



**ZEE Systems, Inc.**

**COMPONENT MAINTENANCE MANUAL SZ63-002-LORU**

***Component  
Maintenance  
Manual***

***with***

***Illustrated Parts List***

***for***

***SZ63-002-LORU  
Evaporator Assembly***



**ZEE Systems, Inc.**

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**RECORD OF REVISIONS**

REVISION NO:	ISSUE DATE:	POSTED DATE:	BY:
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\* INITIAL RELEASE DATE: 1-15-04



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#### 1.0 GENERAL INFORMATION AND REQUIREMENTS

1.1 GENERAL INFORMATION. The design SZ63-002-LORU Evaporator is used as a single unit in small cockpit/cabin aircraft or used with other evaporators in multiple evaporator systems. The part number has coded information about the design and features of the unit. The “SZ63-002” is the basic part number, information after the dash number describes the coil configuration, type of motor, blower outlet position and other details.

#### 1.1 DUCTING REQUIREMENTS

1.1.1 BLOWER OUTLET. Ducting should be as short and direct as possible keeping as straight a line as practical for the unrestricted straight air flow. Duct material should have a smooth inner wall and be capable of air temperature of 32°F (0°C) to 150°F (66°C).

1.1.2 COIL INLET. Cockpit/cabin return air should be unobstructed on the inlet side of the evaporator coil. If the coil is located outside of the conditioned area a duct should be used to return air from the area directly to the coil inlet.

**NOTE:** Refer to the airframe manufacturer recommendations and other appropriate engineering data before attaching components to a structure and/or performing structural modifications. Refer to FAA AC 43.13-1B for guidelines.

#### 1.2 ELECTRICAL REQUIREMENTS

1.2.1 Electrical circuits should be properly engineered to provide adequate current capacity and proper overload protection. Refer to AC 43.13-1B for guidelines.

1.2.2 BLOWER. The SZ63-021 (pancake) blower fan motor draws a maximum of 6A @ 28 VDC on high speed. The SZ63-011 (axial) blower fan motor draws a maximum of 9A @ 28 VDC on high speed.

#### 1.3 SPECIFICATIONS

	SZ63-002-LORU	SZ63-002-LORU-1
INPUT VOLTAGE	28 VDC	28 VDC
CURRENT (MAX)	6A	6A
Btu (MAX)	18,000	18,000
AIR FLOW (MAX)	350 CFM	350 CFM
WEIGHT	11 lbs.(5.0 kgs)	10.5 lbs. (4.8 kgs)
DIMENSIONS	L x D* x H	L x D* x H
INCHES	12 x 16 x 9	12 x 11 x 9
mm	305x407x229	305x280x229

\* ADD 4 inches (102mm) for plumbing connections.

1.4 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



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from chemical or other contamination. Refer to applicable preservation instructions of this manual. Failure to properly preserve components will void all warranty.

#### ***2.0 SPECIAL TOOLS AND MATERIALS***

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

ITEM	SOURCE
Fin Comb Set	Commercially Available

2.1.2 Refer to applicable 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
Bottle of Nitrogen	Commercially Available
Liquid Detergent, water soluble	Commercially available
Cloth, lint free	Commercially available
Tape, Insulation,	Commercially available
Detector, Leak, Suitable for HFC-134a	Commercially available

#### ***3.0 INSPECTION, REPAIR AND REPLACEMENT OF COMPONENTS***

3.0.1 Refer to Installation drawings for instructions to access the evaporator. Remove the covers/panels as necessary.

3.0.2 The only component on the Evaporator Unit which requires routine maintenance is the inlet Air Filter. The unit and other components are serviced on condition.

#### ***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.**



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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.**

#### 3.1 AIR FILTER (4-1)

3.1.1 INSPECTION: Inspect the filter every 100 hours for clogging due to dust or other airborne contaminants. Check for tears in the element. Check the foam insulation for wear or deterioration.

3.1.2 REMOVAL: Slide the top of the filter from the housing until it clears the top cover then lift the filter from the evaporator.

3.1.3 SERVICE: On condition. 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. Replace foam insulation if worn or damaged.

3.1.4 INSTALLATION: Slide the filter into the housing in reverse order of removal.

#### 3.2 DRAIN LINE (NOT SHOWN)

3.2.1 INSPECTION: Check that the connection on the external drain tube is secure. Check for any leaks or damaged areas on the flexible tube. Using an Air Supply, apply 10 PSI (max.) to the flexible tube at the highest point to the external drain outlet. Check that drain line is clear.

3.2.2 REMOVAL: Loosen the clamp that attaches the drain line to the evaporator drain pan. And pull the flexible drain line off of the evaporator drain pan tube.

