DEPARTMENT OF THE ARMY TECHNICAL MANUAL

TECHNICAL MANUAL

DIRECT SUPPORT AND GENERAL SUPPORT

MAINTENANCE MANUAL

POWER PLANT, UTILITY, GAS

TURBINE ENGINE DRIVEN

(LIBBY WELDING CO. MODEL LPU-71)

FSN 6115-165-3842

This copy is a reprint which includes current pages from Changes 1

HEADQUARTERS, DEPARTMENT OF THE ARMY

JUNE 1972

WARNING

Take particular heed to specific warnings and cautions throughout this manual.

HIGH VOLTAGE
is used in the operation of this equipment.

DEATH

or severe burns may result if personnel fail to observe safety precautions. Do not operate this equipment until the ground terminal has been connected to a suitable ground. Disconnect the battery negative cable before removing or installing components in any electrical pane or system.

Before servicing or repairing any part of the power plant, be sure that it is not connected to another power plant that is operating. Do not service the power plant while it is connected for standby operation Ground the ignition plug or ignition unit before removal by grounding the high tension lead contact spring to the ignition immediately upon removal of the lead.

HIGH SPEED ROTATION AND HIGH FREQUENCY NOISE
are present during operation of this equipment.

DEATH

or severe injury or loss of hearing may result if personnel fail to observe safety precautions. During unit starting, operation, or testing stand clear of the sides of the engine. Extreme care must be exercised to prevent debris or other foreign material from entering the air inlet. Turbine or compressor failure induced by foreign material entering the unit may be sufficiently violent to cause severe damage to internal components with possible danger to personnel in the immediate area. Operators working ii the area of equipment generating high frequency noises will be required to wear ear plugs to prevent permanent damage to hearing. Safety or medical officer will provide examination requirements an, federal stock number for ear plugs and ear protectors.

DANGEROUS GASES AND EXTREME HEAT
are generated as a result of operating this equipment.

DEATH

or severe injury may occur if personnel fail to observe safety precautions. Stay clear of exhaust opening during operation of the power plant. Allow exhaust and heat exchanger components to cool before al tempting maintenance on or near them. Extreme exhaust heat is generated by the gas turbine engine Do not operate power plant in enclosed area unless adequate ventilation of exhaust gases is provided Exhaust discharge contains noxious and deadly fumes. Do not smoke or use open flame in vicinity when servicing batteries. Batteries generate explosive gas during charging. Some solvents used for cleaning of components during repair are toxic and shall be used only in well ventilated areas. Observe specific warnings in this manual

LIQUIDS AND GASES UNDER PRESSURE
are generated as a result of operation of this equipment.

INJURY

may result if personnel fail to observe safety precautions. Keep hands and other exposed areas of the body away from any malfunction of plumbing in refrigeration system, hot water system, bleed air system, and lubrication system. Wear protective gloves and other clothing when handling heater components or servicing refrigeration as directed by specific warnings in this manual.

CHANGE

No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC *2 August 1974*

Direct Support and General Support Maintenance Manual

POWER PLANT, UTILITY; GAS TURBINE ENGINE DRIVEN (LIBBY WELDING CO. MODEL LPU-71)
FSN 6115-937-0929 (NON-WINTERIZED)
FSN 6115-134-0825 (WINTERIZED)

TM 5-6115-586-34, 15 June 1972, is changed as follows:

The title is changed as shown above.
Page 2 of cover: Add to Warnings:

Cleaning solvent, PD-680, used for cleaning, is POTENTIALLY DANGEROUS CHEMICAL. Do not use near open flame. Flash point of solvent is 100° - 138°F. (38° - 59°C.).

Page 1-1, paragraph 1-3, lines 5 through 8 are changed to: Commander, US Army Troop Support Command, ATTN: AMSTS-MPP, 4300 Goodfellow Boulevard, St. Louis, MO 63120.

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

To be distributed in accordance with DA Form 12-25A (qty rqr block No. 639) Direct and General Support Maintenance requirements for MUST System.

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DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *15 June 1972*.

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

POWER PLANT, UTILITY: GAS TURBINE ENGINE DRIVEN

LIBBY WELDING CO. MODEL LPU-71

FSN 6115-165-3842

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual contains instructions for the use of direct support and general support maintenance personnel maintaining the power plant, utility, gas turbine engine driven, Libby Model LPU-71, Type A, as allocated by the Maintenance Allocation Chart. It provides information on the maintenance of the equipment which is beyond the scope of the tools, equipment, personnel or supplies normally available to operator and organizational level maintenance personnel.

b. Appendix A contains a list of publications applicable to this manual.

1-2. Forms and Records

Maintenance forms and records and reports which are to be used by maintenance personnel at all maintenance levels are listed in and prescribed by TM 38-750.

1-3. Reporting of Errors

Report of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 Recommended Changes to Publications, and forwarded direct to the Commanding General, U. S. Army Mobility Equipment Command, ATTN: AMSME-MP, 4300 Goodfellow Boulevard, St. Louis, Mo. 63120.

Section II. DESCRIPTION AND DATA

1-4. Description

A description of the power plant, its major components and systems, and its accessory components is provided in TM 5-6115-586-12. Detailed description of specific components and assemblies is contained in the repair instruction chapters in this manual.

1-5. Differences Between Models

This manual covers only Libby Welding Company Power Plant Model LPU-71. There are no differences between units of this model.

1-6. Tabulated Data

a. General. This paragraph provides tabulated data in addition to that supplied in TM 5-6115586-12. This additional data is provided for the use of direct support and general support maintenance personnel.

b. Gas Turbine Engine Classification and Rating.

Acceleration time (start to governed speed)	60 seconds (max)
Compressor type	Two-stage centrifugal
Inlet air temperature	130° F (54° C) (max)
Combustion chanber type	Single reverse flow tube
Igniter plug type	Air gap
Reduction gearing	Spur
Starter motor duty cycle	One minute on, one minute off or five starts in ten minutes
Output shaft speed	6000 rpm
Turbine wheel speed (full load)	40,700 +/- 100 rpm
Governor type	Knife-edge centrifugal
Exhaust gas temperature (full load continuous operations	1225°F (663° C)
Operating oil pressure	90 +/- 10 psig
Electrical system	24 vdc

c. Starter Assembly Classification and Rating.

Horsepower	1.5 (rated)
Operating voltage	24 vdc (rated)
Direction of rotation (viewing end of shaft)	Counterclockwise
Weight	14.9 lb (approx)
No load overspeed test:	
Voltage	27.5 vdc
Current	50 amps (max)
Speed	18,000 to 25,000 rpm
Rated *load test:	
Voltage	27.5 vdc
Current	135 amps (max)
Torque	300 ounce-inches
Speed	4500 to 5500 rpm

d. Starter Assembly Repair and Replacement Standards.

Armature end play	0.008 to 0.010 inch
Shaft seal leakage	10 cubic inches per hour (max)
Special repair compounds and materials:	
Remove minor nicks, scratches or burrs	Abrasive paper (Federal Specification P-P-101, No. 600 Grit)
Outside motor finish removal	Abrasive Paper (Federal Specification P-P-101, No.320 Grit)
Refinish motor exterior	Primer (Cati-Coat No.E42GP15 and Catalyst V77KP15) then one coat of enamel (Cati-Coat No.F55BP15 and Catalyst V66KP15, SherwinWilliams Co., Cleveland, Ohio, or equivalent; no known government specification)

Seal nameplate	Zinc chromate primer (Military Specification MIL P-8585)
Special assembly compounds and materials:	
Lubricate plates, rings, retainer	Lubricating oil (Military Specification MIL-L-7808)

e. Starter Assembly Nut and Bolt Torque Data.

Starter clutch slip torque	135 to 145 inch-pounds

f. Fuel Control Assembly Classification and Rating.

Governor type	Isochronous
Pump type	Gear
Lubrication	Fuel
Acceleration limiter valve cracking pressure	44 to 46 psi

g. Fuel Control Repair and Replacement Standards.

Leakage allowable	None
Special repair compounds and materials:	
Magnetic particle inspect, shaft, gearshaft	Military Specification MIL-I-6868
Repair minor nicks, scratches or burrs in non-critical areas	Abrasive paper (Federal Specification P-P-101, No. 600 Grit) or fine stone (Federal Specification AF-3-JB)

h. Fuel Control Unit Nut and Bolt Torque Data.

Screw to secure cover to housing	40 to 60 inch-pounds
Nut to secure fitting to housing	100 to 110 inch-pounds

i. Fuel Shutoff Solenoid Valve Classification and Rating.

Valve actuator	Electromagnet
Normal valve position	Closed
Operating pressure	0 to 1000 psig
Operating voltage	11 to 30 vdc
Operating current	1.0 amp (max) at 28 vdc
Drop out voltage	4 vdc (mini
Flow	500 phr (pounds per hour) (max)
Pressure drop across valve at 120 phr (pounds per hour) flow	4 psig (max)
Weight	0.3 lb

j. Fuel Shutoff Solenoid Valve Repair and Replacement Standards.

Valve leakage at 300 psig fluid pressure	0.5 cc (cubic centimeters) per
Valve leakage at 1000 psighour (max) fluid pressure	1.0 cc per hour (max)
Operating voltage at 100 -.3 psig fluid pressure	7.2 vdc (min)
Operating voltage at 300 +/- 3 psig fluid pressure	9.0 vdc (min)

k. Ignition Unit Classification and Rating.

Type.	High voltage, capacitor discharge
Enclosure	Hermetically sealed
Operating input voltage	10 to 30 vdc
Input current	4.5 amperes (max)
Output voltage	18,000 vdc (nom)
Stored energy	4.3 joules per spark
Weight	3.5 lb

l. Ignition Unit 'Repair and Replacement Standards.

Spark rate at 10 volts inputOne spark per second (mini	

m. Low Oil Pressure Switch Classification and Rating.

Switch type	Two single pole double thro switches with no internal ground
Actuator	Adjustable diaphragm
Current capacity	4 amperes at 14 to 29 vdc
Proof pressure	.250 psig
Operating pressure:	
Actuation	65 psig
Deactuation (decreasing pressure)	55-3 psig

n. Dual Pad Gearcase Repair and Replacement Standards.

Magnetic particle inspect nuts	Military Specification MIL-I-6868
Special repair compounds and materials:	
Remove burrs, scratches, nicks	Abrasive cloth (Federal Specification P-C-451 or P-C-458)
Treat aluminum parts after corrosion removal	Turco Prepaint (Turco Products, Inc., Los Angeles, California, or equivalent; no known government specification) or Brush Alodine (American Chemical Paint Co., Ambler, Penn.or equivalent; no known
Reanodize aluminum parts as required	Military Specification MIL-A 8625
Strip paint	Kestrip "E" (Kelite Products Los Angeles, California, equivalent; no known government specification
Prime parts to be painted	Primer (Military Specificatior MIL-P-8585)
Paint parts	Black enamel (Military Specification MIL-E-5557 Type II)
Special assembly compounds and materials:	
Coat sealing bore of retainer	Cement (Glyptal, No. 127 General Electric Co., Schenectady, New York, equivalent; no known government specification)

o. Dual Pad Accessory Torque Values.

Nut to gearshaft	145 to 15 inch-pounds
Nut to gearshaft	145 to 155 inch-pounds
Nut to gearshaft	145 to 155 inch-pounds

p. Accessory Gearcase Repair and Replacement Standards

Magnetic particle inspect, jaw	Military Specification MIL-I-6868

Special assembly compounds and materials	
Lubricate packing8agaskets at installation	Petrolatum (Federal Specification VV-P-236)

q. Accessory Gearcase Nut and Bolt Torque Values.

Screws securing retainer	15 to 20 inch-pounds

r. 400 Hz Generator Repair and Replacement Standards.

Rated voltage (line to neutral)	120 vac
Rated voltage (line to line) .	208 vac
Rated load	100 CFM @10" H2 0 cooling air 120 kva
Power factor	0.8
Phase	Three
Frequency	400 Hz
Rated speed	5700 rpm
Maximum speed for regulation	7000 rpm
Overspeed	7500 rpm
Rotation (viewing drive end) .	Counterclockwise
Bolt circle diameter	10.0 in.
Drive spline	24 teeth, 20/30 pitch, 30 degrees pressure angle
Weight	135 lbs max

s. 60 Hz Generator Repair and Replacement Standards.

Rated voltage (line to neutral	120 vac
Rated voltage (line to line) .	240 vac
Rated load	12.5 kva
Power factor	0.8
Phase	Single
Frequency	60 Hz
Rated speed	3600 rpm
Maximum speed for regulation	3600 rpm
Overspeed	4000 rpm
Rotation (viewing drive end)	Counterclockwise
Bolt circle diameter	10.0 in.
Drive spline	24 teeth, 20/30 pitch, 30 degrees pressure angle
Weight (max)	118 lbs. max.

t. Air Conditioning Compressor Replacement Standards.

Type	Two-stage centrifugal compressor, electric motordriven
Operating voltage	Three phase 115/ 200 vac at 400 Hz
Rated operating current	60 amp
Maximum operating current .	75 amp
Locked rotor current	350 amp
Rated output	25-hp at 23,300 rpm
Weight	35 lb (approx)
Special testing compounds and materials:	
Testing refrigerant and oil	Refrigerant 114 (Fed Spec BB-F-1421) and dry oil (885-20KV oil, Bray Oil Co., Los Angeles, Calif., or equivalent)

u. Recirculating Fans Repair and Replacement Standards.

Fan rotation	Counterclockwise viewing fan wheel end of fan
Duty cycle	Continuous
Operating current after 10 minutes of operation	6 amperes per phase
Operating voltage	115/200 vac, 400 Hz, 3 phase
Operating speed after 10 minutes of operation with unobstructed airflow	5700 rpm (min)
Thermal protector trip time with rotor locked	30 seconds (max)
Thermal protector reset time after trip	30 seconds (max)
Electrical connections to connector:	
Pin D (white)	Neutral
Pin A (black	Phase 1
Pin B (red)	Phase 2
Pin C (green)	Phase 3
Weight	17.15 lb (approx)
Special Repair Compounds and Materials:	
Remove minor scratches and nicks on impeller	Abrasive paper (Federal Specification P-P-101, N 400 grit)
Touch up anodic coating on reworked impeller	Anodic Coating (Military Specification MIL-A-8625 Type I)
Remove defective finish on:	
Rotor, end bell	Abrasive cloth (Federal Specification P-C-451, N 320 grit)
Refinish:	
Rotor	Enamel and Catalyst (Cati-Coat, No. F55BP; and Catalyst VV66KP17, Sherwin-Williams Co., Cleveland, Ohio or equivalent; no known government specification
Coat unpainted surfaces of:	
Rotor	Lubricant (DC5 Lube, Dow Corning Corp., Midland, Michigan, or equivalent; known government specification)
Remove cement deposits ..	Methyl-Ethyl-Ketone (Fede Specification TT-M-261)
Special assembly compounds and materials:	
Apply compound to threads of rotor shaft	Anti seize (Federal Specification JAN-A-669)
Solder electrical connections	Solder (Federal Specificat QQ-S-571, Type SN60-WRAP2)
Coat threads of screws with sealant	Sealant (Military Specificat MIL-S-22473, Class 10)
After assembly paint: end of rotor, hex hole in shaft and nut	One coat of primer (Cati-C E42GP15 and Catalyst V66K-P15 Sherwin-Williams Co., Cleveland, Ohio or equivalent; no known government specification) air dry for 1 to 30 minutes and bake a 1500 to 175¢F (66° to 79C).

v. Condenser Fans Repair and Replacement Standards.

Fan rotation	Counterclockwise viewing fan wheel end of fan
Duty cycle	Continuous
Operating current after 10 minutes of operation	15 amperes per phase
Operating voltage	115/200 vac, 400 Hz, 3 phase
Operating speed after 10 minutes of operation with unobstructed airflow	3800 rpm (min)
Thermal protector trip time with rotor locked	30 seconds (max)
Thermal protector reset time after trip	30 seconds (max)
Electrical connections to connector:	
Pin D (white)	Neutral
Pin A (green)	Phase 1
Pin B (red)	Phase 2
Pin C (black)	Phase 3
Pin E	Not used
Weight	58.0 lb (approx)
Special repair compounds and materials:	
Remove minor scratches and nicks on: impeller	Abrasive paper (Federal Specification P-P-101, No. 400 grit)
Touch up anodic coating on reworked impeller	Anodic Coating Military Specification MIL-A-8625, Type 1)

w. Condenser Replacement Standards.

Type	Refrigerant gas to air
Special cleaning compounds and materials:	
Kerosene	Federal Specification VV-K-211
Trichlorethylene	Military Specification MIL-T-7003

x. Evaporator Replacement Standards.

Type	Air to refrigerant gas
Special cleaning compound and materials:	
Kerosene	Federal Specification V V-K-211
Trichlorethylene	Military Specification MIL-T-7003

y. Receiver Repair and Replacement Standards:

Capacity	30 lb. refrigerant
Working pressure	110 psig (nom)
Working pressure	165 psig (max)
Weight	3.8 lb.(approx)
Special cleaning compounds and materials:	
Kerosene	Federal Specification VV-K-211
Trichlorethylene	Military Specification MIL-T-7003
Special repair compounds and materials:	
Brazing alloy	Military Specification MIL-B-20148
Welding	Military Specification MIL-W-6858
Primer	(Cati-Coat No. 42GP15, Sherwin Williams Co., Cleveland, Ohio or equivalent; no known government specification)
Enamel	Military Specification MIL-E-5558 Type II
Catalyst	(Cati-Coat No. V66KP15, Sherwin-Williams Co., Cleveland, Ohio or equivalent; no known government specification)

z. Cold Water Pump Replacement Standards

Power	190 Watts (nom) 270 Watts (max)
Voltage	115/200 vac, 400 Hz, 3 Phase
Flowrate	9 gpm
Pressure rise	30 psi (nom) 25 psi (min)
Length	6.9 Inches
Width	4.38 Inches
Weight	4.63 lb
Speed	11,500 rpm
Duty rating	Continuous

aa. Hot Water Pump Replacement Standards.

Power	190 Watts (nom) 270 Watts (maxi
Voltage	200 vac, 400 Hz, 3 Phase
Flow rate	6 gpm
Pressure rise	23 psi (nom) 22 psi (im)
Length	7.55 in. (Electrical connecto extends approximately 0. in. beyond motor pump)
Diameter	2.50 in. (Discharge nozzle extends 0.50 in. beyond motor pump
Weight	2.6 lb maximum
Speed	11,500 rpm
Duty rating	Continuous

ab. Repair and Replacement Standards. Table 1I li manufacturer's sizes, tolerances, desired clearances, a maximum allowable wear and clearances.

Table 1-1. Repair and Replacement Standards

Component	Manufacturer's dimensions and tolerances in inches		Desired clearance		Maximum allowable wear and clearance
	Maximum	Minimum	Maximum	Minimum	
Fan, recirculating (fig. 6-7)					
Rotor (26) diameter of stack assembly	2.975	2.976			0.000
Rotor (26) shaft bearing surfaces	0.6691	0.6694			0.0004
End bell (23, 24) bearing bore	1.5750	1.5754			0 0000
Impeller (20), bore	0.6693	0.6698			
Rotor (26) in stator (28)			0.024	0.026	
Bearing (25) in end bell (23, 24)			0.0002	0.0009	
Bearing (25) on rotor (26) shaft			Press fit of 0.0003	Loose fit of 0.0002	
Impeller (20) on rotor shaft (26)			Press fit of 0.0001	Loose fit of 0.0007	
Clearance gap between end bell (23, 24) and end of rotor (26) shaft			0.055	0.065	
Fan, condenser (fig. 6-15)					
Rotor (241 diameter of stack assembly	5.970	5.972			0.000
Rotor (24) shaft bearing surfaces	0.7872	0.7875			0.0004
End bell (16), bearing bore	1.8505	1.8510			0.0000
Housing (25), bearing bore	1.8505	1.8510			0.0000
Impeller (22) bore	0.7874	0.7879			0.0000
Rotor (24) in stator (27)			0.0280	0.0315	
Bearing (23) in end bell (16) or housing (25), bore			0.0001	0.0006	
Bearing (23) on rotor (24) shaft			Press fit of 0.0002	Loose fit of 0.0003	
Impeller (22), on rotor (24) shaft			Press fit of 0.0001	Loose fit of 0.0007	
Clearance gap between end bell (16) and end of rotor (24), shaft			0.80	0.84	

ac. Engine Electrical System Schematic. See TM 5-6115-586-12.

ad. Power Plant Electrical System Schematic. See TM 5-6115-586-12.

ae. Instrument Panel Wiring Diagram. See TM 5-6115-586-12.

af. Engine and Skid Wiring Diagram. See TM 56115-586-12.

ag. Water System Wiring Diagram. See TM 56115-526-12.

CHAPTER 2

DIRECT SUPPORT AND GENERAL SUPPORTMAINTENANCE INSTRUCTIONS

Section I. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT

2-1. Special Tools and Equipment

The special tools and equipment required to perform direct support and general support maintenance on the power plant are listed in table 2-1 below and in the Maintenance Allocation chart, Appendix B of TM 5-6115-586-12. Paragraph references and illustrations indicating the use of special tools and equipment are listed in table 2-1.

2-2. Maintenance Repair Parts.

Repair parts, special tools, test and support equipment are listed and illustrated in TM, 5-6115586-34P.

Table 2-1. Special Tools and Equipment

Item	FSN or part number	References		Use
Stand, portable, gas turbine engine	4910-758-6189		2-12*b*	Support gas turbine during assembly, disassembly, and functional testing.
Analyzer, engine, gas turbine	4920-778-6091		2-4*a*	Monitor operation of the gas turbine engine.
Cable assembly, special purpose, electrical, branched	4940-182-4499		2-4*a*	Connect analyzer to electrical harness of the gas turbine engine.
Wrench, spanner	5120-793-0701		3-17,3-19	Removal and installation of accessory output shaft nut.
Adapter, wrench	5120-608-6794		3-17,3-19	Hold output shaft during removal or installation of output shaft nut.
Sling, beam type, adjustable	1730-115-3189	2-12*b*		Lifting gas turbine unit.
Mount, gas turbine engine	1730-015-8005	2-12*b*		Adapt one side mount of the gas turbine unit to the maintenance stand.
Mount, gas turbine engine	1730-015-8002	2-12*b*		Adapt one side mount of the gas turbine unit to the maintenance stand.
Adapter, maintenance stand	4920-118-0346	2-12*b*		Support accessory end of gas turbine unit in maintenance stand.
Dolly set, utility package, transporting	285186-1-1 (99193)			Transport power plant to and from various locations.
Wrench, spanner	5120-320-9613		3-23,3-25	Removal or installation of tailpipe.
Driver, seal	5120-525-8557		3-17,3-19	Installation of output shaft seal in retainer.
Driver, seal	5120-733-7113		3-17,3-19	Installation of oil pump drive shaft seal in accessory case.
Puller, mechanical seal	5120-608-8239		3-17,3-19	Removal of oil pump drive shaft seal.
Screwdriver and wrench assembly	5120-668-6122		3-6	Adjusting fuel control unit.
Adapter, fuel atomizer	4920-924-1196		3-7*e*	Adapt fuel atomizer to tester during testing.
Service kit, refrigeration	4130-400-2150	2-1 thru 2-4	2-4b, 6-5b, 6-6*b*, 6-7*e*	Service and check refrigeration system.
Fixture, end play measuring	905128-1-1 (99193)	6-14,6-22	6-8*d*, 6-9*d*	Measure end play in armature of motor driven fan.
Wrench, torque, holding fixture	5120-178-0057	6-8	6-8	Hold impeller of motor-driven fan while impeller shaft nut is tightened.
Fixture, bearing press	272166 (99193)	6-13,6-21	6-8,6-9	Holds and aligns fan rotor shaft while pressing bearing onto shaft.
Wrench, torque, holding fixture	5120-178-0070	6-16	6-9	Hold motor-driven fan shaft while tightening shaft nut.
Holder, clutch torquing	4920-336-0648	3-7	3-5*f*	Adjustment of starter clutch torque.
Adapter, torque wrench	5120-608-4756	3-7	3-5*f*	Adjustment of starter clutch torque.
Plate, end seal	268129(99193)	6-3	6-5	Seal inlet ports of refrigerant condenser during leakage tests.

Table 2-1. Special Tools and Equipment-Continued

Item	FSN or part number	References		Use
Plate, end seal	905137-1(99193)	6-3	6-5	Seal inlet to refrigerant condenser during leakage tests.
Plate, Adapter flange	268128(99193)	6-4	6-6	Seal port of evaporator during leakage tests.
Plate, end seal	268129-1(99193)	6-6	6-7	Seal inlet and outlet of refrigerant receiver during leakage tests.
Wire twister, plier	5120-305-2306		2-9a	Facilitate lock wiring of various fasteners and electrical connectors.

Section II. TROUBLESHOOTING

2-3. General

a. This section provides information useful in diagnosing and correcting' unsatisfactory operation or failure of the power plant and its components. Malfunctions which may occur are listed in table 22. Each malfunction stated is followed by a list of probable causes of the trouble. The corrective action recommended is described opposite the probable cause.

b. Information concerning the use of special test equipment as an aid to troubleshooting is provided in paragraph 2-4 of this section.

