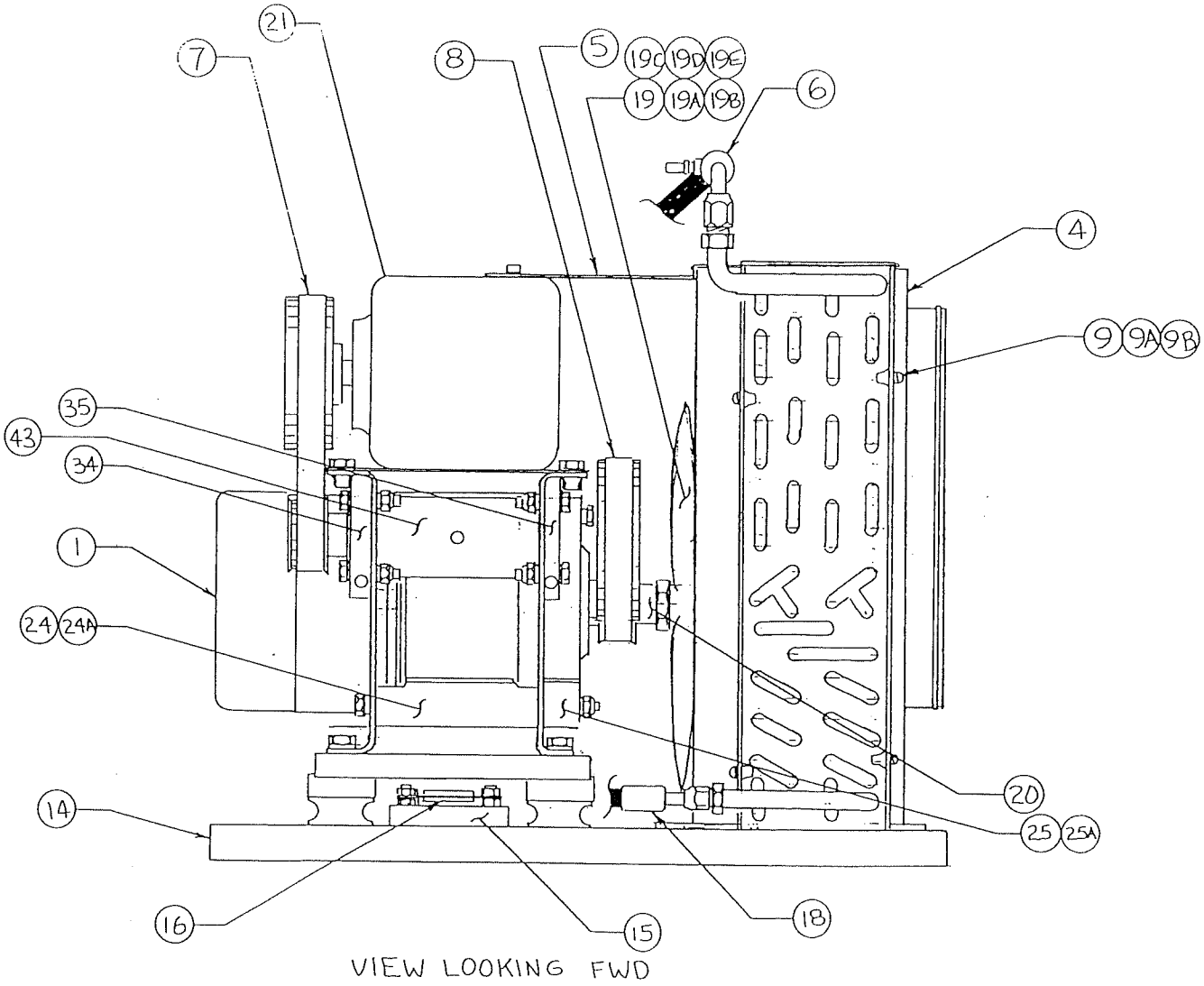
VIEW LOOKING AFT
45

FIGURE 1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VIEW LOOKING FWD

FIGURE 2

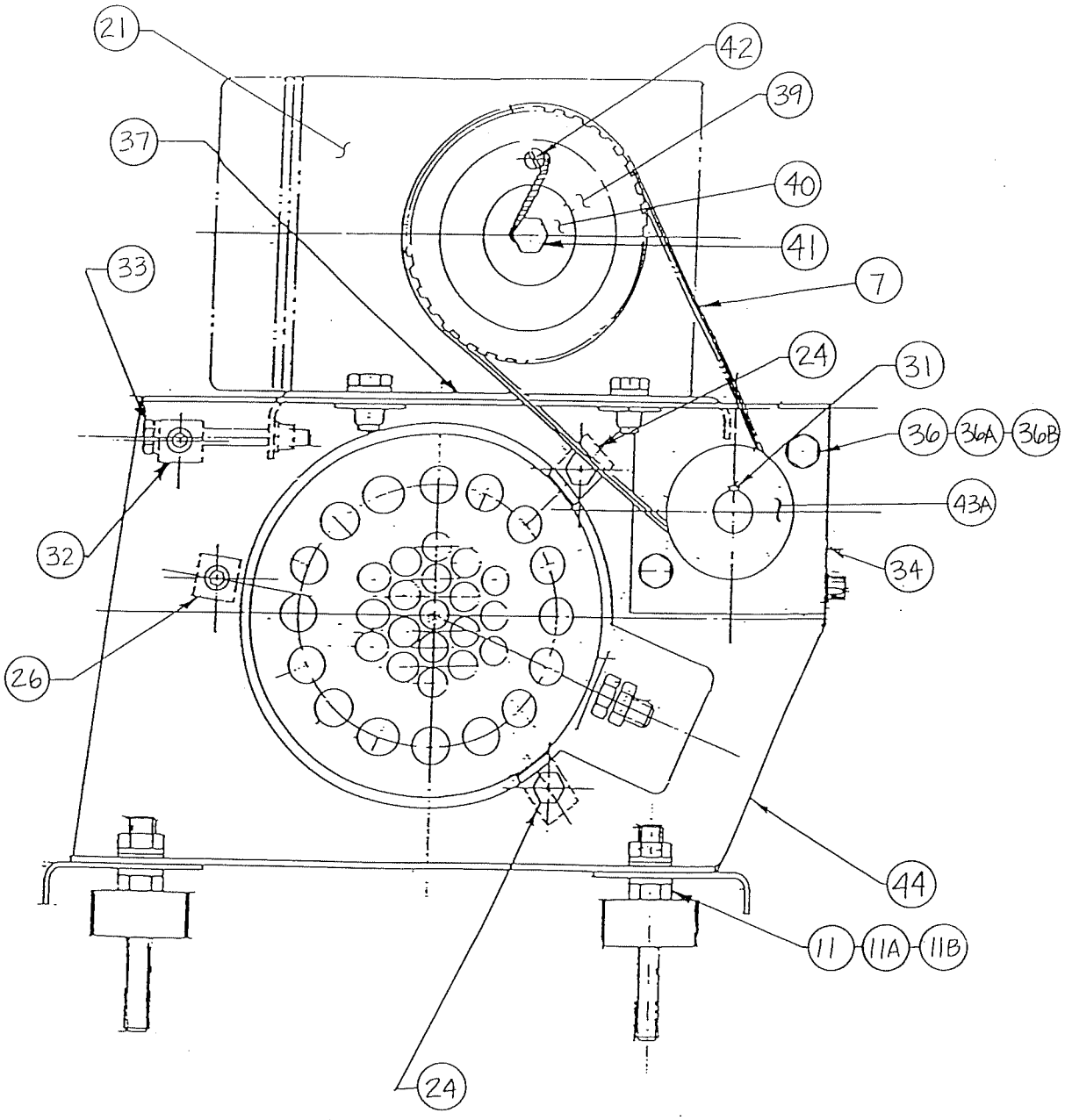
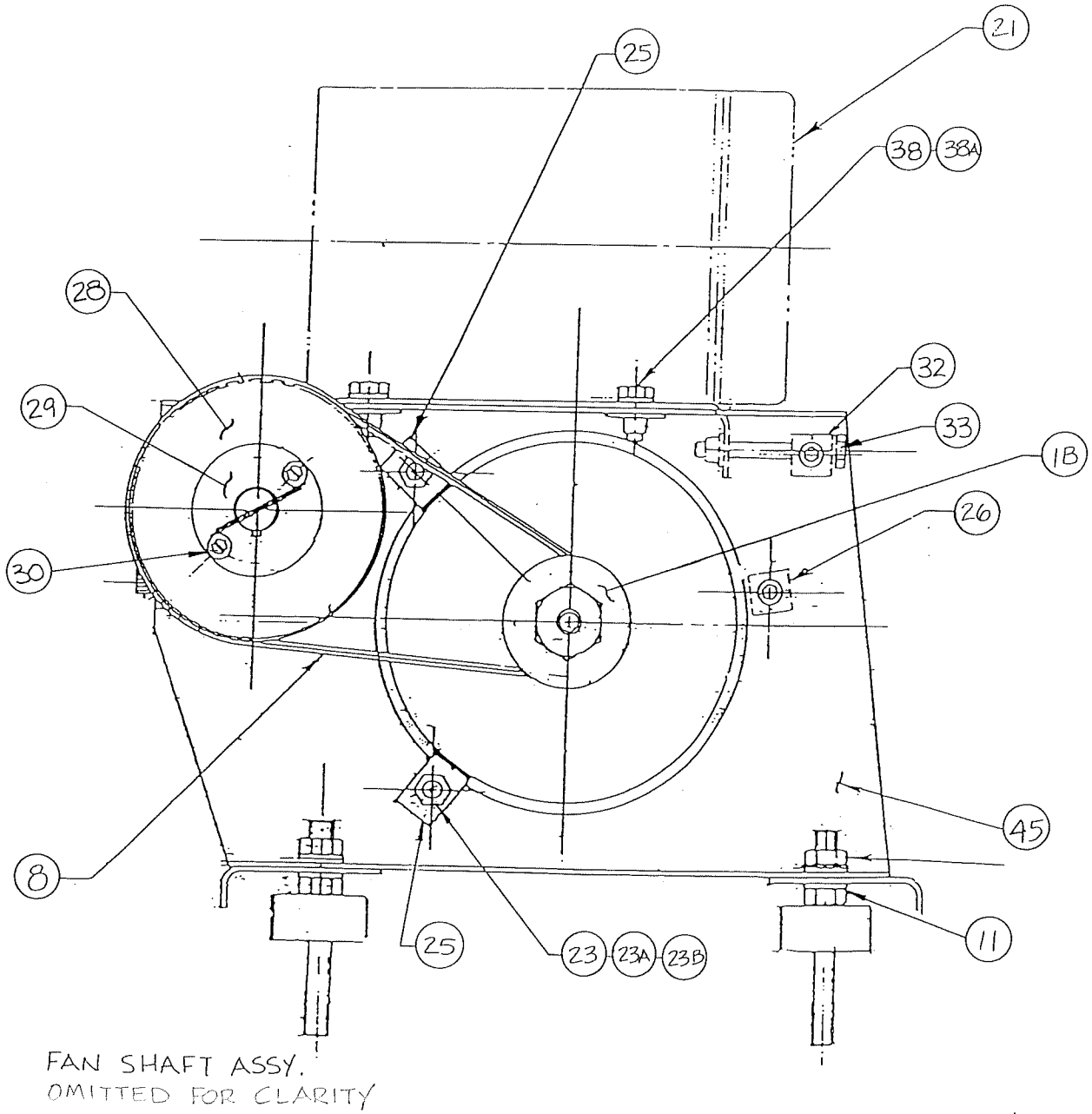


