



**ZEE Systems, Inc.**

**COMPONENT MAINTENANCE MANUAL SZ58-002-1C**

***Component  
Maintenance  
Manual***

***with***

***Illustrated Parts List***

***for***

***SZ58-002-1C***

***SZ58-002-1CM***

***SZ58-002-1A (MOD “B”)***

***Motor-Compressor Assembly***



**ZEE Systems, Inc.**

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***RECORD OF REVISIONS***

REVISION NO:	ISSUE DATE:	POSTED DATE:	BY:

It is our intention to provide the highest degree of support for our products.  
Please contact ZEE Systems, Inc. regarding errors, corrections and comments pertaining to  
this manual at 800-988-2665, 210-342-9761 or via e-mail: [info@zeeco-zeesys.com](mailto:info@zeeco-zeesys.com).



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and  
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## **ZEE Systems, Inc.**

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#### **1.0 GENERAL INFORMATION**

1.1 This document is a maintenance manual provided to aid the operator to perform routine scheduled and preventive maintenance. This manual is not intended to be an overhaul manual for the individual components. For zero time overhaul and repair of components contact the ZEE Company, Inc. 210-342-9479.

1.1.1 The SZ58-002-Series Motor Compressor Assembly is used in many different stand alone applications and as the major Motor Compressor sub-assembly in our SZ45-002-3 Series Motor Compressor Condenser Units. This manual is for the maintenance of the SZ58-002-1C/-1CM/-1A(MOD B) Motor Compressor Assembly only. The major components of the SZ58-002 are the motor, compressor, jack shaft assembly, fan shaft assembly and frames.

#### **CAUTION**

**THE SZ58-002 MOTOR COMPRESSOR ASSEMBLY IS PART OF THE AIRCRAFT AIR CONDITIONING SYSTEM. THE AIR CONDITIONING SYSTEM IS UNDER PRESSURE. APPROPRIATE SAFETY MEASURES SHOULD BE TAKEN WHEN SERVICING THIS EQUIPMENT. ONLY TRAINED PERSONNEL WITH APPROVED SAFETY EQUIPMENT SHOULD PERFORM SERVICING DUTIES.**

1.2 MOTOR: The SZ58-003 Motor is high torque, high speed with internal cooling.

Rated HP	3.75
Voltage - DC	28
Speed (RPM) under load	7,500
Rotation - viewed from drive end	CW
Current - continuous load	150A
Cooling	Internal

**TABLE 1.  
MOTOR SPECIFICATIONS**

1.3. 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. See ILLUSTRATION 1.

1.4 JACK SHAFT ASSEMBLY: The jack shaft is a transmission used to attain the proper compressor speed.

1.5 FAN SHAFT ASSEMBLY: This fan assembly provides forced air over the condenser.

1.6 FRAMES: The frames are a light weight mount for the motor, compressor and jack shaft.

1.7 PRESERVATION: Whenever the air conditioning system will be inactive for more than 30 consecutive days of normal operation system components should be preserved to prevent damage from chemical or other contamination. Refer to applicable preservation instructions of this manual. Failure to properly preserve components will void all warranty.



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#### **2.0 EQUIPMENT AND MATERIAL**

2.1 EQUIPMENT: The following equipment may be required to perform the maintenance described in this manual.

ITEM	SOURCE
Torque Wrench IN-LBS	Commercially Available
Torque Wrench FT-LBS	Commercially Available

2.1.2 Refer to applicable aircraft maintenance manuals or ZEE SYSTEMS Service Letter(s) and Service Bulletin(s) for any additional equipment which may be required to service the air conditioning system.

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

ITEM	SOURCE
MS20995C025 Lock Wire	Commercially Available
MS20995C032 Lock Wire	Commercially Available

#### **R-134a SYSTEM**

Any Synthetic Polyol Ester (P.O.E.) refrigerant oil with an ISO (viscosity) of 68 to 100	Commercially Available
Lubrizol 2916	
Nu-Calgon RL68S	
CCI Retro-Fix II	
Castrol SW100-Icematic	

R-134a Refrigerant (HFC-134a)	Commercially Available
Only use virgin refrigerant. NEVER used reclaimed or recycled Refrigerant in this system.	

**3.0 REPAIR AND REPLACEMENT OF COMPONENTS** Refer to Section 5.0 for Maintenance Schedules

#### **CAUTION**

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

#### **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.**



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#### **NOTE**

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

#### **NOTE**

**WHEN USING A POWER SPRAY WASHER OR SIMILAR DEVICE TO CLEAN THE AIRCRAFT NEVER POINT THE SPRAY DIRECTLY INTO THE COMPRESSOR DRIVE MOTOR AND AT THE JACKSHAFT BEARINGS.**

### **3.1 DRIVE BELTS**

3.1.1 OPERATION AND DESCRIPTION: 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 anodize coating. Extreme care should be taken during maintenance not to strike or use pullers directly against the hardened area of these pulleys as this may crack or chip the anodized surface.

3.1.1.2 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.

3.1.2 INSPECTION: Inspect each belt for deterioration and fraying. Replace as belt condition dictates.

3.1.3 BELT REMOVAL: After the belt tension has been released always slide the belt off of the larger pulley, then the smaller pulley.

3.1.3.1 Secondary Belt (2A-6): To remove the belts start with the secondary belt. Loosen the four bolts (2A-10) then loosen the secondary belt adjusting bolt (2B-12A). This slides the compressor toward the jack shaft (2A-14), remove the secondary belt (2A-6) from the compressor pulley first then the small pulley.

3.1.3.2 Primary Belt (2A-4A): Loosen the two locking bolts (2A-11). 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 first then from the motor pulley.

3.1.4 BELT 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 (2A-14) 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 (2A-10) to the point where the compressor slides but that compressor base plate (2A-30) is fairly well seated. If this is not done the belt tension will change when the bolts (2A-10) are tightened. For final alignment of the secondary belt it may be necessary move the jack shaft assembly (2A-14) axially in the clamps (2A-17,-17A). When the secondary belt is centered on both pulleys align the primary belt by moving the motor (2A-1) axially in the side frames (2A-31,-32). When both belts are aligned proceed to belt adjustment.

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.



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3.1.5.1 Primary Belt (2A-4A) Adjustment: Insert the 3/8" pin in the jack shaft housing (2A-14) and push downward on the pin to tighten the primary belt until a tension of 1/8" deflection midway between pulleys with 2½ - 3 pound pull is achieved. Tighten the two locking bolts (2B-12A) to torque of 30 foot-pounds.