Table 2-2. Troubleshooting

Malfunction	Probable Cause	Corrective Action
1. Fuel boost pump motor assembly fails to operate (batteries charged)	*a.* Defective fuel boost pump motor assembly.	*a.* Check that 24 VDC is present at fuel boost pump connector P35. If 24 VDC is present, repair or replace pump (para 4-4); if voltage is not present, continue to step *b*.
	b. Defective wire harness assembly.	*b.* Test wire harness assemblies (para 5-3, 5-26, 5-24, 5-33, and 5-34).
2. Starter motor runs but does not rotate engine.	Defective starter motor clutch.	Repair or replace clutch (para 3-5).
3. Engine stops motoring when master switch is released from START to RUN position.	No-fuel relay (K44) defective.	Replace relay K44 (para 5-33).
4. Engine motors but combustion does not occur.	*a.* Low oil or depleted fuel supply.	*a.* Service power plant as required. (see TM 5-6115-586-12.)
	b. Fuel filter clogged or defective.	*b.* Clean, repair, or replace fuel filters (para 3-3, 10-8 through 10-12).
	c. Fuel control assembly failed.	*c.* Repair or replace fuel control assembly (para 3-6).
	d. Fuel solenoid failed.	*d.* Replace fuel solenoid (para 3-6).
	e. Oil pressure sequencing switch failed.	*e.* Replace oil pressure sequencing switch. (see TM 5-6115-586-12).
	f. Fuel atomizer screen obstructed.	*f.* Clean or replace screen (para 3-7).
5. Engine starts but will not accelerate to governed speed or accelerates too slowly.	*a.* Control air lines leaking.	*a.* Tighten or repair control air line fittings (para 3-3).
	b. Fuel control pump assembly failed.	*b.* Repair fuel control pump (para 3-6).
	c. Fuel atomizer flow divider sticking closed.	*c.* Repair fuel atomizer (para 3-71.
	d. Acceleration limiter supply orifice plugged.	*d.* Remove and clean orificed fitting (para 3-6).
6. Engine lacks ability to carry load.	*a.* Fuel filter partially clogged.	*a.* Replace filter elements as required (para 3-3, 10-8 through 10-12).
	b. Control air lines leaking.	*b.* Tighten control air lines fittings (para 3-3).
	c. Fuel control failed.	*c.* Repair or replace fuel control (para 3-6).
7. Oil leaks from vent orifice of dual pad gear box.	Gearbox has positive pressure because of pump failure.	Replace pump assembly on dual pad gear box (para 3-11 through 3-13).
8. 60 Hz frequency meter out of limits.	Defective meter.	Test meter and if faulty, replace meter (para 5-26).
9. DC ammeter out of limits.	Improper adjustment.	Center zero adjustment (para 5-26).
10. DC ammeter does not indicate.	*a.* Damaged shunt.	*a.* Replace shunt (para 5-35).
	b. Meter open.	*b.* Replace ammeter (para 5-26).
11. Exhaust gas temperature meter does not indicate.	*a.* Open exhaust gas temperature thermocouple.	*a.* Replace thermocouple (see TM 5-6115-586-12).
	b. Open meter.	*b.* Replace exhaust gas temperature meter. (see TM 5-6115-586-12).
12. 60 Hz ammeter does not indicate on either leg.	Defective meter.	Replace 60 Hz ammeter (para 5-26).
13. 60 Hz ammeter does not indicate on one leg.	Open current transformer.	Replace current transformer (para 5. 26).

Table 2-2. Troubleshooting-Continued

Malfunction	Probable Cause	Corrective Action
14. 60 Hz voltmeter out of limits.	Meter out of adjustment.	Adjust meter (para 5-26).
15. 400 Hz frequency meter out of limits. (True frequency established with test instrument.)	*a.* Meter out of adjustment. *b.* Faulty frequency discrimination circuit.	*a.* Adjust meter (para 5-26). *b.* Replace 400 Hz protective panel (para p-33).
16. 400 Hz ammeter out of limits.	Meter out of adjustment.	Adjust meter (para 5-26).
17. 400 Hz ammeter does not indicate.	*a.* Open current transformer. *b.* Defective meter.	*a.* Replace current transformer (para 5-33). *b.* Replace 400 Hz ammeter (para 5-26).
18. 400 Hz voltmeter out of limits.	Meter out of adjustment.	Adjust meter (para 5-26).
19. Heating system does not operate. Fans run but load control valve does not open.	*a.* Load control valve does not have sufficient pneumatic supply. *b.* Lockout relay (K42A or K42B) failed.	*a.* Tighten fittings; check for damaged tubes or fittings; check for obstructions in supply fittings (para 3-3). *b.* Replace relay (K42A or K42B). (see TM 5-6115-586-12.)
20. Heat valves do not control. Load control valve operates satisfactorily.	*a.* Dummy plug (P93) removed. *b.* Temperature sensors (RT1, RT2, RT5, or RT6) failed. *c.* Temperature controllers (S19 or S20) failed. *d.* Heat system flow control selectors (S35) or (S36) failed.	*a.* Install plug (P93). (see TM 5-6115-586-12.) *b.* Replace defective sensor.(see TM 5-6115-586-12.) *c.* Replace switches (S19 or S20).(see TM 5-6115-586-12.) *d.* Replace selectors (S35 or S36). (see TM 5-6115-586-12.)
21. One or both cooled air systems will not actuate from panel. Main contactor operation satisfactory.	*a.* Mode select switch (S16) failed. *b.* System select switch (S15) failed. *c.* Lockout relay (K42A or 42B failed).	*a.* Replace switch (S16).(see TM 5-6115-586-12). *b.* Replace switch (S15).(see TM 5-6115-586-12.) *c.* Replace relays (K42A or K42B). (see TM 5-6115-586-12.)
22. Condenser fans do not operate.	*a.* Condenser air discharge door switches (S27 and S28) are locked open or have failed. *b.* Condenser fan contactors (K23 and K24) have failed. *c.* Circuit breakers (CB13 and CB17) failed.	*a.* Unlock switches or replace switch (S27 or S28).(see TM 5-6115-586-12.) *b.* Replace contactors (K23 or K24). (see TM 5-6115-586-12.) *c.* Replace circuit breakers (CB13 or CB17). (see TM 5-6115-586-12.)
23. Condenser fans operate but compressor does not energize.	*a.* Compressor delay relays (K17 and K18) failed. *b.* Compressor contactors (K19 or K20) failed. *c.* Compressor circuit breakers (CB14 and CB18) failed. *d.* Condenser fan interlock switches (S33 and S34) do not close. *e.* Compressor overtemperature switches (TS7 and TS8) open. *f.* Compressor overpressure switches (S17 and S18) open.	*a.* Replace relays (K17 or K18).(see TM 5-6115-586-12.) *b.* Replace contactors (K19 or K20). (see TM 5-6115-586-12.) *c.* Replace circuit breakers (CB14 and CB18). (see TM 5-6115-586-12.) *d.* Adjust attitude of switches (S33 or S34) or replace if defective. (see TM 5-6115-586-12.) *e.* Cool compressor or replace defective thermal switch (TS7 or TS8) (para 6-4). *f.* Check refrigeration system for over pressurization. Replace switches (S17 and S18) if defective (para 6-2).
24. Condenser fans and compressors operate but system does not control. (Ambient temperature is between 60° and 90° F.)	*a.* Temperature sensors (RT3, RT4) failed. *b.* Air conditioning temperature controllers (S20 and S21) failed. *c.* Remote temperature relav (K40) failed. *d.* Anti-ice relay (K41) failed. *e.* Anti-ice sensors (TS10 and TS11) failed.	*a.* Replace defective temperature sensor (para 5-23). *b.* Replace switches (S20 or S21). (see TM 5-6115-586-12.) *c.* Replace relay (K40).(see TM 5-6115-586-12.) *d.* Replace relay (K41).(see TM 5-6115-586-12.) *e.* Replace thermal sensors (TS10 or TS11) (para 5-14).

Table 2-2. Troubleshooting-Continued

Malfunction	Probable Cause	Corrective Action
25. Refrigeration system operates but does not meet cooling performance requirement. System power draw is less than normal. (Discharge conditioned air must be mixed for accurate temperature measurement.)	System low on refrigerant. (Low refrigerant level will be indicated if the conditioned air discharge (from a single part) is highly stratafied, i.e., top half may be at near ambient temperature and a thermal pulse is noted at the expansion valve.)	The refrigerant level should be above the lower receiver sight glass when operating system. Check and repair refrigerant leaks, recharge system (para 2-4b.).
26. Refrigeration system operates but does not meet cooling performance requirement. System power draw is normal.	a. Refrigeration, de-icing, or compressor bypass valves are not functioning properly.	a. Compare corresponding tubing temperature with both systems operating and replace defective valve (para.6-2).
	b. Expansion valve defective.	b. Replace expansion valve. (see TM 5-6115-586-12.)
	c. Exhaust gas entering condenser fan inlet.	c. This can occur if unit is operating under roof. Relocate unit or duct exhaust gases.
27. Refrigeration system meets cooling performance requirements but has excessive power draw.	a. Refrigeration system is overcharged. (Cooling performance will also deteriorate with a Substantial overcharge, (4 pounds or more excess.)	a. Reduce refrigerant charge (para 2-4b).
	b. Excessive compressor drag.	b. Replace defective compressor (para 6-4).
28. Hot or cold water pump panel switches (CB11 or CB12) trip and will not hold reset. (Voltage to pumps is satisfactory.	a. Pumps (B14 or B15) are seized.	a. Repeat reset several times. Rotation may be imparied by deposits in pump. Free or replace pumps (B14 or B15). (see TM 5-6115-586-12.)
	b. Pump motor failed.	b. Replace pumps (B14 or B15). (see TM 5-6115-586-12).
29. Cold water pump (B14) does not have supply voltage. (Main contactor operation satisfactory).	Defective cold water pump panel switch (CB12).	Replace pump panel switch (CB12). (see TM 5-6115-586-12.)
30. Hot water pump (B15) does not have supply voltage. (Cold water pump operating and pressure at (S11) exceeds 10 psig.)	a. Defective low pressure water switch (S11).	a. Test and if faulty, replace switch (S11) (para 8-6, 8-7).
	b. Defective hot water pump panel switch (CB11).	b. Replace switch (CB11).(see TM 5-6115-586-12.)
	c. Defective hot water pump contactor (K15).	c. Replace contactor (K15).(see TM 5-6115-586-12.)
31. Flow control valve does not open. K14 does not have supply voltage.	a. Hot water pressure switch (S11) open.	a. Check for sufficient pressure to close switch (S11). Replace defective switch (S11) (para 8-6, 8-7).
	b. Hot water temperature switch (S12) open.	b. Check that water temperature is low enough for switch (S12) or replace if defective (para 8-11).
32. Hot water temperature is out of limits.	a. Hot water temperature switch (S12) is not properly adjusted.	a. Adjust switch (S12) (clockwise to Decrease water temperature) (para 8-11).
	b. Defective hot water temperature switch (S12).	b. Replace switch (S12) (para 8-11).
	c. Defective flow control valve (K14).	c. Isolate by opening main contactor (K10), if exhaust gases continue to flow from water boiler exhaust port, replace flow control valve (K14). (see TM 5-6115-586-12).

2-4. Use of Special Troubleshooting Equipment

a. Gas Turbine Engine Analyzer. The gas turbine engine analyzer provides electrical, hydraulic and pneumatic test systems with their associated controls and instruments for functional testing of the gas turbine engine and malfunctioning components. A portable multimeter and a portable fuel pressure gauge are provided for use in

troubleshooting checks at various components on the engine. A Special Purpose Electrical Branched Cable Assembly and Analyzer Hose Kit are used to connect the test systems of the analyzer to the engine. Refer to TM 5-6115-586-12 for instructions on connecting the gas turbine engine analyzer to the power plant and the procedures to follow for performing static checks and functional tests.

b. Refrigeration System Service Unit. The refrigeration system service unit (fig. 2-1 and 2-2) is designed specifically for servicing refrigeration systems using refrigerant R114 (Fed. Spec. BB-F1421). The unit provides servicing functions for refrigeration system evacuation, dehydration and leak detection; addition of lubricant to refrigeration system; addition of refrigerant to the refrigeration system; and testing the refrigeration system. The instruments and controls are accessible behind a hinged, removable door, with the electrical and fluid schematics and operating instructions on the back of the door. The accessories, stored in the removable door of the unit, include:

(1) One leak detector.
(2) One oil servicing unit.
/3) One oil quantity test unit.
(4) One sling psychrometer.
(5) One refrigeration service wrench.
(6) One 3/4 inch vacuum hose, 10 feet long.
(7) One 3/4 inch vacuum hose, 20 feet long.
(8) One 3/8 inch charging hose, 3 feet long.
(9) One 3/8 inch charging hose, 8 feet long.
(10) Two ¼ inch charging hoses, 12 feet long.
(11) One main power cable, 20 feet long.
(12) One power output cable, 20 feet long.
(13) Four ¼ inch flare seal brass plugs.
(14) Six/8 inch flare seal brass plugs.
(15) Two 3/8 x 3/8 inch unions.
(16) Two 38 x 1/4 inch unions.
(17) One 3/8 inch cylinder adapter fitting.
(18) One cylinder adapter fitting.
(19) One ¼ inch knurled fitting.
(20) One 3/8 inch knurled fitting.
(21) Vacuum hose quick disconnects.

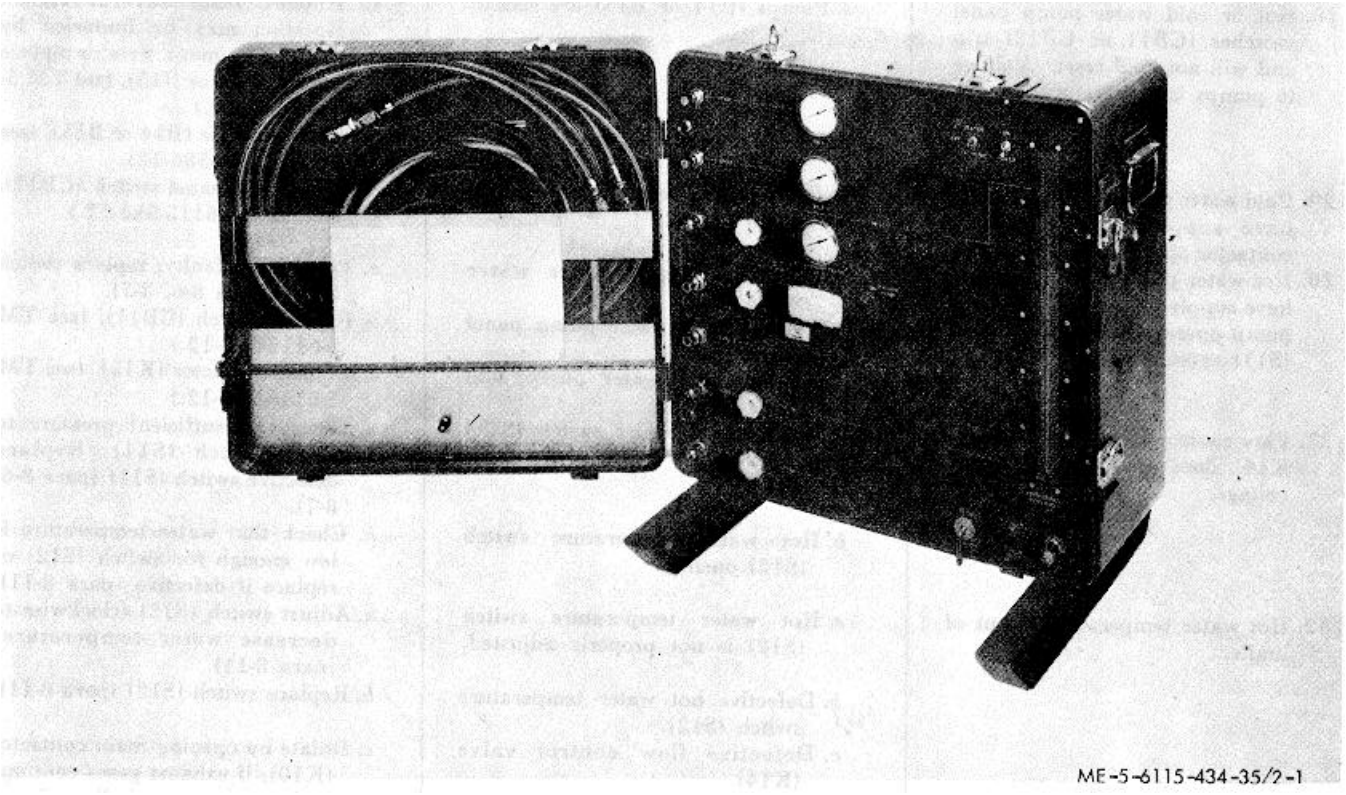


Figure 2-1. Refrigeration service unit.

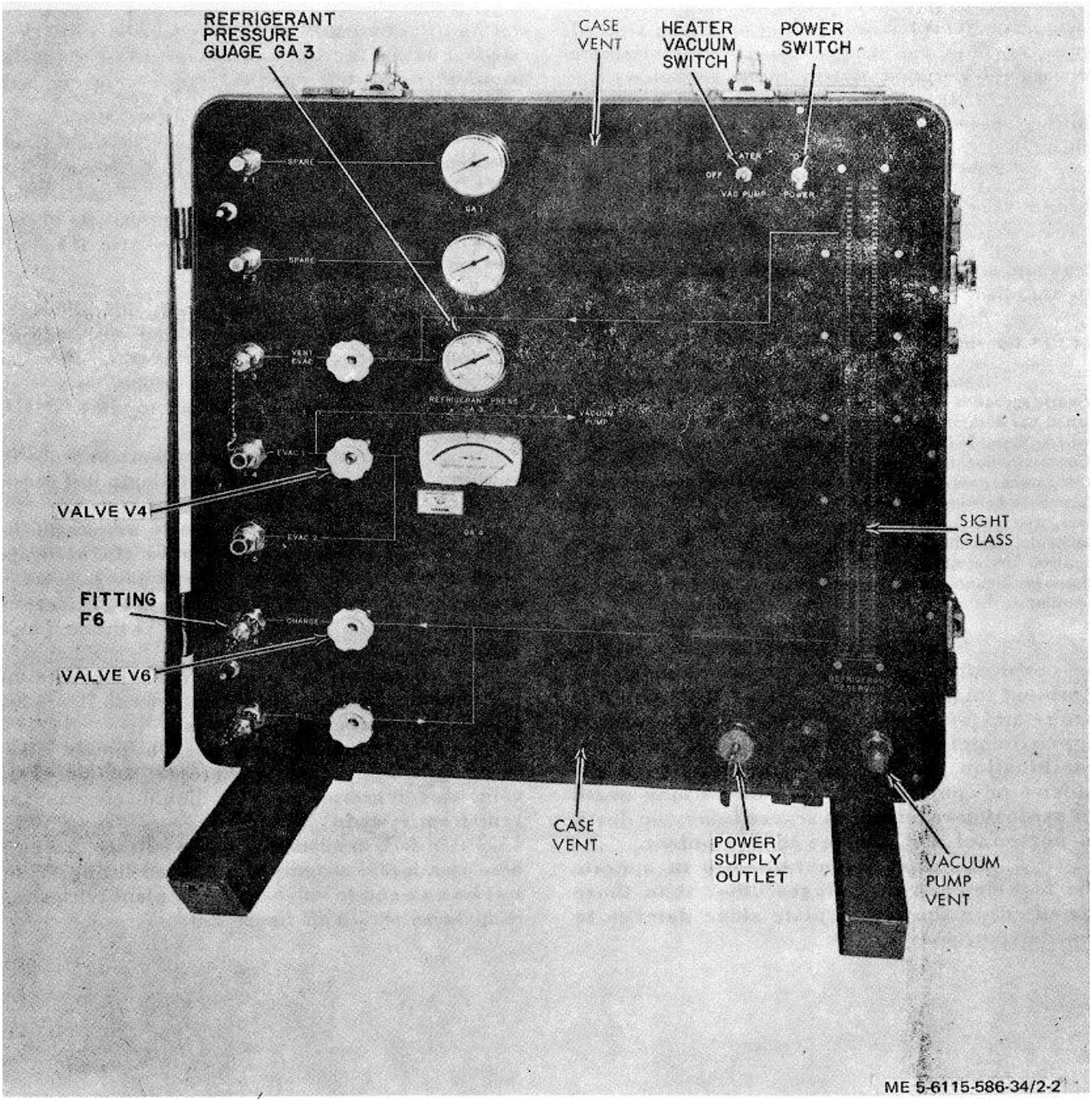


Figure 2-2. Refrigeration service unit panel details.

(a) Leak-detector. The leak detector, housed in a shock-resistant vinyl case, consists of a control unit, a probe, a six foot long, hose, and a six foot long power cord. To operate the leak-detector, refer to figure 2-2 and proceed as follows.

1. Remove cap from bulkhead fitting F1 on refrigeration service unit panel. Loosely connect one end of hose assembly to service unit bulkhead fitting Fl. Securely connect other end of hose assembly to purge valve located at power plant condenser outlet.

2. Crack purge valve to purge air from gauge assembly. When gauge and hose assembly are purged, tighten fitting F 1 and open purge valve fully.

3. If refrigeration system components are below 75° F (24° C) apply heat to refrigerant in power plant receiver and condenser to obtain 15

psig minimum pressure reading on gauge GA1. If pressure does not increase to 15 psig minimum charge refrigeration system (para (c) below).

4. If gauge GAI indicates 15 psig, or more, proceed with leak check as outlined in steps 5 through 10.

Note

Screw is for shipping and storage purposes. Replace screw after using detector.

5. Remove screw from cap on reference leak and allow 15 minutes (minimum) for leak rate to stabilize.

6. Connect power cord to power supply outlet on service unit.

Note

Contamination of the testing area may cause erratic operation of the leak-detector. Contamination can occur when the leak in the refrigeration system is very large and where there is little or no ventilation in the testing area. Contamination may also occur where excessive amounts of refrigerant gases are used. The leak-detector cannot differentiate between atmospheric contamination and a possible leak. Also, in a highly contaminated area, the flash rate will be unstable, and it will be impossible to adjust the balance control. Under these conditions leak detection would not be possible. A contaminated condition can be greatly reduced by ventilating the area or isolating the area to be checked.

Warning

Do not use leak detector in an explosive or combustible atmosphere. Ambient atmosphere is drawn through the probe and over the element which operates at approximately 1800° F (982° C). The resulting combination of high temperature and an explosive or combustible atmosphere may cause an explosion resulting in severe injury or death to personnel and damage to equipment.

Caution

Do not attempt to operate the leak-detector at voltages other than those specified on the rating plate since damage to the detector may result.

Caution

Do not place probe in a stream of refrigerant and do not blow cigarette smoke into the probe since either will drastically shorten element life.

Note

Variations in line voltage may cause erratic operation of the leak detector resulting in reactions similar to those for atmospheric contamination. If voltage variation is suspected, utilize a voltage stabilizing device. Note. If the air flow ball does not rise, tap the probe tip lightly to make sure ball is not sticking. If ball still does not rise, replace detector.

7. Check for sufficient air flow by pointing tip of probe downward and observing air flow ball in probe. If air flow is correct, air flow ball will rise and float above tip of probe.

8. Place sensitivity switch in either HIGH or LOW position.

9. Adjust flashing rate of lamp in probe by rotating balance control knob until lamp just ceases to flash.

10. Hold probe as closely as possible to the area being checked and move tip of probe approximately one inch per second along seams or joints suspected of leaking. When a leak is located, the lamp in probe will flash as long as probe is held at the leak.

(b) Evacuation procedure. To evacuate the power plant refrigeration system, refer to figure 2-3 and 2-4 and proceed as follows:

1. Open service valve on power plant refrigerant receiver and compressor suction purge valve on compressor, allowing liquid refrigerant to vent from system.

2. When venting stops, attach vacuum hose (ten feet in length) to bulkhead fitting F5 on service unit and to valve on power plant refrigerant receiver as shown in figure 2-3.