FIGURE 3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23B
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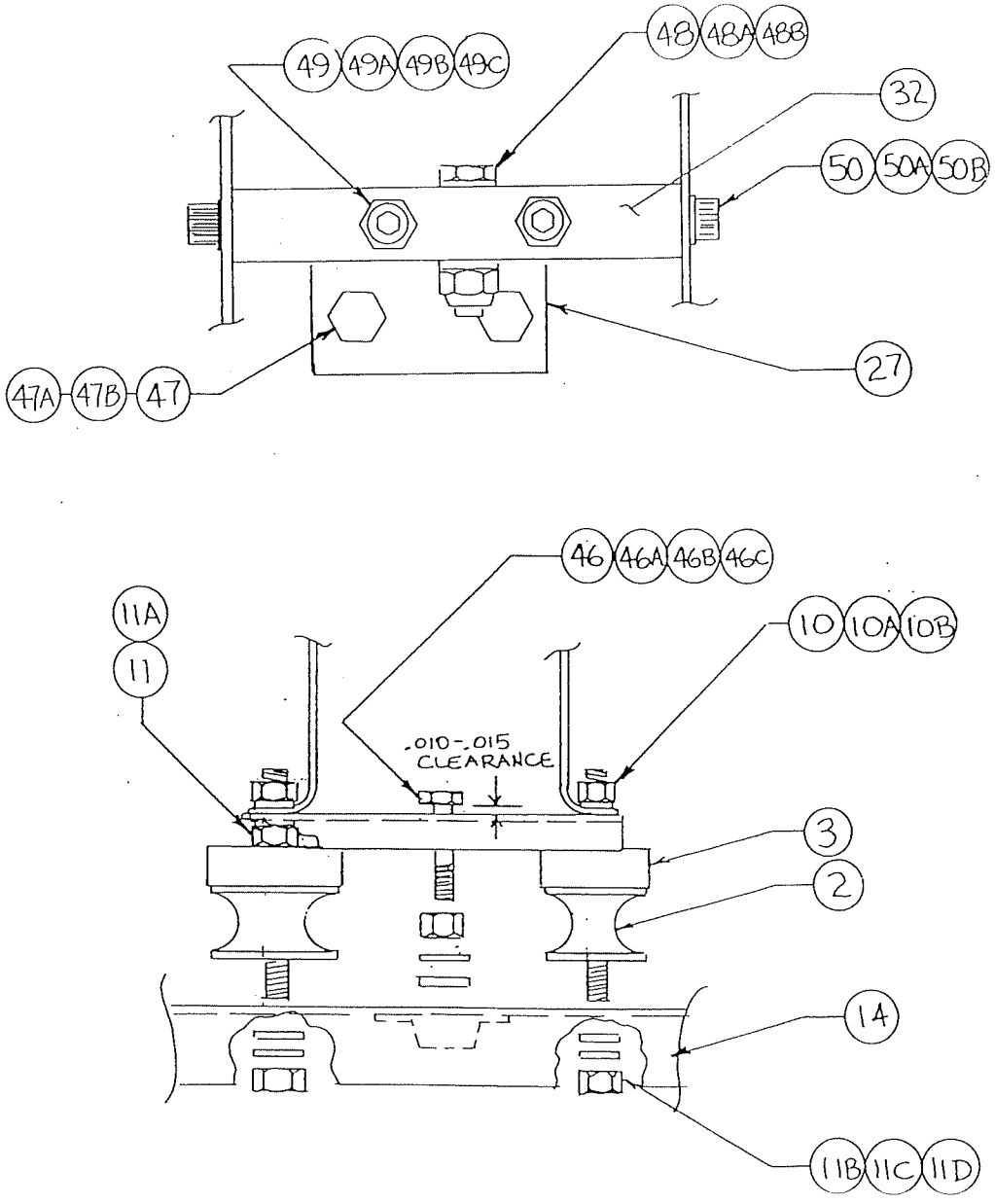
FAN SHAFT ASSY.
OMITTED FOR CLARITY

