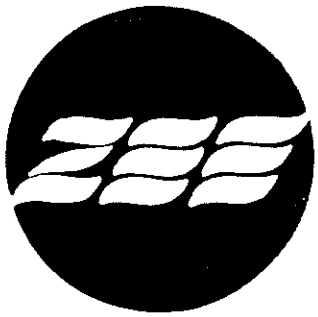

Zee Systems, Inc.

Fairchild
SA227-AC, BC, CC, DC

Maintenance and Parts Manual

SZ84-001-1
Power Motor and Condenser Assembly, LH

and

SZ84-001-2
Power Motor and Condenser Assembly, RH

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TABLE OF CONTENTS

LIST OF EFFECTIVE PAGES

PAGE	EFFECTIVE DATE	REVISION STATUS
COVER	March 1994	REV 1
i	April 1993	*
ii	April 1993	*
iii	March 1994	REV 1
1	April 1993	*
2	April 1993	*
3	April 1993	*
4	March 1994	REV 1
5	March 1994	REV 1
6	March 1994	REV 1
7	April 1993	*
8	April 1993	*
9	April 1993	*
10	April 1993	*
11	April 1993	*
12	April 1993	*
13	April 1993	*
14	April 1993	*
15	April 1993	*
16	April 1993	*
17	April 1993	*
18	April 1993	*

* Initial Release

MAINTENANCE AND SERVICE INSTRUCTIONS P/N SZ84-001-1 POWER MOTOR & CONDENSER ASSY, LH AND P/N SZ84-001-2 POWER MOTOR & CONDENSER ASSY, RH

1.0 INTRODUCTION

1.1 This manual contains maintenance instructions for the service and minor repair procedures for the SZ84-001-1/-2 Power Motor and Condenser Assembly installed on the Fairchild SA227-AC/-BC/-CC/-DC aircraft.

1.2 OPERATION

1.2.1 The Power Motor and Condenser Assembly is a compact modular design using a high speed motor with a high efficiency fan assembly mounted to the condenser coils. The Power Motor and Condenser Assy is located in the nose of the aircraft just forward of the wheel well. Air is drawn in through the nose wheel well and forced over the coils and then exhausted overboard. This design provides continuous airflow over the condenser when the system is in operation.

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. REFER TO FAIRCHILD SPS 12-2 FOR INSTRUCTIONS FOR DISCHARGING AND RECHARGING THE SYSTEM.

WARNING

AVOID PROLONGED SKIN CONTACT WITH THE REFRIGERANT HFC-134a. AVOID CONTACT WITH EYES. DO NOT BREATH THE FUMES. REFER TO THE MATERIAL SAFETY DATA SHEET FOR INFORMATION ON TREATMENT.

2.0 SPECIAL TOOLS AND MATERIALS

2.1 The following special tools are required.

ITEM	SOURCE
Torque Wrench, Ft/Lbs, 1 lb. incr.	Commercially Available.
Torque Wrench, In-lbs, 1 oz. incr.	Commercially available.
Crowfoot Wrench, Open end, 1 inch.	Commercially Available.
SZ84-A Motor/Fan Tool.	Fabricate IAW FIG.A.
Comb Set, Fin.	Commercially Available.
Leak Detector, for HFC-134a	Commercially Available.
Compressed Air source, 30 PSI	Commercially available.

2.1.2 Fairchild SPS 12-2 describes any additional special tools which may be required to service the system.

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

ITEM	SOURCE
MS20995C32 Lockwire	Commercially Available.
MS20995C21 Lockwire	Commercially Available.
Refrigerant, HFC-134a	Commercially Available.
Lubricant, Refrigerantion, Castrol 100	Commercially Available.

3.0 INSPECTION

3.0.1 Items described are followed by a reference to the Figure and Item Number (X-X) which can be found in Section 9, with reference to Section 10.

3.0.2 The location of the condensers creates a high possibility for Foreign Object Damage (FOD). This damage is most likely to occur while the aircraft is parked, in taxi or during take-off and landing.

3.1 Every 100 Hrs.(airframe time) or 30 cycles inspect the Power

Motor Condenser Assy for FOD.

3.1.1 Check the air inlet and exhaust openings for obstructions.

3.1.2 Motor Assy (1-5,2-5): Check that the cannon connector is secure. Check the mounting block (1-13A/B,2-13A/B) for FOD.

3.1.3 Fan Shaft Assy (1-4,2-4): Check for deterioration of the blades due to FOD.

3.1.4 Condenser Coils (1-2,2-2): Check for FOD. Check the fins are straight and not bent over or flat. Bent over or flat coil fins restrict the airflow over the coils and reduce the efficiency of the system.

3.1.5 Using a leak detector, check for leaks.

3.1.6 Anytime when other maintenance inspections in the wheel well take place a check of the condenser coils should be made for FOD.