3.1.5.2 Secondary Belt (2A-6) Adjustment: Tighten the adjusting bolt (2B-12A) until a tension of 1/8" deflection midway between pulleys with a 4½ - 5 pound pull is achieved. Tighten the four bolts (2A-10) to a torque of 40 foot-pounds. Loosen the adjusting bolt (2B-12A) and the retighten to a torque of 15 inch-pounds.

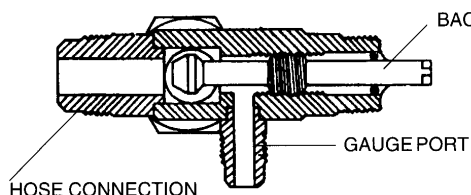
3.1.5.3 Check the belt alignment before running the motor. Turn the compressor pulley by hand to see that belts are properly aligned. Slight striking of the belt against the rim on the small pulleys is normal but not to the point where chafing occurs. Readjust belts if necessary. Next run the motor and 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 is properly tightened no further adjustments should be necessary if the components are not disturbed.

3.1.5.4 PRESERVATION: Whenever the air conditioning system will be inactive for more than 60 consecutive days of normal operation the belts should be inspected prior to start up of the system. Failure to properly preserve the system components will void all warranty.

3.2 COMPRESSOR Refer to ZEE Systems, Inc. CMM SZ206 for detailed repair and maintenance of the compressor.

#### **NOTE**

**IF YOUR COMPRESSOR HAS BACK SEATING VALVES "OP", 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 THE CLOSED POSITION. TURN THE VALVES BACK OUT PRIOR TO OPERATION.**



Turn valve stem all the way forward (clockwise) to shut off connecting line. This is "front seating". Turn valve stem all the way backward (counter-clockwise) to shut off gauge port and allow connection of service line (hose) to gauge port. This is "back seating". In normal operation valve stem is "back seated" to allow full flow through the valve.

#### **ILLUSTRATION 1 BACK SEAT VALVE OPERATION**

3.2.1 REMOVAL: Loosen the four bolts (2A-10) then loosen the adjusting bolt (2B-12A) and remove the secondary belt. Remove the four bolts and washers (2A-10,-10A,) and adjusting bolt (2B-12A) and lift the compressor (2A-2) and base plate (2A-30) from the side frames. Separate the compressor from the base plate



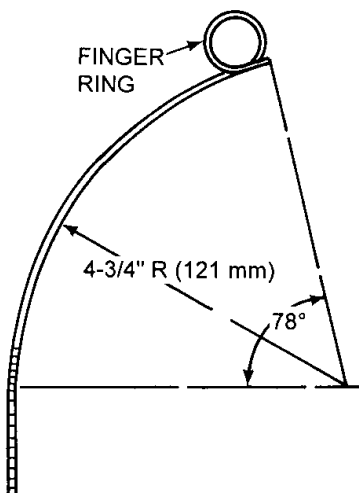
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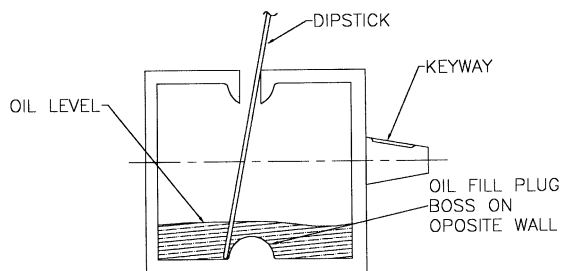
(2A-30) by loosening and removing the three bolts (2A-13,-13A,-13B). To remove the pulley (2A-7) loosen and remove bolt (2C-21) and washer (2C-22). Evenly pry between the compressor boss and the pulley hub.

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 2** 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 2** and add oil as necessary. Return and tighten oil fill plug. If your compressor does not have back seat valves the refrigerant must be removed from the system to check the oil level.



**ILLUSTRATION 2**  
**OIL DIP STICK**



**ILLUSTRATION 3**  
**CHECKING THE OIL**

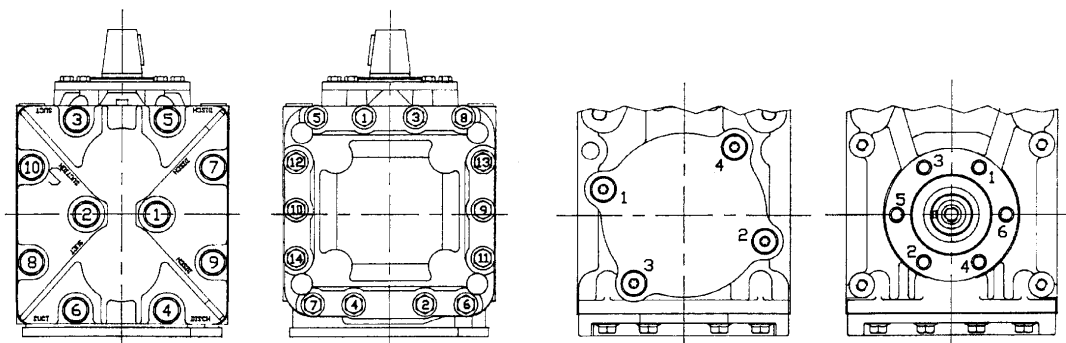


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	Horizontal Mount	Vertical Mount
6 fl. oz. (177 ml)	3/4" (19 mm)	1" (25 mm)
8 fl. oz. (237 ml)	1" (25 mm)	1-1/4" (32 mm)
10 fl. oz. (296 ml)	1-3/16" (30 mm)	1-1/2" (38 mm)
12 fl. oz. (355 ml)	1-7/16" (37 mm)	1-13/16" (46 mm)
14 fl. oz. (414 ml)	1-3/4" (44 mm)	2-1/16" (52 mm)