FIGURE 4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46B
46C
11A
11
10
10A
10B
.010-.015
CLEARANCE
3
2
14
11B
11C
11D

FIGURE 5

9.2 EVAPORATOR

FIG-ITEM	PART NUMBER	NOMENCLATURE	QTY	NOTES
6/				
7/				
8/				
9	SZ97-701-1	Evaporator Assembly		
6/8 -1	SZ97-307-1	Pan Assy, Drain	1	
6/7 -2	SZ97-305-1	Bracket	1	
6/9 -3	SZ97-304-1	Bracket	1	
6 -4	SZ97-308-1	Plate	1	
6 -5	SZ97-320-1	Tube	1	
6/8/9-6	SZ97-070-1	Duct, Manifold	1	
6 -7	SZ63-023-1	.Blower Motor Assy	2	
6/7/8-7A	SZ63-021-1	..Motor Assy	2	
6/8 -8	SZ97-309-1	Cover	1	
ALL -9	MS35206-245	Screw	30	
ALL -9A	AN935-8	Washer, Lock	30	
ALL -9B	AN960-8L	Washer, Flat	30	
7/8 -10	SZ96-036-1	Sensor, Temperature	1	
7/8 -10A	MS21919WDG4	Clamp, Cushioned	1	
7/9 -11	18-2710	Insulation, Black Tar	AR	
7 -12	14-2388	Clip	1	
7 -13	BFJBCP60	Expansion Valve	1	
7 -13A	20-4717	Adapter	1	
7 -13B	NP	Strainer	1	
6/8 -14	356004	Block, Fuse	1	
6/8 -14A	AN507-8R10	(NS) Screw	2	
6 -15	313008	Fuse 8A	2	
	ALT.P/N: MDL-8			
6 -16	313004	Fuse 4A	2	
	ALT.P/N: MDL-4			
8/9 -16A	840836	Cover, Fuse	4	
7/9 -17	SZ97-700-1	Coil	1	
9 -18	RH50	Resistor, 50W,3OHM,1%	2	
6/9 -19	N-3	Clamp, Nylon	4	
6 -20	MS3367-4-9	Tie, Cable	AR	
6/9 -21	M22759/16-18	Wire	AR	
6 NS	MIL-I-23053/5	Tubing, Shrink	AR	
7/8 NS	MS26036-106	Connector, Ring	4	
6/8 NS	MS25036-153	Connector, Ring	4	
6 -22	123-1701	Grommet	2	
9 -23	AN500A6-6	Screw	6	
9 -23A	AN935-6	Washer, Lock	6	
9 -24	MS27212-1-4	Terminal Strip	1	
9 -24A	AN365-632A	Nut	4	
9 -24B	AN960-6L	Washer, Flat	4	
8 -25	SZ48-017-3	Clip	2	
8 -26	SZ97-071-1	Filter	1	

FIG-ITEM	PART NUMBER	NOMENCLATURE		QTY	NOTES
6 -27	259179-1	I.D. Plate	2		
9 -28	264280-1	I.D. Plate	2		
8 -29	102220-1	I.D. Plate	1		
7 -30	SZ96-359-1	Pad	5		

Refer to FIG. 10 for more detailed break down.

FIG-ITEM	PART NUMBER	NOMENCLATURE		QTY	NOTES
10	SZ63-023-1	Blower Motor Assembly			
-1	SZ63-021-1	Motor Assy	2		
-2	MS35206-245	Screw	3		
-3	AN935-8	Washer, Lock		3	
-4	AN960-8L	Washer, Flat		3	
-5	AN960-8	Washer, Flat		6	
-6	3/8 X 3/8	Foam, Urethane		AR	
-7	123-1701	Grommet		1	
-8	RH50	Resistor, 50W,3 OHM, 1%		1	
-9	675L	Housing, CCW Blower		1	
-10	AA326-5/16CCW	Wheel	1		
-11	MS35206-245	Screw	4		
-12	AN935-8	Washer, Lock		4	
-13	AN960-8L	Washer, Flat		4	
-14	AN500A6-6	Screw	2		
-14A	AN935-8	Washer, Lock		2	
-15	MS35206-245	Screw	1		
-15A	AN935-8	Washer, Lock		1	
-15B	AN960-8L	Washer, Flat		1	
-16	N-3	Clamp, Nylon		1	