3.2 Every 250 Hrs (Hobbs Meter time) inspect the four carbon brushes (3-11) in the motor (3-1). If brushes are to be removed, mark the location of each brush, brushes must be returned to the same holder. Examine each brush for even wear. Check the length against the wear mark on the side of the brush, minimum length is .450"(See FIG.B). Replace motor (3-1) if any brush will exceed minimum length before next inspection. Chips, cracks, signs of uneven wear are cause for replacement. If brush replacement is required all four brushes must be replaced.

3.2.1 If brush wear indicates extreme uneven wear or grooving of armature commutator (See FIG.B) replace the motor (3-1).

3.2.2 Check for hydraulic oil contamination on the inside of the motor (1-5,2-5,3-1). Replace motor if contaminated. Repair source of oil leak to prevent future contamination.

NOTE

BRUSH REPLACEMENT IN THE FIELD IS NOT RECOMMENDED. THE END BELL AND BRUSH HOLDER MUST BE DISASSEMBLED TO REMOVE AND INSTALL BRUSHES. REASSEMBLY REQUIRES PROPER ALIGNMENT OF THE BRUSH HOLDER ASSEMBLY FOR CORRECT BRUSH NEUTRAL SETTING. INCORRECT ALIGNMENT WILL RESULT IN SLOWER MOTOR SPEED AND HIGHER AMPERAGE DRAW WHICH WILL ADVERSELY AFFECT THE EFFICIENCY OF THE SYSTEM.

4.0 TOLERANCES

4.1 The following Dimensions and Torques values should be adhered to during inspection and reassembly.

ITEM	TOLERANCE/DIMENSION
Bolt (1-12,2-12)	Torque to 20 In-lbs.
Bolt (1-7,2-7)	Torque to 20 In-lbs.
Fan Shaft Assy (1-4,2-4, 1" hex nut)	Torque to 20 Ft-lbs.
Tool SZ84-A	For proper use see FIG.A
Brush (3-11)	Minimum .450"

5.0 SERVICE/REPAIR/REPLACEMENT

5.0.1 The Power Motor Condenser Assy (1-1, 2-1) is removed on condition. If it is determined there is a defect in the coil assembly (leak or severe fin damage), its operation or effeciency the Power Motor Condenser Assy (1-1, 2-1) is unsatisfactory the unit should be removed and inspected in accordance with this manual and the Fairchild maintenance and service instructions. Limited field repairs of the coil are covered in Section 5.1.1. New Coils (1-2, 2-2) may be acquired and an airworthy Motor (1-5, 2-5) installed to complete the assembly (reference Section 5.5).
NOTE: THE LEFT AND RIGHT COILS ARE NOT INTERCHANGEABLE.

5.0.2 The TBO on the Motor Assy (3-1) is 750 Hobbs Meter Hrs. The motor should returned for overhaul or exchange at this time.

5.1 Power Motor and Condenser (1-1,2-1) Removal: **WARNING: SYSTEM IS UNDER PRESSURE AND MUST BE RELIEVED BEFORE REMOVAL OF THE CONDENSER COIL ASSY. REFER TO FAIRCHILD SPS 12-2.** Disconnect electrical connections (NS). Disconnect the inlet and outlet hose (NS). Discard the conical washer (NS). Plug all open connections to prevent contamination of the system. Loosen and remove bolts (NS) which attach the assembly to the airframe.

5.1.1 Straighten damaged fins by using the fin comb to comb out the fins. There is no other field repair of the condenser coils (1-5,2-5). If there are leaks in the coils the coil assembly (1-5,2-5) must be replaced. The Motor and Fan assy (1-2,2-2) need not be replaced unless defective but can be removed for installation on replacement coil assy.

5.2 To gain access to the brushes remove the brush cover (3-7) by taking off the four screws (3-4), lock washers (3-5) and flat washers (3-6) on the cannon connector and the three screws (3-8) and lock washers (3-9) on the brush cover (3-7). Next, slip the brush cover (3-7) off. Blow out all loose carbon dust from brush holders (3-10) and armature.

5.3 Brush Inspection: Pull the brush spring back (NS) and lift the brush (3-11) from the holder (3-10). Inspect the brushes in accordance with Section 3.2 If the brushes are serviceable return them to the same holder and gently place the spring in the groove on top of the brush. Be careful not to drop or snap the spring back, this may crack or chip the brush. Turn the armature by hand to insure it rotates freely.

5.3.1 Attach the brush cover (3-7) in reverse order of 5.2. Secure screws (3-4, 3-8) with MS20995C21 lockwire.

5.4 Brush Replacement: Replace motor. Remove motor and fan assy (1-3,2-3) from coil assy (1-2,2-2) then remove the fan shaft assy (1-4,2-4) from the motor (1-5,2-5) (See steps 5.5 and 5.6). Reassemble motor and fan assy to coil assy in accordance with Section 6.

