Component

Maintenance

Manual

with

Illustrated Parts List

for

Z09-89600-SERIES Motor-Compressor-Condenser Assembly

Includes Sub-Assemblies

Z09-600-SERIES Power Condenser
and
Z09-8900-SERIES Motor-Compressor

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Z09-89600 COMPONENT MAINTENANCE MANUAL

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1.0 INTRODUCTION

1.1 This Component Maintenance Manual provides information on the maintenance, maintenance schedules and repair and replacement of parts.

1.2 Refer to the Illustrated Parts List (IPL) in Section 5 when using this manual or ordering replacement parts. Parts are identified in parenthesis (FIG-ITEM NO.).

1.3 This Motor Compressor Condenser (MCC) Assembly is part of a vapor cycle air conditioning system.

1.3.1 The MCC has two major sub-assemblies, the Z09-8900 Motor Compressor and the Z09-600 Power Condenser. These components are mounted on a Base Plate. These components may also be removed from the base plate and mounted separately.

1.3.2 The refrigerant used is HFC-134a which is commonly referred to as R134a. The compressor has a lubricant reservoir which is serviced with 14 ounces of Poloyl Ester (P.O.E.) synthetic oil.

1.4 THEORY OF OPERATION

1.4.1 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.

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	Commercially Available.

automotive service connections.

Refrigeration Vacuum Pump.	Commercially Available.
Scale with 0.1 lb. increments (minimum).	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
MS20995C25 Lock Wire	Commercially Available.
MS20995C32 Lock Wire	Commercially Available
Refrigerant, HFC-134a	Commercially Available.
Lubricant, Refrigeration, Lubrizol 2916 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.

3.0 REPAIR AND REPLACEMENT OF COMPONENTS

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

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
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 BELTS (2/3-22, 2/3-23)

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 (2/3-23): To remove the belts start with the secondary belt. Loosen the four bolts (2/4/5-28, 2/3/4/5-29) then loosen the secondary belt adjusting bolt (2-44). This slides the compressor toward the jack shaft assembly (3-8), remove the secondary belt from the compressor pulley first then the small pulley on the jack shaft assembly.

3.1.2 Primary Belt (2/3-22): Loosen the two locking bolts (5-42). 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 (3-8) 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 (2/4/5-28, 2/3/4/5-29) to the point where the compressor slides but that compressor base plate (2/3-18) is fairly well seated. If this is not done the belt tension will change when the bolts (2/4/5-28, 2/3/4/5-29) 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 (2/3-22) Adjustment: Insert the 3/8" pin in the jack shaft assembly (3-8) 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 (5-42) to torque of 30 foot-pounds.

3.1.5.2 Secondary Belt (2/3-23) Adjustment: Tighten the adjusting bolt (2-44) until a tension of 1/8" deflection midway between pulleys with a 4-5 pound pull is achieved. Tighten the four bolts (2/4/5-28, 2/3/4/5-29) to a torque of 40 foot-pounds. Loosen the adjusting bolt (2-44) 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 (2/3/4/5-20, 2/3/4/5-48)

3.2.1 REMOVAL: Compressors that have the fitting code E, F, G, H, M, N, Q, R have back seat valves. To maintain the refrigerant charge during service and replacement the back seat valve may be placed in the full front seat position. This isolates the compressor from the refrigerant charge. Remove the plastic cap seal and expose the 1/4 inch square stem. Turn the stem clockwise until it is tight against the front seat. Now loosen and remove the 12 point 5/16 bolt that secures the fitting flange to the compressor. Lift the fitting from the compressor taking care not to damage the o-ring under the flange.

3.2.1.1 Loosen the four bolts (2/4/5-28, 2/3/4/5-29) then loosen the adjusting bolt (2-44) and remove the secondary belt. Remove the four bolts and washers (2/4/5-28, 2/3/4/5-29, 2/3/4/5-45) and adjusting bolt (2-44) and lift the compressor (2/3/4/5-20, 2/3/4/5-48) and base plate (2/3-18) from the side frames. Separate the compressor from the base plate by loosening and removing the three bolts (NS-40, NS-34, NS-36). To remove the pulley (2/3/5-10) loosen, but do not completely remove bolt (5-30) and washer (5-6). Evenly pry between the compressor boss and the pulley hub until the pulley is free. Now remove the bolt (5-30), washer (5-6) and pulley (2/3/5-10) 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. Compressors that have back seat valves it is not necessary to remove refrigerant to check the oil. Remove each plastic cap seal to expose the 1/4 inch stem. Turn this stem full clock-wise until it is tight against the front seat. 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 Section 6.0 for correct oil level for your system and add oil as necessary. Return and tighten oil fill plug. Before starting the system open the back seat valve and replace the plastic cap seal.

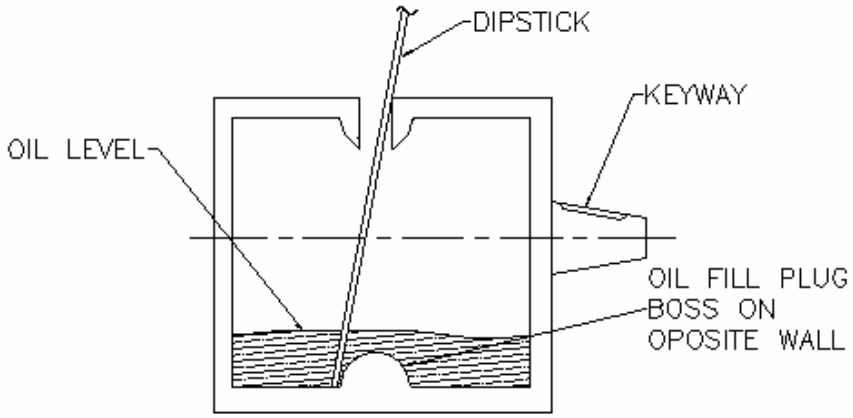


ILLUSTRATION 1.

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 (5-6) and bolt (5-30) in place and torque to 20 foot-pounds, secure with .032 diameter lock wire.

3.2.4 BASE PLATE REASSEMBLY: Attach the base plate (2/3-18) to the compressor using the three bolts (NS-40, NS-34, NS-36), 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 (2/3/5-1, 2/3/4-2) and reassemble using bolts and washers (2/4/5-28, 2/3/4/5-29, 2/3/4/5-45). Install belts in accordance with Section 3.1.4.

3.2.5.1 If the fitting with back seat valves were removed during removal reinstall them in reverse order. Make sure the larger of the two fittings is installed on the suction side of the compressor. The compressor is marked SUCT and DISCH. After the fittings are secured on the compressor. Open both back seat valves. Turn the 1/4 inch square stem counter-clockwise until it is midway between the front and back seat position. When service is complete replace the plastic cover seal over the stem.

3.3 MOTOR, COMPRESSOR DRIVE (2/4/5-17)

3.3.1 REMOVAL: Disconnect the positive and negative leads to the motor. Remove and set aside the primary belt (2/3-22).

3.3.1.1 Remove the safety bolts (2/3-12). Loosen the lock nuts (2-41). Back out the motor mount locking bolts (2-43).

3.3.1.2 The motor may be slightly stuck to the support assemblies (5-3, 5-19), lightly pry with a screwdriver to break it loose. Now slide the motor completely out of the frame.