3.2.3 SERVICE: Clear any obstructions as required. Replace flexible tube as required by condition.

3.2.4 INSTALLATION: Slide the flexible tube over the evaporator drain pan tube. And tighten the clamp.

#### 3.3 BLOWER MOTOR (2/5/6-5)

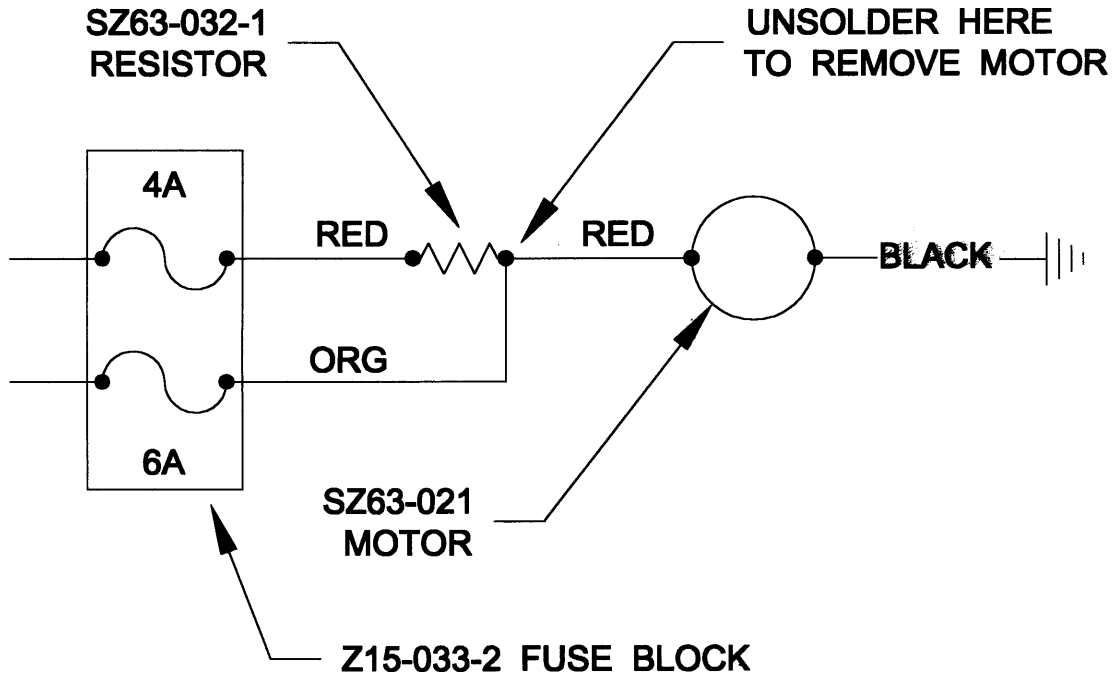
3.3.1 INSPECTION: On condition. Check for slow or noisy operation.

3.3.2 REMOVAL: It may be necessary to remove the whole Evaporator Unit from the aircraft. Refer to Installation drawings for removal procedure. Unsolder the motor red wire at the resistor (3-6) on the blower housing 2-10). Remove the three screws and washers (2/5/6-24,-28,-31) and spacers (1/5/6-29) between the motor and the blower housing. Disconnect the black ground wire.



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*Illustration 1.*

3.3.2.1 Note the spacing of the (squirrel cage) wheel (5/6-9) on the motor shaft. Loosen the set screw on the wheel (5/6-9) and remove from the defective motor (2/5/6-5) and attach wheel (5/6-9) to the new motor with the same alignment spacing.

3.3.3 SERVICE: There is no field repair for this sealed motor. Replace if defective.

3.3.4 INSTALLATION: Attach the (squirrel cage) wheel (5/6-9) on the new motor (2/5/6-5) shaft. Care should be taken to insure the squirrel cage has the same alignment to the motor and is free to rotate. Tighten the set screw. Attach the blower motor with blower wheel to the blower housing in reverse order as removed. Place shrink tube material over the wires that were unsoldered. Solder the red motor wire to the resistor on the same side as the orange wire. Move shrink tubing in place and heat. Connect the black motor wire to the ground post.

3.4 THERMOSTATIC EXPANSION VALVE (TXV) (1/4-34)

**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.**



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#### **WARNING**

**SYSTEM IS UNDER PRESSURE AND MUST BE RELIEVED BEFORE ANY SERVICE TO THE EXPANSION VALVE CAN BE ACCOMPLISHED.**

3.4.1 INSPECTION: On condition.

3.4.2 REMOVAL: Expose the Thermostatic Bulb on the Suction Line on the evaporator by removing the insulating tape (1-35). Care should be taken not to puncture or damage the bulb or any of the coils on the evaporator. Next, carefully remove the clip (1-33) holding the bulb to the Suction Line, retain it for reinstallation.

3.4.2.1 Disconnect and remove the system inlet hose (NS). Plug the hose end to prevent any contamination of the system. Hold the expansion valve (1/4-34) with a wrench and loosen the B-Nut on the Pressure Line (Inlet) on the evaporator. Remove the Expansion Valve (1/4-34) including the bulb. There is an adapter (1-36) and O-Ring (1-19) between the Expansion Valve (1/4-34) and the coil (1/3-3). Retain the adapter to be re-installed. Plug the system inlet hose and inlet on the coil (1/3-3) to prevent contamination to the system.