5.5 To remove the Motor and Fan Assy (1-2,2-2) from the Condenser Coils (1-5,2-5) first remove the electrical connector (NS) then, loosen and remove the two nuts (1-9,2-9) and washers (1-10,2-10) on the block (1-13,2-13), take care that the motor and fan assy do not fall out when the block and the stiffener is removed. To remove the stiffener loosen and remove the two bolts (1-7,2-7) and washers (1-8,2-8) which secure it to the coil assy (1-5,2-5).

5.5.1 There is no field repair of the motor. Defective units must be exchanged. The Motor and Fan Shaft may be replaced as an assembly (1-2,2-2). If the Fan Shaft Assy (1-3,2-3) is still serviceable it may be removed and installed on the replacement motor.

5.6 To remove the Fan Shaft Assy (1-3,2-3) from the Motor (1-4,2-4) place the SZ84-A around the motor shaft and hold it with locking pliers. Loosen the one inch hex nut closest to the motor on the fan shaft assy (1-3,2-3).

6.0 REASSEMBLY

6.1 Install the Fan Shaft Assy (1-3,2-3) on the Motor (1-4,2-4) in the reverse order described in Section 5.3. Use the Crowfoot wrench to hold the 1" nut on the fan shaft assy (1-3,2-3) and a torque wrench to properly secure it to the motor. Take care to comply with the torque tolerances to Section 4.0

6.2 To install the motor and fan assy (1-2,2-2) on the coil assy (1-2,2-2) place the motor assy in block (1-13A,2-13A). Align block (1-13A,2-13A) with block (1-13B, 2-13B) place the bolts (1-12,2-12) and washers (1-11, 2-11) in the blocks attach the nuts and washers (1-10,2-10,1-9,2-9) finger tight only. DO NOT TIGHTEN THEM AT THIS TIME. Next, secure the stiffener (1-6,2-6) to the coil assy (1-5,2-5) tighten bolts (1-7,2-7) and washers (1-6,2-6), torque to 20in-lbs (Reference Section 4.0). Alight the motor cannon plug as shown in FIG.1/2 and place the SZ84-A tool between the block (1-13A,2-13A) and the base of the cannon connector on the motor (1-4,2-4). This spacing is critical to proper fit and operation of the assembly. Now tighten and torque the bolt (1-12,2-12) which is under the motor cannon plug and closest to stiffener (1-14,2-14). Torque this bolt FIRST to 20 in-lbs (Reference Section 4.0). Now tighten and torque the second bolt (1-12,2-12). Take care to comply with the torque tolerances in Section 4.0. Care should be taken to insure the fan is clear of fins and is free to rotate.

6.3 Reinstall the assembly in the aircraft. Install new conical washers (NS) and attach and tighten all hoses and service the system in accordance with Fairchild SPS 12-2. Make all appropriate log book entries.

7.0 TEST PROCEDURES

7.1 The system must be recharged to check the condenser for leaks. Refer to Fairchild SPS 12-2 for charging procedure. With the system fully charged us a leak detector to check for leaks.

7.2 Activate system in the cockpit and check that the power motors are operating and providing adequate airflow through the condenser.

7.3 No other tests are required. Refer to Fairchild SPS 12-2 for proper system operation.

8.0 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 (1-2).
		Check circuit breaker in cockpit, RESET.

continued.

TROUBLE	POSSIBLE CAUSE	REMEDY
		Check fuse on fuse block, REPLACE. Check wiring to motor. Check switch in cockpit. 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 or switch.	Replace bad component.
Condenser Power Motor trips circuit breaker in cockpit.	Motor shorted.	Replace Motor.
	Short in wiring.	Check wiring to motor, repair as required.
	Faulty circuit breaker or switch.	Replace bad component.
Compressor Motor trips circuit breaker.	Motor shorted. Motor brushes worn beyond limits.	Replace Motor.
	Short in wiring.	Check wiring to motor, repair as required.
	Faulty circuit breaker or switch.	Replace bad component.
Compressor Motor inoperative.	Motor open. Motor brushes worn beyond limits.	Replace Motor.
	Short in wiring.	Check wiring yo motor, repair as required.
	Faulty circuit breaker, ON/OFF switch or low/high pressure cutout switch.	Replace bad component.
continued.	Low/high pressure switch tripped.	Reset relay.