NOTE: New or ZEE SYSTEMS overhauled motors do not 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 (2/3/5-1, 2/3/4-2) place the spacer (4-7), blot and washers (2/4-32, 2/4-34, 2/4-36 on the motor shaft and tighten. Hold the motor and line up the two supports (5-3, 5-19) and start the safety bolts (2/3-12).

3.3.3.1 Tighten the two mounting bolts (2-43) and torque to 20 inch-pounds then tighten the lock nuts (2-41). Check to insure the three point mount (two supports and mounting bolts) is maintained. If bolt (5-27) was loosen, tighten it now. Tighten the two safety bolts (2/3-12).

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

3.4 JACK SHAFT ASSEMBLY (3-8)

3.4.1 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.

3.4.1.1 Remove bolts (4-35) from the Browning taper lock bushing (4-37). Place the bolts (4-35) 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 (4-35) and slide jack shaft assembly from frame. It may be necessary to wedge open the clamp (2/5-13, 3-14) if the jack shaft does not readily slide out.
3.4.2 INSPECTION: Inspect the pulley (4-11) for wear. Check for damaged or rounded teeth. Excessive wear will show as shinny areas on the teeth. Replace if damaged.

3.4.2.1 Inspect the small pulley (NS/NP-8A) damaged or rounded teeth. Replace if damaged.

3.4.2.2 Inspect the jack shaft housing 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.

3.4.3 INSTALLATION: Slide jack shaft assembly into clamps (2/5-13, 3-14) and align it so the belt will ride centered on the compressor pulley (2/3/5-10) and the small pulley (NS/NP-8A) on the jack shaft, and tighten bolts (5-42) to hold the assembly while attaching the primary pulley (4-11) (large jack shaft). Slip the pulley (4-11) over the shaft. Using a rawhide mallet tap bushing (4-37) 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.

3.4.3.1 Install the two bolts and washers (4-39, 4-35) 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.

3.4.3.2 Install and align belt(s) in accordance with paragraphs 3.1.4 and 3.1.5. The primary belt (2/3-22) should ride in the middle of the (large) pulley (4-11). Run the motor and check the belt does not walk on the pulley, then secure (4-39, 4-35) bolts and washers with .025 diameter lock wire.

3.5 POWER CONDENSER ASSEMBLY (1-4)

3.5.1 ***WARNING:*** ***THE SYSTEM IS UNDER PRESSURE. SYSTEM PRESSURE MUST BE RELIEVED BEFORE REMOVAL OF THE POWER CONDENSER ASSEMBLY.*** Disconnect the electrical connections from the compressor drive motor (2/4/5-17). Disconnect the inlet hose (1-2) and outlet hose (NS). Plug or cap open connections to prevent contamination of the system. Loosen and remove the screws and washers (1-9, 1-12) which attach the assembly to the base plate (1-3).

3.5.2 INSPECTION: Check the coil (6-3) for leaks or kinks in the tubing. Check the coil fins for debris and flattened areas which prevent air flow over the coils. Only minor field repairs are allowed as described below. Coil is replaced on condition. Defective coils must be replaced. .

3.5.2.1 Straighten damaged or flat fins by using a fin comb to comb out the fins. Remove debris from coil fins that obstruct the airflow over the coil. There is no other field repair of the condenser coil.

3.5.2.2 Replace defective Blower Motor Assembly (6/7/9-7, 6/8/9-8). Disconnect the electrical leads and remove clamp (1-11). For –1 assemblies (6/7/9-7) loosen and remove hardware (6/7-22, 6/7-17, 6/7-19) and remove Blower Motor Assembly from housing (6/7-5). For –2 assemblies (6/8/9-8) loosen and remove hardware (8-15, 8-20) and remove Blower Motor Assembly from housing (6/8-6).
3.5.3 INSTALLATION: Blower Motor Assembly (6/7/9-7, 6/8/9-8). Install in reverse order of step 3.5.2.2.

4.0 SERVICING - REFRIGERANT CHARGE

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.

CAUTION

FOR COMPRESSORS THAT HAVE BACK SEAT VALVES. THE VALVE MUST BE IN THE PROPER POSITION DURING SERVICING AND NORMAL OPERATION. NEW COMPRESSORS AND NEW MOTOR COMPRESSOR ASSEMBLIES ARE SHIPPED WITH THE VALVE IN THE CLOSED (FRONT SEAT POSITION). VALVES MUST BE PUT INTO THE MIDDLE OR FULL OPEN POSITION (BACK SEAT) DURING SERVICE AND OPERATION. FAILURE TO PLACE THE VALVE IN THE PROPER POSITION DURING OPERATION WILL CAUSE THE COMPRESSOR HEAD GASKET TO FAIL.

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.

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. Refer to Installers service instructions for the amount of refrigerant charge to a dry 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.

4.1.1.1 Compressors that have the fitting code E, F, G, H, M, N, Q, R have back seat valves. BEFORE ANY SERVICE. Move both back seat valves to a position midway between the front seat and back seat positions. Turn the 1/4 inch square stem counter-clockwise until it is midway between the front and back seat position. When service is complete turn the stem full counter-clockwise until the valve is tight against the back seat and replace the plastic cover seal over the stem.

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 and a deep vacuum maintained 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.

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 CLOSED, turn ON the compressor motor and evaporator blowers. OPEN only the **Low** pressure manifold valve until the Manifold gauge reads 30-40 pounds pressure (PSIG).

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 (26.7C).

4.2.1 Place a temperature measuring device to read the ambient 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 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		*R-134a PRESSURE*	
F	**C**	**PSI**	**kg/sq.cm**
50	10	45.5	3.2
52	11.1	47.7	3.4
54	12.2	50.1	3.5
56	13.3	52.3	3.7
58	14.4	55.0	3.9
60	15.6	57.5	4.0
62	16.7	60.1	4.2
64	17.8	62.7	4.4
66	18.9	65.5	4.6
68	20	68.6	4.8
70	21.1	71.2	5.0
72	22.2	74.2	5.2
74	23.3	77.2	5.4
76	24.4	80.3	5.6
78	25.6	83.5	5.9
80	26.7	86.8	6.1
82	27.8	90.2	6.3
84	28.9	93.6	6.6
86	30	97.1	6.8
88	31.1	100.7	7.1
90	32.2	104.4	7.3
92	33.3	108.2	7.6
94	34.4	112.1	7.9
96	35.6	116.1	8.2
98	36.7	120.1	8.4

TEMP		*R-134a PRESSURE*	
F	**C**	**PSI**	**kg/sq.cm**
100	37.7	124.3	8.7
102	38.9	128.5	9.0
104	40	132.9	9.3
106	41.1	137.3	9.7
108	42.2	142.8	10.0
110	43.3	146.5	10.3
112	44.4	151.3	10.6
114	45.6	156.1	11.0
116	46.7	161.1	11.3
118	47.8	166.1	11.7
120	48.9	171.3	12.0
122	50	176.6	12.4
124	51.1	182.0	12.8
126	42.2	187.5	13.2
128	53.3	193.1	13.6
130	54.4	198.9	14.0
132	55.6	204.7	14.4
134	56.7	210.7	14.8
136	57.8	216.8	15.2
138	58.9	223.0	15.7
140	60	229.4	16.1
142	61.1	235.8	16.6
144	62.2	242.4	17.0
146	63.3	249.2	17.5
148	64.4	256.0	18.0
150	65.6	263.0	18.5

ILLUSTRATION 2.