3.4.3 SERVICE: Defective expansion valve must be replaced.

3.4.4 INSTALLATION: Apply a light film of P.O.E. oil on the new O-Ring (1-19) and fit it on the adapter (1-36). Fit the adapter and O-Ring in the new expansion valve (1/4-34). Use a back-up wrench to tighten the connection. Next use clip (1-33) to attach the Thermostatic Bulb to the Suction Line on the evaporator so the bulb is on the top side of the line. The Thermostatic Bulb must have FULL contact with the line. Thoroughly cover the bulb by wrapping with insulating tape (1-35).

3.4.4.1 Attach the inlet hose to the expansion valve. During servicing check for leaks.

#### 3.5 COIL (1/3-3)

3.5.1 INSPECTION: On condition. Visually inspect the fins. Check that the fins are straight and not flattened which will restrict air flow over the tubes and through the coil. Visually inspect tubes for leaks or kinks.

3.5.1.1 To pressure check the coil without removal from the air conditioning system, 1) apply a static refrigerant charge to the system, using a leak detector check for leaks within the coil. 2) replace defective coil.

3.5.1.2 To pressure check the coil out of the air conditioning circuit, 1) remove the Thermostatic Expansion Valve (1/4-34) as described in 3.4.2., 2) plug the outlet fitting, 3) connect a supply of dry nitrogen to the inlet, 4) apply 100 PSIG of dry nitrogen and check for leaks within the coil, 5) replace defective coil.

3.5.2 REMOVAL: Remove the Thermostatic Expansion Valve (1/4-34) as described in 3.4.2. Remove the Air Filter (4-1) and Clips (4-2), Union (1-15), Drain Pan (2/4-12), Housing (1/2-11) and Top Cover (1-4,-35). Be sure to save the 4ea Rubber Pads (1/3-43) in the Drain Pan (2/4-12).





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3.5.3 SERVICE: Replace defective coil. Using a fin comb, comb out and straighten fins that are bent and restricting air flow.

3.5.4 INSTALLATION: Apply a light film of RTV adhesive to the 4 Rubber Pads (1/3-43) and place them in the Drain Pan (2/4-12). Set the coil (1/3-3) in the Drain Pan (2/4-12). Place the Top Cover (1-4,-35) and Housing (1/2-11) to the coil in reverse order of disassembly. It may be necessary to locate and re-drill (.25 diameter) the 8 holes in the Top Cover (1-4,-35), Housing (1/2-11) and Drain Pan (2/4-12) to match the mounting holes on the new coil (1/3-3). After the Housing (1/2-11), Top Cover (1-4,-35) and Drain Pan (2/4-12) are attached to the new coil attached the Union (1-15) and Thermostatic Expansion Valve (1/4-34) in accordance with 3.4.4.

#### 4.0 SERVICING

##### CAUTION

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##### NOTE

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##### NOTE

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

4.1 CHECK THE SYSTEM. Anytime refrigerant has been lost or removed from the system. Check for leaks and secure all plumbing connections before filling the system with refrigerant.

4.2 REFRIGERANT CHARGING INSTRUCTIONS. Refer to ZEE Systems, Inc. Service Bulletin 45-1 for servicing instructions.

#### 5.0 SERVICE SCHEDULES

##### 5.1 MAINTENANCE SCHEDULE

ITEM DESCRIPTION	INSPECTION INTERVAL *	R&R/T.B.O. HRS
SZ84-010-3 Air Filter (1-1)	Every 100 Hrs. Inspect for tears or damage. Refer to 3.1.	ON CONDITION
SZ63-021-1 Blower Motor (1/2/4-5)	N/A	ON CONDITION



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ITEM DESCRIPTION	INSPECTION INTERVAL *	R&R/T.B.O. HRS
14-2409 TXV (1/2-31)	N/A	ON CONDITION
SZ63-004-3 Coil	N/A	ON CONDITION

**6.0 TOLERANCES**

6.1 TORQUE VALUES. Use standard torque values for bolts and other fasteners.

**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 Assy.
	Check fuse on fuse block	Replace fuse
	Check wiring to motor. Check switch in cockpit. Check motor for shorts.	Repair or replace faulty system or component.
	Condenser airflow blocked.	Remove obstruction.
System not cooling with adequate airflow over evaporators	Low refrigerant.	Service system.
	Overcharge of refrigerant.	Service system
	Faulty Compressor	Replace Compressor.



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<b>TROUBLE</b>	<b>POSSIBLE CAUSE</b>	<b>REMEDY</b>
	High Discharge Pressure Overcharge of refrigerant.	Service system
	Obstruction in Receiver-Dryer.	Replace defective component and service system
	Obstructed Expansion Valve	Remove obstruction or Replace Expansion Valve and service System.
Low Discharge Pressure.	Low refrigerant.	Service system
	Faulty Compressor.	Replace bad component and service system
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 connections. Replace defective com- ponent. 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



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#### 8.0 ILLUSTRATED PARTS LIST

##### 8.1 EXPLANATION OF SYMBOLS:

ALT - 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.