TROUBLE	POSSIBLE CAUSE	REMEDY
System not cooling. Adequate airflow over evaporators.	Condenser airflow blocked.	Remove obstruction.
	Low refrigerant.	Service system IAW SPS 12-2.
	Overcharge of refrigerant.	Service system IAW SPS 12-2.
	Faulty Compressor	Replace Compressor.
High Discharge Pressure	Overcharge of refrigerant.	Service system IAW SPS 12-2.
	Obstruction in Lines.	Check form proper installation of conical washers; locate and remove obstruction and service system IAW SPS 12-2.
	Condenser Power Motor inoperative.	Replace defective component and service system IAW SPS 12-2.
	Little or no air-flow through Condenser coils	Check Condenser Power Motor, replace as necessary. Check for obstruction, remove.
	Obstruction in Receiver-Dryer.	Replace defective component and service system IAW 12-2.
	Obstructed Expan-sion Valve and/or Line Screen.	Clean Line Screen. Replace Expansion Valve and service system IAW 12-2.
Low Discharge Pressure.	Low refrigerant.	Service system IAW SPS 12-2.
	Faulty Compressor.	Replace bad component and service system IAW SPS 12-2.

continued.

TROUBLE	POSSIBLE 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.
		Replace defective component. Service system IAW SPS 12-2.
	Defective Conical Washer.	Replace defective washer. Service system IAW SPS 12-2.
	Loose connections.	Tighten connections. Service system IAW SPS 12-2.
Slow refrigerant loss.	Loose connections.	Tighten connections. Service system IAW SPS 12-2.