5.0 SERVICE SCHEDULES

5.1 MAINTENANCE SCHEDULE

ITEM DESCRIPTION	INSPECTION INTERVAL *	R&R/T.B.O. HRS
Z09-8900 M-C	FIRST 100 HRS* AFTER OH OR NEW - CHECK OIL LEVEL, REPLENISH AS NECESSARY. EVERY 250 HRS* - INSPECT FOR LOOSE, DAMAGED ITEMS. CHECK FOR SIGNS OF OIL LEAKS. BELT CONDITION AND ALIGNMENT OF PULLEYS.	2500
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
Z09-600 POWER CONDENSER	EVERY 250 HRS – INSPECT FOR FLAT OR DAMAGED FINS. CHECK FOR AND REMOVE ANY DEBRIS OR OBSTRUCT-IONS TO THE CONDENSER COILS. AS PER SECTION 3.5.2	ON CONDITION
BLOWER MOTOR ASSY ***	ON CONDITION	ON CONDITION

* UNIT OPERATING TIME
** COMPONENT IS PART OF THE MOTOR COMPRESSOR ASSY.
*** COMPONENT IS PART OF POWER CONDENSER ASSY.

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.

6.2 REFRIGERANT CHARGE. Refer to installation instructions for amount of HFC-134a (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
Compressor Motor trips circuit breaker.	Motor shorted. Motor brushes worn beyond limits.	Replace Motor.
Compressor Motor trips current limiter.	Short in wiring.	Check wiring to motor, repair as required.
Compressor Motor inoperative.	Motor open. Motor brushes worn beyond limits.	Replace 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 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 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

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.
AR – As Required.
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*	*NOMENCLATURE*	*QTY*	*USAGE CODE*
1		***Z09-89600-1***	***MOTOR COMPRESSOR CONDENSER ASSY***		***A***
1		***Z09-89600-2***	***MOTOR COMPRESSOR CONDENSER ASSY***		***B***
	-1	Z09-040-1	PAD	2	A,B
	-2	Z09-2008180BXC250	HOSE ASSY	1	A,B
	-3	Z09-402-1	PLATE ASSEMBLY, BASE	1	A,B
	-4	Z09-600-1	POWER CONDENSER ASSEMBLY	1	A,B
		Z09-600-2	POWER CONDENSER ASSEMBLY	1	A,B
		(When using Z09-600-2 mark an X in the MODIFICATION STATUS Block A)			
	-5	Z09-8900-1	MOTOR COMPRESSOR ASSEMBLY	1	A
		Z09-8900-2	MOTOR COMPRESSOR ASSEMBLY	1	B
	-6	SZ96-031-2	SWITCH, HIGH PRESSURE CUT OFF	1	A,B
	-7	AN6-6A	BOLT	4	A,B
	-8	AN960-616L	WASHER, FLAT ALT: NAS1149F0632P	4	A,B
	-9	AN960-8L	WASHER, FLAT ALT: NAS1149FN816P	9	A,B
	-10	MS20995C25	LOCK WIRE	AR	A,B
	-11	MS21919WDG3	CLAMP	1	A,B
	-12	MS35206-245	SCREW	9	A,B
	-13	102219-1	I.D. PLATE	1	A,B

FIG-ITEM		*PART NUMBER*	*NOMENCLATURE*	*QTY*	*USAGE CODE*
2/3/4/5		***Z09-8900-1***	***MOTOR COMPRESSOR (MC) ASSEMBLY***		***A***
2/3/4/5		***Z09-8900-2***	***MOTOR COMPRESSOR (MC) ASSEMBLY***		***B***
2/3/5	-1	Z09-400-1	FRAME	1	A,B
2/3/4	-2	Z09-401-1	FRAME	1	A,B
1	-3	Z09-402-1	PLATE ASSY, BASE	1	REF
2	-4	Z09-403-1	CLIP, SAFETY	1	A,B

FIG-ITEM		*PART NUMBER*	*NOMENCLATURE*	*QTY*	*USAGE CODE*
3	-5	Z09-405-3	SUPPORT ASSEMBLY, MOTOR	1	A,B
5	-6	SZ37-014-3	WASHER	1	A,B
4	-7	SZ41-019-5	SPACER	1	A,B
3	-8	SZ43-004-1A	JACK SHAFT ASSY	1	A,B
NP	-8A	SZ43-009-3	--PULLEY	1	A,B
2/4	-9	SZ43-008-3	PULLEY, MOTOR	1	A,B
2/3/5	-10	SZ43-017-3	PULLEY, COMPRESSOR	1	A,B
4	-11	SZ43-018-3	PULLEY, PRIMARY	1	A,B
2/3	-12	SZ43-020-3	BOLT, SAFETY	3	A,B
3/5	-13	SZ44-007-3	CLAMP	1	A,B
3	-14	SZ44-007-4	CLAMP	1	A,B
2	-15	SZ44-008-7	BAR	1	A,B
2	-16	SZ44-008-5	BAR, ADJUSTING	1	A,B
2/4/5	-17	SZ58-003-2	MOTOR ASSY, COMP. DRIVE	1	A,B
5**	-17A	--AN316-6R	NUT	1	A,B
5**	-17B	-- AN935-616L	WASHER, LOCK ALT: MS35338-46	1	A,B
5**	-17C	-- AN960-616L	WASHER, FLAT ALT: NAS1149F0632P	2	A,B
2/3	-18	SZ58-009-3	PLATE, COMPRESSOR	1	A,B
5	-19	SZ58-010-3A	SUPPORT ASSY	2	A,B
2/3/4/5	-20	SZ84-913QJ-1 ALT: Z09-913QJ-1	COMPRESSOR	1	A,B
2/4/5	-20A	022-21959M	FITTING, SUCTION	1	A
2/4/5	-20B	Z09-980-8	FITTING, DISCHARGE	1	A
2/5	-21	SZ96-031-2	SWITCH, HIGH PRESSURE CUT OFF	1	A,B
2/3	-22	187L075	BELT, PRIMARY	1	A,B
2/3	-23	187L100	BELT, SECONDARY	1	A,B
5	-24	AN364-428A	LOCKNUT ALT: MS21083N4	2	A,B
3/5	-25	AN365-428A	LOCKNUT ALT: MS21044N4	4	A,B
3	-26	AN4-10A	BOLT	4	A,B
5	-27	AN4-44A	BOLT	2	A,B
2/4/5	-28	AN5-4A	BOLT	2	
2/3/4/5	-29	AN5-5A	BOLT	2	A,B
5	-30	AN5H5A	BOLT	1	A,B
5	-31	AN501A10-6	SCREW ALT: MS35266-61	1	A,B
2/4	-32	AN6-6A	BOLT	1	A
2/3/4/5	-33	AN935-416	WASHER, LOCK ALT: MS35338-44	12	A,B
2/3/4	-34	AN935-616L	WASHER, LOCK ALT: MS35338-46	7	A,B
2/3/4/5	-35	AN960-416L	WASHER, FLAT ALT: NAS1149F0432P	20	A,B
2/4	-36	AN960-616L	WASHER, FLAT ALT: NAS1149F0632P	13	A
2/3/4	-37	G X 5/8 ATL: G X 5/8M	BUSHING	1	A,B
2/3/4/5	-38	MS20995C25	LOCK WIRE	AR	A,B
2/4/5	-39	NAS1352-4H16P	BOLT	6	A,B
NS	-40	SZ58-440-1	SCREW, SOCKET HEAD	3	