FIG-ITEM	PART NUMBER	DESCRIPTION	QTY	USAGE/NOTE
1/2/3/4/5/6	SZ63-002-LORU	EVAPORATOR ASSEMBLY		A
	SZ63-002-LORU-1	EVAPORATOR ASSEMBLY		B
4 -1	SZ84-010-3	FILTER, AIR	1	
4 -2	SZ48-017-3A	CLIP	2	
1/3 -3	SZ63-004-3	COIL ASSY	1	
1 -4	SZ63-014-3	COVER, TOP	1	
2/5/6 -5	SZ63-021-1	MOTOR, BLOWER	1	
3 -6	SZ63-032-1	RESISTOR	1	
1/5/6 -7	SZ63-300-1	TUBE ASSY	1	A
1/3 -8	SZ63-303-1	BRACKET, SUPPORT	1	
3/5/6 -9	SZ63-326CCW-5/16	BLOWER WHEEL	1	
	ALT: SZ63-326CCW-5/16M			
1/2/5/6 -10	SZ63-675-1	HOUSING, BLOWER	1	
1/2/5/6 -11	SZ89-310-1	HOUSING	1	
2/4 -12	SZ89-311-1	DRAIN PAN	1	
6 -13	Z05-402-1	SPACER	1	B
1 -14	Z15-033-2	FUSE BLOCK	1	
1 -15	DS200U137-108	UNION	1	
1 -16	MDL-4	FUSE	1	
	ALT: 313004			
1 -17	MDL-6	FUSE	1	
	ALT: 313006			
3/5 -18	MS21044N08	LCOK NUT	4	A
	ALT" AN365-832A			
1(NS) -19	MS28775-013	O-RING	1	
3 -20	MS3367-4-9	CABLE TIE	AR	
1 -21	MS3367-7-9	CABLE TIE	1	A
1 -22	MS35206-229	SCREW	2	
1/2/3 -23	MS35206-245	SCREW	21	
3/5 -24	MS35206-246	SCREW	4	
1/5/6 -25	MS35206-247	SCREW	4	
3 -26	MS35265-32	SCREW	2	



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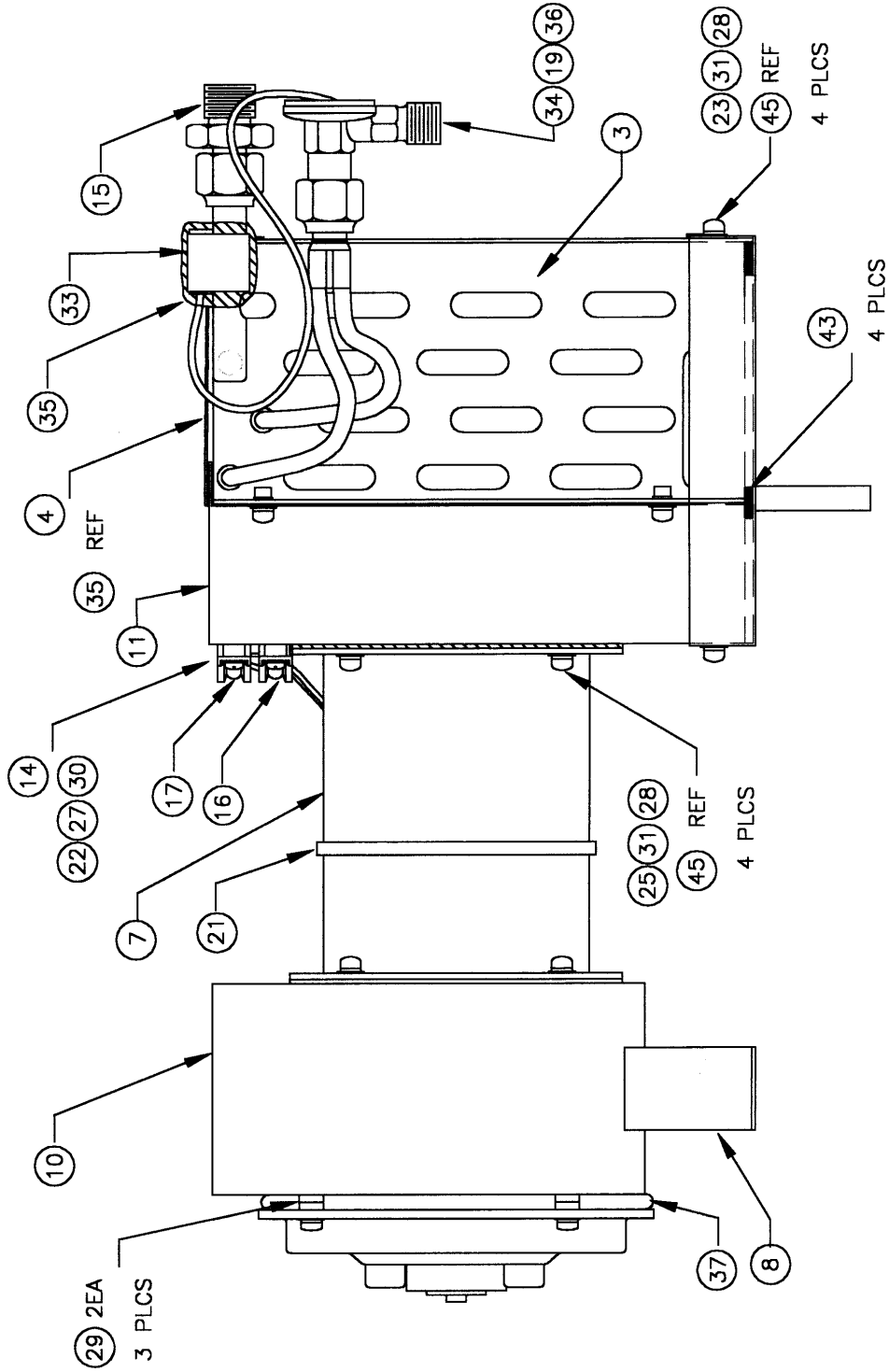
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<b>FIG-ITEM</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>	<b>USAGE/NOTE</b>
1/3	-27	MS35338-41 ALT: AN935-6	2	
1/2/3/5/6-28	MS35338-42	WASHER, LOCK	25	A
	MS35338-42 ALT: AN936-8	WASHER, LOCK	21	B
1/5/6	-29	NAS1149F0363P	6	
2/3	-30	NAS1149FN616P ALT: AN960-6L	2	
1/2/3/5/6-31	NAS1149FN816P	WASHER, FLAT	29	A
	NAS1149FN816P ALT: AN960-8L	WASHER, FLAT	25	B
3	-32	N3	1	
1	-33	14-2388	1	
1/4	-34	14-2409	1	
1	-35	18-2710	AR	
1(NS)	-36	6242 ALT: 20-4444	1	
5/6	-37	67470	AR	
NS	-38	10220-1	1	
2	-39	259179-1	1	
2	-40	405690-1	1	
NS	-41	403904-1	1	
NS	-42	SZ45-090-1	1	
1/3	-43	SZ63-500-1	4	
3	-44	02150600	4	
5/6	-45	02130832 ALT: 02150800	22	