9.0 ILLUSTRATED PARTS LIST

9.0.1 Refer to FIG.1, FIG.2 and FIG.3 on pages 11 through 16.

9.1 Codes: (NP) Item is Not Procurable, See next higher assembly. (NS) Item is Not Shown.

9.2 Notes:

A. P/N SZ84-006-3, 2 each, are manufactured as matched sets, procurable only as matched set.

B. See FIG.A for fabrication instructions.

10.0 DIFFERENCE DATA SHEETS

10.1 P/N SZ84-001-2 is the same as P/N SZ84-001-1 except as follows:

10.1.1 INTRODUCTION: Same.

10.1.2 SPECIAL TOOLS AND MATERIALS: Same.

10.1.3 INSPECTION: Same.

10.1.4 TOLERANCES: Same.

10.1.5 SERVICE/REPAIR/REPLACEMENT: Same.

10.1.6 REASSEMBLY: Same.

10.1.7 TEST PROCEDURES: Same.

10.1.8 TROUBLE SHOOTING: Same.

10.1.9 ILLUSTRATED PARTS LIST: Use FIG.2.

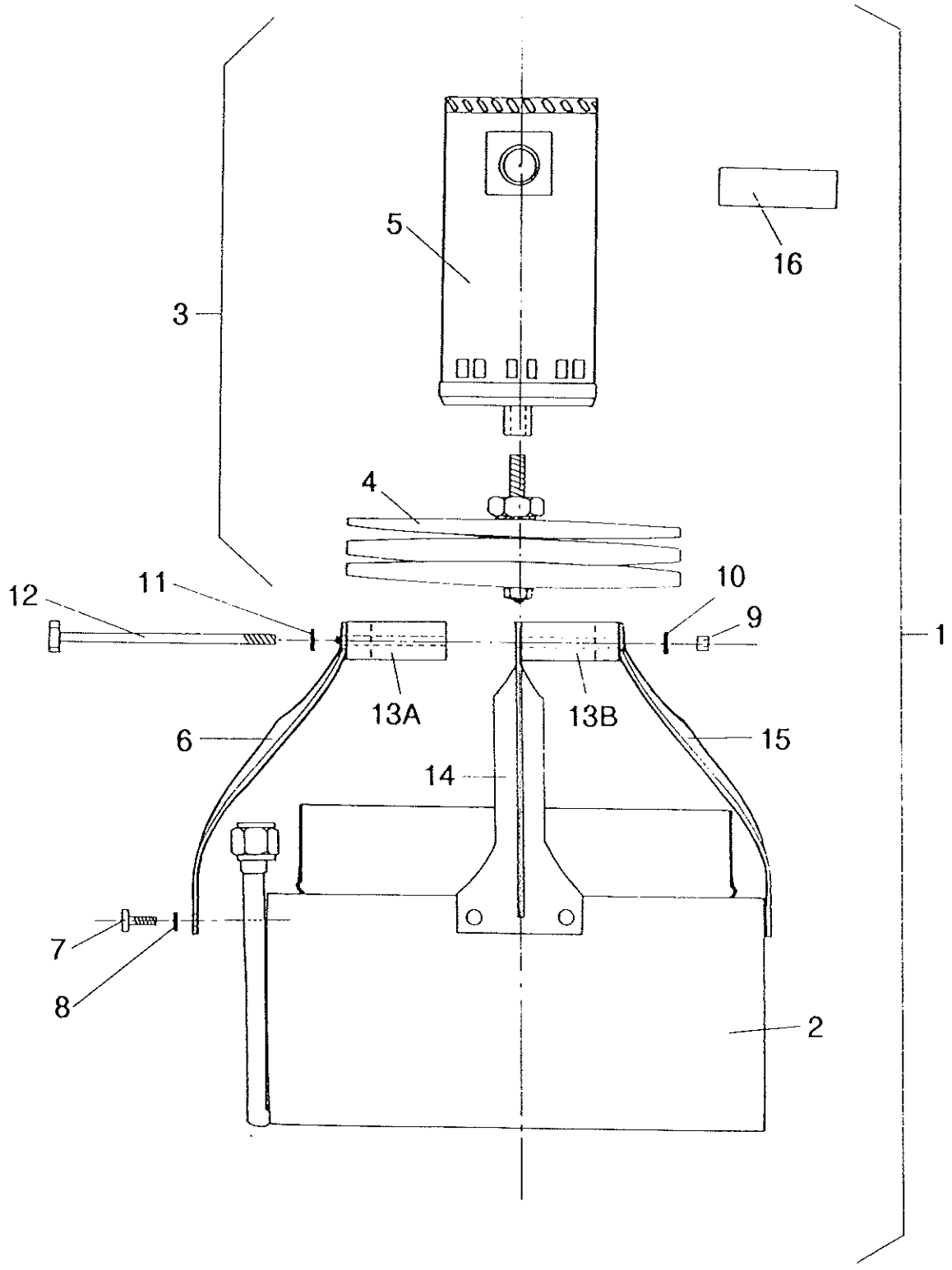


FIGURE 1

PARTS LIST

FIG.	ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	-1	SZ84-001-1	Power Motor & Condenser,LH	
	-2	SZ84-004-1	.Condenser Coil Assy,LH	1
	-3	SZ84-002-7	.Motor & Fan Assy	1
	-4	SZ41-034-1	..Fan Shaft Assy	1
	-5	SZ84-002-1	..Motor	1
	-6	SZ84-008-1	...Stiffener	1
	-7	AN3-7A	...Bolt	2
	-8	AN960-10	...Washer	2
	-9	AN365-1032	...Nut	2
	-10	AN960-10	...Washer	2
	-11	AN960-10	...Washer	2
	-12	AN3-40A	...Bolt	2
	-13A	SZ84-006-3	(See Note A)...Block	NP
	-13B	SZ84-006-3	(See Note A)...Block	NP
	-14	SZ84-008-5	...Stiffener	1
	-15	SZ84-008-3	...Stiffener	1
	-16	SZ84-A	(See Note B) Tool	1