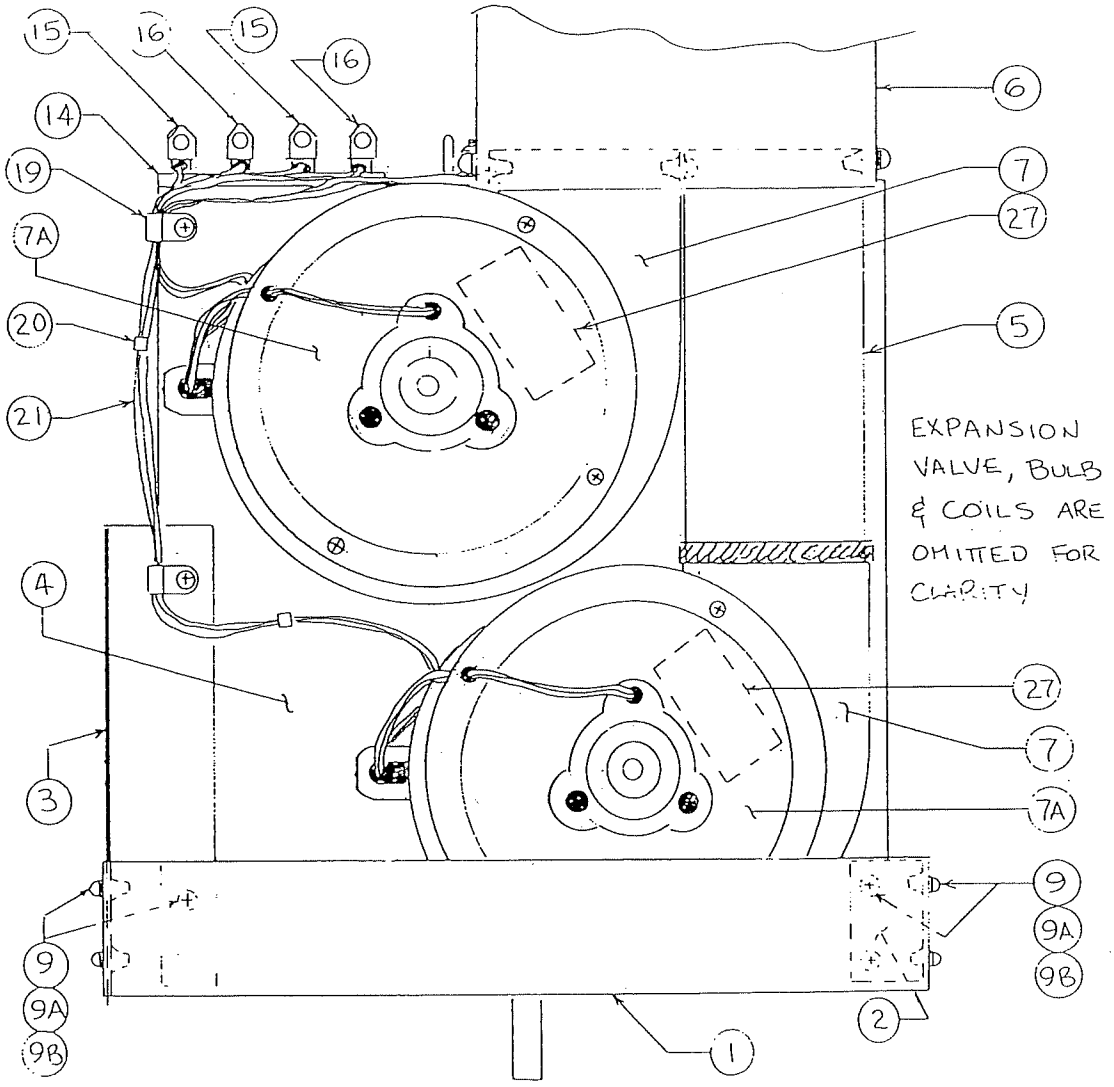
15
16
15
16
14
19
7A
20
21
4
3
9
9A
9B
6
7
27
5
EXPANSION VALVE, BULB & COILS ARE OMITTED FOR CLARITY
27
7
7A
9
9A
9B
2
1