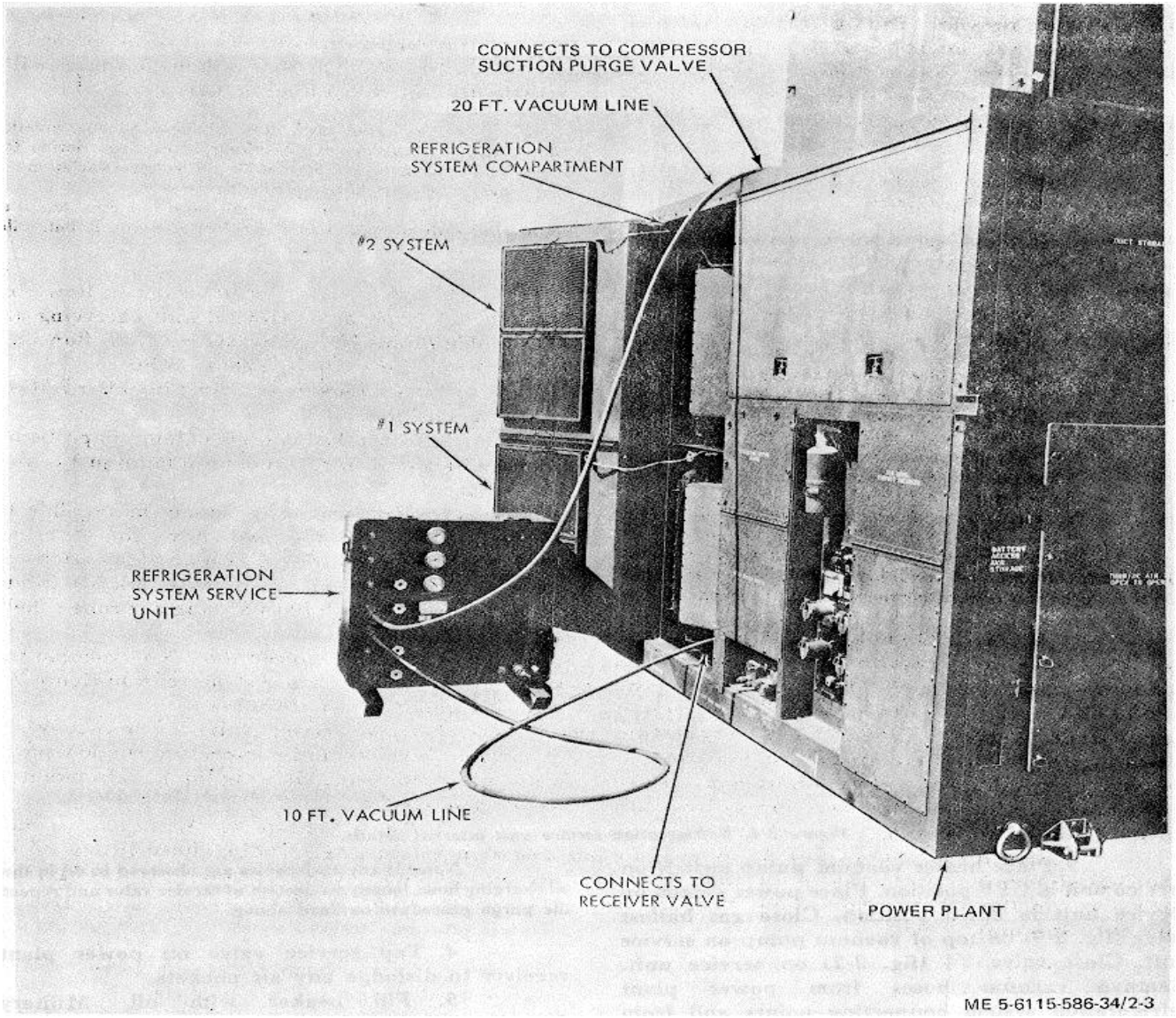


Figure 2-3. service unit connected to power plant.

3. Attach vacuum hose (20 feet in length) to fitting F4 on service unit and to power plant compressor suction purge valve.

4. Open valve V4 on service unit.

5. Open gas ballast valve (fig. 2-4) on top of vacuum pump on service unit.

6. Place power switch on service unit (fig. 2-2) in ON position and place heater vacuum pump switch on service unit in VAC PUMP position.

Note

Close valve V4 on service unit to obtain accurate measurement of pressure in refrigeration system on vacuum gauge GA4. If pressure of 200 microns of Mercury absolute cannot be obtained or held for two hours, leakage in refrigeration system is indicated. Check for leak (para (a) above 1.

7. Operate vacuum pump and evacuate refrigeration system to a pressure of 200 microns Mercury, absolute, as indicated on vacuum gauge GA4. Maintain pressure of 200 microns, or less, for a minimum of two hours.

8. Close service valve on power plant refrigerant receiver and close compressor suction purge valve on power plant compressor.

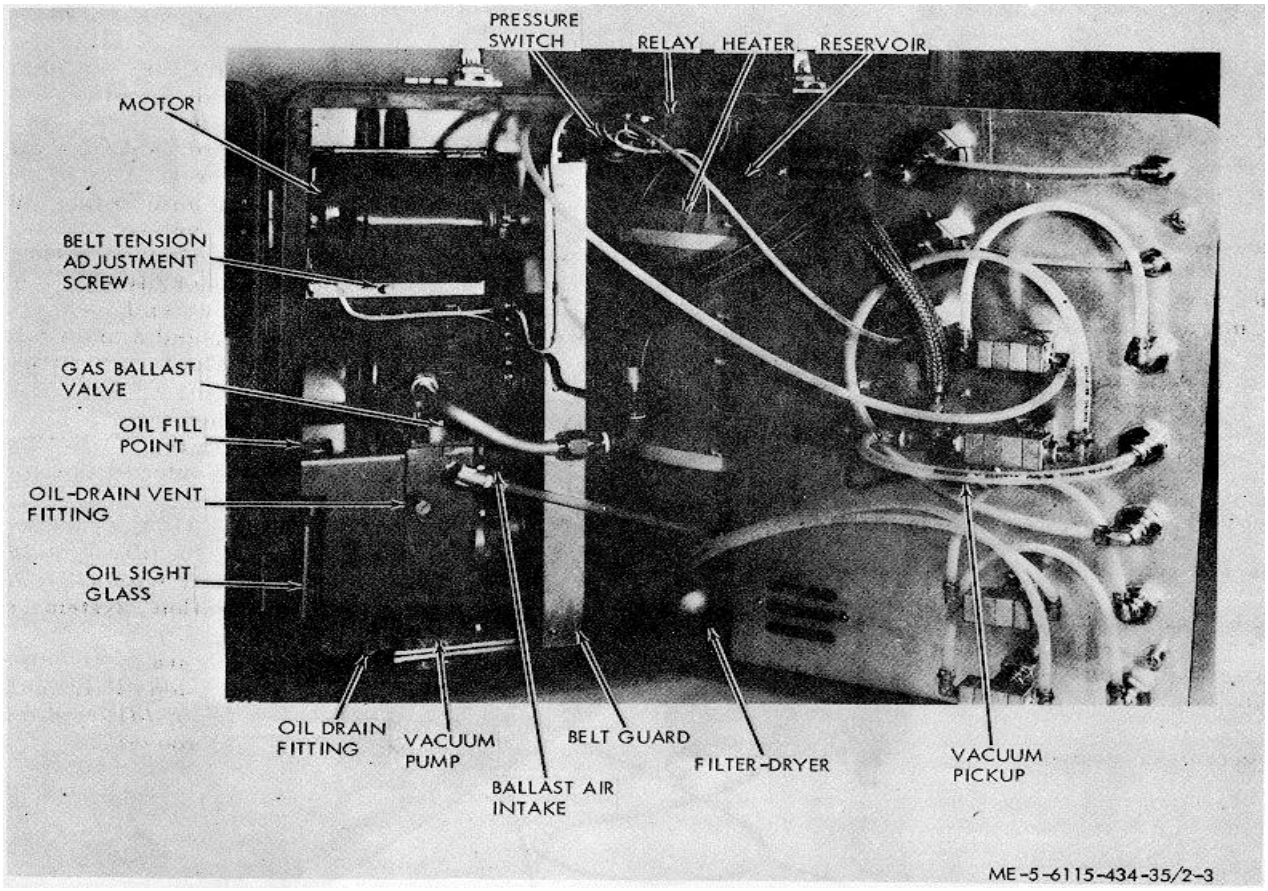


Figure 2-4. Refrigeration service unit internal details.

9. Place heater vacuum pump switch on service unit in OFF position. Place power switch on service unit in down position. Close gas ballast valve (fig. 2-4) on top of vacuum pump on service unit. Close valve V4 (fig. 2-2) on service unit. Remove vacuum hoses from power plant refrigeration system connecting points and from service unit.

(*c) Refrigeration system charging procedure*. To charge the power plant refrigeration system, first evacuate the system as described in paragraph (b) above. When system has been properly evacuated, refer to figure 2-2 and proceed as follows:

1 Loosely connect oil charging hose (part. of refrigeration system service unit) to service valve on power plant refrigerant receiver.

2 Fill beaker (part of refrigeration system service unit) with oil, -Mil Spec MIL-L-6085A, enough to purge all air from oil charging hose.

3 Tighten oil charging hose fitting at service valve on power plant refrigerant receiver while oil is bleeding from connection.

Note
If any air bubbles are observed in oil in the oil charging hose, loosen connection at service valve and repeat the purge procedure outlined above.

4 Tap service valve on power plant receiver to dislodge any air pockets.

5 Fill beaker with oil, Military Specification MIL-L-6085A, enough to charge system and enough left over to prevent entrance of air into charging hose.

6 Crack service valve on power plant receiver.

7 Charge system with oil, Military Specification MIL-L-6085A.

8 Close service valve on power plant receiver.

9 Remove oil charge hose from power plant service valve.

10 Place heater vacuum switch on service unit in HEATER position and place power switch to ON position.

11 Allow service unit refrigerant reservoir heater to stabilize pressure at 70 10 psig

as indicated on refrigerant pressure gauge GA3 on service unit.

12. Loosely connect refrigerant charging hose to service valve on power plant refrigerant receiver and to fitting F6 on service unit.

13. Check valve V6 on service unit and allow refrigerant to purge all air from charging hose. Tighten hose connection at service valve while liquid refrigerant is purging from connection.

14. Fully open valve V6 and fully open service valve. Charge system with refrigerant.

15. Close valve V6 on service unit and service valve on power plant receiver. Remove charging hose and replace protective caps. Check service valve for leakage (para (a)) above.

d. Checking oil quantity in refrigeration system. To check the oil quantity in the power plant refrigeration system refer to figure 2-2 and proceed as follows:

1. Operate refrigeration system according to operating procedure as described in TM 5-6115586-12 for fifteen minutes to thoroughly mix the refrigerant with the oil.

2. Connect refrigerant charging hose to service valve on power plant refrigerant receiver.

Warning
Do not hold oil-quantity check beaker without gloves or cloth to protect hands from cold refrigerant.

3. Crack service valve and flow 100 cc refrigerant-oil mixture into oil-quantity-check beaker (part of refrigeration system service unit). Close service valve.

4. Place beaker in a warm place and allow refrigerant to boil off.

5. Quantity of oil remaining in beaker after refrigerant has boiled off shall be one cc.

(e) Operation to add oil to refrigeration system. To add oil to the power plant refrigeration system, refer to figure 2-2 and proceed as follows.

1. Connect oil charging hose to the power plant compressor suction purge valve.

2. Operate refrigeration system as described in TM 5-6115-586-12 for fifteen minutes to thoroughly mix the refrigerant and oil.

3. Purge oil charge line and add oil to the system as described in paragraph (c), steps 1 through 9 above.

(f) Operation to remove oil from refrigeration system. If quantity of oil in refrigeration system is too great, refer to figure 2-2 and proceed as follows.

1. Operate refrigeration system as described in TM 5-6115-586-12 for fifteen minutes to thoroughly mix the refrigerant with the oil.

2. Shut off refrigeration system and evacuate system. (para (b) above.).

3. Charge system (para (c) above), omitting oil charging procedure, steps 1 through 9.

4. Recheck oil level, (para (d)above), and add oil, if necessary (para (e) above).

Section III. GENERAL MAINTENANCE

2-5. Power Plant Test Instructions

a. General. The following test instructions are provided to test the operation of the power plant as a unit both as an initial test to indicate the extent of repairs required and as a final test to establish serviceability of the power plant following repairs.

b. Test Connections. Standard instrumentation shall be provided to measure all data shown on the data sheet. All instrumentation shall have been calibrated. Standard instrumentation required is listed in table 2-3. Test set-up services required is listed in table 2-4. Record all test data during testing.

c. Precautions During Testing. Shut down the power plant immediately if any of the operating limits are exceeded or if any malfunction occurs that might result in further damage to components if testing was continued. Determine the cause and take corrective action before proceeding with tests. Power plant operating limits are provided in tables 2-5 and 2-6.

Table 2-3. Standard Instrumentation

Item	Range	Remarks
(1) I-C Brown	0 to 600° F	Enclosure inlet temperature.
(2) C-A Brown	0 to 2000° F	Turbine discharge temperature.
(3) Temperature bulb	0 to 300° F	Oil temperature.
(4) Vibration pickup (2)	0 to 1 mil	Engine accessory and turbine section pickups.
(5) Frequency meter	0 to 500 Hz	Generator speed.
(6) Wattmeter	0 to 150 kw	Generator output.
(7) Voltmeter (3)	*(a)* 0 to 300 volts, ac, 400 Hz	Generator output*.
	(b) 0 to 300 volts, ac, 60 Hz	Generator output **
	(c) 0 to 30 volts, de	Battery voltage.
(8) Ammeters (4)	*(a)* 0 to 700 amperes, ac, 400 Hz	Generator output, 3-phase.
	(b) 0 to 125 amperes, ac, 60 Hz	Generator output, 1-phase.
	(c) 30-0-30 amperes, dc	Battery charger output.
(9) Phase rotation tester		
(10) VOM	Variable	Indicating device (volt-ohmmeter).
(11) Current transformers		
(a) 400 Hz (3)	600/5 (turns ratio)	Generator output.
(b) 60 Hz (2)	400/5 (turns ratio)	Generator output.
(12) Analyzer, engine gas turbine		Special equipment (table 2-1).
(13) Cable, special purpose		Special equipment (table 2-1).
(14) Refrigeration system service unit		Special equipment (table 2-1).

* Three line-to-line and three line-to-neutral readings required.
* *One line-to-line and two line-to-neutral readings required.

Table 2-4. Test Setup Services

Item	Range	Remarks
(1) Electrical power dc.	External 24 vdc, or two 12 vdc in series, 6TN type witch standard battery posts, independent of electrical system, and a laboratory battery equivalent to set battery.	Required to operate the starter motor, relays, and ignition circuit.
(2) Fuel	MIL-T-5624, Grade JP-4 or JP-5	Filtered and supplied at 140°0F (60°C) (maximum) to the fuel inlet of the unit.
(3) Lubricant	MIL-L-7808	Synthetic base lubricating oil.
(4) Load banks	(a) 150 kw, 120/208 vac, 3-phase, 4-wire, 400 Hz with adjustable power factor.	To apply electrical load to the 400 Hz generator to check the overload sensor.
	(b) 16 kw, 120/240 vac, single-phase, 2-wire 60 Hz with adjustable power factor.	To apply electrical load to the 60 Hz generator to check the overload sensor.
(5) DC power supply, reostats, switches, and miscellaneous wiring.	Power supply of 24 vdc: 0 to 50 ohm, 50 watt rheostats SPDT switches with 5 ampere contacts.	To supply external field excitation to 400 H-. generators to simulate overvoltage, and undervoltage.
(6) (a) 400 Hz power cable (5-wire) (3)	Capable of carrying 30 kw, 4-wire, three-phase continuous power.	To apply external load to the power plant through the 400 Hz power output receptacle.
(b) 60 Hz power cable (4-wire)	Capable of carrying 10 kw, 3-wire, single phase continous power.	To apply external load to the unit through the 60 Hz power output receptacle.
(c) 400 Hz power cable (4-wire) (2)	Capable of carrying 15 kw, 3-phase continous power.	To apply external load to the unit through the 400 Hz remote power output receptacle.
(7) DC stand-by power cable	15 ampere capability.	To supply stand-by start signal to the power plant.
(8) Shunt	50 ampere, 50 mv type.	To check the accuracy of the dc ammeter.
(9) Switches (2)	10 ampere, SPDT	To simulate remote temperature sensor.

Table 2-5. Power Plant Operating Limits (Gas Turbine Engine)

Type	Limit	Tolerance	Remarks
(1) Leakage (a) Fuel	One drop per minute	Maximum	From accessory drain only. Fuel leakage from plenum drain is permitted only after a false start or blowout.
(b) Oil	One drop per 15 minute period	Maximum	From accessory drain.
(2) Acceleration time	60 seconds	Maximum	Starting after 5 psig oil pressure is attained.
(3) Temperatures:			
(a) Turbine	1300° F (705°C)	Absolute maximum	***Caution*: This temperature must not be exceeded at any time under any operating circumstances.**
(b) Turbine	1225° F (663° C)	Maximum	Maximum allowable temperature for continous operation.
(4) Oil consumption	0.25 lb/hr	Maximum	Under all operating conditions.
(5) Starter motor duty cycle	One minute on one minute off or 5 starts in 10 minutes.	Maximum	Cool the starter before repeating duty cycle. Do not exceed 28,000 rpm turbine speed with the starter energized.
(6) Turbine Wheel Speeds			
(a) Continuous operation	40,700 rpm	±100 rpm	Full-load condition.
(b) Continuous operation	41,600 rpm	Maximum	No-load condition.
(c) Absolute maximum	44,500 rpm		
(d) 10-second operation	42,500 rpm	Maximum	Do not operate at a speed in excess of 42,500 rpm for longer than 10 seconds.
(7) Vibration:			
(a) Accessory pickup	0.6 mil at any frequency	Maximum	Maximum peak vibrations greater than the limits shown may occur at certain critical turbine wheel speeds from 17.000 to 23,000 rpm. **Caution: Do not operate the unit continuously at any speed where vibration exceeds these limits.**
(b) Turbine end pickup.	0.4 mils		At any frequency.

d. Preliminary Test Procedure.

(1) Check that instrumentation calibration is current.

(2) Remove all accessory components from stowage compartments. Visually check at this time for loose or damaged lines, fittings, and wire harnesses.

(3) Secure all access doors that are not normally to be open or removed during testing.

(4) Connect instrumentation called out in table 2-3.

(5) Check that oil tank is filled with oil.

(6) The unit shall be stopped and started in accordance with operating instructions on the control panel.

(7) Record turbine engine and two air conditioner hourmeter readings when power plant is installed in test setup.

(8) Prime fuel and oil as follows:

(a) Remove electrical connector 'from the oil pressure fuel sequencing switch.

(b) Disconnect fuel boost pump connector and connect to a 24 vdc lamp. Acutate master switch to RUN, lamp shall not glow. Actuate master switch momentarily to START, lamp shall glow. If the preceding tests check correctly, reconnect fuel boost pump connector.

Table 2-6. Power Plant Operating Limits (Electrical System)

Type	Limit 400-Hz	Limit 60 Hz	Tolerance	Remarks
(1) Frequency Regulation:				
No-load to full-load.	390 Hz 410	58.5 Hz 61.5	Maximum Maximum	
(2) Voltage Regulation:				
Line-to-neutral.	120 volts	120 vac	Rms± 1.2	At balanced loads under all ambient operating conditions. Line side of main contactor.
(3) Specified Outputs:	Generator			
Rated power output	120 kva	12.5 kva	Nominal	At 0.8 power factor.
Line-to-neutral	120 volts	120 vac		Refer to nameplate rating.
Line-to-line	208 volts	240 vac		Refer to nameplate rating.
Frequency	400 Hz	60 Hz		See Item (1).
{4) System Electrical Output:				
(a) Rated continuous performance.	90kw 0kw	10kw 10 kw	Approx Approx	At all specified operating conditions.
(b) Rated continuous external power through the output receptacle.	30kw (0.8 pf)	10)kw (0.8 pf)	Approx	At all specified operating conditions.
(c) 400 Hz remote output	25 kw		Approx	12.5 kw each output. Mode sw in OFF or VENT.
(d) 400 Hz auxiliary output	60 kw		Approx	30 kw each output. Environmental system locked out.
(5) Undervoltage Trip: Average line-to-neutral voltage	90 volts	90 vac		Relay has nominal actuation time of 4.5 seconds
(6) Overvoltage Trip:				
Average line-to-neutral voltage	129 vac 135 vac	129 vac 135 vac	No trip. 0.5 to 10 seconds	Step input above 120 vac base voltage.
(7) Overspeed Switch:				
AC system frequency	420 Hz 440 Hz		Minimum Maximum	Centrifugal switch will shut down the turbine and de-energize the ac system.
(8) Underfrequency Switch:				
AC system frequency	370 Hz 378 Hz		Minimum Maximum	Protective panel will de-energize the ac system and open line contactor.
(9) Battery Charger:				
(a) Charging rate	30 amps dc		Peak rate	Charging system is completely automatic.
(b) Voltage range	28 vdc		0.5v,±0	Maximum at any charge rate.
(10) Overload Protection (Gen.):				
110 percent load	No trip (367 amps load current)		No trip (58 amps load current)	
(11) Overload Protection (400 Hz Output Receptacle)				
Single or three-phase	225 amp at calibrated temperature			Overload sensor will trip the output contactor in 10 to 70 seconds at 77° F.(25° C).
12) Overload Protection (400 Hz Remote Output)				
10 to 30	95 amps each output (190 amp total) at calibrated temperature		(25° C).	Overload sensor will trip remote output contactor in 10 to 70 seconds at 77°F.
(13) Overload Protection (400 Hz auxiliary output receptacle):				
3-phase	225 amps at calibrated temperature at either out put receptacle.			Overload sensor will trip the output contactor in 10 to 70 seconds at 77° F. (25° C)

Caution

Do not exceed starter motor duty cycle specified in item (5) of table 2-5.

(c) Motor gas turbine engine by means of starter until oil pressure gauge on test panel registers pressure.

(d) Reconnect electrical connector to oil pressure switch.

(e) Check unit for fuel and oil leaks immediately after this operation. If leakage is apparent, correct the difficulty.

e. Instrument Panel Checks.

(1) Close the dc circuit breakers and check the following items for proper operation as specified.

(a) Check panel light for proper operation. Panel light shall come on when switch is actuated in ON position.

(b) With air intake door in open position, check fuel boost pump for proper operation. Set MASTER switch in STOP position. Actuate fuel boost pump by throwing FUEL BOOST switch to ON position. Pump shall run. Set the MASTER SWITCH in RUN position. Fuel boost pump shall stop.

(c) With MASTER switch in RUN position, check PRESS-TO-TEST indicator lights. Pressing in on each light shall cause it to glow. This test indicates only that light bulb is functional and not the condition of its associated circuit. Replace faulty light bulbs.

Note

In order to check compressor trip lights and remote trip light, unit must be operating, 400 Hz main contactor switch must be in CLOSE position and mode-select switch in OFF position.

(d) Check for proper operation of start interlock of 60 Hz load contactor switch and 400 Hz main contactor switch. Actuate 60 Hz load contactor switch to CLOSE position. Actuate MASTER switch to START. The power plant shall not start. Actuate 60 Hz load contactor switch to OPEN. Repeat this procedure with 400 Hz contactor switch.

(e) Check for proper operation of battery charger and ready-to-load light. Close battery charger circuit breaker. Start power plant. Readyto-load light shall glow at 95 percent governed speed. Battery charger shall come on when 400 Hz generator voltage builds up. Generator shall reach full voltage at approximately 70 percent governed speed.

(2) Run power plant for three minutes at noload governed speed to allow for stabilization and transients.

(3) Check for phase rotation of 400 Hz system at the following locations.

(a) The 400hz power output receptacles J7 and J8, located on the power output panel. The phase rotation shall be LI, L2, L3, N: A,B,C,D and E. Pin E is equipment ground.

(b) Disconnect power plug from each of the air-conditioning compressors and check phase rotation. The phase rotation shall be LI, L2, L3, N: A, B, C and D.

(4) Check generator terminal connections at 60 Hz output panel, J5 60 Hz output receptacle and J6 60 Hz output receptacle. The connection sequence shall be TI, T2, T3: B, D, C and E is equipment ground and A is emergency 24 vdc, output; T3 is neutral. Voltage indication shall be 240 volts B to D and 120 volts B to C and D to C.

(5) Check accuracy of the following instruments on power plant instrument panel against calibrated test instruments. Using external adjust screw, adjust each master to correspond to associated laboratory meter. Reject and replace any meter that cannot be adjusted within specified limits.

(a) Using the voltage-adjust potentiometer on the voltage regulator, set C-N voltage at 120 volts (red line). Record C-N voltage indicated on test meter. Error shall not exceed +/-2 volts. Check A-N and B-N voltage.

(b) Using the voltage-adjust potentiometer on voltage regulator, set TI-T3 voltage at 120 volts (red line). Record TI-T3 voltage indicated on test meter. Error shall not exceed +/- 2 volts. Check T2T3 voltage. T2-T3 voltage shall be 120 -'2 volts. TI-T3 voltage shall be 120 +/-2 volts. Check TiT2 voltage. TI-T2 voltage shall be equal to the sum of T I-T3 and T2-T3 voltage (240 +/- 4 volts).

(c) Using a variable-load 0. 8 PF load bank, set up 100 percent readings on instrument panel 60 Hz ammeter. Test each leg individually. Record amperage indicated on test meter for leg being tested. Error shall not exceed +/-3 percent. The 100 percent load is equal to 52 amperes per leg when a 120 volt load is applied.

(d) Using a variable load 0. 8 PF load bank, set tp 100 percent readings on instrument panel 400 Hz ammeter. Test each phase individually. Record amperage indicated on the test meter for the phase being tested. Error shall not exceed +/-3 percent. The 100 percent load is equal to 333 amperes per phase.

(e) Regulate engine speed to 390 Hz, 400 Hz and 410 Hz as indicated by the instrument panel 400 Hz frequency meter. For each of these settings, log frequency reading. Error shall be within +/-2. 5 Hz.