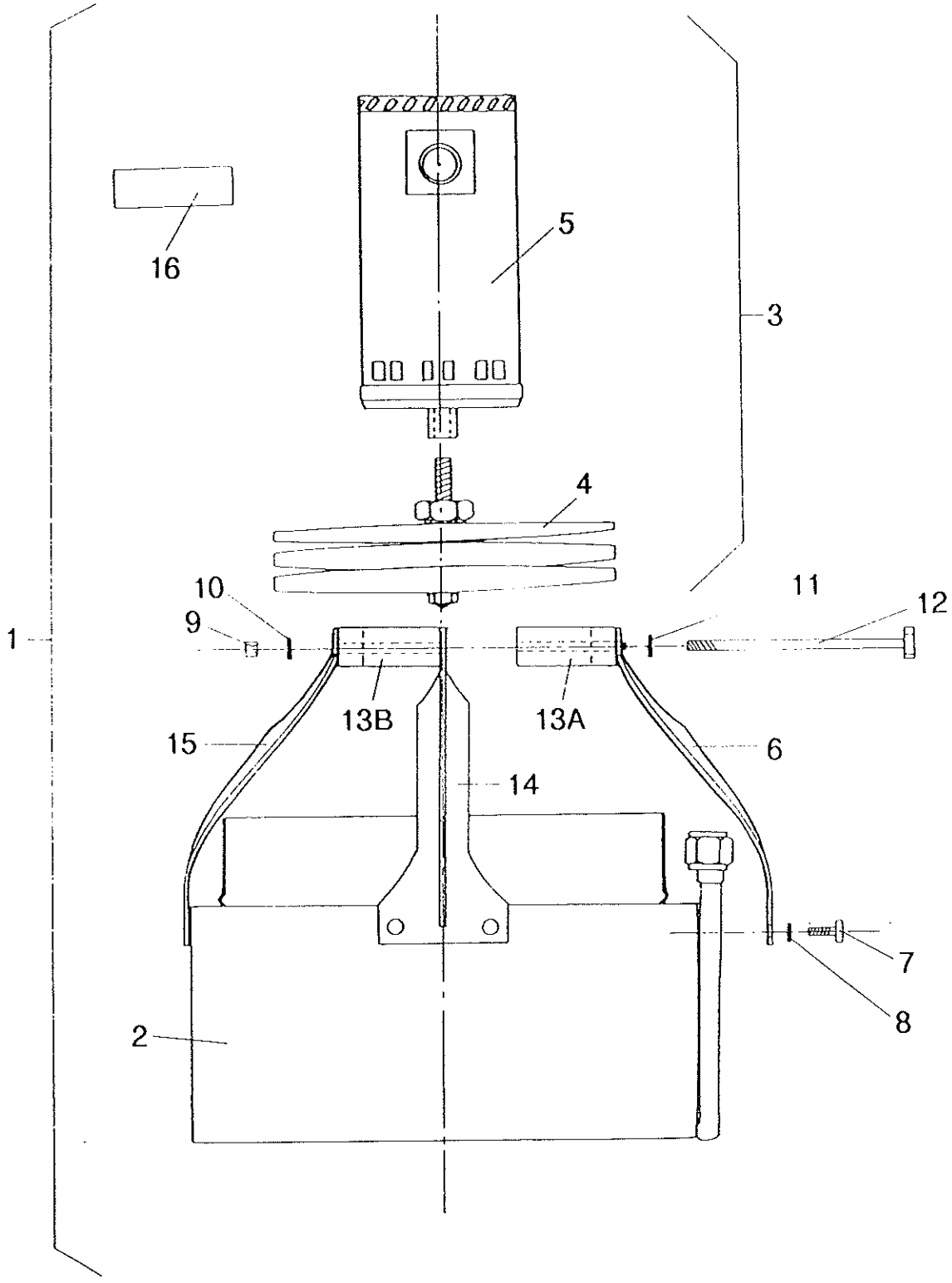


FIGURE 2

PARTS LIST

FIG.	ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
2	-1	SZ84-001-2	Power Motor & Condenser,RH	
	-2	SZ84-004-2	.Condenser Coil Assy,RH	1
	-3	SZ84-002-7	.Motor & Fan Assy	1
	-4	SZ41-034-1	..Fan Shaft Assy	1
	-5	SZ84-002-1	..Motor	1
	-6	SZ84-008-1	...Stiffener	1
	-7	AN3-7A	...Bolt	2
	-8	AN960-10	...Washer	2
	-9	AN365-1032	...Nut	2
	-10	AN960-10	...Washer	2
	-11	AN960-10	...Washer	2
	-12	AN3-40A	...Bolt	2
	-13A	SZ84-006-3	(See Note A)...Block	NP
	-13B	SZ84-006-3	(See Note A)...Block	NP
	-14	SZ84-008-5	...Stiffener	1
	-15	SZ84-008-3	...Stiffener	1
	-16	SZ84-A	(See Note B) Tool	1