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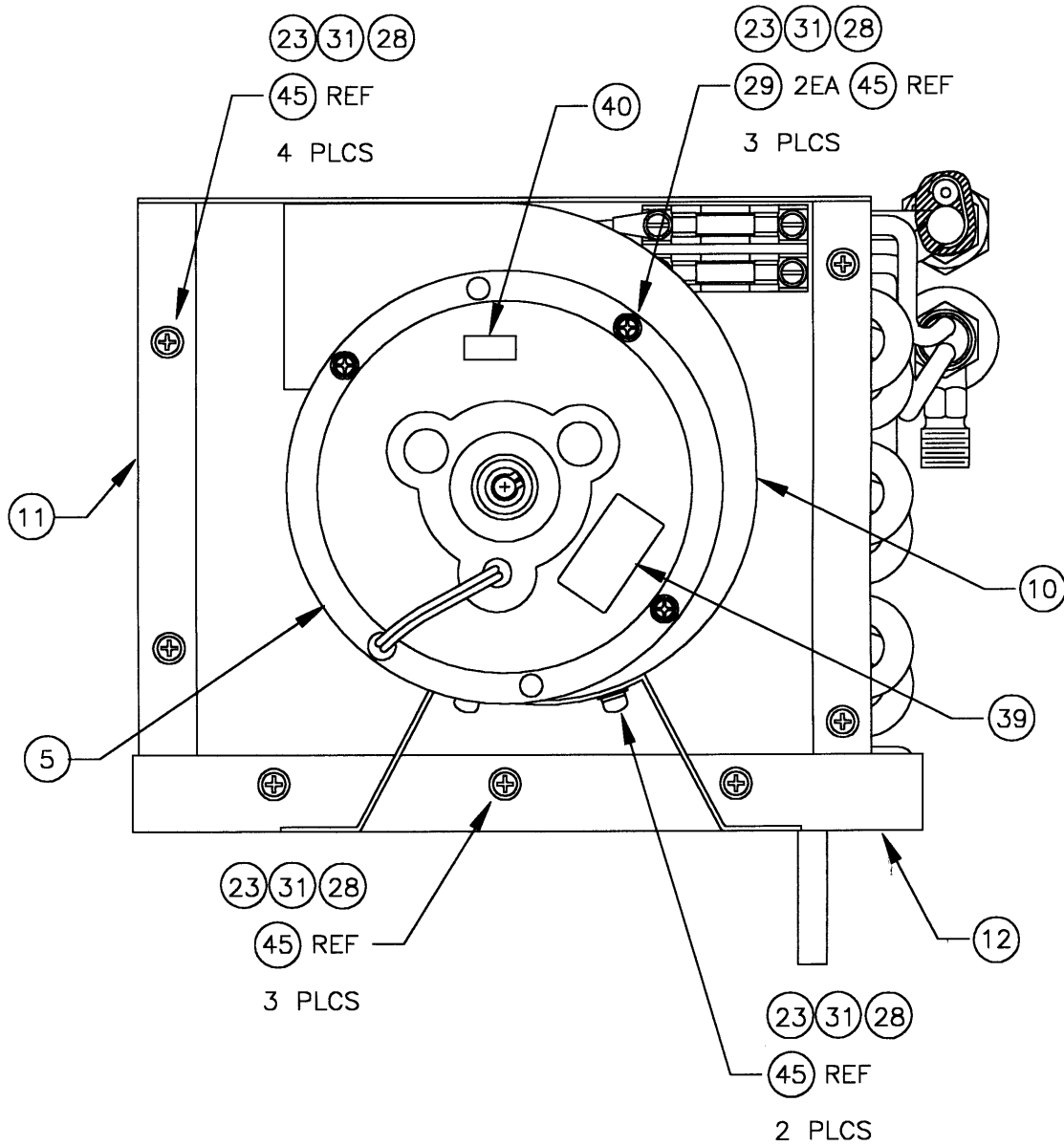