FIGURE 6

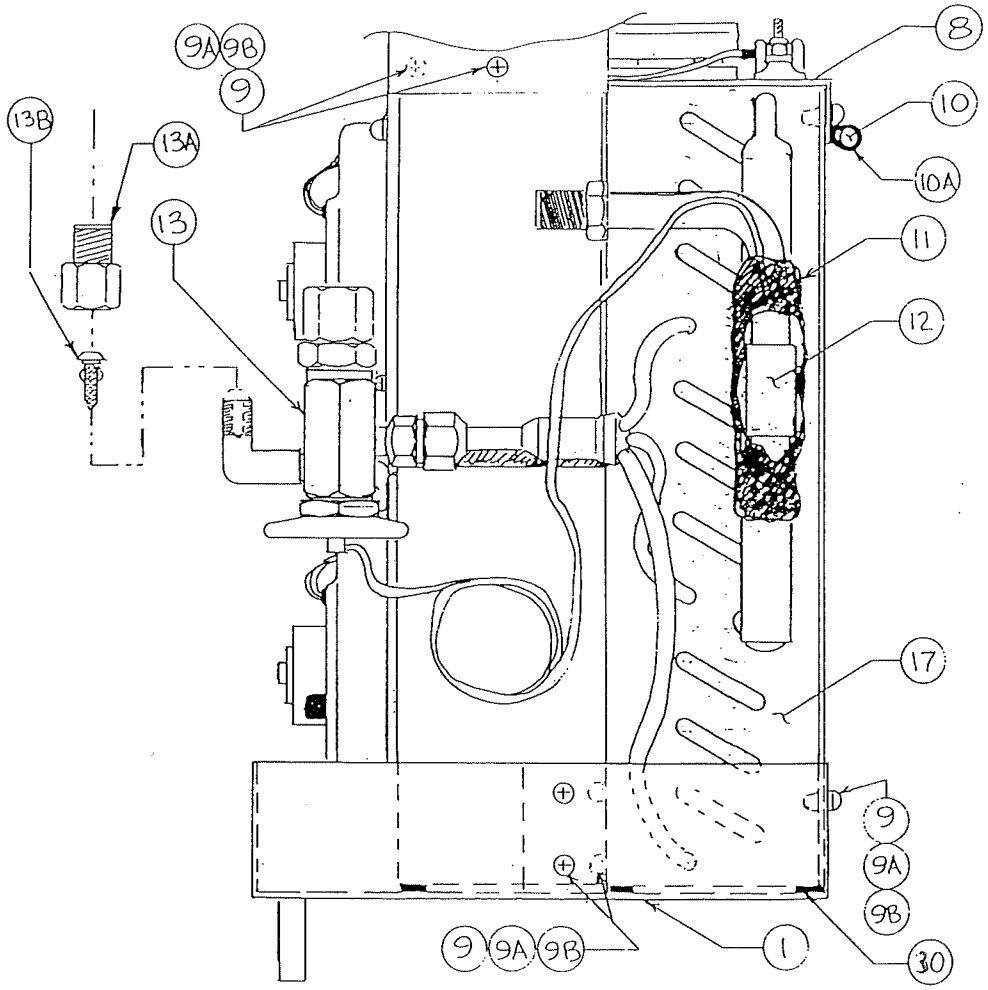

FIGURE 7

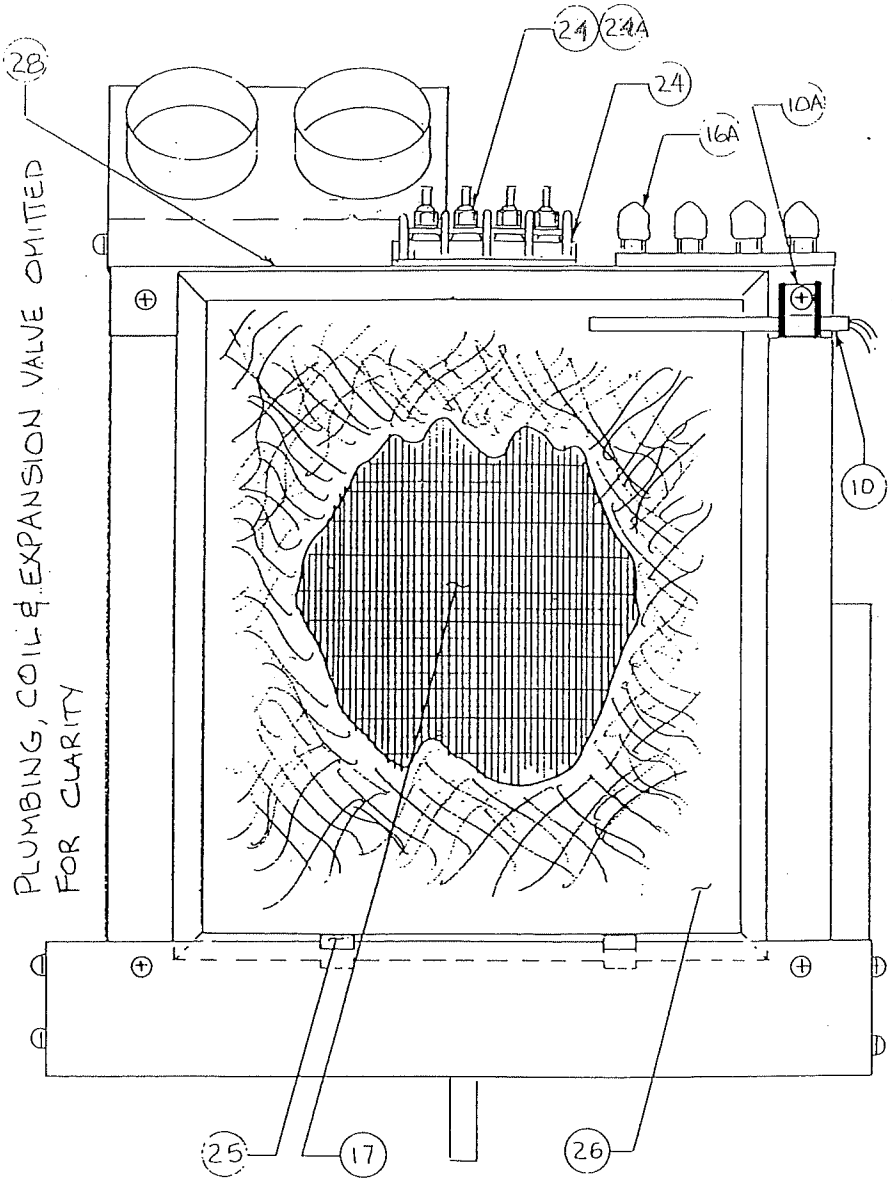
28
24
24A
24
16A
10A
10
PLUMBING, COIL & EXPANSION VALVE OMITED FOR CLARITY
25
17
26

FIGURE 8

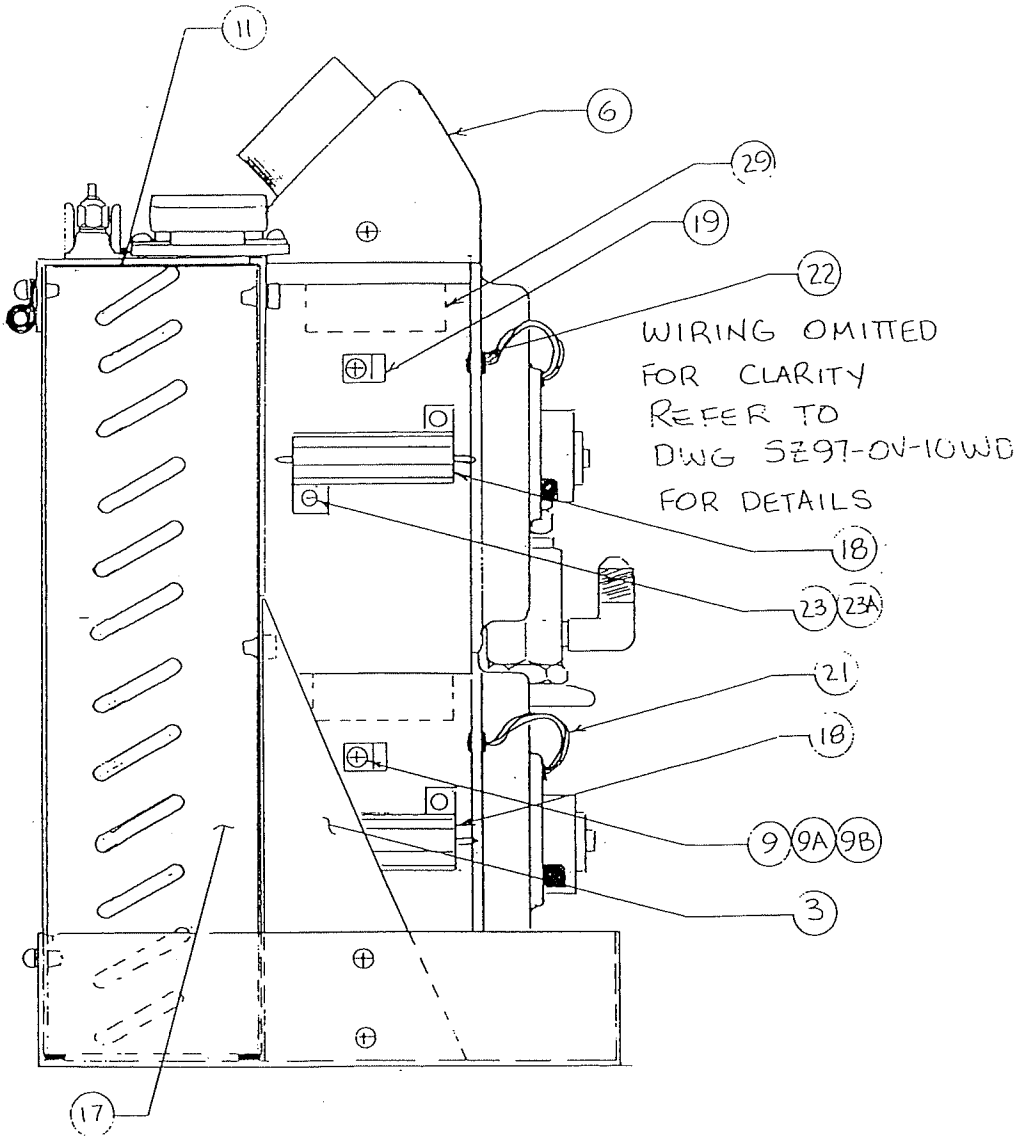
11
6
29
19
22
WIRING OMITTED
FOR CLARITY
REFER TO
DWG SZ97-OV-10WD
FOR DETAILS
18
23
23A
21
18
9
9A
9B
3
17