**TABLE 2.**  
**COMPRESSOR OIL LEVEL**



LOCATION	THREAD	HEAD	FIELD TORQUE SPECS
Baseplate	1/4" - 20 UNC	Hex	10-16 ft.-lb. (13.6-21.7 N-m)
Rear Bearing Cover Plate	1/4" - 20 UNC	Flat	10-16 ft.-lb. (13.6-21.7 N-m)
Cylinder Head	5/16" - 18 UNC	Hex	17-25 ft.-lb. (23.0-33.9 N-m)
Seal Plate	10-24 UNC	Hex	5-8 ft.-lb. (6.8-10.8 N-m)
Oil Fill Plug	3/8" - 24 UNF	Hex	5-10 ft.-lb. (6.8-13.6 N-m)
Clutch Mounting Screw	1/4" - 20 UNC	Hex	13-19 ft. lb. (17.6-25.8 N-m)
Clutch Center Bolt	5/16" - 24 UNF	Hex	20-25 ft. lb. (27.1-33.9 N-m)
Rotalock Valve	1" - 14 UNS	Hex	35-40 ft. lb. (47.5-54.2 N-m)
Tube 'O' Valve	1" 14 UNS	Hex	35-40 ft.-lb. (47.5-54.2 N-m)
Flange Valve	5/16" - 18 UNC	Torx	17-25 ft.-lb. (23.0-33.9 N-m)
Pressure Relief Valve	3/8" - 24 UNF	Hex	5-10 ft.-lb. (6.8-13.6 N-m)

**TABLE 3**  
**COMPRESSOR TORQUE INFORMATION**



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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. Place washer (2C-22) and bolt (2C-21) in place and torque to 20 foot-pounds, secure with .032 diameter lock wire.

3.2.4 BASE PLATE REASSEMBLY: Attach the compressor plate (2A-30) to the compressor using the three bolts and washers (2A-13,-13A,-13B), torque to 45 foot-pounds.

3.2.5 INSTALLATION: Set the assembled compressor and plate on the side frames and attach using bolts and washers (2A-10,-10A). Tighten the four compressor mount bolts (2A-10) to the point where the compressor slides but that compressor base plate (2A-30) is fairly well seated. Install and align belts in accordance with Section 3.1.5.2. Tighten the four bolts (2A-10) to a torque of 40 foot-pounds. Loosen the adjusting bolt (2B-12A) and then retighten to a torque of 15 inch-pounds.

3.3.7 PRESERVATION: Whenever the air conditioning system will be inactive for more than 30 consecutive days of normal operation the compressor should be run for 30 consecutive minutes every 7 (seven) days to maintain the seat on the shaft seal. Failure to properly preserve the components will void all warranty.

3.3 MOTOR, COMPRESSOR DRIVE It may be necessary to remove the motor is to remove the entire SZ58-002 Motor-Compressor Assembly from the aircraft. Check the aircraft maintenance instructions.

3.3.1 REMOVAL: Disconnect the positive and negative leads to the motor. Loosen (and remove) the secondary belt (2A-6) and the primary belt (2A-4A), section 3.1.3. Loosen the hardware (2B-9,-40,-41) holding the safety clip (2B-37). Remove safety bolts (2B-38). Hold the motor pulley with a spanner wrench and loosen the fan shaft assembly (2A-20) by turning the 1" hex nut (right hand thread) Do not completely remove the fan shaft assembly at this time. Loosen the lock nuts (2B-15A). Back out the motor mount locking bolts (2B-15). The motor may be slightly stuck to the motor support assembly (2C-24) pads, 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 (2A-20) and spacer (2A-18) from the motor shaft, set it aside. Now slide the motor completely out of the frame.

3.3.2 INSPECTION: If brushes are removed from the motor for inspection mark the location and return each brush to its original holder.

3.3.2.1 Refer to ZEE Systems, Inc. Service Letter 99-800 for additional information on brush inspection procedures. Remove the brush cover and inspect the brushes. Mark each brush so that it may be returned to the same holder. If any brush is worn to the wear mark on the side of the brush, minimum length is 0.75 inches from top of brush to contact wear area ALL brushes must be replaced. Check for chips, cracks, pitting, signs of arcing or overheating. If any brush is in a condition to be replaced ALL brushes must be replaced. Replace in sets only. Order Brush Kit P/N: Z6386K or alternate Z6386AK. Make sure that all brushes installed comply with Service Bulletin 6386-1.

3.3.2.2 With brushes removed inspect the commutator for signs of overheating or unusual wear. Turn the (motor pulley) armature by hand and check there is no binding or end play. If the armature commutator has unusual wear the motor should be removed for further inspection or overhaul.

3.3.3 INSTALLATION: Place the new drive motor loosely in the side frames (2A-31,-32) and against the two support assembly pads (2C-24). Attach the safety clip (2B-37) to the adjusting support bar (2D-25) snug but do not tighten the hardware (2D-15,-15A,-15B,-15C). There are two drilled and threaded holes located on the motor stator housing approximately 180° opposite the electrical terminals. Loosely attach the two motor safety bolts (2-B-38) through the safety clip and into the motor. When the adjusting support bar and the motor safety clip are all aligned tighten adjusting support bar (2D-25) and loosely attach the hardware (2D-15,-15A,-15B,



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-15C). Make sure the motor is firmly in contact with the pads on the motor support assemblies (2C-24) this will insure the three point mount of the motor. Now, evenly finger tighten the motor mount locking bolts (2D-15). Make sure pads are seated against motor then tighten the hardware (2C-34,-34A,-34B) for the two motor supports (2C-24). Place the motor pulley (2A-3) on motor shaft making sure the pulley fits into the flats on the shaft. Place the spacer (2A-18) on the pulley and screw the fan shaft assembly (2A-20) into the motor shaft. Using a spanner wrench hold the motor pulley and tighten the fan shaft assembly (1" hex nut). Check the mounting points then tighten the two adjusting bolts (2D-15) evenly and torque to 20 inch-pounds, then tighten the lock nuts (2D-15A). Tighten the hardware (2B-39,-40,41) holding the safety clip (2B-37) to the adjusting support bar (2D-25) and then the motor safety bolts (2B-38) and torque to 20 inch-pounds.

3.3.3.1 Install the primary and secondary belts and adjust in accordance with Section 3.1.5.

3.3.4 PRESERVATION: Whenever the air conditioning system will be inactive for more than 30 consecutive days of normal operation The motor should be cleaned and all debris and contaminants removed, inside and outside. Failure to properly preserve the components will void all warranty.

3.3.4.1 A complete inspection of the motor should be performed before the air conditioning system is started. Remove the brush covers and check that each brush is free and slides easily in each holder, also check that each brush is in contact with the commutator of the armature. Turn the motor by hand. Turn the motor clockwise, the bearings should feel smooth with no binding. Turn the motor counter clockwise, the motor should turn smooth and slight clicking should be noted.

#### **3.4 FAN SHAFT ASSEMBLY**

3.4.1 REMOVAL: Remove and set aside the secondary and primary belts in accordance with paragraph 3.1.3. Hold the motor pulley with a spanner wrench and turning the 1" hex nut on the fan shaft (right hand thread) loosen and remove the fan shaft assembly (2A-20).