FIG-ITEM		*PART NUMBER*	*NOMENCLATURE*	*QTY*	*USAGE CODE*
2	-41	1/4-20UNC-2B	NUT (ANSI)	2	A,B
5	-42	1/4-20UNC-2B X 2.25	BOLT (ANSI)	2	A,B
2	-43	1/4-20UNC-2B X 1.25	BOLT (ANSI)	2	A,B
2	-44	1/4-28UNC-2A X 2.25	BOLT (ANSI)	1	A,B
2/3/4/5	-45	5/16 X 3/4	WASHER, FLAT, STEEL	4	A,B
4	-46	605	WOODRUFF KEY	1	A,B
NS	-47	400649-1	I.D. PLATE	1	A,B
2/3/45	-48	SZ84-913QP-1 ALT: Z09-913QP-1	COMPRESSOR	1	B
2/3/4/5	-48A	022-04362B	FITTING, SUCTION, W /B.S.V.	1	B
2/3/4/5	-48B	SZ96-940-8	FITTING, DISCHARGE, W/B.S.V.	1	B

* Used to attach compressor to compressor plate.
** Used to attach electrical connections to motor. Quantity is per each stud.

FIG-ITEM		*PART NUMBER*	*NOMENCLATURE*	*QTY*	*USAGE CODE*
6/7/8/9		***Z09-600-1***	***POWER CONDENSER ASSEMBLY***		***A***
6/7/8/9		***Z09-600-2***	***POWER CONDENSER ASSEMBLY***		***B***
NS	-1	SZ45-090-1	PLACARD “CAUTION”	1	A,B
6	-2	SZ45-029-3A	COVER	1	A,B
6	-3	SZ44-030-1B	COIL	1	A,B
6/7/8	-4	Z09-300-1	DUCT, OUTLET	1	A,B
6/7	-5	Z09-308-1	DUCT, INLET	1	A
6/8	-6	Z09-308-2	DUCT, INLET	1	B
6/7/9	-7	Z09-601-1	BLOWER MOTOR ASSEMBLY	1	A
6/8/9	-8	Z09-601-2	BLOWER MOTOR ASSEMBLY	1	B
NS	-9	0214100011	THREADCERT	4	A
6/7/8	-10	02150800	THREADCERT	8	A,B
6	-11	18-2710	TAPE, INSULATION	AR	A,B
6	-12	264281-1	I.D. PLATE	1	A,B
NS	-13	403904-1	PLACARD “FLOW”	1	A,B
6	-14	67470	TAPE, FOAM	AR	A,B
8	-15	AN4-6A	BOLT	4	B
6/7/8	-16	AN935-8	WASHER, LOCK ALT: MS35338-42	8	A,B
6/7	-17	AN935-10	WASHER, LOCK ALT: MS35338-43	4	A
6/7/8	-18	AN960-8L	WASHER, FLAT ALT: NAS1149FN816P	8	A,B
6/7	-19	AN960-10L	WASHER, FLAT ALT: NAS1149FO332P	4	A
8	-20	AN960-416L	WASHER, FLAT ALT: NAS1149FO432P	4	B
6/7/8	-21	MS35206-245	SCREW	8	A,B
6/7	-22	MS35207-268	SCREW	4	A