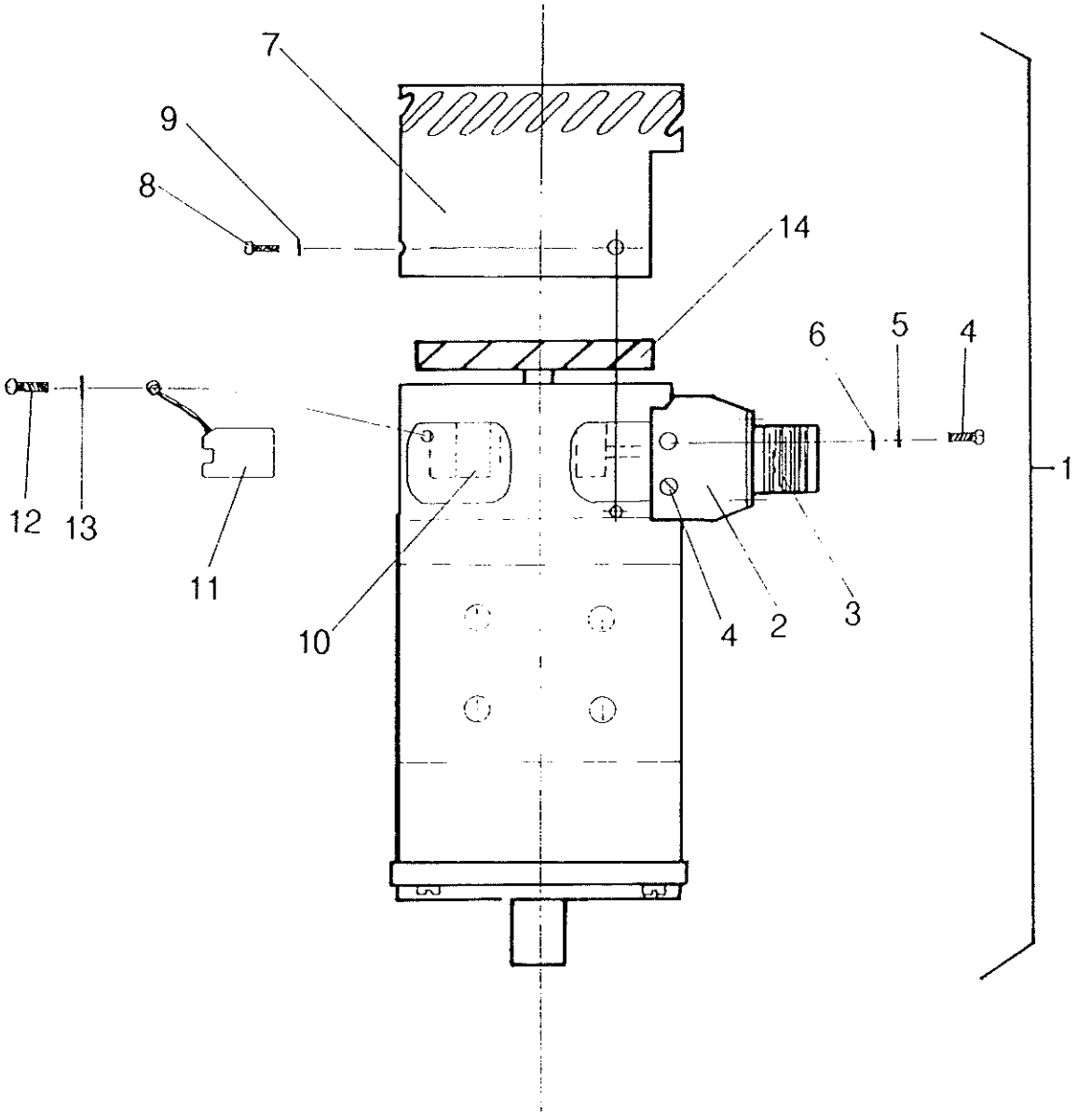
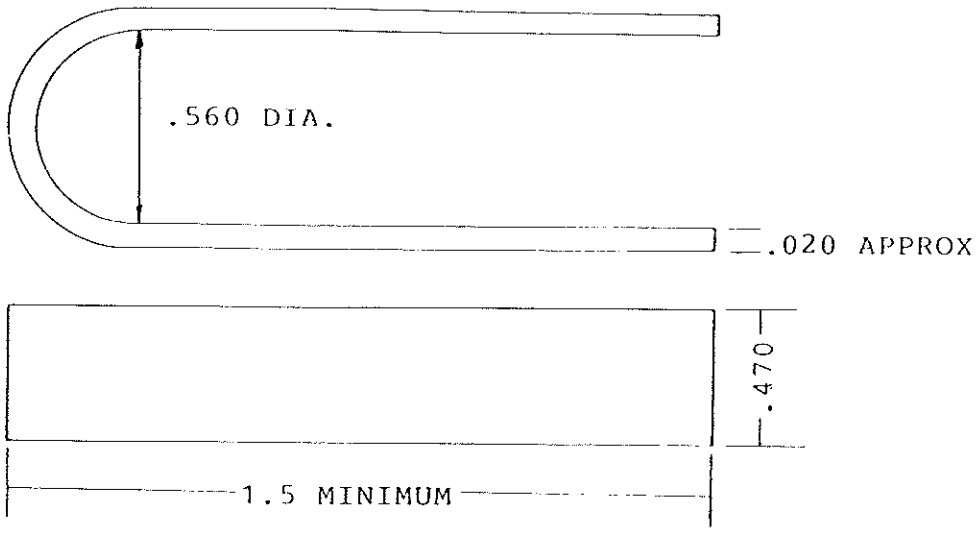


FIGURE 3

PARTS LIST

FIG.	ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
3	-1	SZ84-002-1	.Motor Assembly	
	-2	4C8781A1	..Cannon Plug Holder	1
	-3	AN3102-12-5P	..Cannon Plug	1
	-4	AN500A4-6	..Screw	4
	-5	AN935-4	..Washer, Lock	4
	-6	AN960-4	..Washer, Flat	4
	-7	4C2190	..Cover	1
	-8	AN500A4-3	..Screw	3
	-9	AN935-4	..Washer, Lock	3
	-10	9B5183-A2	..Brush Holder	4
	-11	P15D6573	..Brush Assembly	4
	-12	AN500A6-4	..Screw	4
	-13	AN935-6	..Washer, Lock	4
	-14	2C9392-B1	..Fan Assembly	1



(drwg. not to scale)

SZ84-A TOOL Fabrication instructions:

1. Fabricate from soft aluminum strip approximately .020" thick about 4.000" X .470".
2. Machine or cut strip to a parallel width of .470" +/- .005".
3. Bend in the center to a diameter of .560" +.003"/-.000.