3.4.2 INSPECTION: Check each blade for cracks, chips or other damage. The Z99 Motor turns clockwise when viewed from the shaft side. Check that the straight edge of the blade is the leading edge of the fan blade for the CW rotation. Replace any blade that is damaged.

3.4.3 REASSEMBLY: Place a new O-Ring (1-2) on the fan shaft (1-1). Stack three fans (1-3) on the shaft so that "TRACTOR" is toward the motor. Check that the straight edge of the blade is the leading edge of the fan blade for the CW rotation and that the pitch of the blades will move air away from the motor. Rotate each fan so the blades are equally spaced at 40°. Secure with the washer (1-4) and lock nut (1-5).

3.4.4 INSTALLATION: Attach the fan shaft assembly (2A-20) and spacer (2A-18). Using a spanner wrench hold the motor pulley tighten the fan shaft assembly (1" hex nut). Adjust belt(s) in accordance with paragraph 3.1.5.

3.4.5 PRESERVATION: Whenever the air conditioning system will be inactive for more than 30 consecutive days of normal operation the system should be preserved to prevent damage from chemical or other contamination. No special preservation of the Fan Shaft Assembly is required.

#### **3.5 JACK SHAFT ASSEMBLY**

3.5.1 REMOVAL: First remove both belts in accordance with paragraph 3.1.3.

NOTE: Take care not to nick or damage the hard anodized area of the pulley.



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3.5.1.1 Remove bolts (2D-9) from the Browning taper lock bushing (2D-5). Place the bolts (2D-9) 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 (2C-11) on clamps (2A-17,-17A) and slide jack shaft assembly from frame. It may be necessary to wedge open the clamp(s) if the jack shaft does not readily slide out.

3.5.2 INSPECTION: Inspect the pulley (2D-4) for wear. Check for damaged or rounded teeth. Excessive wear will show as shiny areas on the teeth. Replace if damaged.

3.5.2.1 Inspect the small pulley on the jack shaft assembly (SZ43-009-3) damaged or rounded teeth. Replace if damaged.

3.5.2.2 Inspect the jack shaft housing (SZ43-010-3) 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: Jack Shaft Assembly from ZEE SYSTEMS will come with the small pulley fitted to the shaft.

3.5.3 REPAIR: Due to manufacturing process field repair is not recommended.

3.5.4 INSTALLATION: Slide jack shaft assembly into frame and align it so the belt will ride centered on the compressor pulley and the secondary (small) pulley on the jack shaft, and tighten bolts (2C-11) to hold the assembly while attaching the other jack shaft (large) pulley (2D-4). Slip the pulley (2D-4) over the shaft. Using a rawhide mallet tap the bushing (2D-5) 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.

3.5.4.1 Install the two bolts and washers (2D-9,-11A) and evenly tighten this will move the pulley (2D-4) toward the bushing (2D-5), 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.

3.5.4.2 Install and align belt(s) in accordance with paragraphs 3.1.5. The belt should ride in the middle of the (large) pulley. It may be necessary to move the motor in the side frames (2A-31,-32) to align the motor pulley (2A-3) and the primary pulley (2A-4) on the jack shaft. Refer to paragraph 3.3.3 for this procedure. Run the motor and check the belt does not walk on the pulley, then secure (2D-9) bolts with .025 diameter lock wire.

3.5.5 PRESERVATION: Whenever the air conditioning system will be inactive for more than 30 consecutive days of normal operation the system should be preserved to prevent damage from chemical or other contamination. No special preservation of the Jack Shaft is required.

3.5.5.1 Inspect the Jack Shaft before starting the air conditioning system. Turn the shaft in the housing it should turn free and true, there should not be any end play in the bearings.

## **4.0 SERVICING**

### **CAUTION**

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



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#### **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.**

#### **NOTE**

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

#### **NOTE**

**DO NOT USE A SIGHT GLASS WHEN USING R-134a REFRIGERANT TO DETERMINE THE PROPER CHARGE.**

#### **NOTE**

**USE ONLY VIRGIN REFRIGERANT IN THIS SYSTEM. DO NOT RETURN REMOVED REFRIGERANT TO THIS SYSTEM.**

#### **NOTE**

**DO NOT ADD OIL WITH THE REFRIGERANT. ONLY ADD OIL TO THE CRANKCASE OF THE COMPRESSOR. IF THE COMPRESSOR DOES NOT HAVE BACK SEAT VALVES THE SYSTEM MUST BE DISCHARGED TO ADD OIL.**

4.1 SERVICING INSTRUCTIONS: The SZ58-002 Motor Compressor is part of the aircraft air conditioning system. Refer to applicable service instructions for that aircraft or ZEE Systems, Inc. Service Letter 45-1.

### **5.0 MAINTENANCE SCHEDULES**

5.1 MAINTENANCE SCHEDULE: This maintenance schedule is only an estimate it is the maximum interval between service. When this MCC is installed on an agricultural spray plane the maintenance schedule should be amended to each individual operator. When spraying a chemicals which may contain high corrosive potential the inspection and TBO intervals should be adjusted accordingly to shorter intervals.

<b>ITEM</b>	<b>INSPECTION</b>	<b>R&amp;R/T.B.O.</b>
DESCRIPTION	INTERVAL *	HRS
SZ58-002	FIRST 100 HRS* AFTER OH OR NEW -	2000
M-C	CHECK COMPRESSOR OIL LEVEL, REPLENISH AS NECESSARY.	
	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	500



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MOTOR **	EVERY 1000 HRS* - INSPECT AS PER SECTION 3.3.2	2000
JACK SHAFT**	EVERY 1000 HRS* - INSPECT AS PER SECTION 3.5.2	2000
COMPRESSOR**	EVERY 250 HRS - INSPECT AS PER SECTION 3.2.2	ON CONDITION

\* UNIT OPERATING TIME

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

5.2 PRESERVATION Whenever the air conditioning system will be inactive for more than 30 consecutive days of normal operation the system should be preserved to prevent damage from chemical or other contamination. Failure to winterize the motor will void all warranty.

## **6.0 TOLERANCES**

6.1 COMPRESSOR OIL. The minimum compressor oil depth is 13/16" (20mm). The Maximum is 1-5/8" (41mm). Replenish as necessary. See Section 2.2 for oil type.

6.2 BRUSH LENGTH, COMPRESSOR DRIVE MOTOR. The minimum brush length on the drive motor is 0.750" (19mm). Refer to SERVICE LETTER 99-800.