(f) With 400Hz generator operating at 400 Hz, 60 Hz meter should read 60 Hz. Error shall be within 1 Hz.

(g) Remove positive lead from unit battery charger and connect test shunt (50A) in series. Record instrument panel meter reading and test meter reading. Error shall not exceed three amperes.

(h) Install thermocouple in boss provided on engine tailpipe section. Cheek tailpipe temperature circuit by using the Brown indicator and unit thermocouple. Adjust so that unit thermocouple reads within +/- 25° F (14° C) of indicator reading.

f. Electrical System Checks. Perform electrical system checks as follows:

(1) Operate unit in the following sequence at steadv-state loads at zero. 100, zero, 50 and 100 percent rated loads of 0.8 PF. Perform test on both 60 Hz generator and 400 Hz generator. Log on each data sheet voltage, frequency and percent load it each load point for each phase of the 400 Hz generator and for each leg and L-L of the 60 Hz generator.

(2) Perform voltage regulation check (step load application and removal) as follows.

Note

The 10 kw, 60 Hz load can be applied directly through output receptacles. To apply 90 kw. 400 Hz loads. attach extra power loads to terminal board on the air conditioning panel. Apply 30 kw to power output and 60 kw to terminal board connection.

(a) Apply a step load of 10 kw at 0. 8 PF to 0it) Hz generator. Allow voltage to stabilize, then remove 10 kw load.

(b) Using a 90 kw at 0. 8 PF load, repeat paragraph f. step (2), (a) above for 400 Hz generator.

(3) Unit shall meet the following electrical requirements.

(a) Voltage variation shall not exceed 2. 5 percent from no-load to full-load as set throughout entire load range and -1 percent at any fixed load.

(b) Upon application or removal of rated load I10 kw at 0. 8 PF), voltage shall not vary sufficiently to cause generator protective panel to trip generator off the line.

(c) Upon application or removal of 90 kw at 0. 8 PF, voltage shall not vary sufficiently to cause protective panel to trip generator off the line.

(d) Frequency shall remain within limits of +/- 2 percent for (0' Liz system and 392 to 408 Hz for 400 Hz system for all steady-state load conditions.

(e) Transient-frequency limits for sudden application or removal of 10 kw at 0. 8 PF shall be within 4+/- 3 percent for 60 Hz system. Transient-frequency limits for sudden application or removal of 80 kw at 0. 8 PF shall be 390 to 410 Hz for the 400 Hz system.

(f) Transient-frequency shall return to and remain within the range of 58 to 62 Hz for 60 Hz system and 392 to 408 Hz for 400 Hz system within three seconds.

(4) Check air-intake door interlock switch as follows.

(a) Attempt a start with air-intake door closed. Unit shall not start.

(b) While operating, press intake door interlock switch and hold momentarily. Unit shall shut down.

(5) With unit operating and 400 Hz main contactor switch in OPEN position, actuate 400 Hz output contactor switch to CLOSE-RESET and release. Using a volt-ohmeter, set on 300 vac scale, check voltage at J7 and J8, 400 Hz output receptacle and across pins A,B,C and E. There shall be no voltage indicated.

(6) With 400 Hz main contactor switch in OPEN position and air-conditioning control circuit breaker pushed in, rotate ac mode select switch to VENY COOL AND HEAT. In the VENT, COOL AND HEAT Modes, there shall be no power, ac or dc, applied to air-conditioning system. No fan or compressor shall start nor shall load control or heating flow-control valves open in the HEAT mode.

(7) Perform emergency dc output and standby receptacle output check as follows:

(a) Using a volt-ohmmeter, set at 50 vdc, check across pin A (+) of J5 and J6, 60 Hz output receptacle and pin D (-) of J7 and J8, 400 Hz output receptacle and also across pin 1 (+) and pin 2 (-) of J 1 dc standby receptacle. This test can be made while performing 400 Hz output overload sensor trip test, or by placing 400 Hz output contactor switch in center position with 400 Hz main contactor closed. When 400 Hz output contactor trips, there should be a 24 vdc indication between J5-A and J7-D, J6-A and J8-D and J1-1 and J1-2.

(b) With same meter connection as in (a) above and when performing underfrequency trip check or any of the other protective device checks that trip 400 Hz generator, check for voltage indication. Each check point shall indicate 24 vdc.

(c) With same meter connections as in (a) and (b) above and when performing any of the protective device checks that trip 60 Hz generator, observe meters for voltage indication. When 60 Hz contactor trips, there shall be 24 vdc showing on meter attached to pin A of J5 or J6.

(8) Place all circuit breakers and switches in normal position for starting and proceed as follows.

(a) Close air-intake door. Reconnect 24 vdc to J 1. Unit shall not start. Disconnect 24 vdc from J1.

(b) Open air-intake door. Reconnect 24 vdc to J1. Unit shall start. At 95 percent governed speed, 24 vdc signal from J1 shall cease and all contactors shall close. The 60 Hz and 400 Hz power shall be available at output receptacles. With a volt-ohmmeter set at 300 vac, check pins B and C of J5 and J6 and pins C and D of J7 and J8.

(c) After unit reaches governed speed, actuate switches as indicated below in the sequence as listed.

Master switch to RUN.

400 Hz output contactor switch to RESET-CLOSE.

60 Hz load contactor switch to CLOSE.

400 Hz main contactor to CLOSE.

Unit shall continue to run from unit battery and load contactor shall stay closed without interruption of power.

(9) Check unit capability for achieving successful starts with the following battery arrangement.

Note. Ascertain unit has started from unit battery before performing this test. Disconnect battery within the unit. External battery must have a full charge with 25.5 vdc minimum.

(a) Connect dc battery cable to external battery, with reverse polarity to power output panel receptacle. Reverse polarity light shall glow. With battery still connected with reverse polarity, attempt to start unit. Unit shall not start.

(b) Connect dc battery cable to external battery with correct polarity. Reverse polarity light shall not glow and unit shall start.

(c) Connect an external 24 Vdc battery to power-out panel receptacle with unit battery connected. Start unit. External battery voltage must be one volt higher than unit battery.

(10) With unit operating, actuate 400 Hz main contactor switch to CLOSE and 400 Hz output switch to RESET-CLOSE. Push in 400 Hz convenience receptacle circuit breaker. Using a volt-ohmmeter set at 300 vac, check for voltage at each of the two outlets. Meter shall indicate approximately 120 volts L-N.

(11) With unit operating, actuate 60 Hz load contactor switch to CLOSE. Push in 60 Hz convenience receptacle circuit breaker. Using a voltohmmeter set at 30.0 vac, check for voltage at each of the two outlets. Meter shall indicate approximately 120 volts L-N at each outlet.

(12) Connect a zero to 30 vdc voltmeter across battery terminals. Observe panel 30-0-30 ampere ammeter and log indicated readings on data sheet. Log voltage when battery charger is fully charging (30 amperes) and when battery charger is supplying the unit's rated use. The panel 30-0-30 ammeter shall indicate approximately zero amperes. Battery charger is completely automatic and is current limited. Charging current shall be limited to 30 amperes. Battery charger output voltage shall not exceed 28 volts when carrying full charge or minimum charge rate. Adjust voltage as required. With correct voltage set, adjust current boost and taper charge on K-R battery charger to maximum cycle time. Turn adjustment counterclockwise.

(13) With unit operating, actuate 400 Hz main contactor switch to CLOSE and 400 Hz output switch to RESET-CLOSE. Push in water line heating circuit breaker CB6. Using a voltohmmeter set at 300 vac, check for voltage at each of the two water line heater receptacles J72 and J73 (pin C to pin D). Meter shall indicate approximately 120 volts, L-N, at each receptacle.

(14) With unit operating and mode-select switch in OFF position, actuate 400 Hz main contactor switch to CLOSE position and proceed as follows.

(a) Actuate remote operation switch to OPERATE-RESET. Check phase rotation at each of the remote output receptacles. Phase sequence shall be L1, L2, L3, N: A, B, C, E and D is +24 vdc. Voltage shall be 120 volts L-N and 24 vdc from pin D and ground.

(b) Rotate mode-select switch to VENT position. Vent fans, as set on the vent-select switch, shall run. Voltage at remote receptacles shall be the same as in paragraph f. step (14), *(a)*above.

(c) Rotate mode-select switch to HEAT and COOL. No voltage shall be available at the remote output receptacles.

(d) Where two units are available at test site, attach a 400 Hz auxiliary power output cable to remote power-output receptacle on operating unit to remote input on non-operating unit. Actuate remote operation switch on operating unit to OPERATE-RESET, then actuate remote-operation switch on non-operating unit. Vent fans on non-operating unit shall operate as if unit were operating. Check vent fan operation through each output.

(e) When two units are not available, remote input can be checked as follows:

1. Connect a 400 Hz auxiliary power output cable between test box and remote input receptacle.
2. Place 400 Hz main contactor switch in OPEN position.
3. Actuate remote switch located on test box by placing it in ON position.
4. Actuate the remote operation switch located on control panel to OPERATE-RESET.
5. Place mode-select switch to VENT.
6. Rotate vent-system-select switch to each position and check for proper operation of vent fans.
7. Rotate mode-select switch to HEAT, COOL and OFF. Vent fans shall not operate.

(15) With unit operating and mode-select switch in OFF position, actuate 400 Hz main contactor switch to CLOSE position and proceed as follows.

(a) Actuate Output 1 400 Hz auxiliary operation switch to OPERATE-RESET. Check phase rotation at Output 1 receptacle (J101).

Phase sequence shall be L1, L2, L3, N: A, B, C, D with E as the equipment ground. Voltage shall be 120 volts line-to-neutral and 208 volts line-to-line.

(b) With Output 1 400 Hz auxiliary power actuated, the voltage at Output 1 receptacle shall remain the same as noted above and there shall be no power, ac or de, applied to the no. 1 conditioned air system under the following operating conditions.

1. Mode select switch in HEAT position as heat system select switch is rotated to positions 1, 2 and 1 and 2 (no. 2 heated air system shall operate in position 2 or position 1 and 2).

2. Mode select switch in COOL position as air conditioning system select switch is rotated to positions 1. 2, and 1 and 2 (no. 2 cooled air system shall operate in position 2 or position 1 and 2).

(c) Place output I auxiliary operation switch in OFF position and actuate output 2 auxiliary operation switch to OPERATE-RESET. Check phase rotation at output 2 receptacle (J102). Phase sequence shall be L1, L2, L3, N: A, B, C, D with E as equipment ground. Voltage shall be 120 volts line-to-neutral and 208 volts line-to-line.

(d) With output 2 400 Hz auxiliary power actuated, the voltage output at output 2 receptacle shall remain the same as noted above and there shall be no power, ac or dc, applied to the no. 2 conditioned air system under the following operating conditions:

1. Mode select switch in HEAT position as heat system select switch is rotated to positions 1, 2, and I and 2 (no. 1 heated air system shall operate in position 1 or position 1 and 2).

2. Mode select switch in COOL position as air conditioning system is rotated to positions 1, 2, and 1 and 2 (no. 1 cooled air system shall operate in position 1 or position 1 and 2).

(e) With both No. 1 and No. 2 400 Hz auxiliary operation switches actuated to OPERATE-RESET position, required voltage shall be present at both Output 1 and Output 2 receptacles and no power shall be applied to either conditioned air system in any HEAT or COOL mode.

(f) Actuate remote operation switch to OPERATE-RESET. No voltage shall be present at either of the remote output receptacles (J74 and J75).

(g) With 400 Hz main contactor closed and remote operation switch, mode-select switch and auxiliary operation switches in OFF position, actuate remote operation switch to OPERATE-RESET. Voltages shall be present at remote output receptacles. Actuate auxiliary operation switch to OPERATE RESET. Voltage shall not be present at remote output receptacles but shall be present at auxiliary output receptacles.

(h) With the remote operation switch and the auxiliary switch in the OFF position, rotate the mode-select switch to VENT. Actuate the auxiliary switch to OPERATE-RESET. The vent fans should continue to operate and voltage should be present at the auxiliary output receptacles.

(i) Repeat paragraph f, step (15), *(f)*,above, except rotate mode-select switch to HEAT. Complete heating system shall be de-energized (shut off) and voltage shall be present at auxiliary on output receptacles.

(j) Repeat paragraph f, step (15), *(f)*,above, except rotate mode-select switch to COOL. Complete air-conditioning system shall be deenergized (shut-off) and voltage shall be present at auxiliary output receptacles.

g. Protective Device Checks. The following checks are to be performed to ensure proper functioning of electrical system protective circuits.

(1) While reading 400 Hz generator frequency on a frequency meter, slowly reduce turbine speed until meter reads 370 Hz by manually bypassing fuel. Then perform test with the EMERGENCY OPERATION switch closed and determine that under frequency device will not trip 400 Hz generator off the line. Generator shall be tripped off the line when frequency drops to 374 $\pm$ 4 Hz with EMERGENCY OPERATION switch open.

(2) Observe and record exact speed reading as indicated by frequency meter. Then, operating at no-load, slowly increase turbine speed by means of governor adjustment screw until overspeed protective-device actuates. Do not exceed 44,500 rpm. Use fuel bypass to perform this test. Overspeed protective device must shut down unit between generator frequencies of 420 and 440 Hz. Repeat test with EMERGENCY OPERATION switch closed and ascertain that switch does not render overspeed switch inoperative. Readjust speed to original frequency reading.

(3) Both generators shall be operated at no-load and rated speed while performing the following tests. Ascertain that load contactors are in CLOSED position. Refer to paragraph g, step (7) below.

(a) Remove connector from voltage regulator of system being checked. Connect voltage regulator connector to test box. Adjust rheostat until base voltage of 120 volts L-N on each generator is set up.

(b) Monitor generator voltage on the load side of contactors to determine voltage at which protective panel energizes the GCR and trips load contactors.

(c) Adjust generator voltage to 128 volts L-N for 30 seconds. Reset to 120 volts L-N. Adjust voltage to 135 volts L-N. Do not exceed 30 seconds.

(d) Immediately after contactors trip, decrease voltage to 120 volts L-N.

(e) Reset generator control relay. Check under voltage protective device by lowering voltage to 92 volts for 30 seconds. Readjust to 120 volts L-N. Decrease to 90 volts L-N. The under voltage protective device trips generator control relay and de-energizes load contactors.

(f) The 40U Hz overvoltage protective device shall provide a trip signal on the 400 Hz generator when three phase average voltage increases to 135 volts and remains thus from 0.5 to 10 seconds. No trip at 128 volts. The 60 Hz overvoltage increases to 135 volts and remains there from 0.5 to 10 seconds. No trip at 128 volts.

(g) The 400 Hz undervoltage device shall provide a trip signal on 400 Hz generator when three phase average voltages decrease to 90 volts and remain there for 4.5 seconds, minimum. The 60 Hz undervoltage device shall provide a trip signal when lowest leg voltage decreases to 90 volts and remains there for 4.5 seconds minimum. No trip at 92 volts.

(4) Apply 110 percent or rated three phase balanced load to 400 Hz generator and 110 percent of rated single-phase, three-wire, balanced load to 60 Hz generator. Repeat this procedure with 150 percent balanced load. Refer to paragraph g, step (7) below. Line contactor shall open at calibrated temperature within the 30 to 120 seconds at 150 percent. Contactor shall not trip at 110 percent (operate for five minutes). The total air-conditioning system will have to be operating and external loads will have to be attached to power cable through output connector. The 60 Hz power can be taken from output receptacle. Obtain meter readings of generator voltage and current.

Caution: **Do not exceed 45 kw on the external 400 Hz output connector.**

Note. To apply loads required for this test for 400 Hz generator, extra leads will have to be attached to terminal board on air-conditioning panel.

(5) Apply a three-phase balanced 115 ampere load to each of the 400 Hz output power receptacles. Overload sensor shall trip at approximately 225 amperes within 10 to 70 seconds at calibrated temperature. The 400 Hz output contactor shall not reset unless reset with contactor switch. The 400 Hz output trip light shall glow when 400 Hz output contactor trips.

(6) When performing the protective devices check herein, observe contactor trip indicator lights on unit control panel. Lights shall glow each time 400 Hz main contactor or 60 Hz load contactor trips. Actuation of corresponding contactor switch to its reset position shall extinguish indicator lamp.

(7) When performing one of the protective panel trip functions in 60 Hz generating system, actuate control switch to RESET position and hold it there until reset control trips and remains tripped and ac system becomes de-energized. Remove simulated fault and again actuate control. Repeat this procedure for 400 Hz generating system. Reset control shall reset only once after actuation and shall then trip and remain tripped as long as the fault exists and control-switch is hold in RESET position. Upon removal of the fault and reactuation of control, the system shall return to normal operation.

(8) Low oil pressure shutdown check can be performed at completion of any test that requires operation of turbine engine. Disconnect plug from low oil pressure switch. Turbine engine shall shut down. Reconnect plug to low oil pressure switch. This test checks continuity of electrical circuit only. This is no indication of switch setting or operation.

(9) Check 400 Hz remote output overload sensor by applying a three-phase balanced 95 ampere load to each of the remote output receptacles. Overload sensor shall trip at approximately 190 amperes total within 10 to 70 seconds at calibrated temperature. Remote output contactor shall not be reset unless reset with remote operation switch. Remote trip light shall glow when remote output contactor trips.

(10) Check 400 Hz auxiliary output overload sensors by applying a three-phase balanced 225 ampere load to each of the auxiliary output receptacles, individually. With overload applied, overload sensors shall trip at approximately 225 amperes within 10 to 70 seconds, at calibrated temperature, without loss of power to the other auxiliary output receptacle. The 400 Hz auxiliary trip lights shall glow. Tripped output contactor shall not reset unless reset with 400 Hz auxiliary operation switch. Acutation of 400 Hz auxiliary switches to OPERATE-RESET shall reset tripped contactor without loss of power to output receptacle. Perform for each output. A delay in resetting of contactor will be required to allow overload sensors to cool down.

(11) Check the transient voltage (motor starting load) as follows.

(a) With 400 Hz generator operating at no-load, suddenly apply a 240 volts, two per unit, 0.4 power factor load on 60 Hz generating system or start a 120 volts, two horsepower motor. Do not hold two per unit load on longer than 15 seconds. Voltage shall not dip sufficiently low to cause the protective panel to trip generator off the line within the limits of undervoltage trip.

(b) With 60 Hz generator operating at no-load and 400 Hz system operating at a steady-state

three-phase load of 30().0 .kw at 0.8 power factor, apply the additional surge (starting) current demand of the total air-conditioning system. Voltage shall not dip sufficiently low to cause protective panel to trip generator off the line within limits of the undervoltage trip.

(12) Generator protective devices shall not trip generator and load contactor off the line while undergoing voltage regulation and frequency check and air-intake door interlock switch check. During air-intake door interlock test, the protective device will trip 60 Hz generator if overload time is exceeded.

h. Air-conditioning Systems. Perform operational checks in accordance with TM 5-6115-586-12.

i. Heating System. Perform operational checks in accordance with TM 5-6115-586-12.

j. Hot and Cold Water System. Perform operational checks in accordance with TM 5-6115-586-12.

k. Bleed-Air System. Perform operational check in accordance with TM 5-6115-586-12.

l. Vacuum System. Perform operational check in accordance with TM 5-6115-586-12.

2-6. General Disassembly Instructions

a. Make sure that all wiring, wire harness connectors, and tubing are disconnected and will not be subject to damage before removal of major assemblies and their components.

b. Be certain to drain fuel, oil, and water from reservoirs before attempting to remove them from their associated tubing and fittings.

c. Remove all shims where used. Keep shims together and identify them as to location for correct reassembly. Keep shims clean and flat until they are reinstalled.

d. If a part offers unexpected resistance to removal, check that all attaching hardware has been removed and that other parts are not interfering with removal before exerting force.

e. Do not disassemble riveted or interference-fitted parts unless repair is necessary.

2-7. General Cleaning and Inspection Instructions.

a. Prior to inspection, all parts should be cleaned at least to the extent necessary to determine the condition of the part. All-metal parts may be cleaned with a dry-cleaning solvent (Fed Spec P-D-680 or equivalent) or may be steam cleaned. Never use any petroleum base solvent for cleaning electrical parts as these solvents will damage electrical insulation and dissolve electrical varnishes. Special cleaning solvents for electrical parts are Trichlorethylene (Military Specification MIL-T-700) and Naptha (Military Specification MIL-N-15178). Any special cleaning procedures for other components are also specified in applicable paragraphs.

b. To aid inspection, a table of repair and replacement standards is provided in table 1-1. This table specifies maximum clearance and desired clearance. It may be necessary or economical to replace parts prior to their reaching maximum wear limits. Factors such as hours of operation and remaining useable life of the component will be considered in replacement.

c. When visual inspection of parts is not sufficient to determine their serviceability, refer to testing procedures included in the repair instructions.

2-8. General Repair and Replacement Instructions

a. All forgings and castings that will not withstand specified torque values shall be repaired by installing helical inserts or replaced.

b. Hardware items such as screws, washers, and nuts shall be replaced if missing or found to be damaged in any manner that might impair efficiency. Self-locking nuts, used extensively in this equipment, shall be replaced if there is any damage that might impede the self-locking feature..

c. Loose or damaged rivets shall be replaced.

d. Do not use mire brush, sand blast, or other highly abrasive procedures to remove rust or corrosion from machined surfaces unless specific instructions are provided for their use in repair instructions. Use crocus cloth. (Fed Spec P-C-458) for ferrous surfaces and aluminum oxide abrasive cloth (Fed Spec P-C-451) to smooth out scores, burrs. rough spots, and galling from machined surfaces unless otherwise directed. The finish of the repaired part must be approximately that of the original finish and the repair and replacement standards in table 1-1 shall be consulted for parts with critical dimensions and tolerances.

e. Damaged threads may be repaired with a thread chaser or by chasing on a lathe. If threads can not be restored to satisfactory condition so as not to impare the efficiency of threaded fastening, the part shall be replaced.

f. Painted surfaces to be refinished will be treated and printed in accordance with MIL-T-704, type A prior to refinishing. Exterior surfaces of the power plant shall be)painted with paint in accordance with MIL-T-704, type A, Lusterless. Also refer to TM 9-213.

2-9. General Reassembly Instructions

a. Attaching hardware and electrical connectors shall where applicable be lockwired in accordance with MS35540 using new lockwire MS2095C20, when reinstalled.

b. All tubing shall be reinstalled so that it does not make direct contact with other surfaces of the power plant. Use clamps to support tube and hose

assemblies and prevent contact. The high frequency vibration of the power plant may cause rapid wear and damage leading to early failure of these parts if they are incorrectly installed.

Section IV. REMOVAL AND INSTALLATION OF MAJOR COMPONENTS AND AUXILIARIES

2-10. General

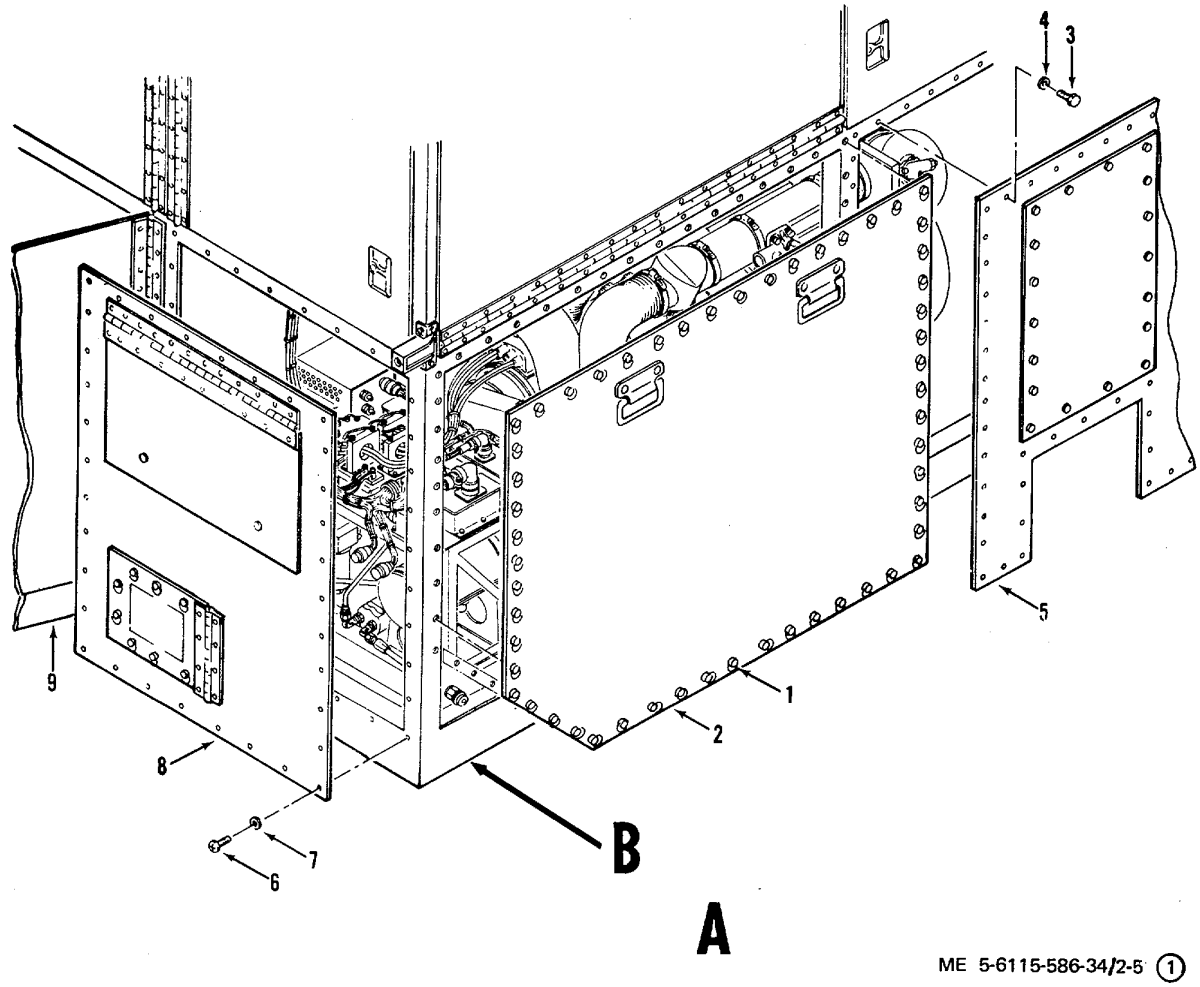
a. The primary component of the power plant is the engine and skid assembly which is made up of the following major components: a pneumatic and shaft power gas turbine engine, a 10 kw 60 Hz generator, a 90 kw 400 Hz generator, a lower electric power chassis assembly, an upper electric power chassis assembly, and a skid assembly. The engine and skid assembly may be removed from the power plant as a unit to facilitate removal of the engine. Removal of major components other than the engine may be accomplished without removing the engine and skid, assembly if desired.

b. The other major components of the power plant are the instrument panel assembly, conditioned air system electrical components panel, auxiliary power tray, receptacle panel assembly, four condenser fans, and four recirculating fans. Refer to paragraph 2-13 for removal and installation instructions regarding the auxiliary power tray. Refer to TM 5-6115-586-12 for instructions regarding removal and installation of the remaining major components.