**FIGURE 1.**



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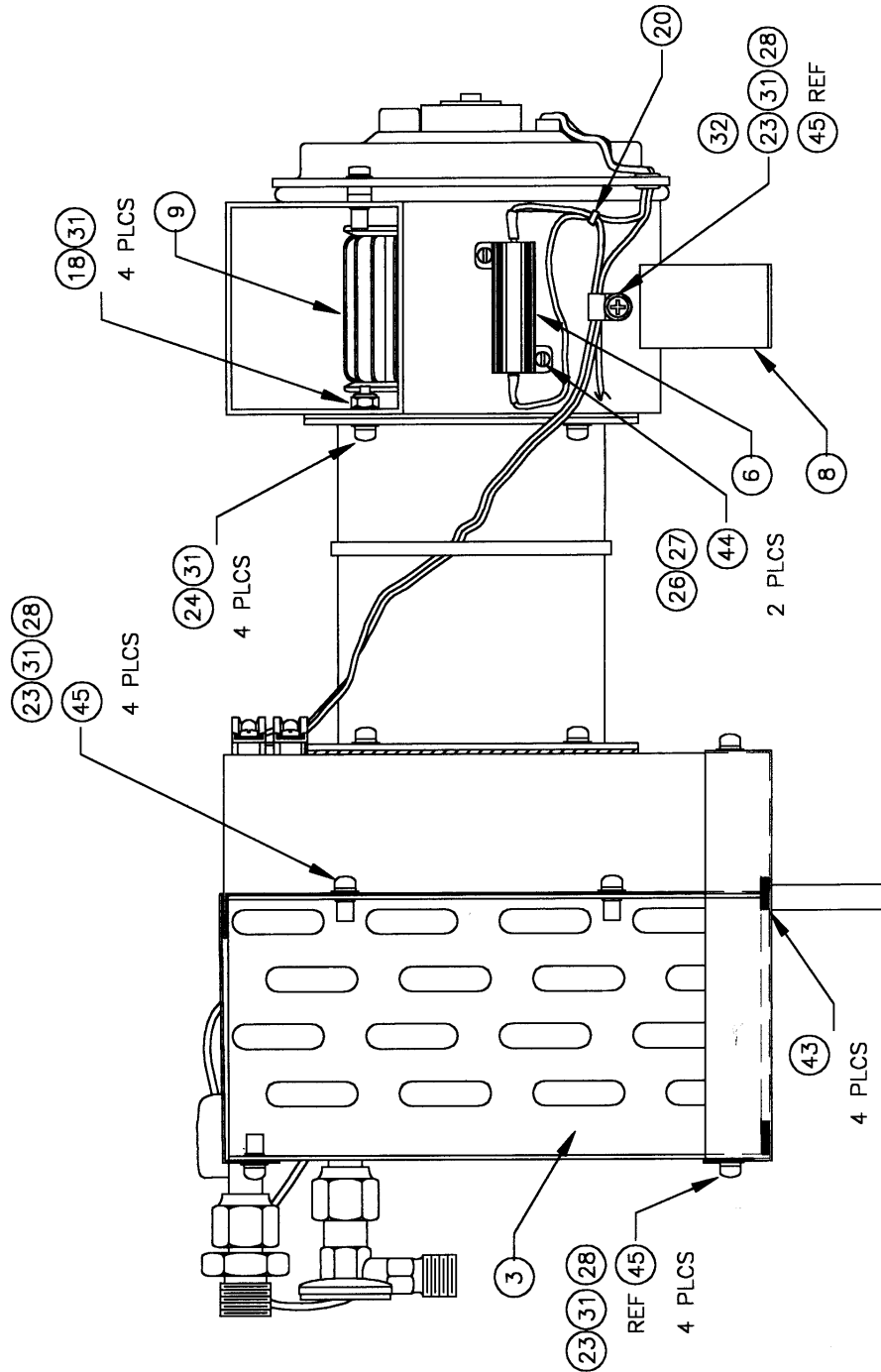