6.3 TORQUE VALUES. Use standard torque values for bolts. Refer to TABLE 3 and Manual SZ206 for torque values and torque sequence for the compressor.

## **7.0 TROUBLE SHOOTING**

<b>TROUBLE</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>
Compressor Motor trips circuit breaker.	Motor shorted.	Replace Motor.
	Motor brushes worn beyond limits.	Overhaul Motor.
	Defective or undersize Circuit Breaker.	Check Circuit Breaker.
Compressor Motor trips current limiter.	Short in wiring.	Check wiring to motor, repair as required.
	Motor brushes worn beyond limits.	Overhaul Motor.
	Wrong or undersize Current Limiter.	Check Current Limiter.



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TROUBLE	POSSIBLE CAUSE	REMEDY
Compressor Motor inoperative.	Motor open.	Overhaul or Replace Motor.
	Motor brushes worn beyond limits.	Overhaul Motor.
	Short in wiring.	Check wiring to motor, repair as required.
Excessive vibration at Motor/Compressor.	Improper belt tension.	Adjust belt to correct tension.
	Worn, damaged or loose or over tightened motor mounts.	Adjust or replace mounts.
	Pulleys out of alignment.	Adjust pulley alignment.
Quick refrigerant loss.	Open in system.	Check compressor head gasket. Check Hoses or tubing for holes. Check connections. 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.
	Compressor Shaft Seal.	Replace Shaft Seal. Service Sysstem.



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#### **8.0 ILLUSTRATED PARTS LIST**

##### **8.1 EXPLANATION OF SYMBOLS:**

ALTERNATE - 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. See Section 9.0 for description of the modifications.

NP - Not Procurable individually, see next higher assembly.

NS - Not Shown

OBS - Obsolete

USAGE - This identifies parts used on specific applications (not common to all units). Blank indicates the part is used on all applications.

.. - Part of higher assembly.

\*/# - See explanation at end of parts list.

NOTES: Refer to the notes at the end of the IPL for clarification.

“AN”, “MS” and “NAS” equivalent hardware is considered to be approved alternates for each other and may be used. The most common are as follows:

PART NUMBER	ALTERNATE	DESCRIPTION
AN345-516	MS35650-3312	NUT, MACHINE
AN364-624A	MS21083N6	LOCK NUT
AN365-428A	MS21044N4	LOCK NUT
AN365-832A	MS21044N08	LOCK NUT
AN501A10-6	MS35266-61	SCREW
AN935-416	MS35338-44	WASHER, LOCK
AN935-516	MS35338-45	WASHER, LOCK
AN935-616	MS35338-46	WASHER, LOCK
AN935-8	MS35338-42	WASHER, LOCK
AN960-416	NAS1149F0463P	WASHER, FLAT
AN960-416L	NAS1149F0432P	WASHER, FLAT
AN960-516	NAS1149F0563P	WASHER, FLAT
AN960-516L	NAS1149F0532P	WASHER, FLAT
AN960-616	NAS1149F0663P	WASHER, FLAT
AN960-616L	NAS1149F0632P	WASHER, FLAT
AN960-8L	NAS1149FN816P	WASHER, FLAT



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#### 8.2 FAN SHAFT ASSEMBLY

FIG-ITEM	PART NUMBER	DESCRIPTION	QTY	USAGE	NOTE
1	.SZ41-034-5T	FAN SHAFT ASSY			
-1	..SZ41-018-5	SHAFT	1		
-2	..MS28775-114	O-RING	1		
-3	..1063T-925	BLADE, FAN	3		
-4	..R80	WASHER	1		
-5	..AN364-624A	NUT	1		