2-11. Removal and Installation of Engine and Skid Assembly

a. Removal.

(1) Remove the gas turbine engine access panel (2, fig. 2-5, sheet 1 of 3) by loosening stud fasteners (1).



1. Stud fastener
2. Gas turbine engine access panel
3. Screws
4. Washer
5 Engine combustor access panel
6. Screw
7. Washer
8. Fuel and oil components access panel
9. Battery access and storage compartment door

Figure 2-5. Removal of engine and skid assembly (sheet 1 of 3)

10. Clamp
11. Generator cooling air discharge hose
12. Clamp
13. Cooling fan inlet air duct
14. Engine air inlet duct
13. Nut
16. Washer
17. Bolt
18. Grounding wire
19. Clamp
20. Tube
21. Gasket
22. Clamp
23. Clamp
24. Duct assembly
25. Gasket
26. Clamp
27. Hose assembly
28. Clamp
29. Venturi tube assembly
30. Bolt
31. Washer
32. Compartment divider panel
33. Bolt
34. Washer

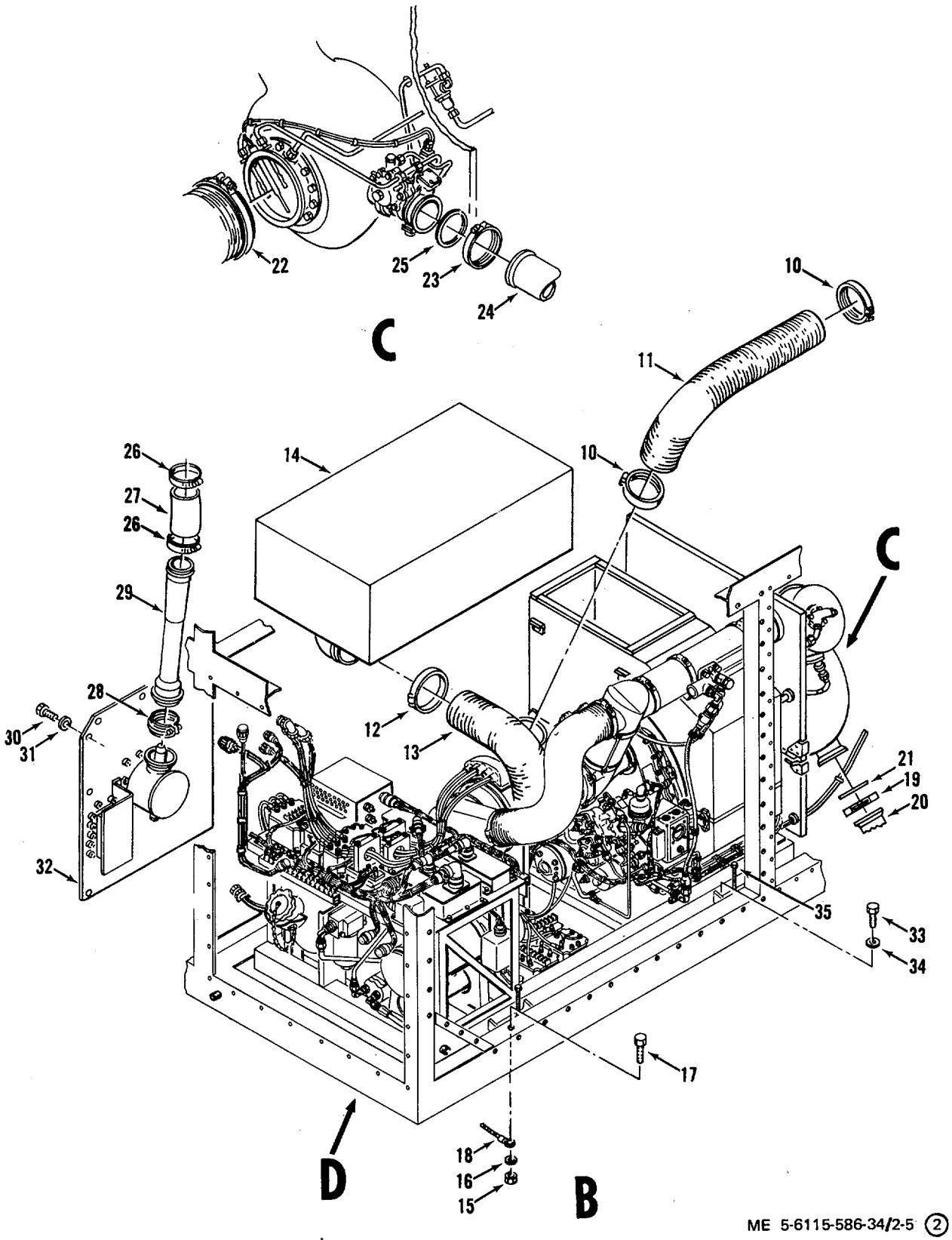
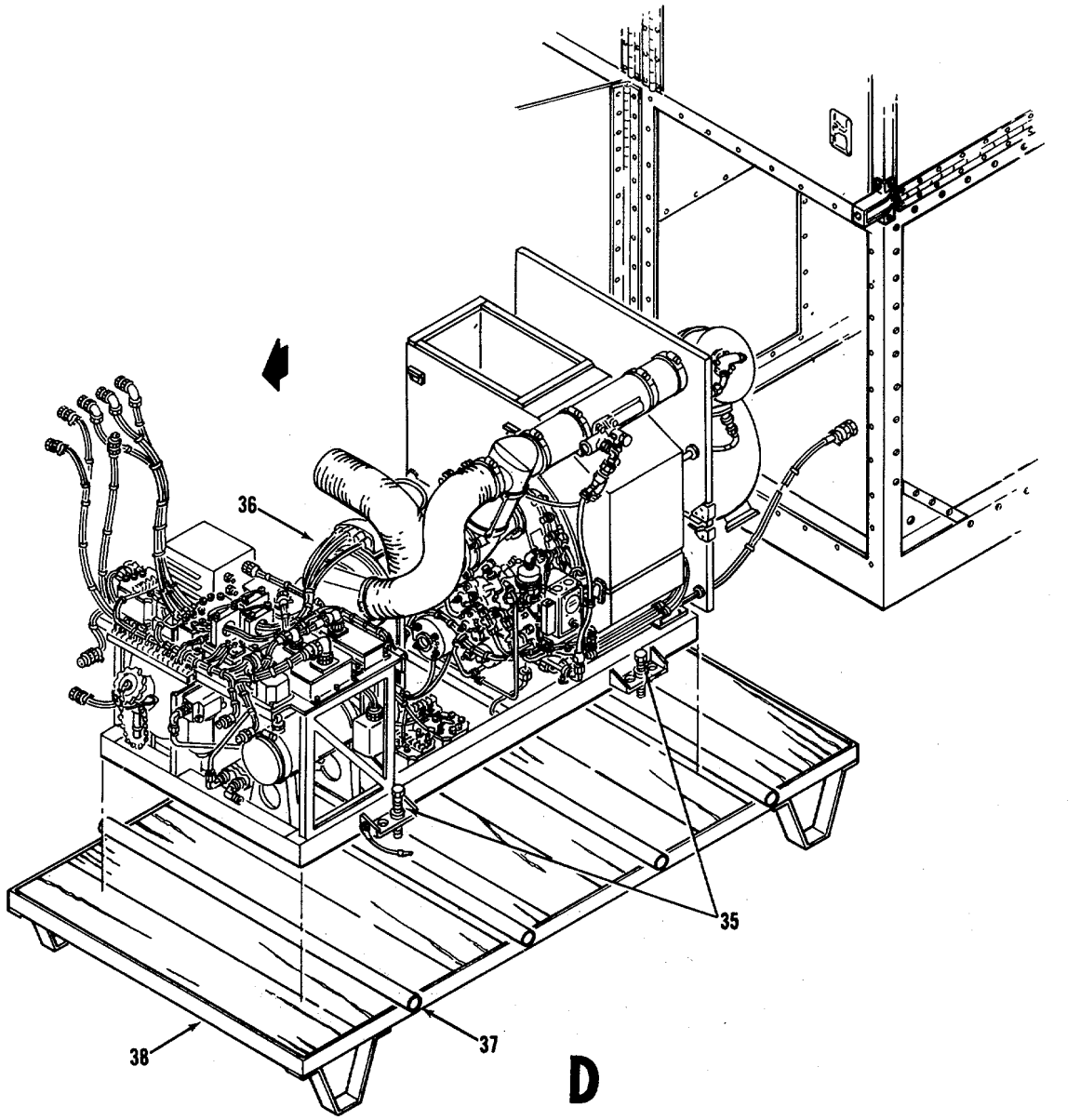


Figure 2-5. Removal of engine and skid assembly (sheet 2 of 3)



ME 5-6115-586-34/2-5 (3)

35. Jackscrew
36. Engine and skid assembly
37. 34 inch pipes
38. Platform

Figure 2-5. Removal of engine and skid assembly (sheet 3 of 3)

(2) Remove screws (3) and washers (4) and remove the engine combustor access panel (5).

Note. Tag or otherwise identify harness connectors as removed to aid at installation.

(3) Disconnect wiring harness connectors P 12, P13, and P14 from instrument panel. Remove screws 16) and washers (7) and remove the fuel and oil components access panel (8).

(4) Open battery access and storage compartment door (9).

(5) Loosen clamps (10, fig. 2-5, sheet 2 of 3), remove generator cooling air discharge hose (11) and clamps (10).

(6) Loosen clamp (12), separate cooling fan inlet air duct (13) from engine air inlet duct (14) and remove clamp (12).

(7) Unlatch four suitcase type clamps holding engine air inlet duct (14) to engine air inlet plenum and remove engine air inlet duct (14).

(8) Disconnect five harness connectors located near top of divider panel between engine compartment battery access and storage compartment, connectors (P49, P50, P51, P52 and P106). Disconnect one harness connector (P38) located on top of engine compartment. Disconnect one harness connector located near bottom of divider panel between engine compartment and battery access and storage compartment (connector P64).

(9) Remove nut (15), washer (16), and bolt (17) to disconnect grounding wire (18) from enclosure frame.

(10) Loosen clamp (19) at compressed air discharge flange. Disconnect tube (20), remove gasket (21) and clamp (19).

(11) Remove clamp (22) at turbine exhaust flange.

(12) Loosen clamp (23) at bleed-air load control valve, separate duct assembly (24) from load control valve and remove gasket (25) and clamp (23).

(13) Loosen clamps (26), remove hose assembly (27) and clamps (26). Loosen clamp (28), remove venturi tube assembly (29) and clamp (28). Remove bolts (30), washers (31) and compartment divider panel (32).

(14) Drain oil tank and then remove oil tank drain hose from bottom of oil tank and from enclosure frame fitting. Remove drain tube from the spill drain below the oil filler cap.

(15) Remove bolts (33) and washers (34) from skid assembly mounts.

(16) Install jackscrews (35, fig. 2-5, sheet 3 of 3) and turn down to raise the engine and skid assembly (36) approximately one inch above the enclosure frame. Place four 3/4 inch pipes (37), or equivalent, across the enclosure frame under the engine and skid assembly. Turn jackscrews (35) to lower skid assembly to pipes (37).

(17) Position platform (38) in front of the enclosure and adjacent to the power plant enclosure frame. Roll skid assembly out of enclosure, positioning pipes (37) from the enclosure to the platform (38) so that an even rolling motion is maintained.

(18) Turn jackscrews down to raise engine and skid assembly. Remove pipes (37) and turn jackscrews to lower skid assembly to platform.

b. Installation. Install engine and skid assembly with all attached components in reverse order of removal procedure using figure 2-5 as a guide. Perform power plant test procedures described in paragraph 2-5 after engine and skid assembly installation to ensure proper power plant performance.

2-12. Removal and Installation of Engine and Skid Assembly Major Components

a. Generators. Refer to TM 5-6115-586-12 for removal and installation instructions for the 400 Hz generator and the 60 Hz generator.

b. Gas Turbine Engine.

(1) Removal.

(a) Refer to TM 5-6115-586-12 and remove the 400 Hz generator and the 60 Hz generator.

Note. Tag or otherwise identify harness connectors and wires as removed to aid at installation.

(b) Remove wiring harness connectors as required and feasible to accomplish engine removal. Remove clamps to allow removal of harness with engine.

Note. Tag or otherwise identify hose and tube assemblies as removed to aid at installation.

(c) Loosen or remove hose and tube assemblies as required and feasible to accomplish engine removal. Refer to paragraph 3-3 as an aid to identifying and removing tube assemblies.

(d) Loosen four clamps (1, fig. 2-6) and support (2). Remove the tee and duct (3) and support (2) as an assembly. Remove ducts (4) and oil temperature regulator (5).

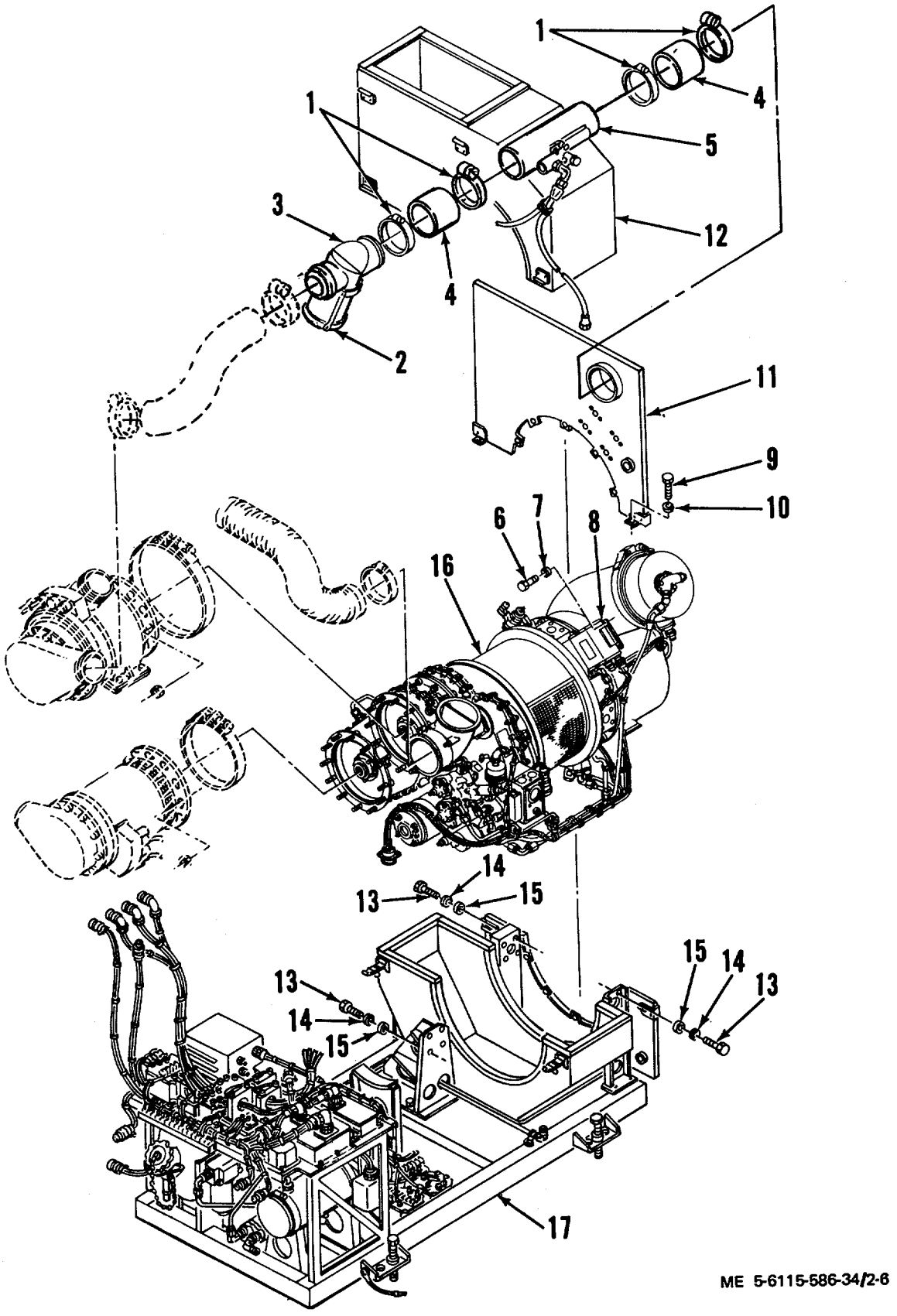


Figure 2-6. Removal of gas turbine engine.

KEY to figure 2-6.

1. Clamps
2. Support
3. Tee and duct
4. Duct
5. Oil temperature regulator
6. Bolt
7. Washer
8. Ignition unit
9. Bolt
10. Washer
11. Upper heat shield
12. Inlet air plenum
13. Bolt
14. Washer
15. Spacer
16. Gas turbine engine
17. Skid assembly

***Warning. Do* not remove ignition unit or ignition lead without grounding. The high tension ignition lead must be grounded as soon as it is removed from the igniter plug. Ground by touching the contact spring in the lead to the igniter.**

(e) Remove four bolts (6) and washers (7), and remove ignition unit (8) from upper heat shield (11).

Note. Keep ignition lead and ignition unit with gas turbine engine.

(f) Remove bolts (9), washers (10), and upper heat shield (11).

(g) Unlatch inlet air plenum (12) top half, and remove from bottom half.

Note. Tag or otherwise identify harness connector and wires as removed to aid at installation.

(h) Attach beam type adjustable sling with overhead hoist of at least 2000 lb. capacity. Remove bolts (13), washers (14), spacers (15) and three mounts and lift engine (16) from skid assembly (17). Guide wiring harness assembly and hose and tube assemblies to prevent damage during removal. Install engine in gas turbine engine portable stand, using maintenance stand adapters. Remove beam type adjustable sling.

(2) *Installation.*

(a) Install gas turbine engine in reverse order of removal procedures, using figure 2-6 as a guide.

(b) Refer to TM 5-6115-586-12 and install the generators.

c. Upper Electric Power Chassis Assembly. Refer to TM 5-6115-586-12.

d. Lower Electric Power Chassis Assembly. Refer to TM 5-6115-586-12.

2-13. Removal and Installation of Auxiliary Power Tray Assembly

a. Removal.

(1) Disconnect four wire harness leads (wire numbers X200AG4N, X200AH8N, X200AJ4N, and X200AK8N) from the ground terminal E3 (located on the receptacle panel).

(2) Disconnect connector (P103) from rear of auxiliary power tray assembly.

(3) Remove four screws and washers that attach the front panel to the enclosure and seven screws and washers that attach the tray to the enclosure. Remove the auxiliary power tray assembly.

b. Installation. Install the auxiliary power tray assembly by reversing the removal procedure.

CHAPTER 3

REPAIR OF ENGINE

Section I. ENGINE ELECTRICAL AND PLUMBING INSTALLATION

3-1. General

This section includes instructions for repair of the engine wire harness assembly, hose assemblies, tube assemblies and fittings. Refer to TM 5-6115-586-12 for schematics of the electrical, fuel, bleedair and lubrication systems as an aid to troubleshooting and repair. Refer to TM 5-6115-586-12 for a description of these components.

3-2. Gas Turbine Engine Branched Wire Harness Assembly

a. General. The gas turbine engine branched wire harness assembly is a multiple lead wiring harness for engine electrical components and control circuits. All circuits for the engine are connected to the power plant electrical system through connector J36. Before the wire harness assembly is removed, tag electrical leads, note location of clamps and routing of harness, and location of lockwire as an aid at installation.

b. Removal. Remove gas turbine engine wire harness assembly according to sequence of index numbers 1 through 14 assigned to figure 3-1.

c. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement using the sequence of index numbers 1 through 15 assigned to figure 3-2 and figure 3-3 as guides.

d. Cleaning and Inspection.

(1) Clean harness assembly with lint-free cloth or soft bristle brush.

(2) Visually inspect harness assembly wiring for wire breaks, frayed or burned insulation, chafing or other evidence of damage.