**FIGURE 2.**



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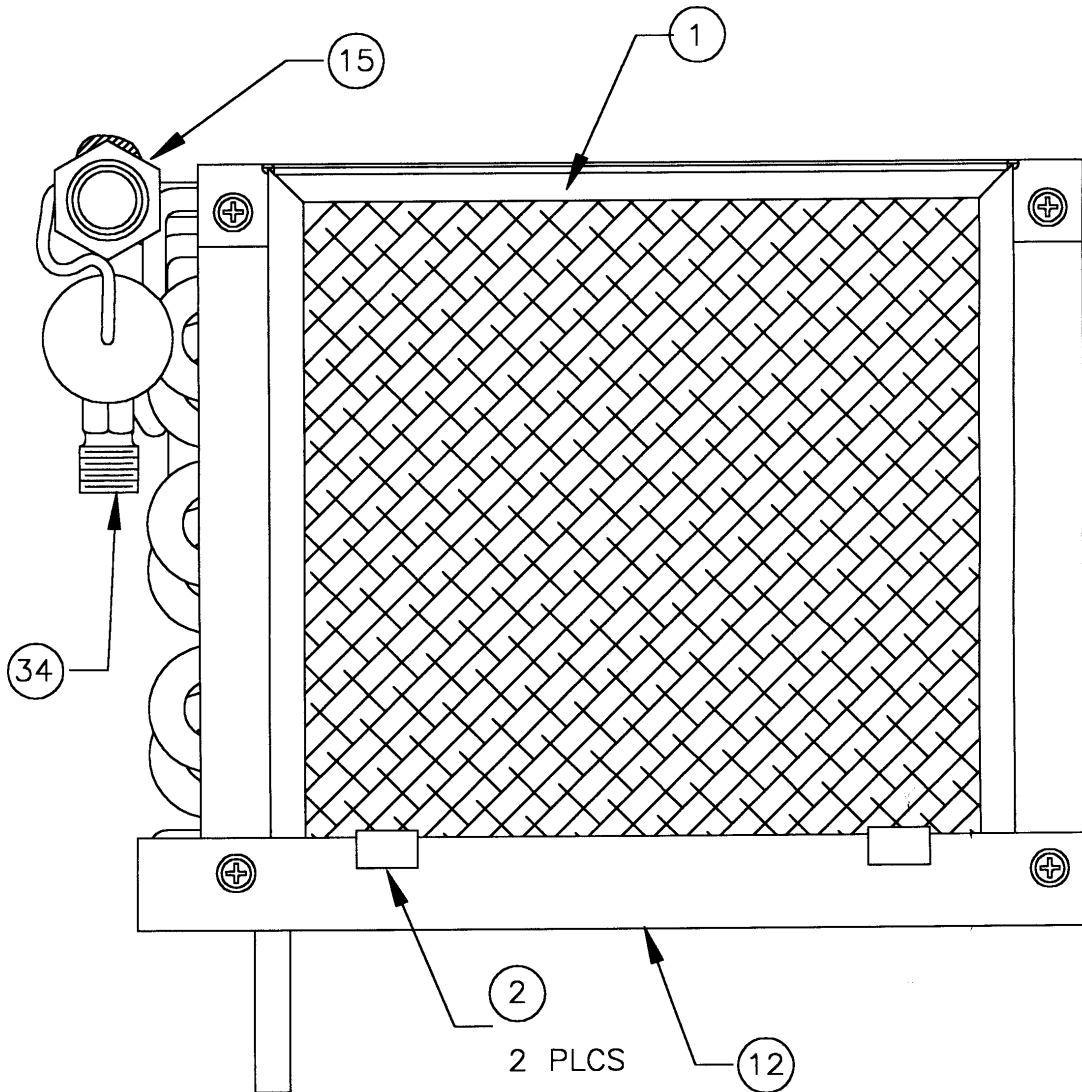
**FIGURE 3.**





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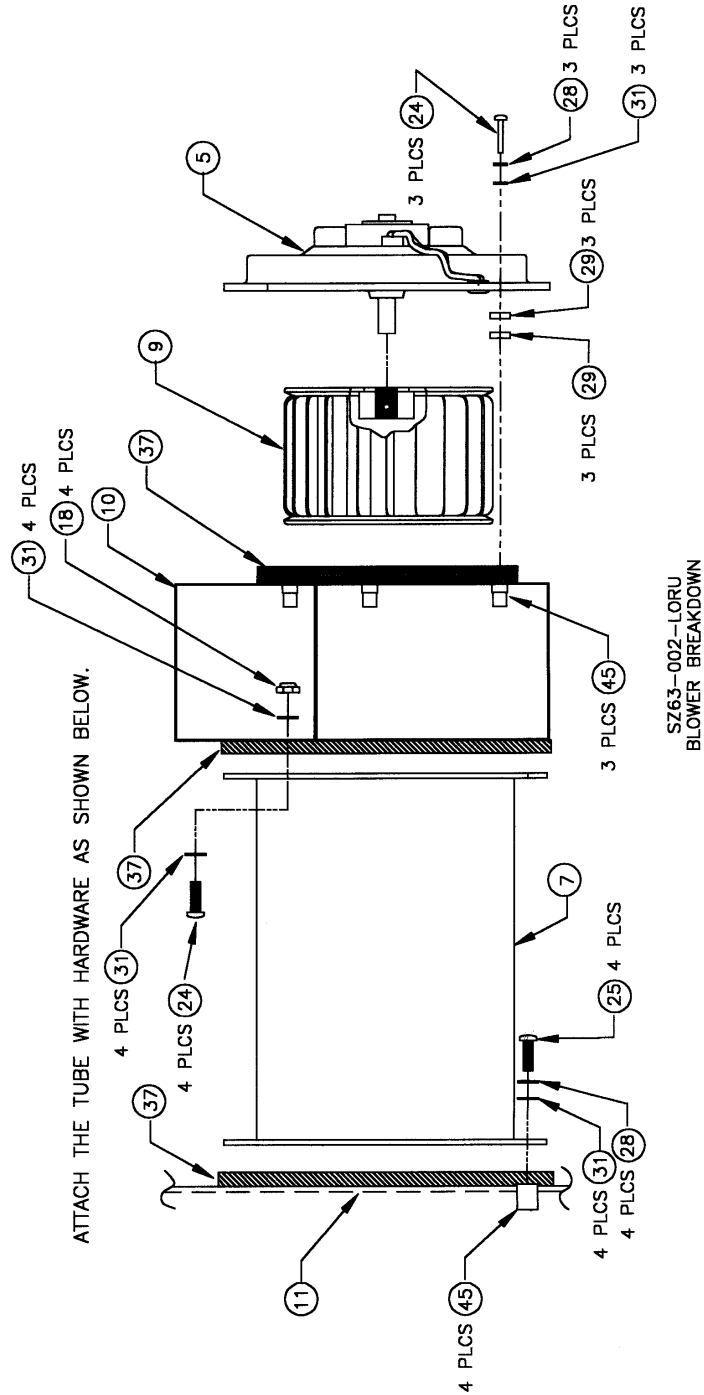