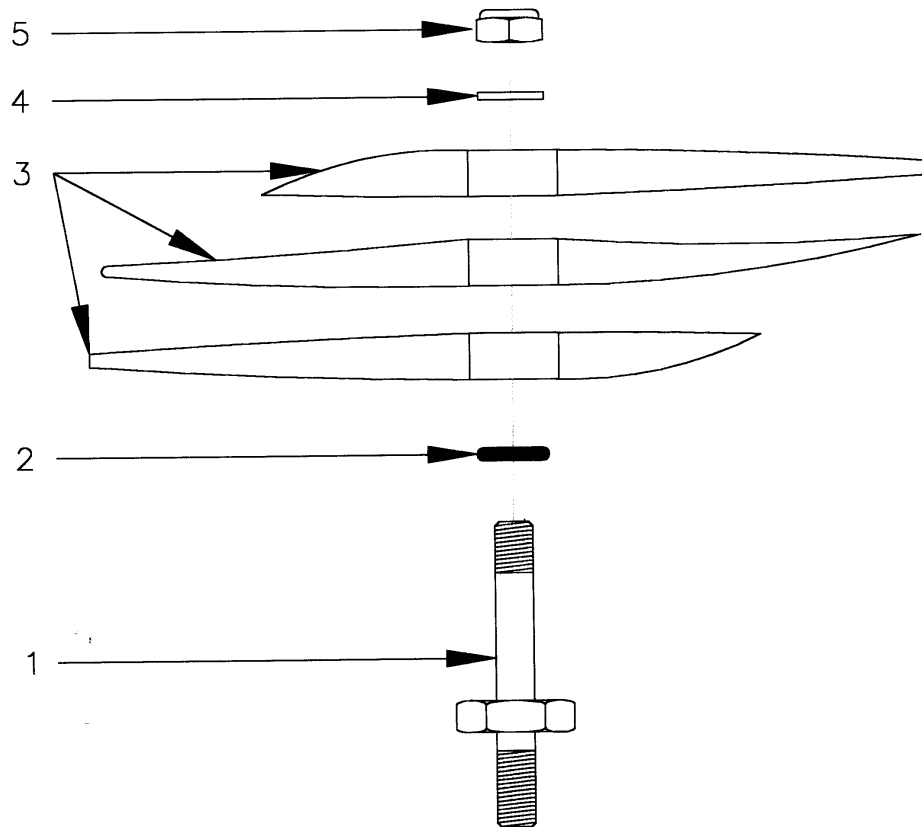


FIGURE 1



## ZEE Systems, Inc.

### COMPONENT MAINTENANCE MANUAL SZ58-002-1C

#### 8.3 MOTOR-COMPRESSOR ASSEMBLY

FIG-ITEM	PART NUMBER	DESCRIPTION	QTY	USAGE	NOTE
<b>2A/2B/2C/2D</b>					
	SZ58-002-1A/MOD B			A	NOTE 1.
	SZ58-002-1C			B	
	SZ58-002-1CM			C	
-1	. Z99-800-1	MOTOR	1		MOD C
-2	. SZ84-913OP-1	COMPRESSOR	1		
	. SZ84-913TJ-1	COMPRESSOR	1	C	NOTE 2.
	. . 029-09888	Key, shaft	1		NOTE 3.
	. . . 488-20797	Kit, Gasket	AR		NOTE 3.
	. . . 488-25274	Kit, Shaft Seal	AR		NOTE 3.
-3	. SZ43-008-3	PULLEY, MOTOR	1		
	. SZ43-008-3A	PULLEY, MOTOR ALTERNATE			
-4	. SZ43-018-3	PULLEY, PRIMARY	1		
-4A	. 187L075	BELT, PRIMARY	1		
-5	. G X 5/8	BUSHING	1		
	. G X 5/8M	BUSHING ALTERNATE			
-6	. 210L100	BELT, SECONDARY	1	B/C	
	. 187L100	BELT, SECONDARY	1	A	
-7	. SZ44-013-3	PULLEY, COMPRESSOR	1	B/C	
	. SZ43-017-3	PULLEY, COMPRESSOR	1	A	
-8	. SZ58-440-1	SCREW, SOCKET CAP	3		
-8A	. AN960-616	WASHER, FLAT	3		
-8B	. AN935-616	WASHER, LOCK	3		
-9	. NAS1352-4H16P	BOLT	2		
	. . MS20995C025	LOCK WIRE	AR		
-10	. AN5-5A	BOLT	4		
-10A	. 5/16 X 3/4	WASHER	4		
-11	. 1/4-20UNC2Ax2-1/4	BOLT, ANSI	2		
-11A	. AN960-416	WASHER	2		
-11B	. AN935-416L	WASHER	2		
-12	. SZ44-008-5	BAR	1		
-12A	. 1/4-20UNC-2A X 2.25	BOLT	1		
-12B	. AN960-416	WASHER	1		
-13	. 3/8-16UNCx1S	BOLT, COMPRESSOR MOUNT	3		
-13A	. AN960-616	WASHER	3		
-13B	. AN935-616	WASHER	3		
-14	. SZ43-004-1B	JACK SHAFT ASSY	1	B/C	
	. SZ43-004-1A	JACK SHAFT ASSY	1	A	
NP	. . SZ43-010-3	JACK SHAFT HOUSING	1		
NP	. . SZ43-009-3	PULLEY, SECONDARY	1		
NP	. . 605	KEY	1		
-15	. 1/4-20UNC2Ax1-1/4	BOLT, ANSI	2		
-15A	. 1/4-20UNC-2B	LOCK NUT	2		
-15B	. AN960-416	WASHER	2		
-15C	. AN935-416	WASHER	2		
-16	. AN4-10A	BOLT	4		
-16A	. AN960-416	WASHER	8		



## ZEE Systems, Inc.

### COMPONENT MAINTENANCE MANUAL SZ58-002-1C

FIG-ITEM	PART NUMBER	DESCRIPTION	QTY	USAGE	NOTE
<b>2A/2B/2C/2D</b>					
-16B	. AN365-428A	NUT	4		
-17	. SZ44-007-3	CLAMP	1		
-17A	. SZ44-007-4	CLAMP	1		
-18	. SZ41-019-5	SPACER	1		MOD A
-19	. SZ44-006-3	BRACKET	2		
-20	. SZ41-034-5T	FAN SHAFT ASSY	1		SEE FIG. 1
-21	. AN5H5A	BOLT	1		
-22	. SZ37-014-3	WASHER	1		
-23	. AN501A10-6	SCREW	1		
	. . MS20995C032	LOCK WIRE	AR		
-24	. SZ58-010-1	SUPPORT ASSY, MOTOR	2		
	. . SZ58-010-3A	SUPPORT BAR	2		
	. . SZ44-009-5	PAD	2		
-25	. SZ44-008-7	ADJUSTING SUPPORT BAR	1		
-26	. 1X495-1	RUBBER MOUNT	4		
	. 1X495	RUBBER MOUNT	4		MOD D, NOTE 4 & 5.
-27	. MS35649-2382	NUT	12		
-28	. AN960-616	WASHER	12		
-29	. AN935-616L	WASHER	8		
-30	. SZ44-005-3	COMPRESSOR PLATE	1	B/C	
	. SZ58-009-3	COMPRESSOR PLATE	1	A	
-31	. SZ58-012-3	FRAME, SIDE	1		
-32	. SZ58-012-4	FRAME, SIDE	1		
-33	. AN345-516	NUT, LOCK	1		
-33A	. AN960-516	WASHER	1		
-33B	. AN935-516L	WASHER	1		
-34	. AN4-55A	BOLT	2		
-34A	. AN960-416	WASHER	4		
-34B	. AN365-428	NUT	2		
-35	. SZ41-011-3	BOLT, SAFETY	2		
	. SZ65-008-5	BOLT, SAFETY	2		NOTE 5.
-36	. SZ43-026-3	STRAP	1		
-37	. SZ58-013-3	SAFETY CLIP	1		
-38	. SZ43-020-3	BOLT, MOTOR SAFETY	2		
-39	. AN365-428	NUT	1		
-40	. AN960-416	WASHER	1		
-41	. AN4-11A	BOLT	1		

NOTE 1. Some early installations and dual cockpit aircraft have this unit.

NOTE 2. The "TJ" compressor is no longer available. The "OP" and "TJ" models are interchangeable with respect to fit form and function. The "OP" has back seat valves. Refer to ILLUSTRATION 1 for special instructions.

NOTE 3. Refer to ZEE Systems, Inc. Manual SZ206 for compressor repair instructions.