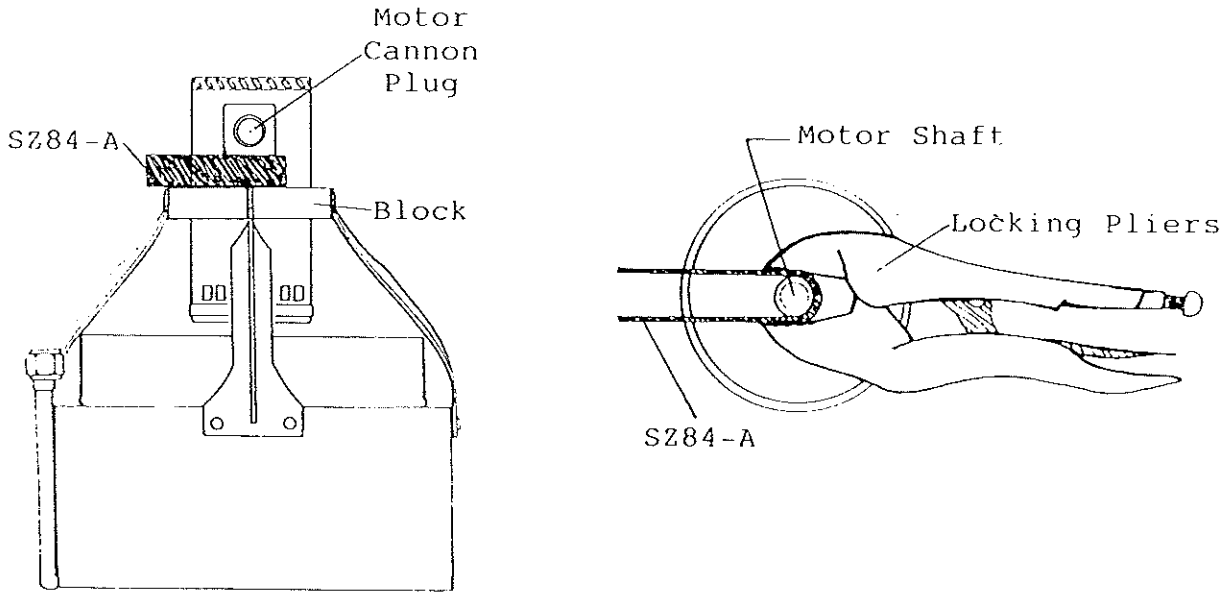
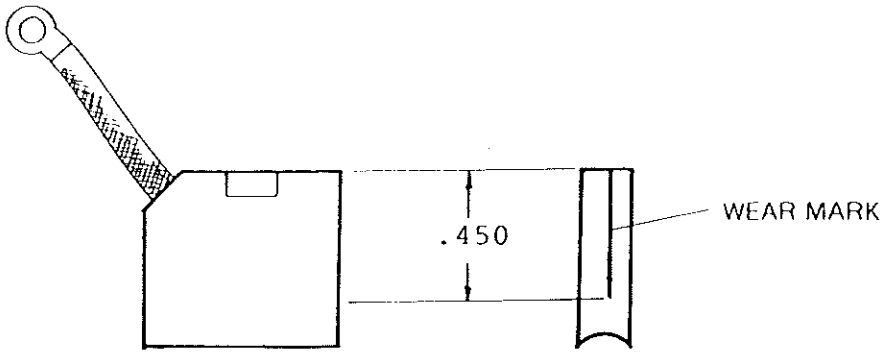
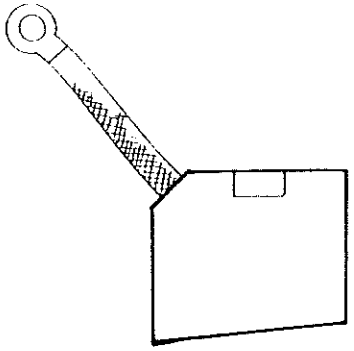


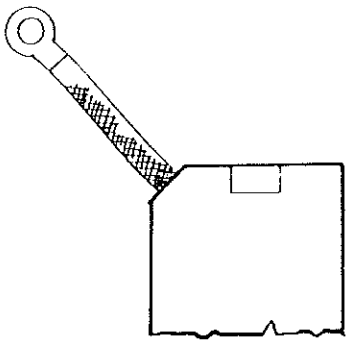
FIGURE A



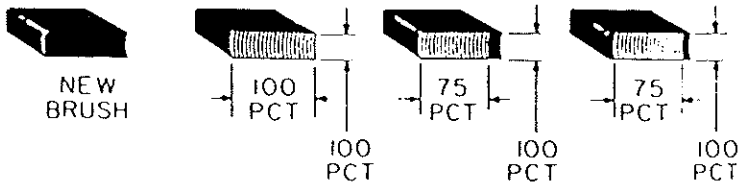
MINIMUM DIMENSIONS



UNEVEN WEAR



GROOVED WEAR



SATISFACTORILY SEATED BRUSHES

UNSATISFACTORILY SEATED BRUSHES

LEGEND: NON SEATED AREAS
SEATED AREAS

FIGURE B