**FIGURE 4.**



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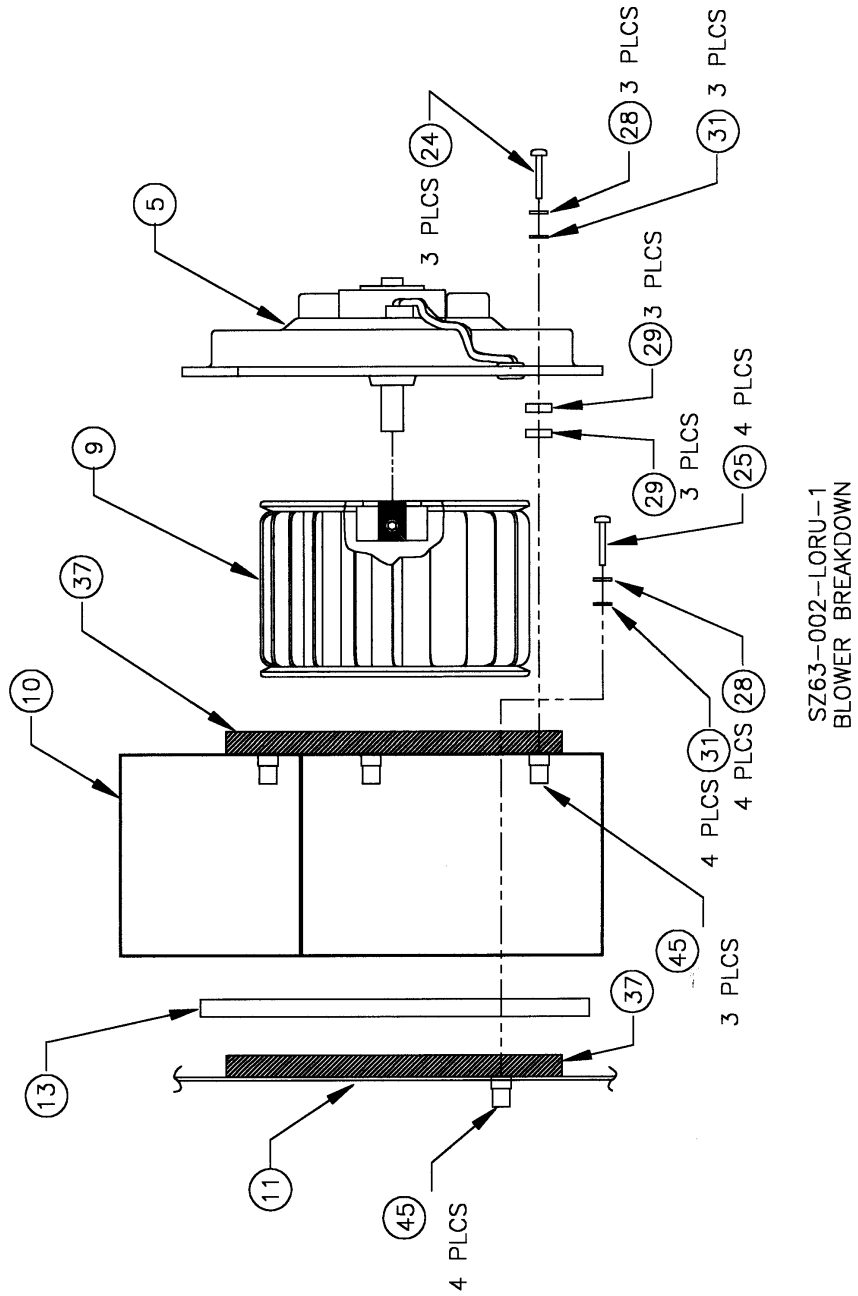


**FIGURE 5.**



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**FIGURE 6.**