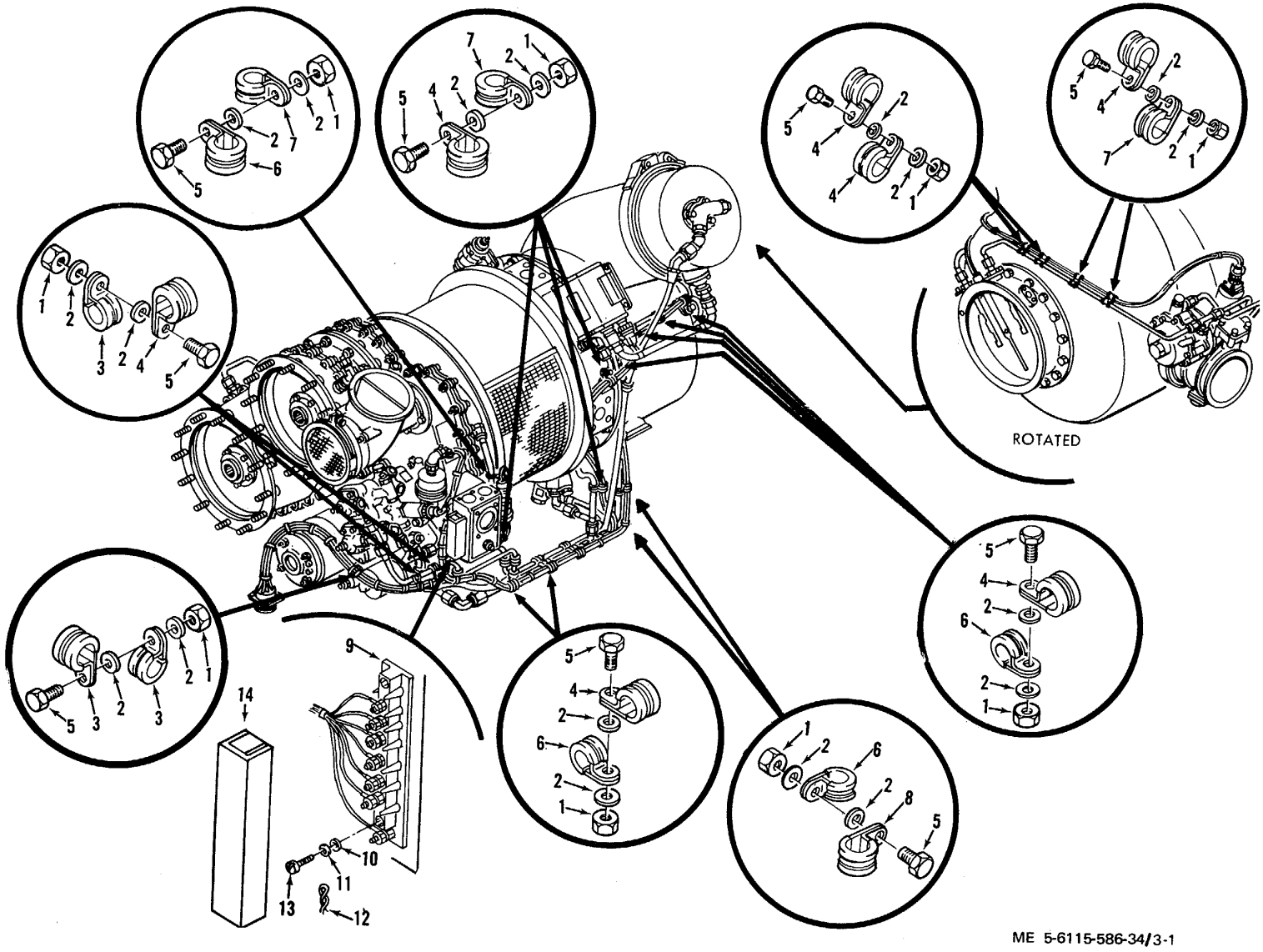
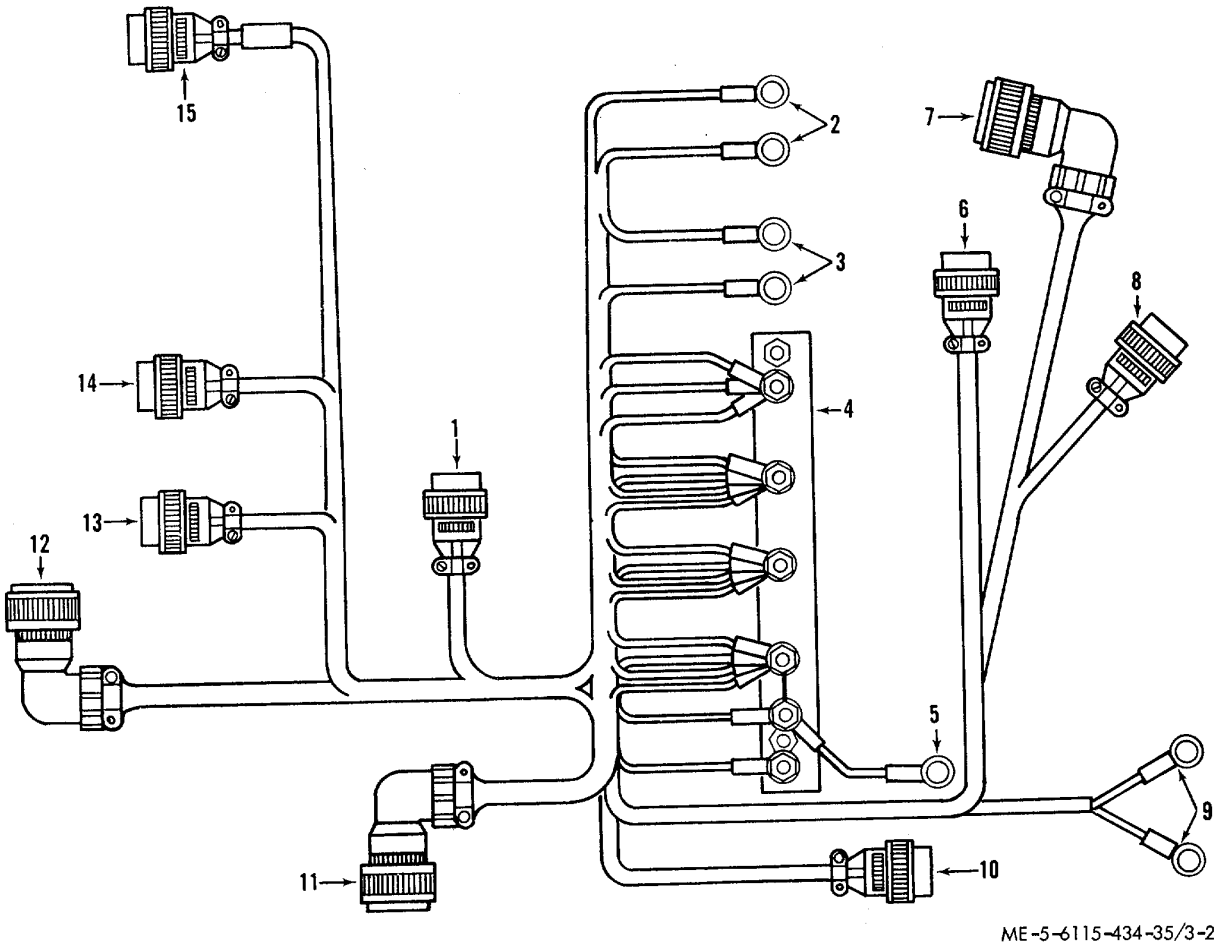


Figure 3-1. Gas turbine engine wire harness installation.

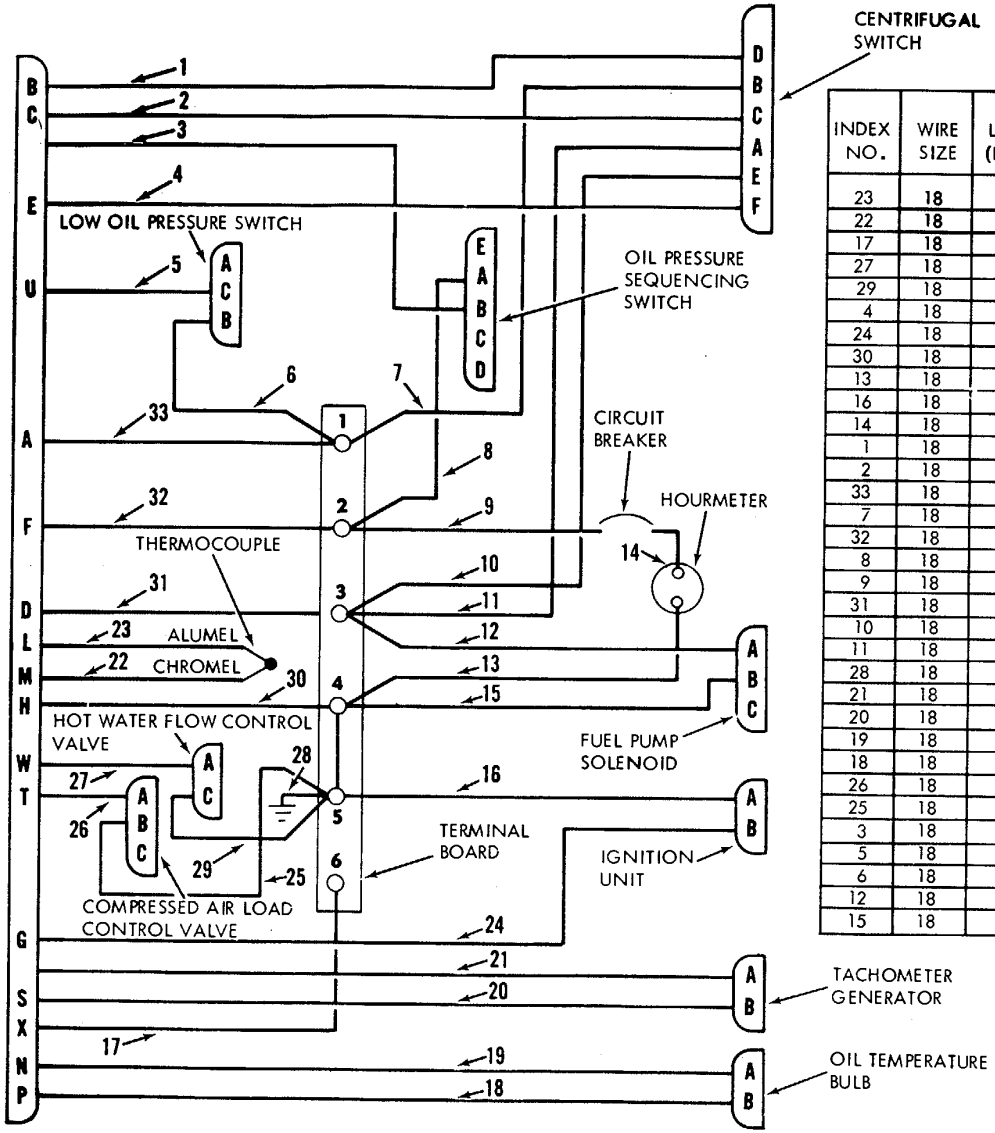
KEY to figure 3-1.

1. Nut
2. Washer
3. Clamp
4. Clamp
5. Bolt
6. Clamp
7. Clamp
8. Clamp
9. Terminal board
10. Washer
11. Washer
12. Lockwire
13. Screw
14. Terminal board cover



1. Fuel solenoid connector
2. Hourmeter terminals
3. Hourmeter circuit breaker terminals
4. Terminal board
5. Ground terminal
6. Ignition coil connector
7. Load control valve connector
8. Flow control valve connector
9. Thermocouple terminals
10. Low oil pressure switch connector
11. Oil pressure sequencing switch connector
12. Tachometer generator connector
13. Oil temperature bulb connector
14. Centrifugal switch connector
15. Power plant electrical system connector

Figure 3-2. Gas turbine engine wire harness assembly.



INDEX NO.	WIRE SIZE	LENGTH (INCHES)	WIRE NO.	FROM LOCATION NO.	FROM PIN NO.	TO LOCATION NO.	TO PIN NO.
23	18	80	E7A18	1	L	12	ALUMEL
22	18	80	E9A18	1	M	12	CHROMEL
17	18	38	H1A18	1	X	2	6
27	18	118	H18A18	2	W	A	36
29	18	101	H19A18N	2	4	C	36
4	18	12	J3A18	1	E	3	F
24	18	70	J3B18	1	G	27	B
30	18	29	J8A18N	1	H	2	4
13	18	8	J8B18N	2	4	8	NEG
16	18	50	J8D18N	2	5	27	A
14	18	45	J8[illegible]18	8	POS	7	
1	18	12	K1A18	1	B	3	D
2	18	12	K2A18	1	C	3	C
33	18	29	K4A18	1	A	2	1
7	18	24.5	K4B18	2	1	3	B
32	18	29	K5A18	1	F	2	2
8	18	24.5	K5B18	2	2	3	A
9	18	8	K5C18	2	2	7	LINE
31	18	29	K6A18	1	D	2	3
10	18	23.5	K6B18	2	3	3	E
11	18	14	K6C18	2	3	5	A
28	18	23	K8E18N	2	5	GROUND	
21	18	15	K10A18	1	R	13	A
20	18	15	K11A18	1	S	13	B
19	18	15	K12A18	1	N	15	A
18	18	15	K13A18	1	P	15	B
26	18	108	K14A18	1	T	28	A
25	18	86	K14B18N	28	B	2	5
3	18	29	K15A18	1	V	5	B
5	18	46	K16A18	1	U	30	C
6	18	35	K16B18	30	B	2	1
12	18	8	Q6D18	2	3	9	A
15	18	9	Q8C18N	2	4	9	B

Figure 3-3. Gas turbine engine wire harness diagram and wire identification chart.

(3) Inspect connectors for crossed, stripped or peened threads and for bent, broken, or otherwise damaged pins.

e. Test. Refer to figure 3-3 and check individual wires for continuity using a multimeter.

f. Repair and Replacement.

(1) Replace any part that does not meet inspection requirements and is damaged beyond simple repair. Solder all connectors except thermocouple terminals according to Military Specification MIL-S-6872 using solder in accordance with Federal Specification QQ-S-571, Composition Sn60.

(2) Solder thermocouple terminal according to Military Specification MIL-S-6872 using solder in accordance with Federal Specification QQ-S-561, Class 5.

(3) If wire (22, fig. 3-3), or wire (23) require replacement, use wire in accordance with Military Specification MIL-W-5846B, Type II, Class A.

(4) If wires (25, 26, 27, or 29, fig. 3-3) require replacement, use wire in accordance with Military Specification MIL-W-25038, Size 18.

(5) All other wire to be in accordance with Military Standard MS27110-18.

(6) Identify all leads with wire number in accordance with figure 3-3.

(7) If connector and terminal location markers are damaged or missing, apply new markers.

(8) Tie wires at all junctions and at all other places as required with cable tie strap.

g. Reassembly. Assemble harness assembly in reverse order of disassembly.

h. Installation.

(1) Install harness in reverse order of removal procedure, using figure 3-1 as a guide and observe the following.

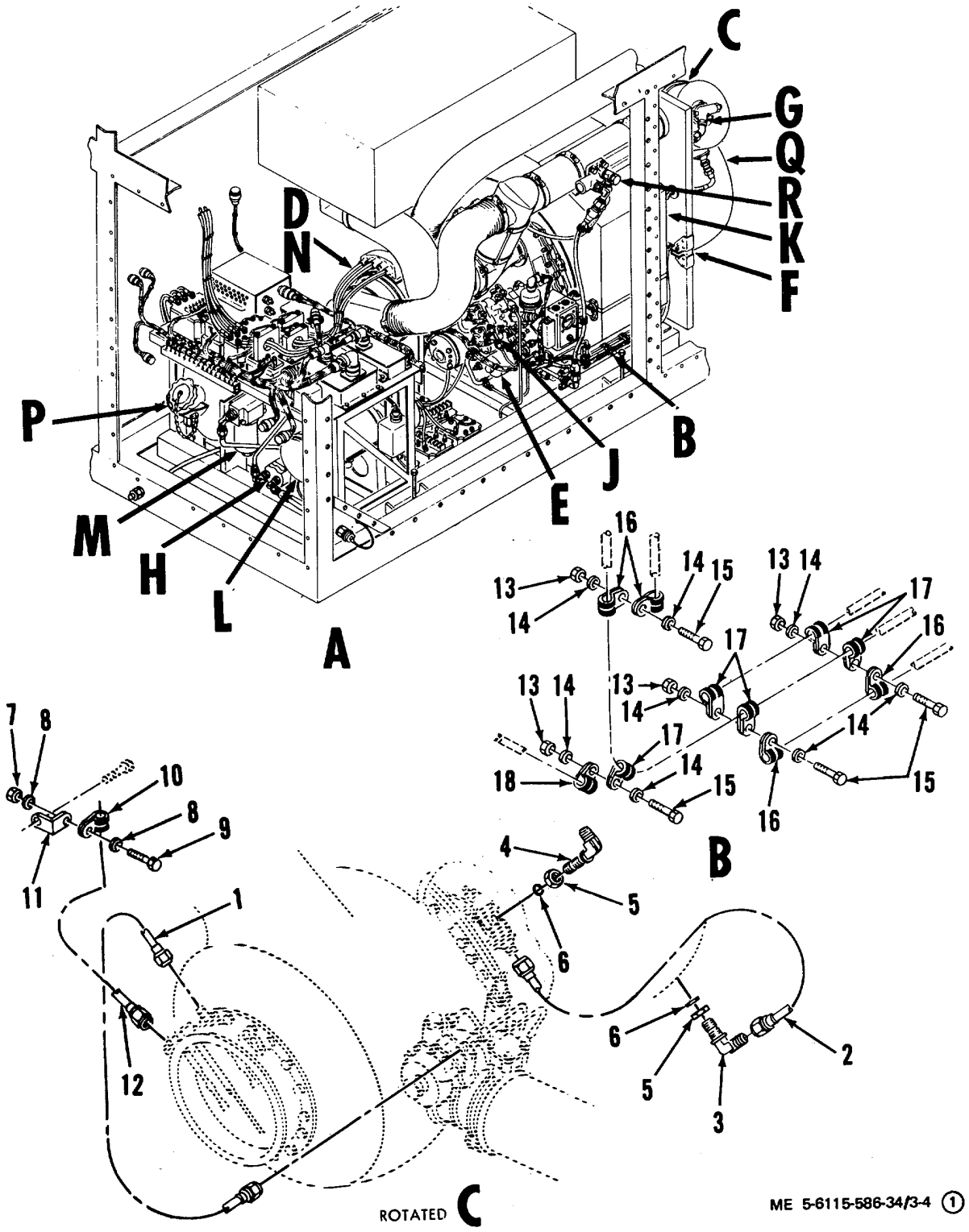
(2) Remove all paint from starter flange before attaching harness ground wire. Use starter motor attaching nut to attach harness ground wire to starter flange.

(3) Lockwire (terminal board, cover) according to Military Standard MS33540.

3-3. Plumbing Installation

a. General. The engine and skid plumbing installation provides interconnection of fuel, lubrication, and bleed air system components. The hose assemblies consist of metallic-braid-protected hoses with permanently secured end fittings. Support clamps hold the tube and hose assemblies in place and prevent them from directly contacting the skid where they would be subject to early failure due to vibration. Tag the hose and tube assemblies before removal, and note location of clamps and routing of plumbing as an aid at installation.

b. Removal. Remove hose and tube and plumbing fittings according to sequence of index numbers 1 through 193 assigned to figure 3-4.



1.	Tube assy	7.	Nut	13.	Nut
2.	Tube assy	8.	Flat washer	14.	Flat washer
3.	Elbow	9.	Bolt	15.	Bolt
4.	Elbow	10.	Loop clamp	16.	Loop clamp
5.	Coupling nut	11.	Bracket	17.	Loop clamp
6.	O-ring	12.	Tube assy	18.	Loop clamp

Figure 3-4. Engine and skid plumbing installation. (sheet 1 of 5)

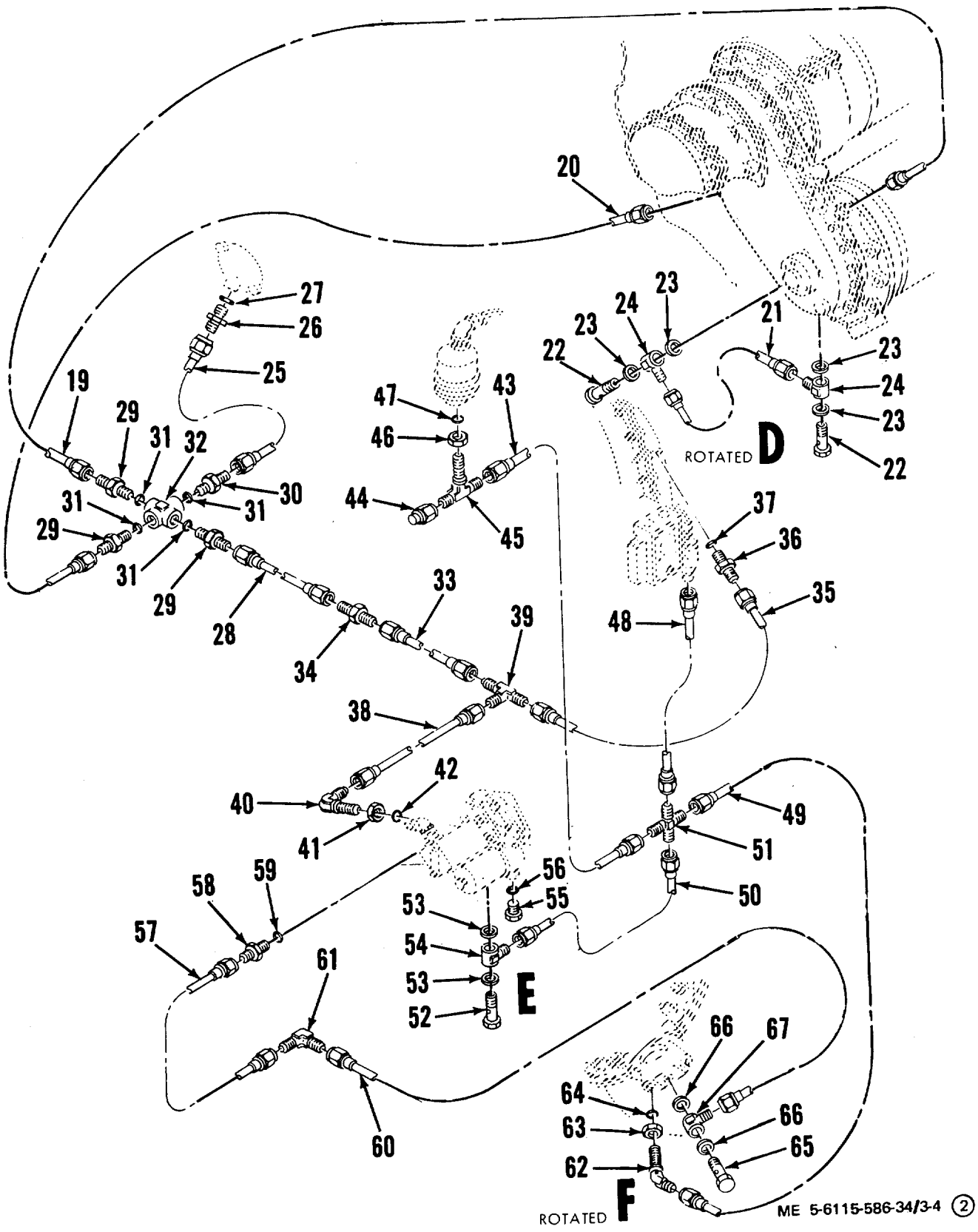


Figure 3-4. Engine and skid plumbing installation. (sheet 2 of 5)

KEY to figure 3-4-Continued:

19. Tube assy
20. Tube assy
21. Tube assy
22. Fluid passage bolt
23. Packing
24. Connector
25. Tube assy
26. Union
27. 0-ring
28. Tube assy
29. Union
30. Reducer
31. 0-ring
32. Cross fitting
33. Tube assy
34. Reducer
35. Tube assy
36. Nipple
37. Packing
38. Tube assy
30). Tee
40. Elbow
41. Nut
42. Packing
43. Tube assy
44. Tube cap
45. Tee
46. Coupling nut
47. O-ring
48. Tube assy
40. Tube assy
50. Tube assy
51. Tube cross
52. Fluid passage bolt
53. Packing
54. Connector
55. Oil pump plug
56. Packing
57. Tube
58. Reducer
59. Packing
60. Tube assy
61. Elbow
62. Elbow
63. Coupling nut
64. O-ring
65. Fluid passage bolt
66. Packing
67. Connector

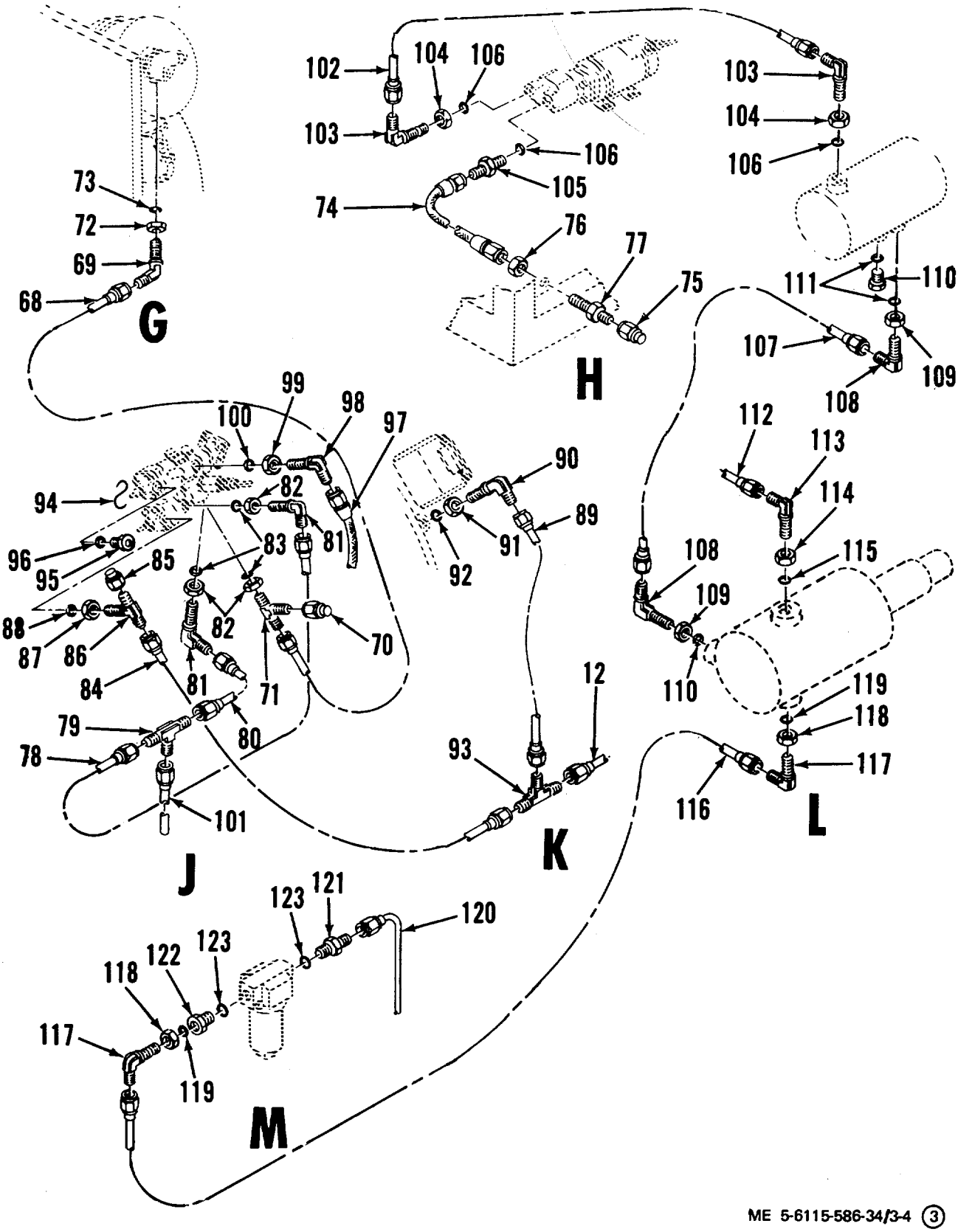


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Figure 3-4. Engine and skid plumbing installation. (sheet 3 of 5)