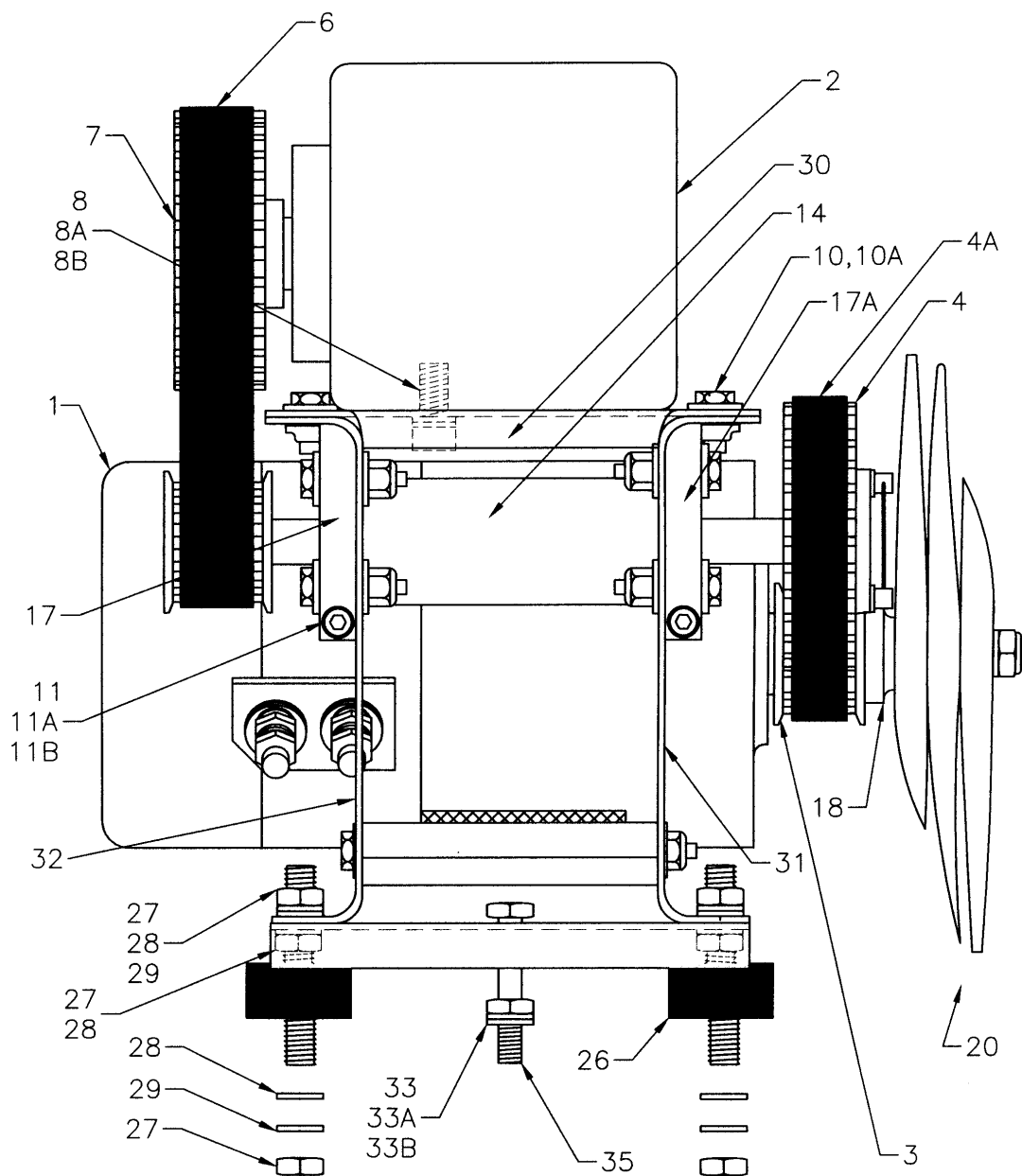
NOTE 4. Check with aircraft manuals for hardware when attaching unit to airframe.

NOTE 5. Used for Thrush factory kit SZ45H000-3AC installation.



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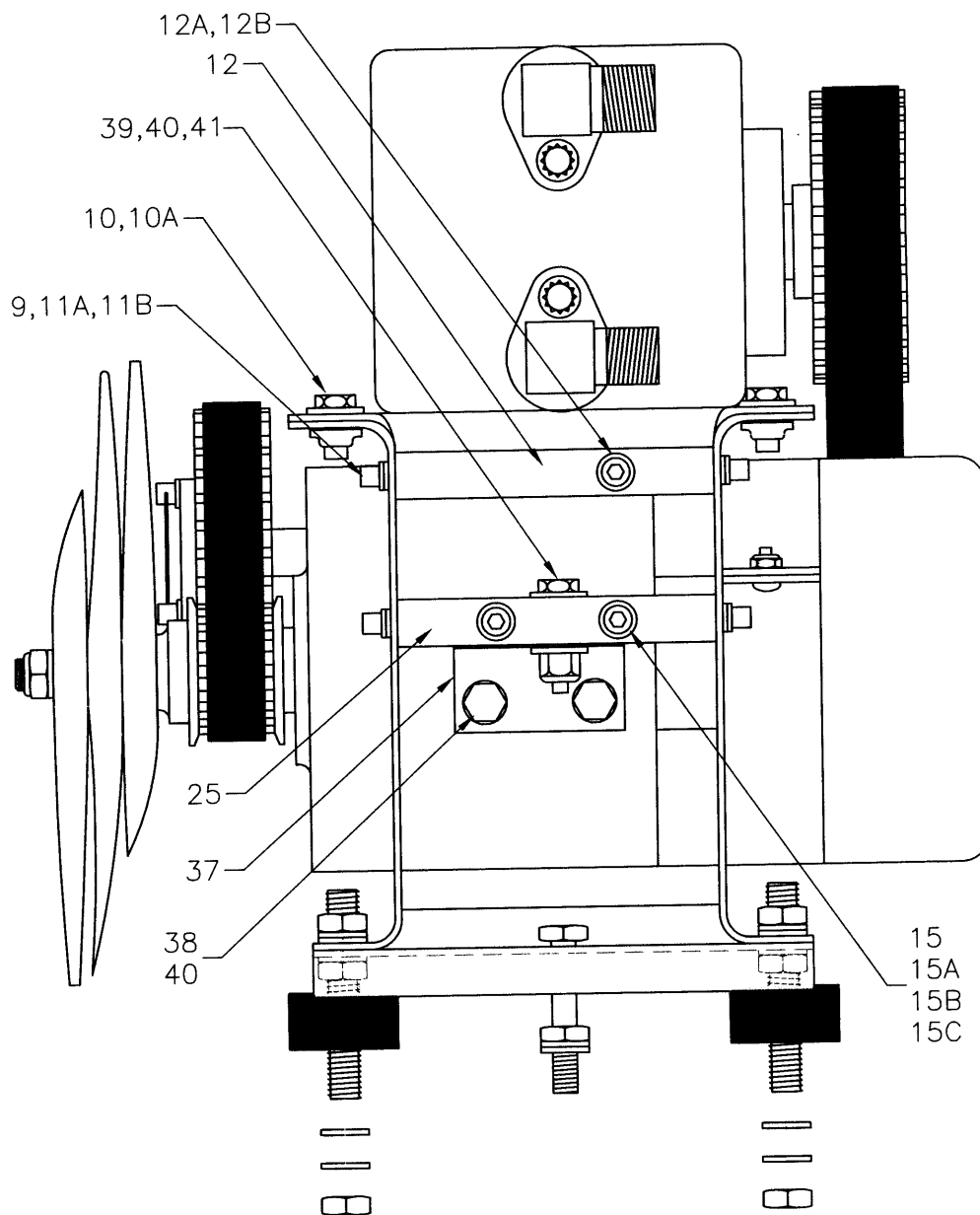