FIGURE 9

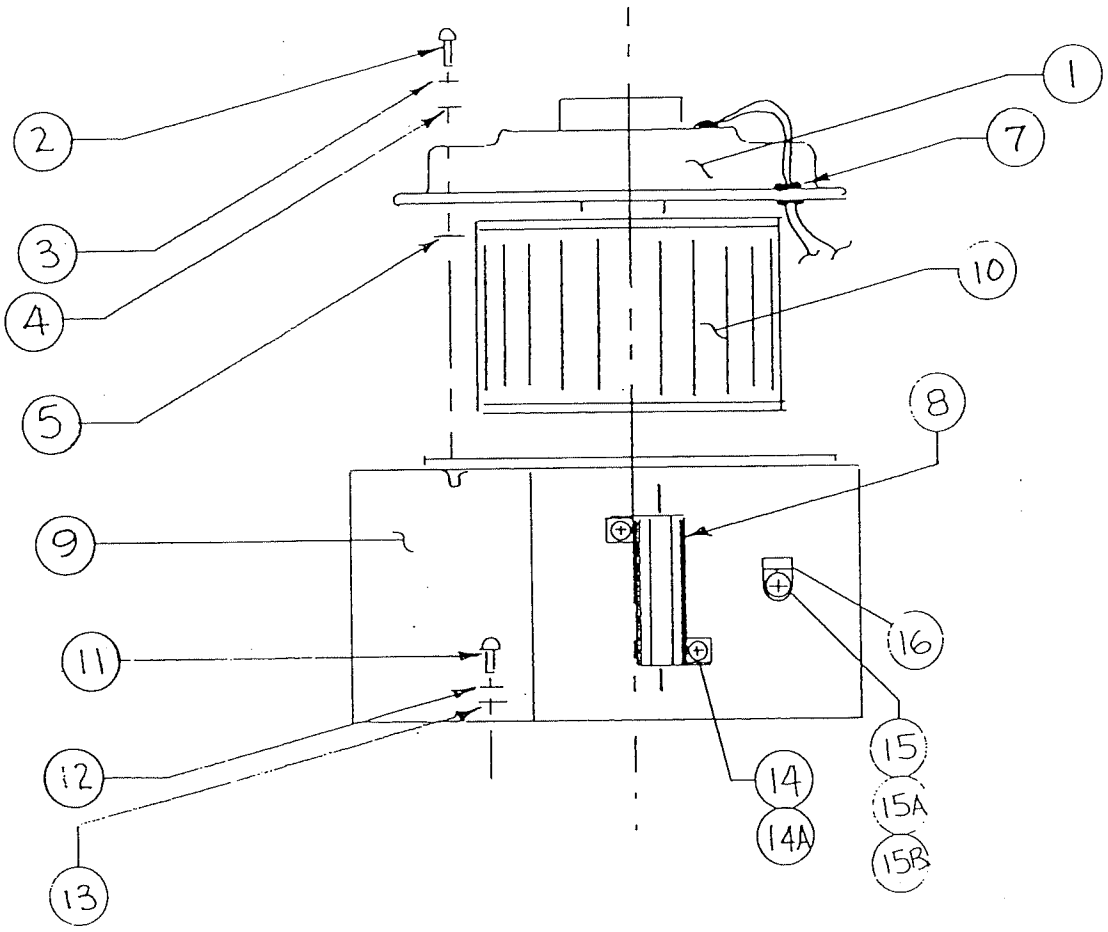

FIGURE 10

9.3 PLUMBING COMPONENTS

9.3.1 Zee Systems, Inc. supplies components for the plumbing as part of KIT SZ97-000. The plumbing installation and routing is a Dyncorp design. Refer to Dyncorp installation procedures for more detailed information.

FIG-ITEM	PART NUMBER	NOMENCLATURE	QTY	NOTES
11	DWG SZ97-000P	OV-10 Plumbing Components	(Ref)	
-1	SZ84-913NO-1	Compressor	1*	
-2	Z2008260BC090X180	Hose Assy	1*	
-3	SZ97-601-2	Coil, Condensing	1*	
-4	Z2006000AA266	Hose Assy	1*	
-5	207-101B	Reciever-Dryer	1	
-6	25L20-6-6	Fitting, 90 DEG	1#	
-7	235-6	Hose, Parker	AR	
-8	25920-6-6	Fitting, ST	1#	
-9	BFJ-B-CP90	Expansion Valve	1**	
-10	SZ97-701-1	Coil, Evaporator	1**	
-11	25920-10-10	Fitting, ST	2##	
-12	235-10	Hose, Parker	AR	
-13	25/50	Insulation, Armaflex 7/8 I.D. X 3/8 WALL	AR	

* Part of SZ97-001-1A MCC
** Part of SZ97-701-1 Evaporator
# Use MS28775-011 O-Ring (supplied)
Use MS28775-013 O-Ring (supplied)