KEY to figure 3-4-Continued:

68. Tube assy
69. Elbow
70. Tube cap
71. Tee
72. Coupling nut
73. 0-ring
74. Tube assy
75. Tube cap
76. Nut
77. Union
78. Tube assy
79. Tee
80. Tube assy
81. Elbow
82. Coupling nut
83. 0-ring
84. Tube assy
85. Tube cap
86. Tee
87. Nut
88. 0-ring
89. Tube assy
90. Elbow assy
91. Coupling nut
92. O-ring
93. Tee
94. Lockwire
95. Plug/bleeder-ring
96. 0-ring
97. Hose assy
98. Elbow
99. Nut
100. O-ring
101. Tube assy
102. Tube assy
103. Nut
104. Nut
105. Reducer
106. 0-ring
107. Tube assy
108. Elbow
109. Nut
110. Plug/bleeder
111. O-ring
112. Tube assy
113. Elbow
114. Nut
115. O-ring
116. Tube assy
117 Elbow
118. Nut
119. O-ring
120. Tube assy
121. Reducer
122. Bushing
123. O-ring

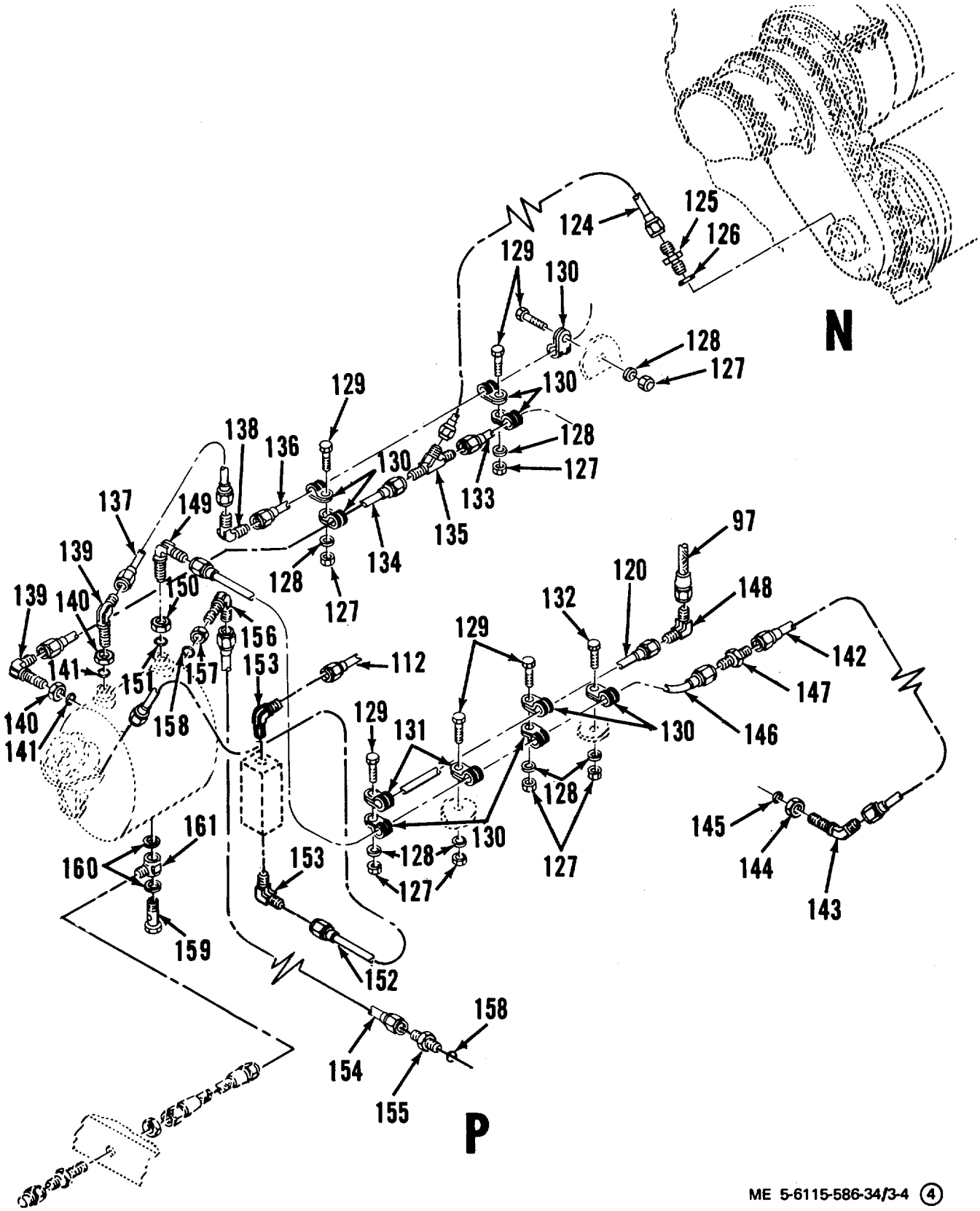


Figure 3-4. Engine and skid plumbing installation. (sheet 4 of 5)

KEY to figure 3-4-Continued:

124. Tube assy
125. Union
126. O-ring
127. Nut
128. Flat washer
129. Bolt
130. Loop clamp
131. Loop clamp
132. Bolt
133. Tube assy
134. Tube assy
135. Fitting
136. Tube assy
137. Tube assy
138. Elbow
139. Elbow
140. Nut
141. 0-ring
142. Tube assy
143. Elbow
144. Nut
145. 0-ring
146. Tube assy
147. Union
148. Elbow
149. Elbow
150. Nut
151. 0-ring
152. Tube assy
153. Elbow
154. Tube assy
155. Union
156. Elbow
157. Elbow
158. O-ring
159. Fluid passage bolt
160. Packing
161. Elbow

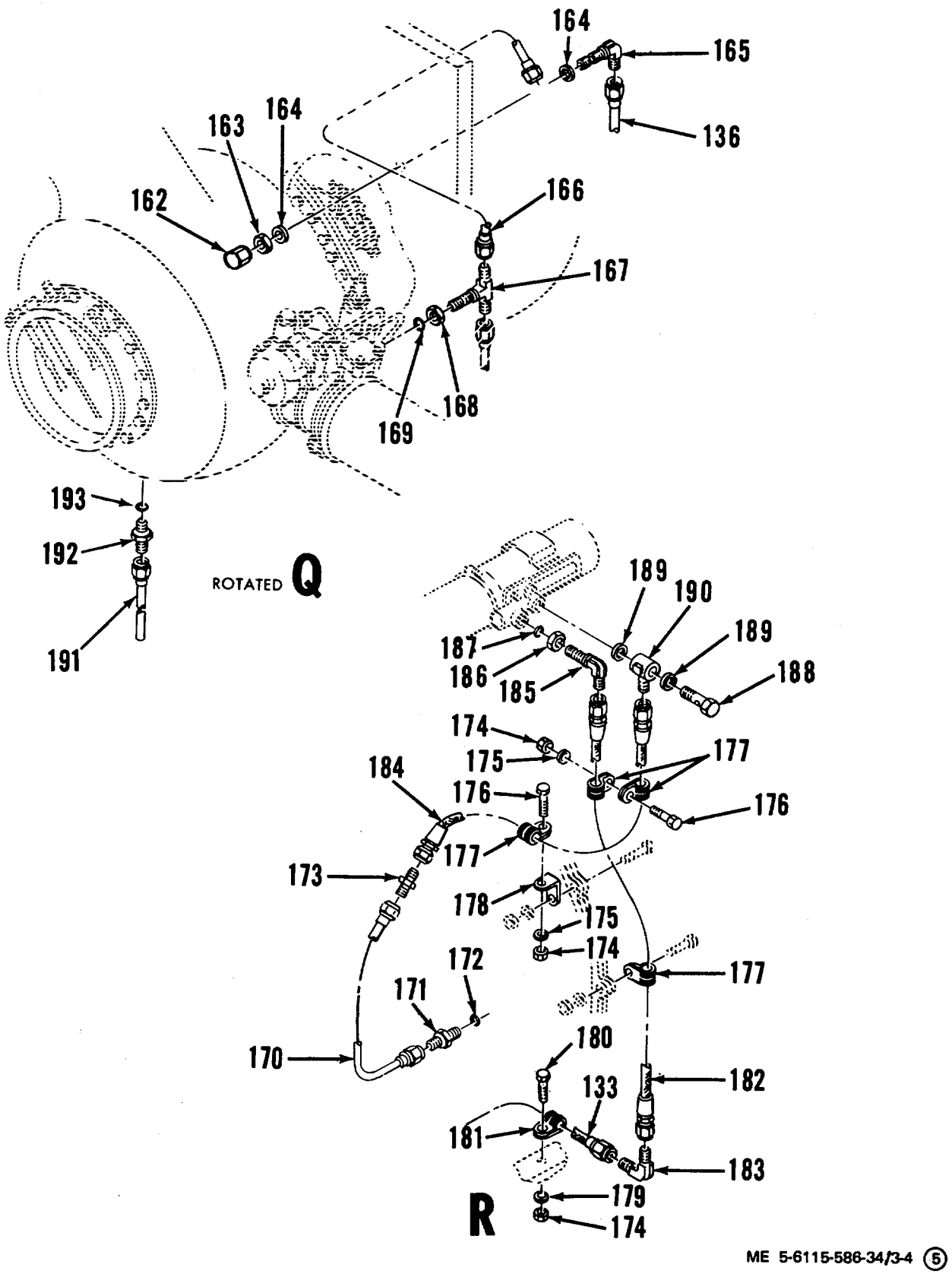


Figure 3-4. Engine and skid plumbing installation. (sheet 5 of 5)

KEY to figure 3-4-Continued:

162. Cap
163. Nut
164. Flat washer
165. Elbow
166. Tube assy
167. Tee
168. Nut
169. O-ring
170. Tube assy
171. Union
172. O-ring
173. Union
174. Nut
175. Flat washer
176. Bolt
177. Loop clamp
178. Bracket
179. Flat washer
180. Bolt
181. Loop clamp
182. Hose assy
183. Elbow
184. Hose assy
185. Elbow
186. Nut
187. O-ring
188. Fluid passage bolt
189. Packing
190. Elbow
191. Tube assy
192. Relief valve
193. O-ring

c. Cleaning, Inspection and Repair.

(1) Clean hose and tube and plumbing fittings with an approved cleaning solvent and dry thoroughly with filtered compressed air.

(2) Inspect all threaded parts for stripped, crossed, or peened threads. If threads are damaged beyond simple repair, replace part.

(3) Inspect hose for cracks, breaks, chafing and damage to hose interior. If damaged, replace hose assembly.

(4) Inspect tube for kinks, bends, cracks, or other damage which might restrict flow or result in leakage. Inspect connection nuts and sleeves on tube for loose sleeves or damage to nuts. If damaged, replace tube.

(5) Inspect plumbing fittings for cracks or clogged passages. Clean clogged passages and replace cracked fittings.

(6) Replace all gaskets and packings at each overhaul regardless of condition.

d. Installation. Install hose and tube and plumbing fittings in reverse order of removal procedures of paragraph b. above.

Section II. ENGINE ACCESSORIES

3-4. General

This section provides instructions for repair and replacement allocated to direct support and general support maintenance for engine accessory components. The components included in this section are the starter assembly, fuel control assembly, fuel atomizer assembly, and oil temperature regulator valve. Refer to TM 5-6115-586-12 for repair instructions on other accessory components.

3-5. Starter Assembly

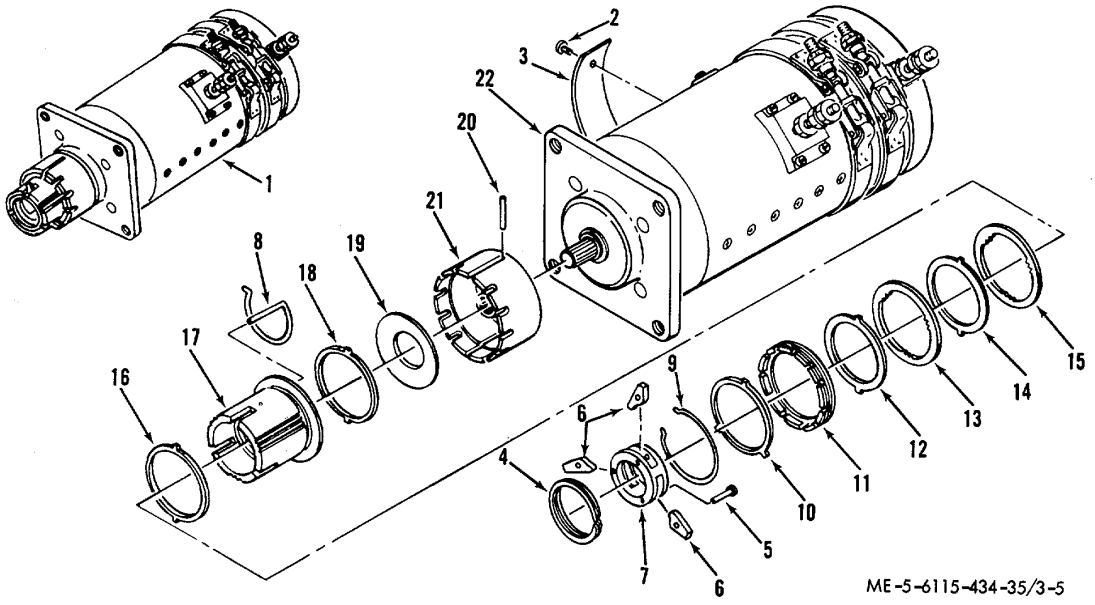
a. General. The starter is a 24 VDC high torque motor with a pawl and clutch mechanism installed to absorb initial shock of starter rotation. Repair instructions for the starter clutch assembly and for replacement of brushes are provided in this paragraph. If repair of the motor is necessary, refer to depot maintenance.

b. Removal. Refer to TM 5-6115-586-12 and remove the starter assembly according to the instructions provided.

c. Disassembly of Clutch Assembly. Refer to figure 3-5 and disassemble the starter clutch assembly as follows:

(1) Do not remove screws (2) or nameplate (3) from the starter assembly (1) unless replacement of the ,nameplate is required after inspection.

(2) Note and record the position of the pawls (6) and spider (7) as an aid at reassembly. Support starter assembly (1) on the workbench and straighten the end of the spring (8) so that ring (4) and assembled pawls and spider may be removed. Remove pins (5) to disassemble pawls (6) from spider (7).



1. Starter assembly
2. Screw
3. Nameplate
4. Ring
5. Pin
6. Pawl
7. Spider
8. Spring
9. Ring
10. Washer
11. Ring
12. Plate
13. Ring
14. Plate
15. Ring
16. Plate
17. Retainer
18. Plate
19. Spring
20. Pin
21. Housing
22. Motor, engine starter

Figure 3-5. Starter clutch assembly.

(3) Remove spring (8). Remove ring (9), washer (10), and ring(11).

(4) Remove plate (12), ring (13), plate (14), ring (15), plate (16), retainer (17), plate (18), and spring (19).

(5) Remove pin (20) and then remove housing (21) from motor (22).

d. Cleaning and Inspection of Clutch Assembly.

(1) Clean all disassembled starter clutch assembly components with a dry cleaning solvent (Fed Spec P-D-680) and dry with filtered compressed air.

Note. Dimensional checks are not necessary in steps (2) through (5) unless parts show visible evidence of wear or other damage.

(2) Check pins (5, fig. 3-5) for damage to wearing surface. Outside diameter of wear surface shall be 0.1223 inch (minimum).

(3) Inspect pawls (6) for nicks, flats, or other damage on wearing surface of engaging end. Replace pawls (6) if flats, nicks, or other damage is observed.

(4) Inspect pin holes in spider (7) for wear. Hole diameter shall be 0.1245 inch to 0.1255 inch.

(5) Inspect rings (11, 13, 15), retainer (17) and housing (21) for wear, nicks, burrs, grooves, galling, corrosion, or other damage. Ring (11) shall have a flat finish of AA64 or better, rings (13, 15) shall have a finish of AA32, or better. Sides of rings (13, 15) shall be parallel within 0.002 inch TIR (total indicator reading). Retainer (17) shall have a flange thickness of 0.075 inch (minimum), faces of flange shall be parallel within 0.002 inch TIR, and flange surface shall have 'a finish of AA32, or better. Wear in grooves of housing (21) shall not exceed 0.010 inch (maximum).

(6) Inspect plates (12, 14, 16, 18) for galling or other damage. Replace plates (12, 14, 16, 18) if breaks in bonding material are observed.

(7) Inspect all threaded parts for stripped, crossed, or peened threads, or foreign particles imbedded in threads.

(8) Perform magnetic particle inspection on pin (5), pawl (6), spider (7), rings (11, 13, 15), retainer (17) and housing (21) in accordance with Military Specification MIL-I-6868.

(9) Inspect nameplate (2) for legibility.

e. Repair and Replacement of Clutch Assembly.

(1) Remove any minor nicks, scratches, burrs or mild corrosion from clutch components with fine abrasive paper (Fed Spec P-P-101, No. 600 grit). Parts shall meet applicable inspection dimensions after repair. After repair, clean parts thoroughly.

(2) Replace spring (8, fig. 3-5).

(3) If nameplate (2) is defective, apply zinc chromate primer (Mil Spec MIL P-8585) to screws (1) and install new nameplate before primer dries.

(4) Replace all other damaged or excessively worn parts. If threads are damaged beyond simple repair, replace part.

f. Reassembly of Clutch Assembly.

(1) Apply light film of oil (Military Specification MIL-L-7808) to both sides of plates (14, 16, fig. 3-5), rings (13, 15) and flared end of retainer (17).

(2) Insert spring (19) in bottom of housing (21) with convex side toward starter motor. Install plate (18) on top of spring (19) with smooth (unbounded) side next to concave side of spring.

(3) Install plate (16) on retainer (17). Install ring (15) on plate (16) align internal spline teeth of ring (15) with external spline teeth of retainer.

(4) Install plate (14) on retainer (17). Install ring (131 after aligning teeth.

(5) Install plate (12) over retainer (17) with rough (bonded) side next to ring (13).

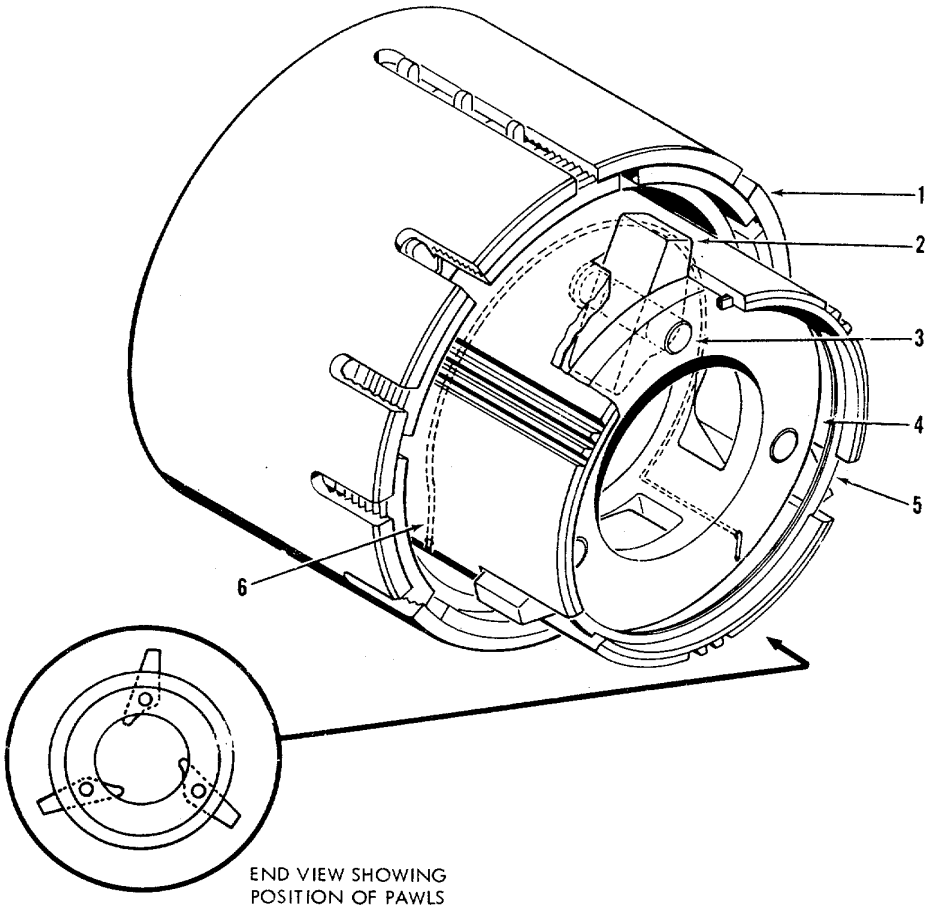
Note. Do not install ring (9) at this time.

(6) Install ring (11 over retainer (17) with smooth (unslotted) side next to plate (12). Install washer (10) over retainer.

(7) Insert pawls (6i) in spider (7), align holes and insert pins (5).

(8) Install assembled parts (5, 6, 7) inside retainer (7) with pawls (6) protruding through slots in retainer and with spring hole in spider clockwise 90 degrees to spring hole in wall retainer, as viewed from flange end of retainer. See figure 3-6, items 1-6, for proper installation of pawls in the spider.

Note. Make sure that spring holds pawls in the retracted position. If not, reverse pawls in spider.



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1. Housing
2. Pawl
3. Pin
4. Spider
5. Ring
6. Spring

Figure 3-6. Pawls installed in spider.

(9) Install ring (4, fig. 3-5) inside retainer (17) to secure assembled parts (5, 6, 7). Install new spring (8) on bottom side of spider (7) with long flared end through spring hole in spider and short flared end, through spring hole in retainer.

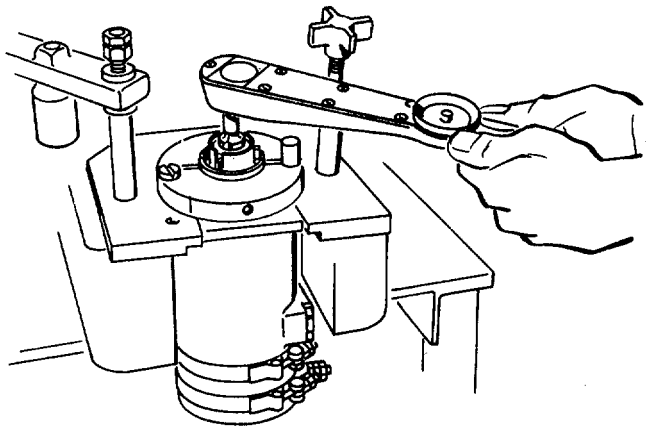
Caution: **Spring (8) shall not be bent in toward center or out toward periphery of spider (7).**

(10) Bend protruding end of spring (8) to approximately 45 degrees.

(11) Insert assembled parts (4 through 8, and 10, 12 through 17) in housing (21) after aligning tangs on plates and rings with the two long slots on housing. Screw ring (11) loosely into housing, holding up washer (10) to perform this operation.

Note. Install ring (9) after ring (11) has been adjusted to give proper slip torque as described below.

(12) Install starter (1, fig. 3-5) in clutch torquing holder (special tool; see table 2-1) to prevent rotation of starter armature assembly (fig. 3-7).



ME 5-6115-434-35/3-14

Figure 3-7. Using clutch torquing holder and torque wrench adapter to check clutch slip torque.

(13) Raise washer (10, fig. 3-5) so that tangs are not engaged in slot of ring (11) or housing (21).

(14) Turn in ring (11) by wedging a screwdriver between radial slots in ring and clutch housing and rotating screwdriver clockwise until top surface of ring is secure against plates. Spray light film of oil (Military Specification MIL-L7808) on parts in retainer (17).

Note

It is necessary to hold washer (10) away from ring (11) to prevent tang catching in slots when adjusting torque.

Caution

Check movement of pawls (6) in spider (7) to be sure they pivot freely and do not bind or stick. It is imperative that pawl action is free and unimpeded through entire stroke. If pawls bind, adjust spring (8) and check for extraneous material in spider.

(15) Insert torque wrench adapter (special tool; see table 2-1) into retainer (17) engaging pawls (6) and attach suitable torque wrench to socket (fig. 3-7). Slip torque required to turn retainer (17, fig. 3-5) clockwise shall be within 135 to 145 inch-pounds, as indicated on torque wrench dial. If slip torque is not within specified limits, tighten or loosen ring (11) as required.

(16) Slip clutch 10 revolutions after torque adjustment, using adapter. Recheck slip torque and readjust as required. Continue to slip clutch 10 revolutions and readjust until slip torque remains within 135 to 145 pound-inches after slippage.

(17) Lower washer (10) and insert large tang where a slot in ring (11) is exactly aligned with a slot on housing (21).

(18) Install ring (9) over washer (10) so that gap of ring is opposite large tang of washer, larger hook is in a slot of ring (11) and remaining length is in inner groove of ring.

g. Removal of Starter Brushes.

(1) Remove the clamp and, insulator strip from the starter motor end cap.