**FIGURE 2A**



**ZEE Systems, Inc.**

***COMPONENT MAINTENANCE MANUAL SZ58-002-1C***

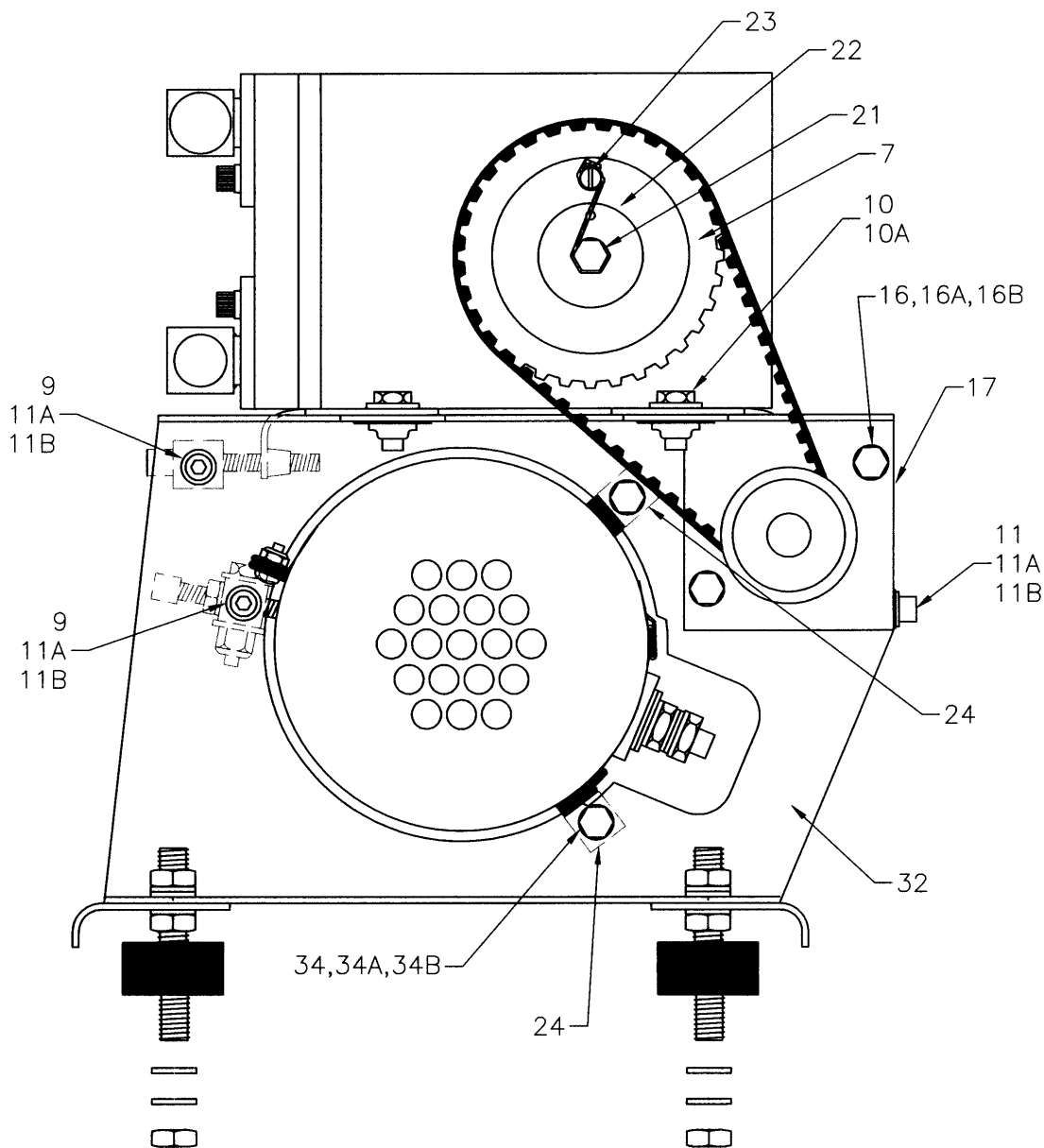


**FIGURE 2B**



**ZEE Systems, Inc.**

**COMPONENT MAINTENANCE MANUAL SZ58-002-1C**



**FIGURE 2C**





## **ZEE Systems, Inc.**

### **COMPONENT MAINTENANCE MANUAL SZ58-002-1C**

#### **9.0 SUMMARY OF MODIFICATIONS**

9.1 MOD 'A' This modification changes the Fan Shaft Assembly spacing.

**DELETE:**

PART NUMBER	DESCRIPTION	QTY
SZ41-019-3	SPACER	1

**ADD:**

SZ41-019-5	SPACER	1
------------	--------	---

This is a factory modification, no field action required.

9.2 MOD 'B' This modification deletes the Fan Shaft Assembly.

**DELETE:**

PART NUMBER	DESCRIPTION	QTY
SZ41-019-3	SPACER	1
SZ41-034-5T	FAN SHAFT ASSEMBLY	1

**ADD:**

SZ41-019-5	SPACER	1
AN6H6A	BOLT	1
AN935-616L	WASHER	1

This modification is only applicable upon customer request.

9.3 MOD 'C' This modification allows for the use of the Z99-800-1 Motor.

**DELETE:**

PART NUMBER	DESCRIPTION	QTY
SZ58-003-1	MOTOR ASSEMBLY	1

**ADD:**

Z99-800-1	MOTOR ASSEMBLY	1
-----------	----------------	---

This is a factory modification, no field action required.

9.4 MOD 'D' This modification allows for the use of alternate mounts.

**DELETE:**

PART NUMBER	DESCRIPTION	QTY
1X495-1	MOUNT	4

**ADD:**

1X495	MOUNT	4
-------	-------	---

This is a factory modification, no field action required. This modification is applicable to SZ58-002-1C Motor Compressor Assembly provided in Kit SZ45H000-3AC.