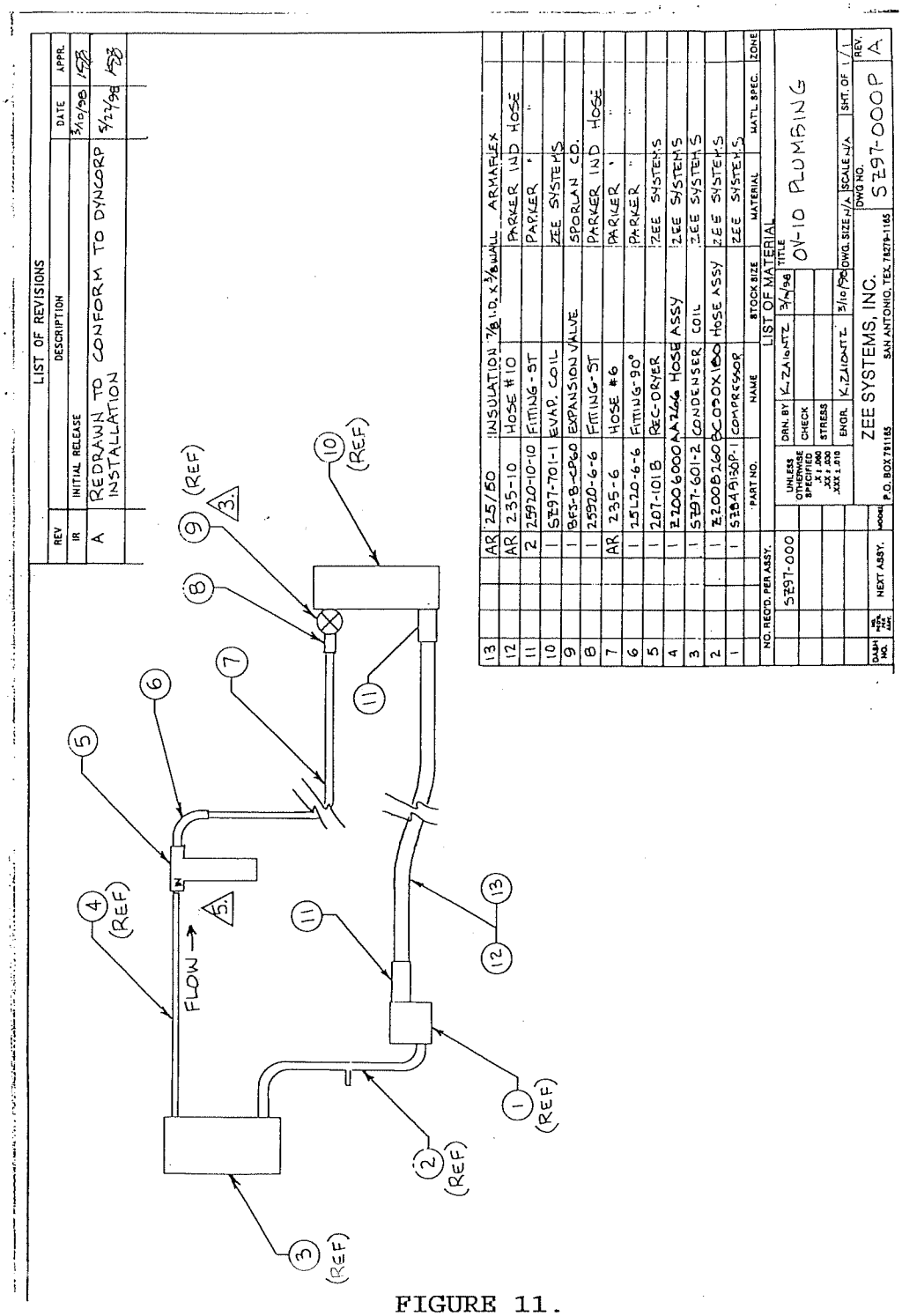
LIST OF REVISIONS
REV
DESCRIPTION
DATE
APPR.
IR
INITIAL RELEASE
3/10/98
A
REDRAWN TO CONFORM TO DYNCORP INSTALLATION
5/21/98
13 AR 25/50 INSULATION 7/8 I.D. x 3/8 WALL ARMAFLEX
12 AR 2.35-10 HOSE #10 PARKER IND HOSE
11 2 25920-10-10 FITTING-ST PARKER "
10 1 SZ97-701-1 EVAP. COIL ZEE SYSTEMS
9 1 BFS-B-CP60 EXPANSION VALVE SPORLAN CO.
8 1 25920-6-6 FITTING-ST PARKER IND HOSE
7 AR 2.35-6 HOSE #6 PARKER "
6 1 25120-6-6 FITTING-90° PARKER "
5 1 207-1018 REC-DRYER ZEE SYSTEMS
4 1 2200 6000 AA266 HOSE ASSY ZEE SYSTEMS
3 1 SZ97-601-2 CONDENSER COIL ZEE SYSTEMS
2 1 2200 8260 BC050X180 HOSE ASSY ZEE SYSTEMS
1 1 5184 9130P-1 COMPRESSOR ZEE SYSTEMS
NO. REQD. PER ASSY. PART NO. NAME STOCK SIZE MATERIAL MATL. SPEC. ZONE
LIST OF MATERIAL
5297-000
UNLESS OTHERWISE SPECIFIED .XX ± .030 .XXX ± .010
DRN. BY K.ZAHNTZ 3/4/98
CHECK
STRESS
ENGR. K.ZAHNTZ 3/10/98
TITLE OV-10 PLUMBING
DWG. SIZE A/A SCALE N/A SHT. OF 1/1
DWG NO. SZ97-000P REV. A
NEXT ASSY.
USED ON
ZEE SYSTEMS, INC.
P.O. BOX 791185 SAN ANTONIO, TEX. 78279-1185
FLOW
(1) (REF)
(2) (REF)
(3) (REF)
(4) (REF)
(5)
(6)
(7)
(8)
(9) (REF)
(10) (REF)
(11)
(12)
(13)

FIGURE 11.

9.4 ELECTRICAL WIRING DIAGRAM

9.4.1 The electrical wiring is a Dyncorp design and installation. Zee Systems, Inc. supplies electrical components as part of KIT SZ97-000. Refer to Dyncorp installation procedures for more detailed information.

FIG-ITEM	PART NUMBER	NOMENCLATURE	QTY	NOTES
12	DWG SZ97-OV-10WD	Wiring Diagram (Ref)		
CB2	Existing ACFT item	Circuit Breaker	1	
CR1	1N4007	Diode	1*	
F1	MDL-8	Fuse, 8A	1#	
F2	MDL-4	Fuse, 4A	1#	
F3	MDL-8	Fuse, 8A	1#	
F4	MDL-4	Fuse, 4A	1#	
F6	ANL125	Current Limiter, 125A	1**	
K1	6041H275	Relay	1	
M1	SZ58-003-1	Motor, Comp. Drive	1**	
M3	SZ63-021-2	Motor, Blower	1#	
M4	SZ63-021-2	Motor, Blower	1#	
R1	RV4NAYSD103A	Potentiometer	1	
S1	MS24524-21	Switch, Master	1	
S2	MS24523-23	Switch, Blower Speed	1	
TB2	MS27212-1-4	Terminal Block	1#	
TB3	4164	Terminal Block	1**	
	SZ96-035-1	Controller	1	
	SZ97-035-1	Wire Harness	1	
	SZ97-036-1	Temperature Sensor	1#	

* Part of 6041H275 Relay
** Part of SZ97-001-1A MCC
# Part of SZ97-701-1 Evaporator