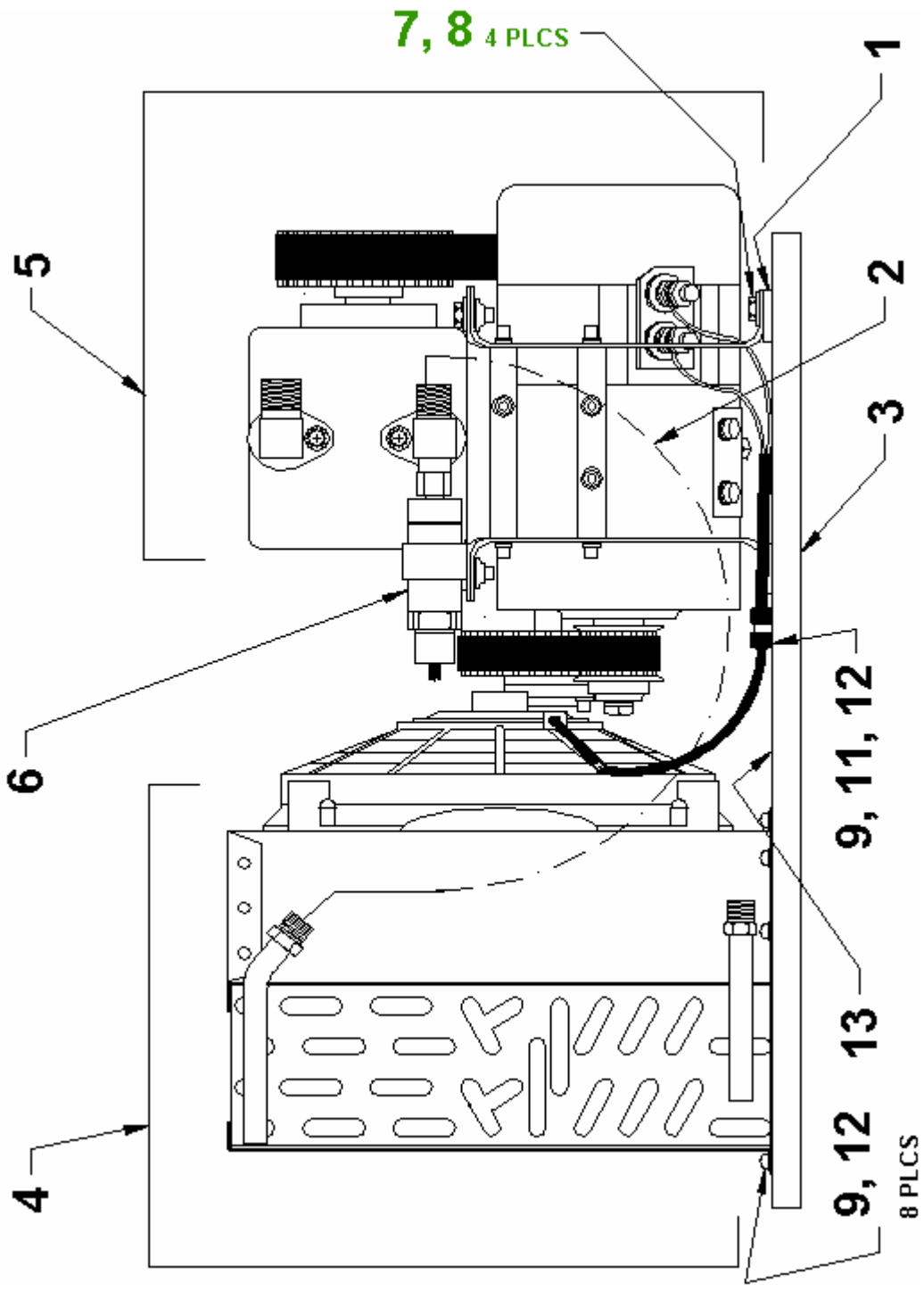


FIG. 1

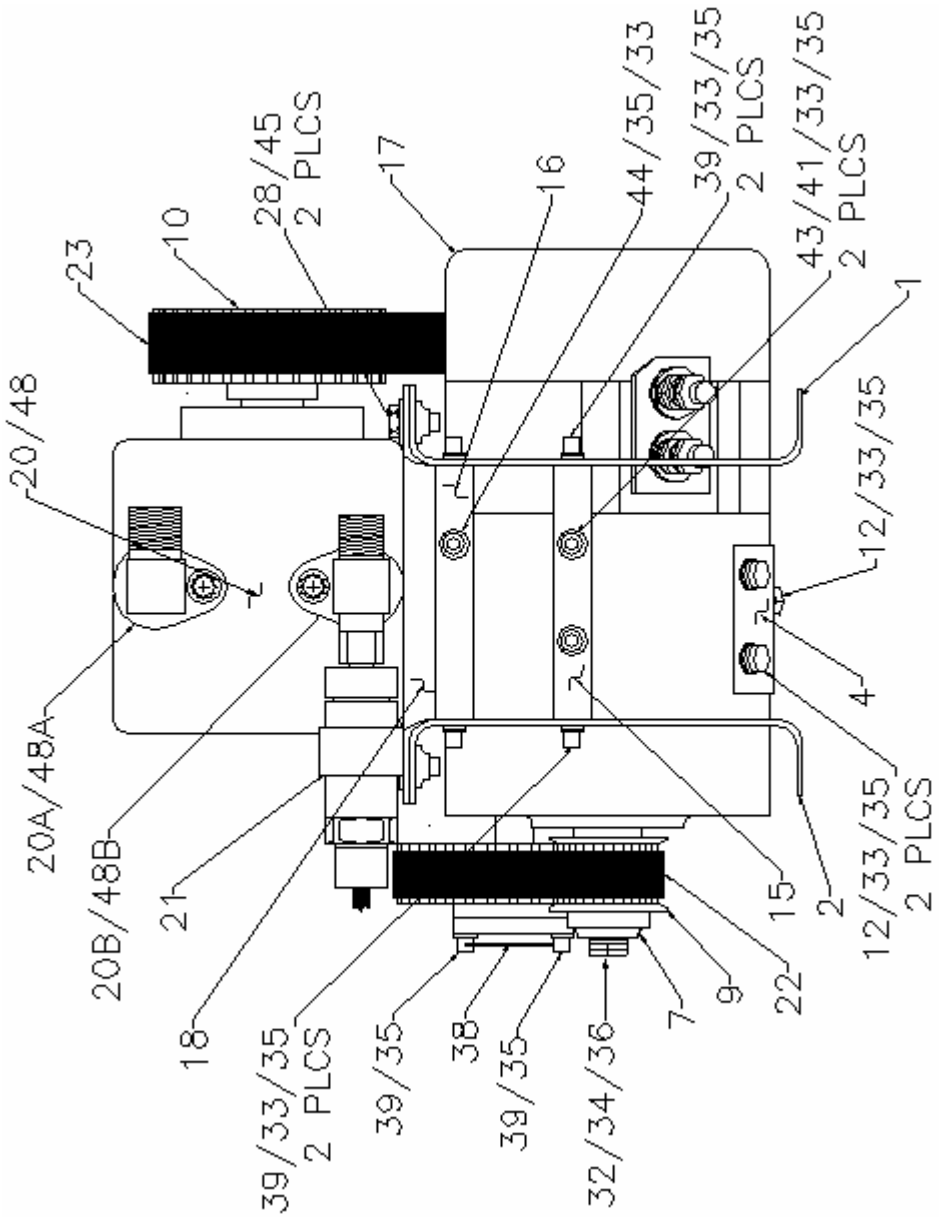

23
10
28/45
2 PLCS
17
16
44/35/33
39/33/35
2 PLCS
43/41/33/35
2 PLCS
1
20/48
12/33/35
4
20A/48A
20B/48B
21
18
39/33/35
2 PLCS
39/35
38
39/35
32/34/36
7
9
22
15
2
12/33/35
2 PLCS

