



Zee Systems Inc.

AIRBORNE AIR CONDITIONING SYSTEMS & COMPONENTS

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Zee Systems Inc.

Maintenance and Service Instructions

SZ72-001-1 SZ76-001-1B SZ77-001-1

Air Conditioning Motor/Compressor/Condenser Unit

Revision 2
12/7/89

Installation

The SZ72-001/SZ77-001 drawing is used as reference for the maintenance and service instructions and parts information.

A Modulator Valve is provided for installation in the Compressor Inlet hose. The Valve is pre-set to control Compressor Inlet pressure and thereby effectively control Motor Current draw to a pre-determined value. The Modulator is only in control under certain conditions of heat overload. These conditions have to be present during Modulator adjustment so it is highly recommended that no field adjustment of this valve be made.

The Compressor is equipped with Back Seating Shut Off Valves and the unit should never be run without adjusting the shut off stem to the fully screwed out position to insure that the Compressor is not damaged from valved off operation.

Any Receiver/Dryer used should be kept capped until installed as the last operation prior to pulling vacuum on the circuit. All hoses in the circuit, particularly those after the Receiver/Dryer must be kept clean to prevent rubber residue from blocking the expansion valve or entering Compressor Valving.

Freon Servicing

All safety precautions should be taken when servicing Freon Systems. Discharge of freon can be extremely dangerous to the eyes. Discharging the system should be done through proper valving to prevent body injury, remembering that a charged system is always pressurized when operational or static.

The Back Seating Compressor Valves should be backed fully out (after installing servicing gauges) and then turned inward approximately two turns to open the port to the gauges. After servicing is completed valves are returned to the fully out position. If a system that has been in service has a loss of freon and there is evidence of appreciable oil discharge from the circuit, the compressor oil level should be checked to insure a level of one inch.

The system is to be serviced with refrigerant oil viscosity 520 which can be purchased at any automotive supply.

The system is to be serviced with Freon 12, which can be purchased from an automotive supply or other commercial source.

With the Back Seating Valves set as previously described and gauges and Freon bottle installed, discharge Freon into the Compressor inlet and outlet ports with the unit not running, until the system will take no further charge. Shut off High Pressure Valve on service gauges and start the motor compressor unit. Adjust gauge valve to inlet side of Compressor until low side gauge reads 35 to 40 pounds pressure and watch sight glass for elimination of bubbles. When sight glass no longer shows bubbles the system is fully charged.

The evaporator blower must be running during charging operation. It is mandatory that the Freon bottle be kept discharge port up during charging to permit entry of gas only to the Compressor. Inversion of the bottle will permit liquid entry to the compressor resulting in compressor slugging damage or severe overcharge.

Drive Belt Adjustment

The drive belt train is an efficient single reduction design to provide the proper ratio. The large diameter pulley is aluminum with hard anodized surface (black color) on the tooth and rim area. This eliminates abrasion of the aluminum pulley from the rubber belts and grit particles. Extreme care should be taken during handling and maintenance not to strike or use pullers directly against the hardened black area of the pulley as this might result in cracking or chipping of the hard surface. If a motor or compressor is changed, a belt adjustment must be made, using the top drawing SZ72-001/SZ77-001 reference.

Compressor Change

Before removing fittings or hoses, back seating valves must be in the off position. This is accomplished by turning clockwise until they are seated. Use freon gauge and hose set to allow freon in compressor to be dissipated. Then the fittings can be removed from compressor. Back seating valves with hoses attached can be removed from the compressor with twelve point 1/4 drive socket. Lower SZ41-004-3 plate by loosening nuts below the plate. Belt can now be removed from pulley. Remove four nuts and washers and remove top plate. Remove compressor from SZ41-004-3 plate and install new compressor using same hardware or new as needed. Replace "O" rings on back seating valves before installing on compressor.

New compressors will have new "O" Rings. Removal and replacement of pulley can be done as follows. Pulley can be removed from the compressor by loosening 5/16 bolt and washer part way from hub of pulley and wedging between the compressor boss and pulley hub. When replacing pulley degrease compressor shaft taper and tap pulley onto shaft with light hammer and piece of wood. Do not strike pulley on rim area. Replace bolt and washer part numbers as shown in drawing, torque and re-safety. Align and tension belt by adjusting nuts beneath the compressor mount plate.

Motor Change

Same procedure as removal of compressor. This will give access to motor mount plate which can be removed by removal of four 3/8 nuts and washers. This will allow motor and plate to be removed in one piece. Remove fan shaft by holding motor pulley with spanner wrench. The four bolts mounting the motor to mount plate can then be removed. The new motor is provided with mount foot and pulley fitted to the shaft by selection to insure best pulley retention. Replace motor in reverse order. Tighten fan shaft and fan assembly by the same method used for removal. Extreme care should be used in holding pulley with spanner wrench so as not to nick the teeth and no force at all should be put on the pulley flanges. Fan shaft should be torqued to 80-90 inch pounds. Replace belt and adjust. Re-install motor and mount plate assembly onto support structure with existing hardware, nuts and washers as shown in SZ72-001/SZ77-001 drawing. Follow by replacing compressor and mount plate assembly with existing hardware or new.

To adjust belt tension SZ41-004-3 plate must be raised evenly and level by readjustment of the four 3/8 nuts below the plate. The top four nuts should be tightened against the plate in sequence as the plate is being raised to reach the proper belt tension described in Note I on drawing SZ72-001/SZ77-001.

The features of positive traction drives that contribute so greatly to their well recognized success also contributes to their intolerance of improper use. The long life characteristics of these drives is partially attributed to the fact they maintain adjustment well. This characteristic will invariably cause extreme bearing abuse if the belts are adjusted too tight, as the drive belts will maintain this improper adjustment. Other types of drives (V belts) will yield to an overtight condition generally before they will cause bearing failure.

If belts are operated too loose they will attempt to climb the pulley teeth and cause improper loading and failure of the belt teeth. Failure of the belt teeth when belts are known to be properly adjusted can only be attributed to massive overload conditions such as excessively high inlet pressures during charging of system or other improper charging procedures.

Once the belt is properly adjusted, it generally needs no further adjustment over the life of the belt.

The production test run provides a "seating in" of the belts prior to their final adjustment. The drives should need no further attention unless they are disturbed through normal maintenance of other components.

The condenser coil, face adjacent to the fan, should be inspected for trash accumulation. The condenser fans should be inspected for security on the shaft.

The belts should be inspected for any indication of cracking at the edges which is the earliest sign of age deterioration. Belts with any such age indications should be replaced as a practical matter during access. Inspect the belts for tension. A significant change in belt tension is usually an indication that there has been some belt deterioration. The practice of always increasing belt tension as a routine matter (as with V belts) should not be employed. Positive traction drives need minimal attention and should be adjusted only when it is clear that an adjustment should be made. Extreme care in making these adjustments will be rewarded by long trouble-free service.

The rubber mounts should be replaced during the fifteen hundred (1500) hour maintenance period. The replacement of the mounts at this time should be an economical option.

The Zee Systems units are designed for rugged service and therefore need minimal attention. Information, service and parts are readily available.

Manufacturer Service

The manufacturer can provide a complete overhaul, exchange and parts service on all components without delay. A complete re-manufactured service can be provided during the winter season as a practical method of minimizing maintenance during cooling season. Motor and Compressor unit should be overhauled at fifteen hundred (1500) hours of service time.