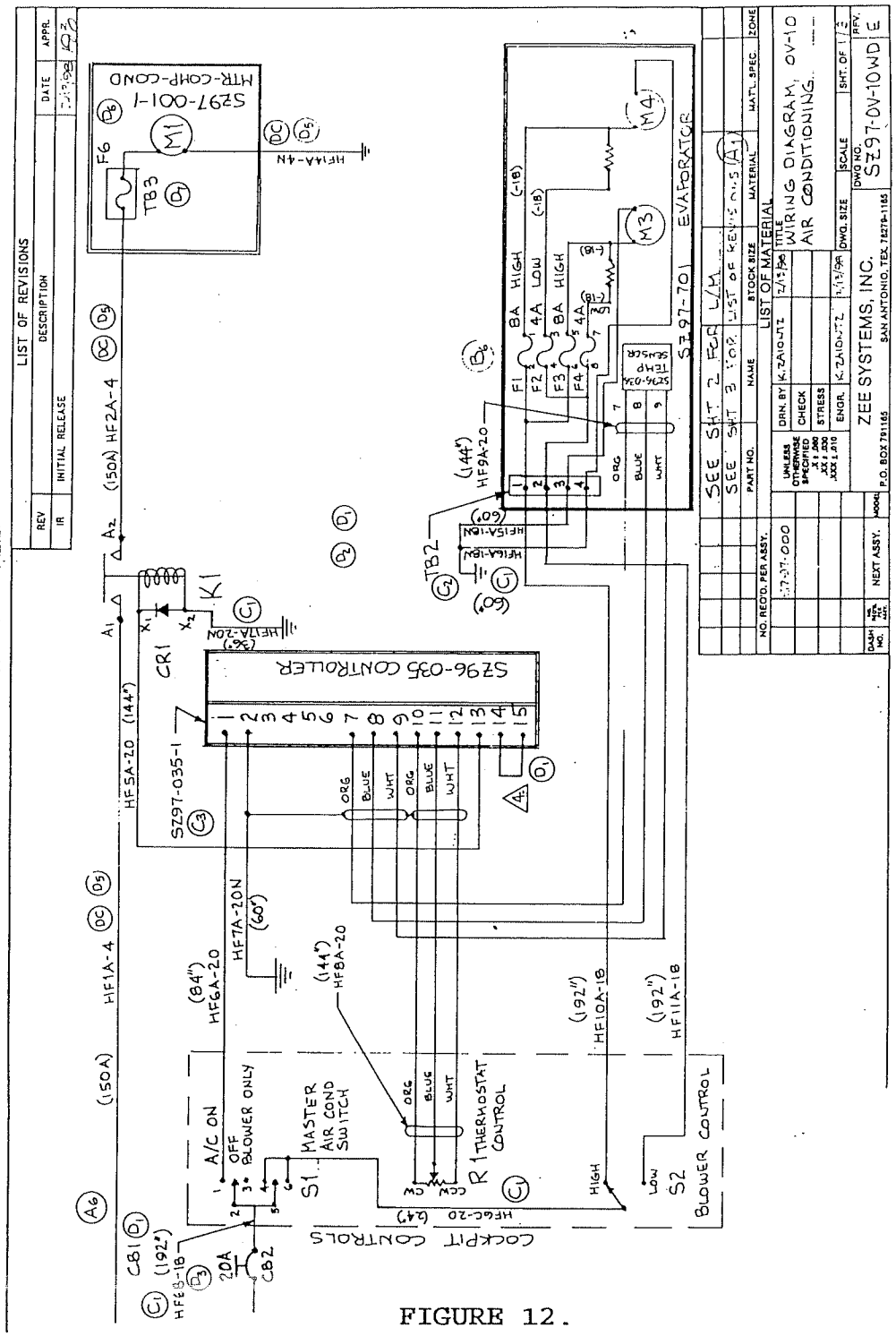
LIST OF REVISIONS
REV
DESCRIPTION
DATE
APPR.
IR
INITIAL RELEASE
SZ97-001-1
MTR-COMP-COND
M1
TB3
F6
HF14A-4N
(150A) HF2A-4
K1
CR1
HF15A-20N
SZ96-035 CONTROLLER
SZ97-035-1
HF5A-20 (144")
HF1A-4
(150A)
HF6A-20 (84")
HF7A-20N (60")
HF8A-20 (144")
HF10A-18 (192")
HF11A-18 (192")
HF8-18 (192")
A/C ON
OFF
BLOWER ONLY
MASTER AIR COND SWITCH
S1
R1 THERMOSTAT CONTROL
HIGH
LOW
S2
BLOWER CONTROL
COCKPIT CONTROLS
CB1
CB2
20A
SZ97-701 EVAPORATOR
SEE SHT 2 FOR L/H
SEE SHT 3 FOR LIST OF REVISIONS (A1)
BA HIGH
4A LOW
4A HIGH
HF9A-20 (144")
HF15A-18N (60")
TB2
ORG
BLUE
WHT
LIST OF MATERIAL
PART NO.
NAME
STOCK SIZE
MATERIAL
MATL SPEC.
ZONE
NO. REQ'D. PER ASSY.
DASH NO.
NEXT ASSY.
DRN. BY K. ZAIONTZ 2/15/96
CHECK
STRESS
ENGR. K. ZAIONTZ 2/15/96
UNLESS OTHERWISE SPECIFIED
DWG. SIZE
SCALE
SHT. OF 1/2
REV.
DWG NO. SZ97-0V-10WD E
TITLE WIRING DIAGRAM, 0V-10 AIR CONDITIONING
ZEE SYSTEMS, INC.
P.O. BOX 791165 SAN ANTONIO, TEX. 78279-1165

FIGURE 12.

If your compressor has back seating valves the position of the stem is important to the safe and efficient operation of the compressor.

1. To isolate the compressor from the system the valve can be completely turned in (clockwise) until the stem seals on the front seat. This allows for negligible refrigerant loss when performing service on or replacing the compressor. (FIG.1)
CAUTION: Operating the system with the stem in the front seating position will cause compressor or system failure.

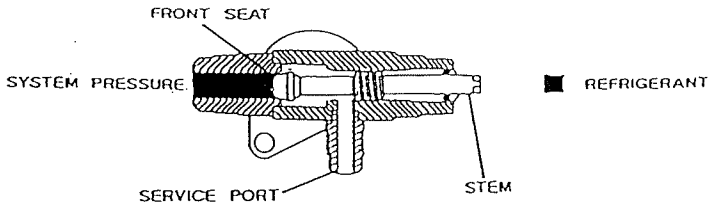

FIG.1

2. During servicing, to permit refrigerant flow to the system, compressor and the service port simultaneously the stem must be between the front seat and the back seat.(FIG.2)
NOTE: The stem should only be in this position during servicing.

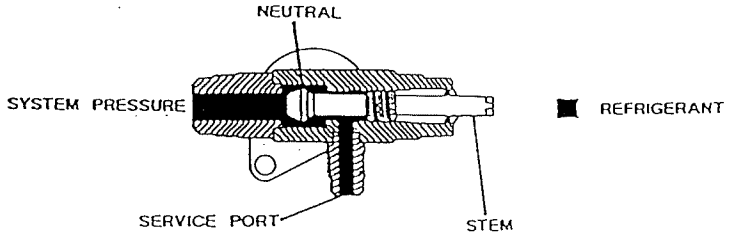

FIG.2

3. During normal operation the stem must be turned completely out (counter clockwise) against the back seat.(FIG.3)
CAUTION: The stem must be in the back seating position during operation. Other positions will cause compressor or system failure or refrigerant loss.

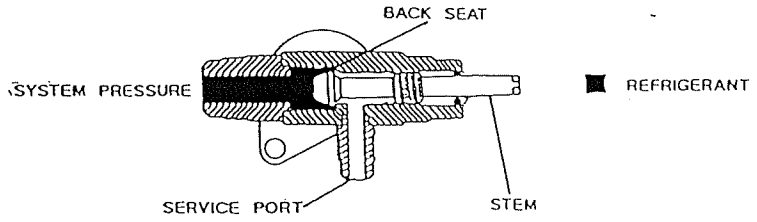

FIG.3

ATTACHMENT 1