FIG. 2

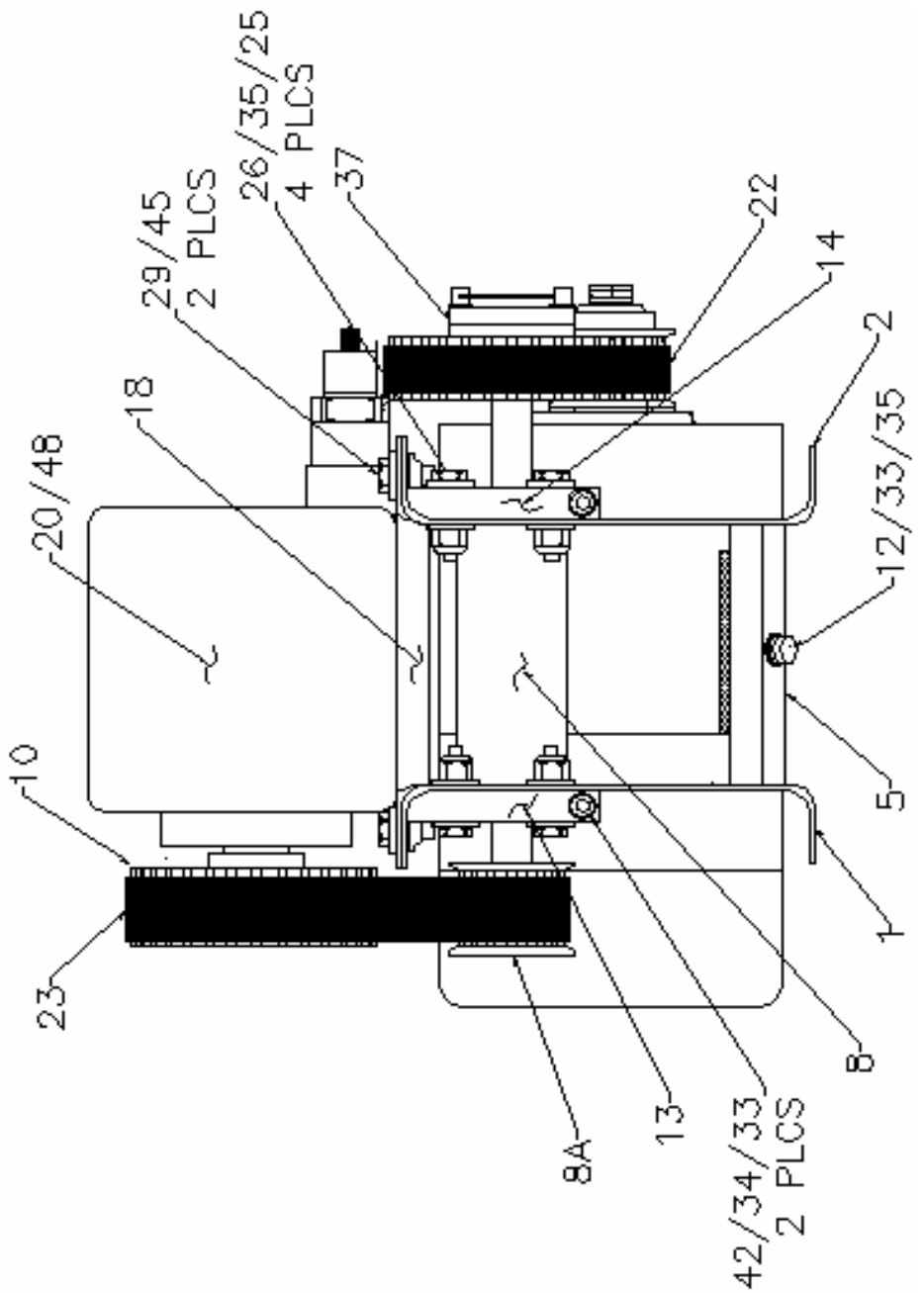

29/45
2 PLCS
26/35/25
4 PLCS
37
22
14
2
18
20/48
12/33/35
10
5
1
23
8
13
8A
42/34/33
2 PLCS

FIG. 3

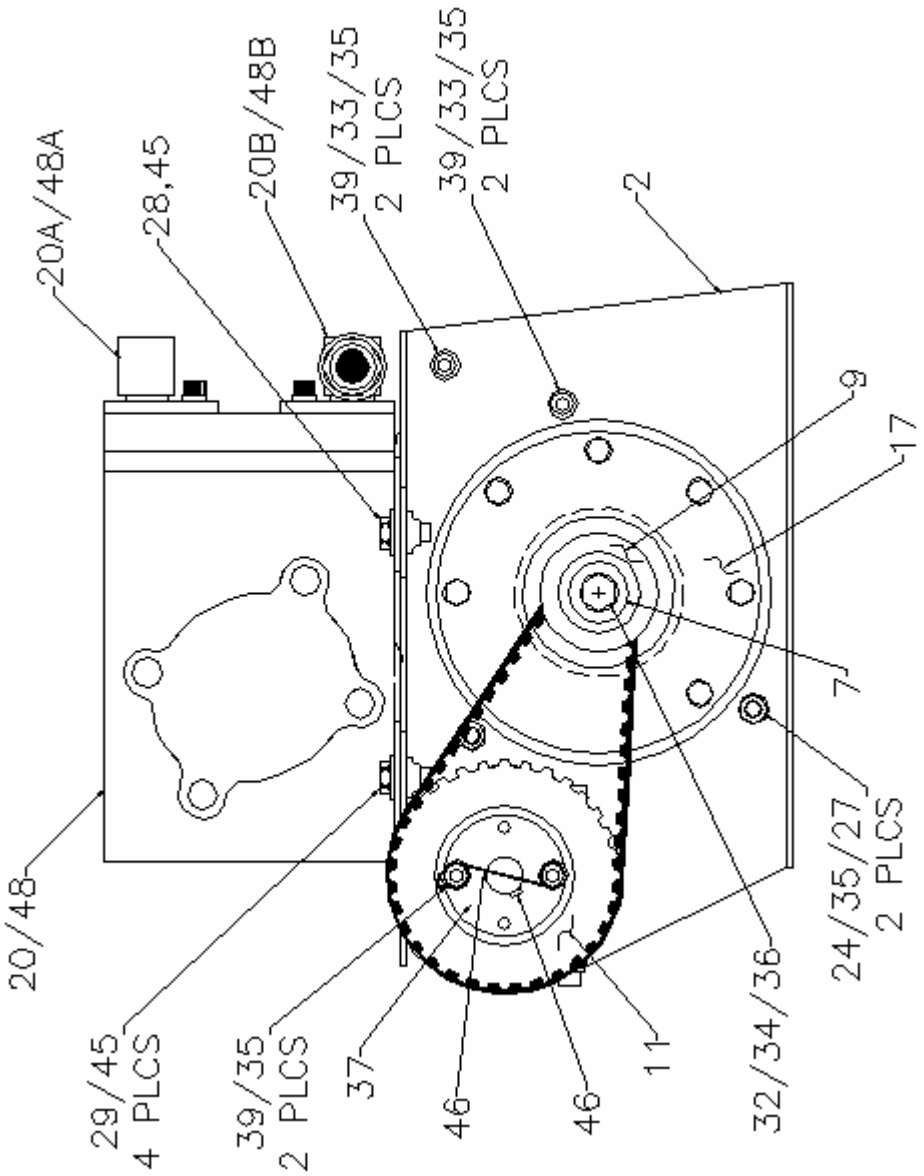
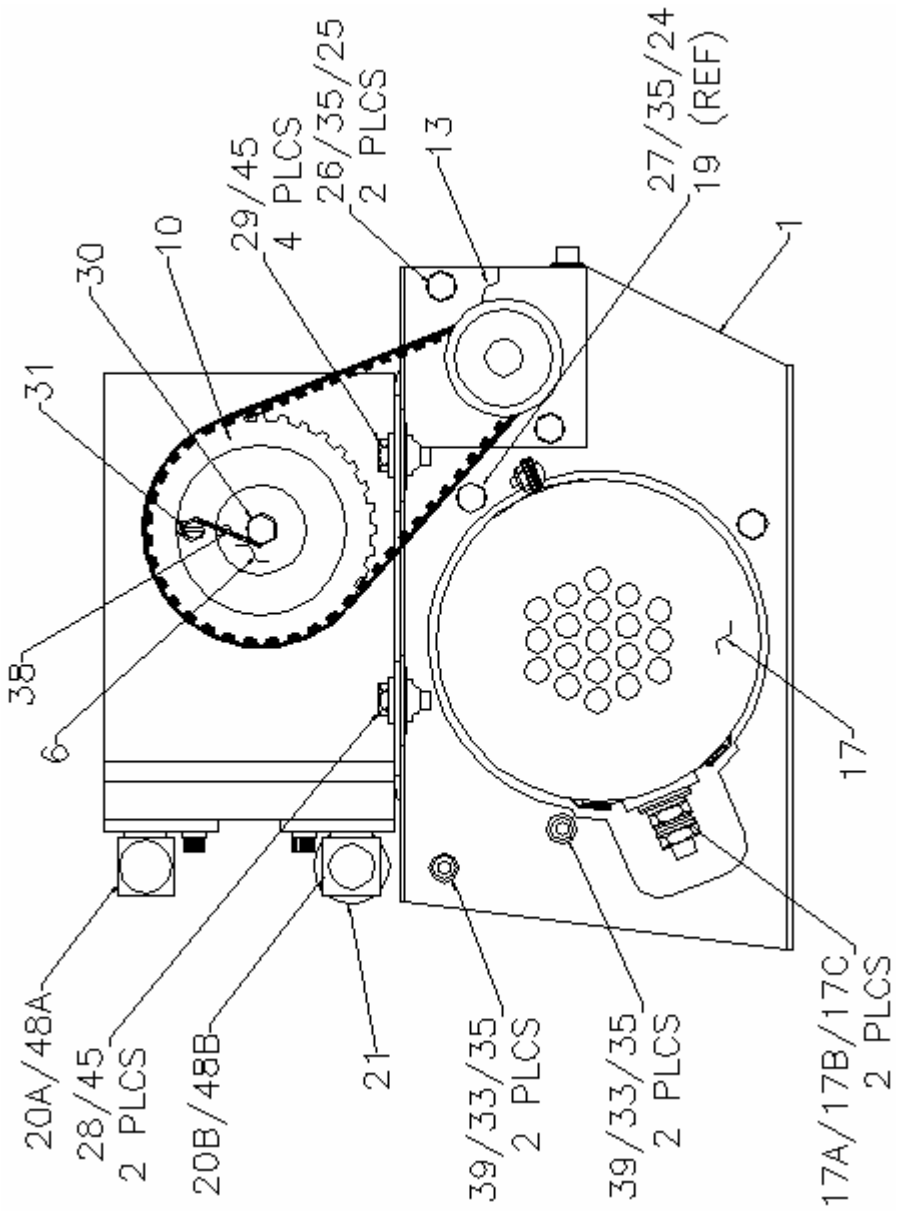

20A/48A
28,45
20B/48B
39/33/35
2 PLCS
39/33/35
2 PLCS
2
9
17
7
24/35/27
2 PLCS
20/48
29/45
4 PLCS
39/35
2 PLCS
37
46
46
7
11
32/34/36

FIG. 4


27/35/24
19 (REF)
29/45
4 PLCS
26/35/25
2 PLCS
13
1
30
10
31
38
6
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28/45
2 PLCS
20B/48B
21
39/33/35
2 PLCS
39/33/35
2 PLCS
17A/17B/17C
2 PLCS

FIG. 5

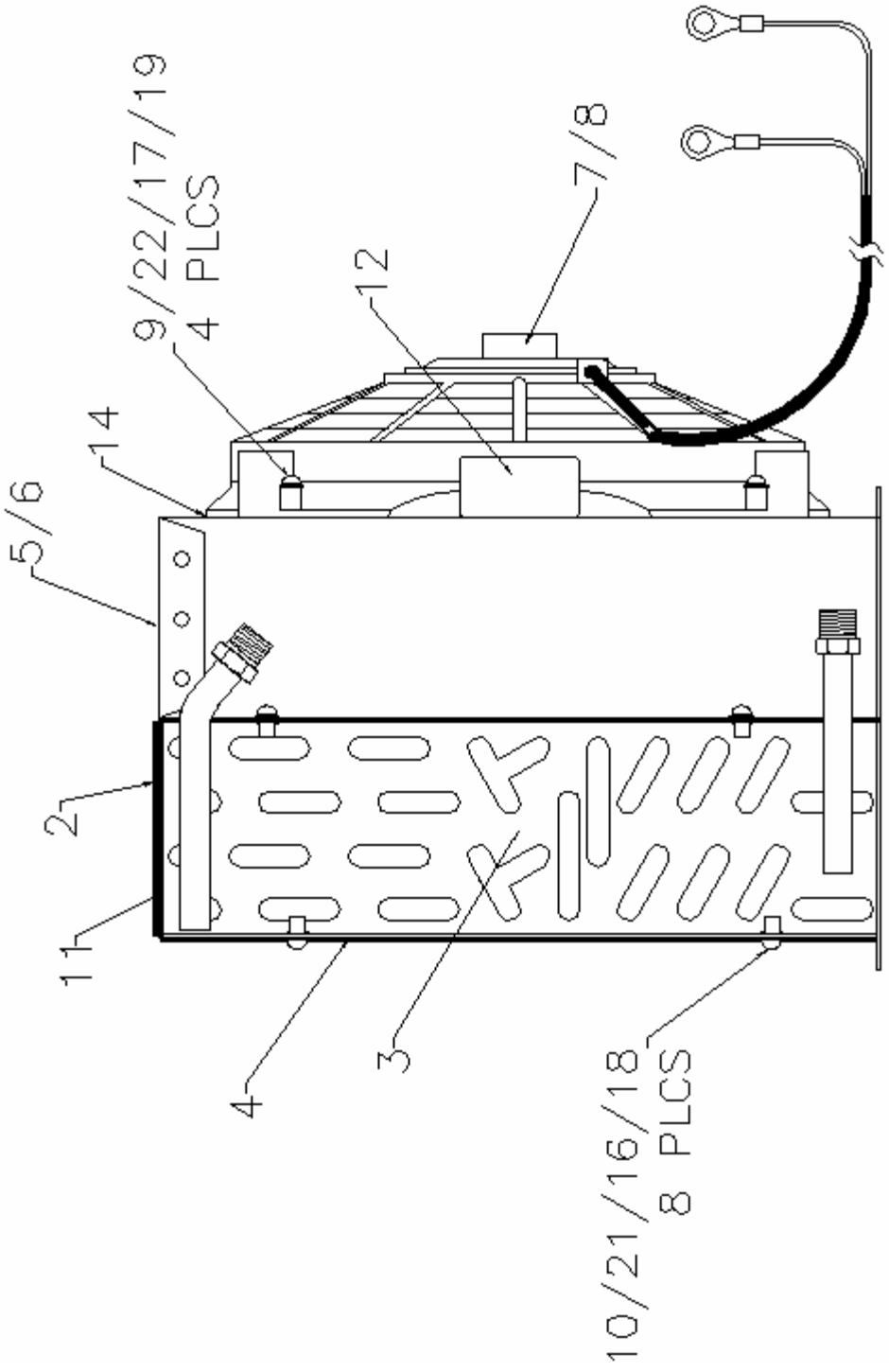

FIG. 6

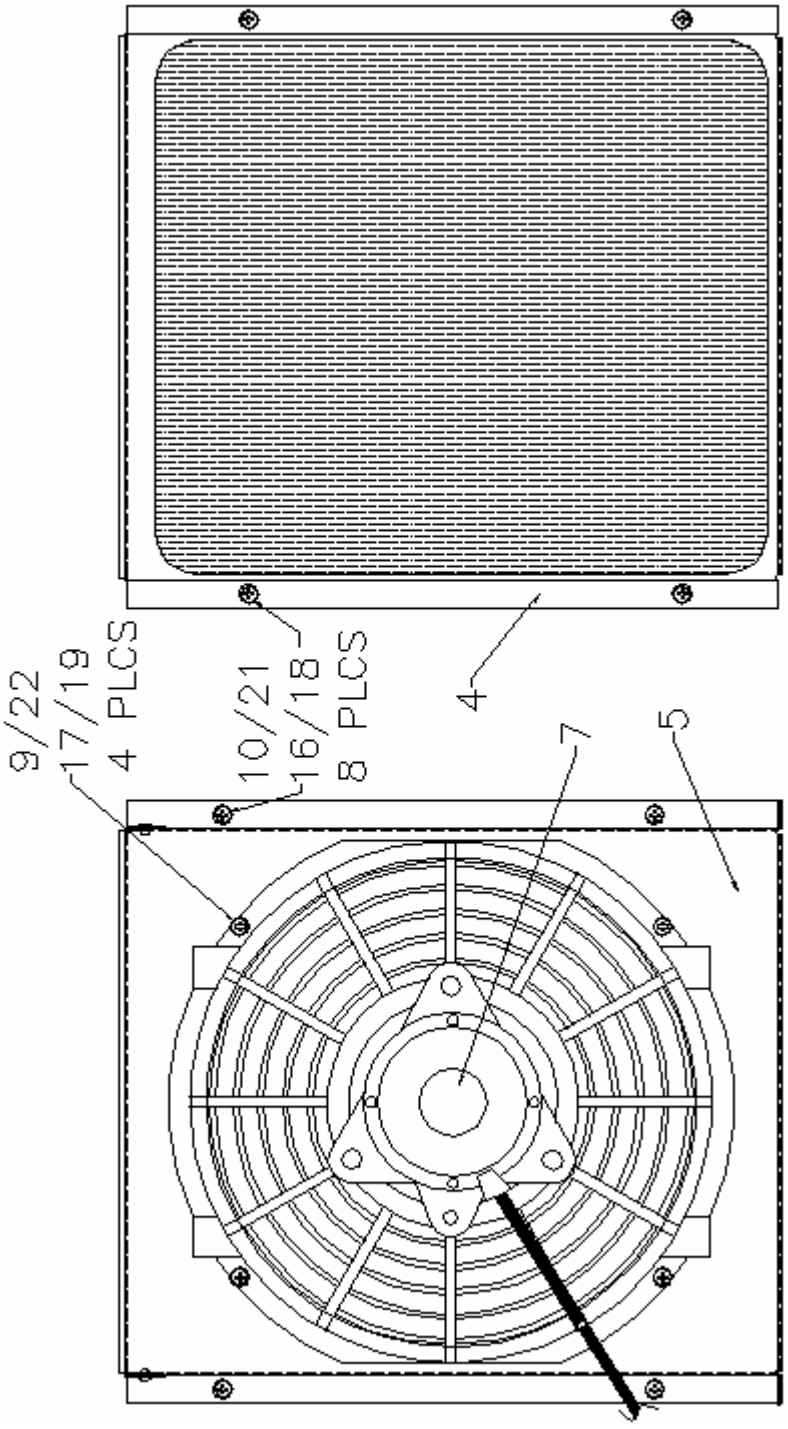

FIG. 7

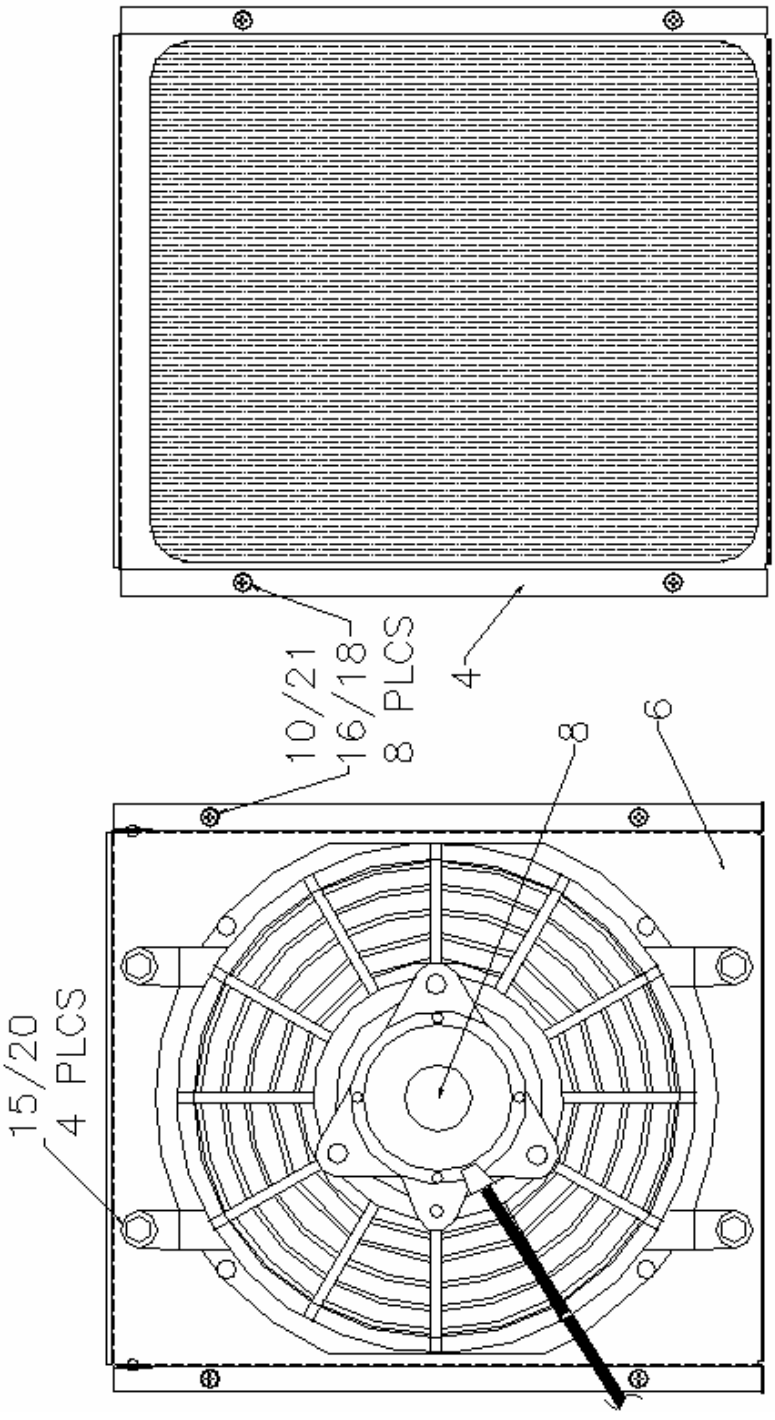

FIG. 8

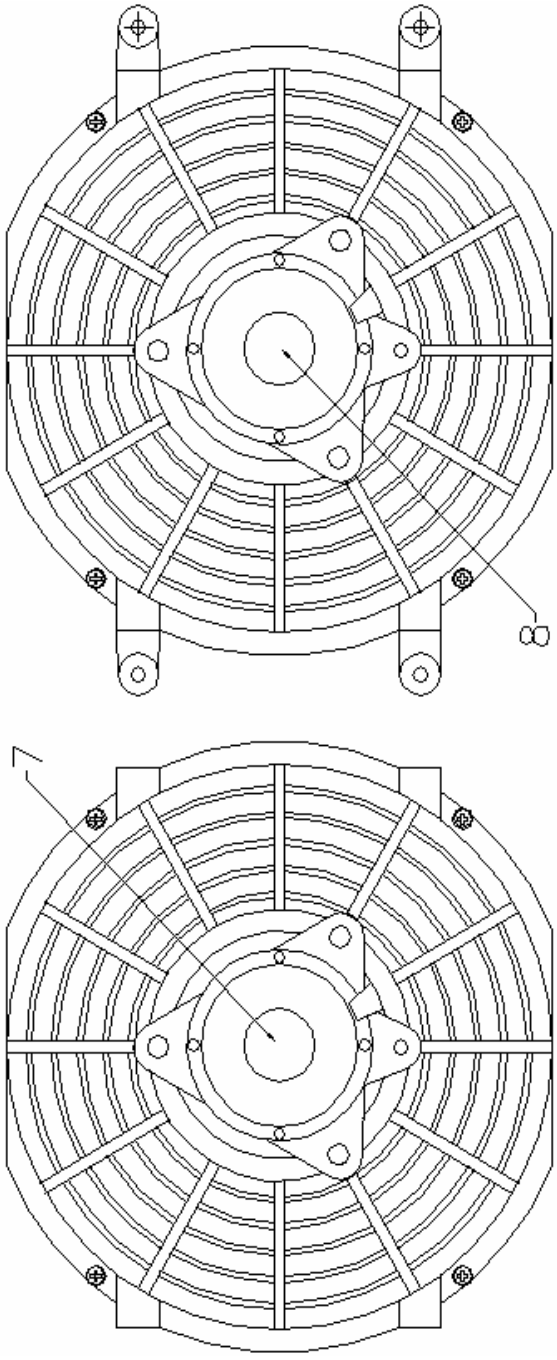

FIG. 9