(2) Remove six screws, six lockwashers, and six flat washers from each of the four brush springs and eight brush assemblies.

h. Inspection, Replacement, and Installation of Starter Brushes.

Note

A repair kit shall always be utilized instead of replacement of individual parts.

(1) Discard all brush assemblies and replace with new brush assemblies from repair kit.

(2) Discard insulator and replace with new insulator from repair kit.

(3) The repair kit contains partial replacements for other parts. Inspect the other parts and replace any damaged or defective parts with those supplied in the kit.

(4) Install the brush components by reversing removal procedure.

i. Bench Test and Brush Run-In. Provide a source of DC power capable of producing 16 VDC at approximately 50 amps. With no load on the starter, run-in the brushes until they are seated on at least 80 percent of their contact area. Be sure rotation of the starter motor is counter-clockwise when viewing the starter from the shaft end.

j. Installation. Refer to TM 5-6115-586-12 and install the starter assembly.

3-6. Fuel Control Assembly

a. General. The fuel control unit provides regulated fuel flow to the fuel atomizer assembly in response to engine acceleration conditions and varying load conditions. The fuel control assembly consists of a fuel pump assembly, governor assembly, acceleration limiter valve, full filter assembly and connections for pneumatic control, electrical control, fuel inlet, fuel outlet, fuel bypass, fuel pressure gauge and a fuel seal drain mainfold.

b. Removal. Refer to TM 5-6115-586-12 for fuel control assembly removal instructions, c. Disassembly. Disassemble fuel control assembly according to sequence of index numbers (1 thru 43) assigned to figure 3-8, observing the following.

(1) Record location and manner of lockwiring for aid at assembly.

(2) Do not disassemble any staked, swaged, or press-fit assemblies unless so instructed or unless required after inspection. Do not remove identification plates, decals, studs, passage hole plugs or inserts unless so instructed or unless required after inspection.

(3) Record location and thickness of shims and spacers for aid at assembly.

Note

It is possible all fluids have not been drained from the fuel control assembly. Position assembly over suitable container to catch any remaining fluid when separating major assemblies or removing parts from cavities that might contain fluids.

(4) Remove drive shaft (1, fig. 3-8).

(5) Unscrew filter cap (2) and remove packings (3 and 4) and filter element (5).

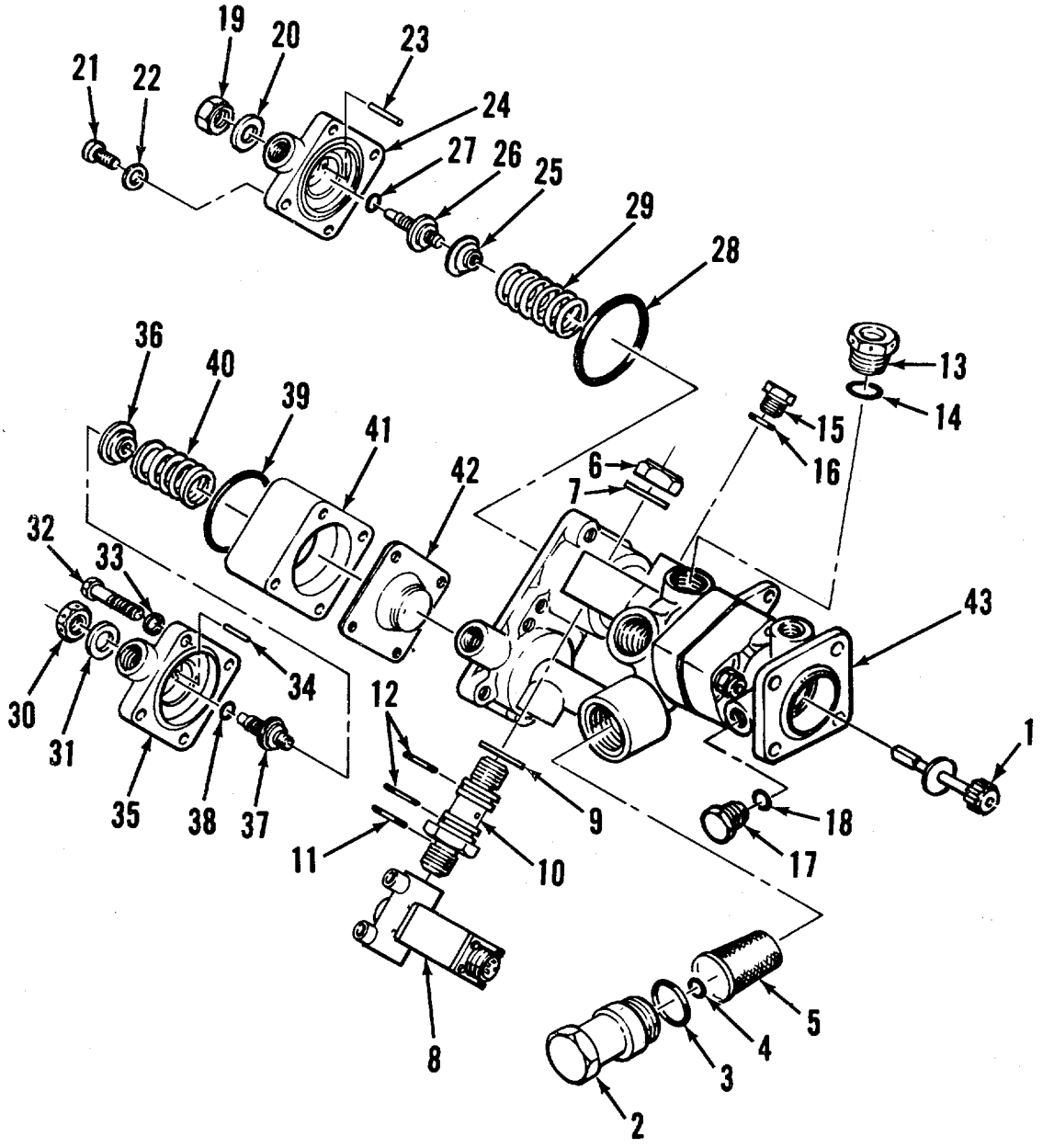


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Figure 3-8. Fuel control assembly.

KEY to figure 3-8.

1. Drive shaft
2. Filter cap
3. Packing
4. Packing
5. Filter element
6. Nut
7. Washer
8. Fuel solenoid valve
9. Washer
10. Fitting
11. Gasket
12. Packing
13. Plug
14. Gasket
15. Plug
16. Packing
17. Plug
18. Packing
19. Nut
20. Washer
21. Screw
22. Washer
23. Pin
24. Cover
25. Nut
26. Adjustment screw
27. Packing
28. Packing
29. Spring
30. Nut
31. Washer
32. Screw
33. Washer
34. Pin
35. Cover
36. Nut
37. Adjustment screw
38. Packing
39. Packing
40. Spring
41. Spacer
42. Diaphragm assy
43. Housing assy

(6) Remove nut (6), washer (7) and remove fuel solenoid valve (8) with items (9 through 12) attached. Remove washers (9). Remove fitting (10) from fuel solenoid valve (8) then remove gasket (11) and packings (12) from fitting (10).

(7) Remove plug (13) with gasket (14) attached, then remove gasket (14) from plug (13).

(8) Remove plug (15) with packing (16) attached, then remove packing (16) from plug (15).

(9) Remove plug (17) with packing (18) attached, then remove packing (18) from plug (17).

(10) Remove nut (19) and washer (20) from screw (26) in cover (24) to release compression load of spring (29).

Note

Nut (25) has left-hand thread.

(11) Remove screws (21) and washers (22) and remove cover (24). Do not remove pin (23) from cover unless damage is indicated by inspection. Remove nut (25), screw (26), packings (27), (28), and spring (29).

Note

If flyweight assembly is removed, do not disassemble from the sleeve and bearing.

(12) Remove nut (30) and washer (31) from screw (37) in cover (35) to release compression load of spring (40).

Note

Nut (36) has left-hand thread.

(13) Remove screws (32) and washers (33) and remove cover (35). Do not remove pin (34) from cover unless damage is indicated by inspection. Remove nut (36), screw (37), packings (38, 39), spring (40) and spacer (41).

(14) Remove diaphragm assembly (42) from housing assembly (43).

Note

Do not disassemble the fuel control assembly further. Refer additional repair to depot maintenance.

d. Cleaning, Inspection and Repair.

(1) *Cleaning.* Clean all components of control unit in an approved solvent, except solenoid valve. Wipe valve with a lint-free cloth dampened in an approved solvent such as trichlorethylene.

(2) *Inspection.*

(a) Visually inspect all parts for obvious damage, excessive wear, or abnormalities. Inspect threaded parts for stripped, crossed, or peened threads.

(b) Inspect springs for distortion, cracks, or other damage.

(c) Check operation of solenoid valve. Apply Test Fluid (Military Specification MIL-T-5624, Grade UP-4 or JP-5) to valve inlet at 100±3psig pressure. Energize solenoid with 7.2 volts dc (maximum) at coil temperature of 80°F (27° C). Valve shall open. Slowly reduce voltage. Valve shall close at 4 volts dc or less.

(d) Increase test fluid pressure to 300±3 psig. Maintain coil temperature at 80° F (27° C) and energize valve with 9.0 volts de (maximum). Valve shall open. Slowly reduce voltage. Valve shall close at 4 volts dc or less.

(e) Check leakage of solenoid valve. Maintain test fluid at 300±3psig pressure and check valve for maximum leakage of 0.5 cc per hour. Reduce test fluid pressure to zero and remove valve from test setup.

(f) Check for insulation breakdown of coil of solenoid valve (8). Apply 750 volts rms between case and coil for one minute. No shorting is permitted.

(g) Visually inspect shaft (1) for wear, crack, nicks, or burrs. Check square end of shaft for 0.180 inch minimum across flats and 0.237 inch

minimum across corners. Check splined end of shaft for 0.5706 inch minimum measured across two 0.0800 inch diameter pins set in any two serrations across diameter.

e. Reassembly. Assemble fuel control unit in reverse order of disassembly while observing the following.

Note

Refer to paragraph 1-6h for torque data.

(1) Coat packings with thin film of compound (Military Specification MIL-C-11796, Class 3) before installation.

(2) Install diaphragm assembly (42) with open convolute side facing outward from housing assembly (43).

(3) Install pin (34) in cover (35). Assemble nut (36), adjustment screw (37), packing 38), washer (36) and nut (30) to cover (35).

(4) Install spacer (41) on housing assembly 143) with drain hole oriented 90 degrees clockwise from limiter valve drain boss and with recess in spacer up. Install packing (39), spring (40) and cover (35) with attached parts on housing, exercising care that pin (34) locates inside spring (40) and cover (35) is oriented as shown in figure 3-8. Secure parts with washers (33) and screws (32).

(5) Install flyweight assembly in cage if removed.

(6) Install pin (23) in cover (24). Assemble nut (25), adjustment screw (26), packing (27), washer (20), nut (19) and packing (28) to cover (24).

(7) Install spring (29) and cover (24) with attached parts on housing assembly (43), exercising care that pin (23) locates inside spring (29) and that cover (24) is oriented as shown in figure 3-8. Secure parts with washers (22) and screws (21). Tighten screws (21) to a torque of 50 to 60 inchpounds.

(8) Install packing (18) on plug (17). Install plug (17) with attached packing (18) in housing assembly (43). Install packing (16) on plug (15). Install plug (15) with attached packing (16) in housing. Install gasket (14) on plug (13). Install plug (13) with attached gasket (14) in housing.

(9) Install gasket (11) on fitting (10) and install fitting (10) in end of fuel solenoid valve (81, opposite of keyway in fuel solenoid valve electrical connector. Install packings (12) and washer (9) on fitting, then insert fitting through boss on housing assembly. Secure with washer (7) and nut (6) tightened to 100 to 110 inch-pounds torque value.

(10) Install filter element (5) over guide in housing assembly. Install packings (4, 3) and filter cap (2).

(11) Install drive shaft (1).

f. Installation. Refer to TM 5-6115-586-12 for instructions regarding installation and adjustment of the fuel control unit.

3-22 3-7. Fuel Atomizer Assembly

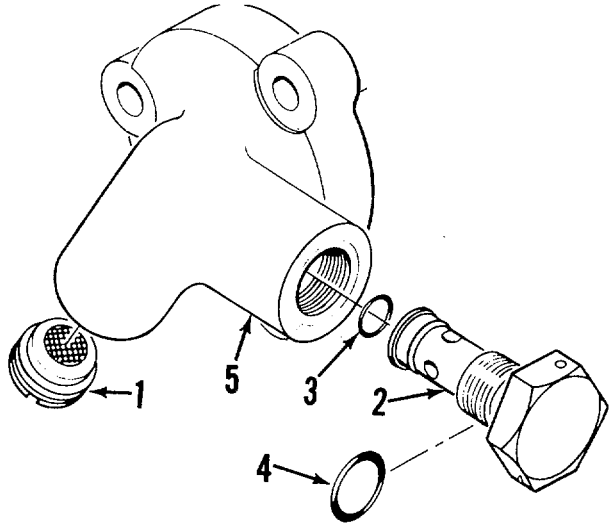
a. General. The fuel atomizer assembly sprays fuel into the combustion chamber in a pattern that provides proper combustion. Fuel at low pressures is metered through a small orifice and ejected in a somewhat concentrated spray pattern of low volume flow. At higher inlet fuel pressures, a relief valve opens and permits a large volume of flow to be ejected through a layer orifice in a wide-angle spray pattern. The flow volume is dependent on the fuel pressure at the fuel atomizer assembly inlet. Repair of the fuel atomizer assembly consists of cleaning or replacement of the screen and replacement of the relief valve packing. Further repairs must be referred to depot maintenance.

b. Removal. Refer to TM 5-6115-586-12 for instructions on removal of the fuel atomizer assembly.

c. Disassembly.

(1) Remove screen (1, fig. 3-9) from fuel atomizer housing (5).

(2) Remove relief valve (2); then remove packings (3 and 4) from the valve.



ME 5-6115-586-34/3-9

1. Screen
2. Relief valve
3. Packing
4. Packing
5. Fuel atomizer housing

Figure 3-9. Fuel atomizer assembly.

d. Cleaning, Inspection, and Replacement.

(1) Clean the screen thoroughly with solvent and dry the screen with clean, filtered compressed air.

(2) Replace the packings (3 and 4, fig. 3-9). Replace the screen (1) if it is damaged.

e. Reassembly and Testing. Reassemble the fuel atomizer assembly by reversing the disassembly

procedure. Refer to TM 5-6115-586-12 and test the fuel atomizer assembly according to the instructions provided.

f. Installation. Refer to TM 5-6115-586-12 and install the fuel atomizer assembly.

3-8. Oil Temperature Regulator Valve

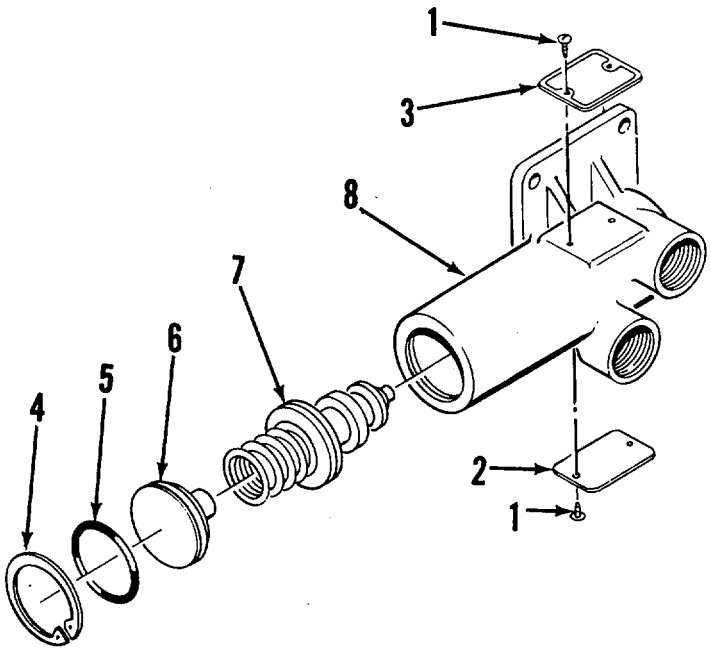
a. General. The oil temperature regulator valve maintains oil temperature in the engine lubrication system within specified limits.

b. Removal. Refer to TM 5-6115-586-12 for oil temperature regulator and valve removal instructions.

c. Disassembly. Refer to figure 3-10 and disassemble the oil temperature regulator valve (items 1 thru 8) in the numerical sequence shown.

Note

Do not remove modification plate (2) or name plate (3) unless they must be replaced.



ME 5-6115-586-34/3-10

1. Screw
2. Modification plate
3. Nameplate
4. Retaining ring
5. Packing
6. Valve cap
7. Valve
8. Valve housing

Figure 3-10. Oil temperature regulator valve.

d. Cleaning, Inspection and Replacement.

(1) Clean the parts with dry cleaning solvent (Fed Spec P-D-680 or equivalent) and dry thoroughly.

(2) Replace the packing (5, fig. 3-10).

(3) Check the modification plate (2) and nameplate (3) for legibility and secure mounting.

(4) Inspect other parts for damage and replace defective parts.

e. Reassembly. Reassemble the oil temperature regulator valve by reversing the disassembly sequence.

f. Installation and Test. Refer to TM 5-6115-586-12 and install the valve to the oil temperature regulator; then test the oil temperature regulator valve as follows:

(1) Test oil temperature regulator, using a test setup as shown in figure 3-11. Use corrosive preventative oil (Military Specification MIL-C-8188) at 70° to 30°F (21° to 1.1°C).

(2) Attach pressure line to OIL IN port and discharge line to OIL OUT port of valve.

(3) Open both shutoff valves and start pump.

(4) Close outlet shutoff valve after all air has been bled from system. Apply an inlet pressure of 100 psi gauge, close shutoff valve in inlet line and observe leakage and pressure drop. No leakage or pressure drop is allowable during a five minute test period.

(5) Drain unit, but do not flush.

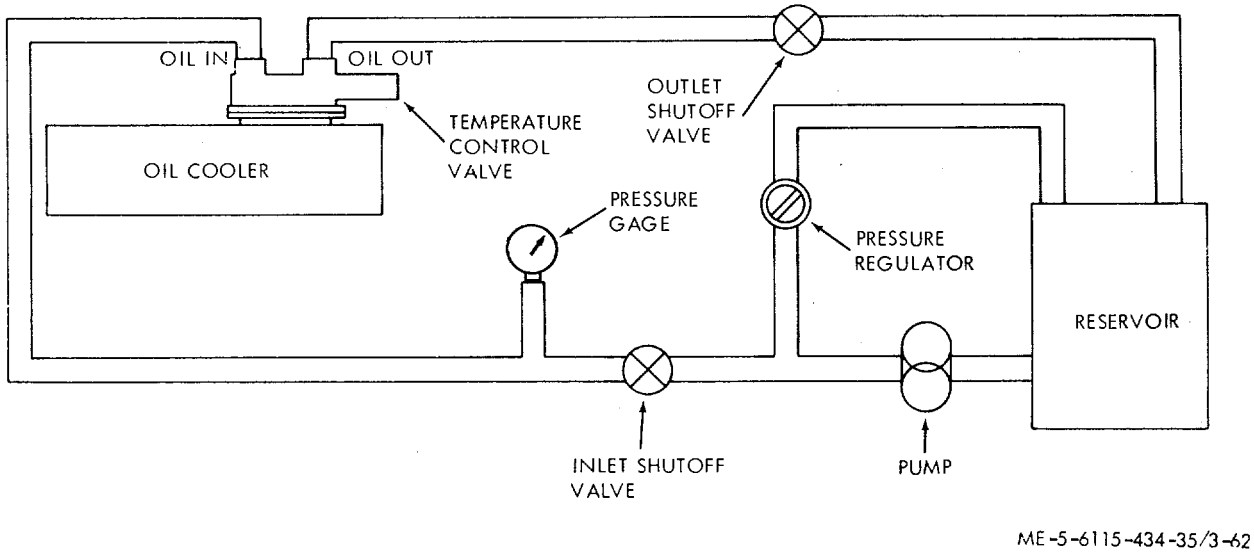


Figure 3-11. Test set-up for oil temperature regulator.

Section III. DUAL PAD ACCESSORY DRIVE ASSEMBLY

3-9. General

This section contains repair instructions for the dual pad accessory drive assembly which is mounted to and driven by the accessory gearcase assembly. The 60 Hz and 400 Hz generators are in turn mounted to and driven by the dual pad accessory drive assembly.

3-10. Removal

a. Removal of Generators. Refer to TM 5-6115586-12 and remove the 400 Hz generator and the 60 Hz generator according to the removal instructions provided.

b. Removal of Dual Pad Accessory Drive Assembly.

(1) Support the dual pad accessory drive assembly; remove twelve nuts (1, fig. 3-12, sheet 1 of 2) and washers (2) that secure the dual pad accessory drive assembly (3) to the accessory gearcase assembly (9) studs, and separate the dual pad accessory drive assembly.

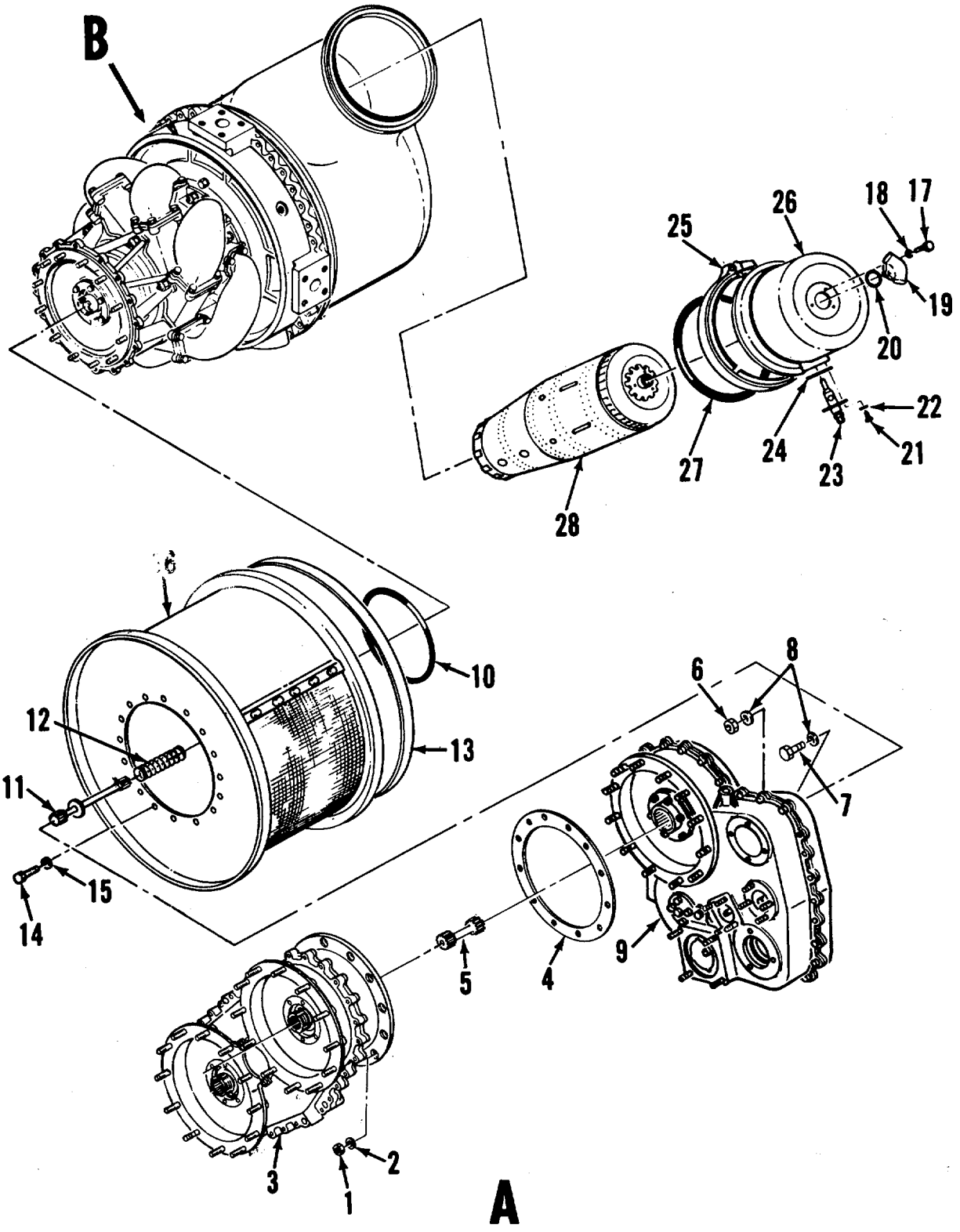
(2) Remove the shaft (5) and gasket (4) from the accessory gearcase assembly (9).

3-11. Disassembly

a. Repair of the dual pad accessory drive assembly by direct support or general support maintenance personnel shall be confined to replacement of seals, oil jets, oil scavenge pump, and their associated parts and external mounting studs. If the housing is cracked or otherwise defective or the drive gears are defective, the dual pad accessory drive assembly shall be replaced by a serviceable assembly and the defective assembly shall be returned to depot maintenance for overhaul.

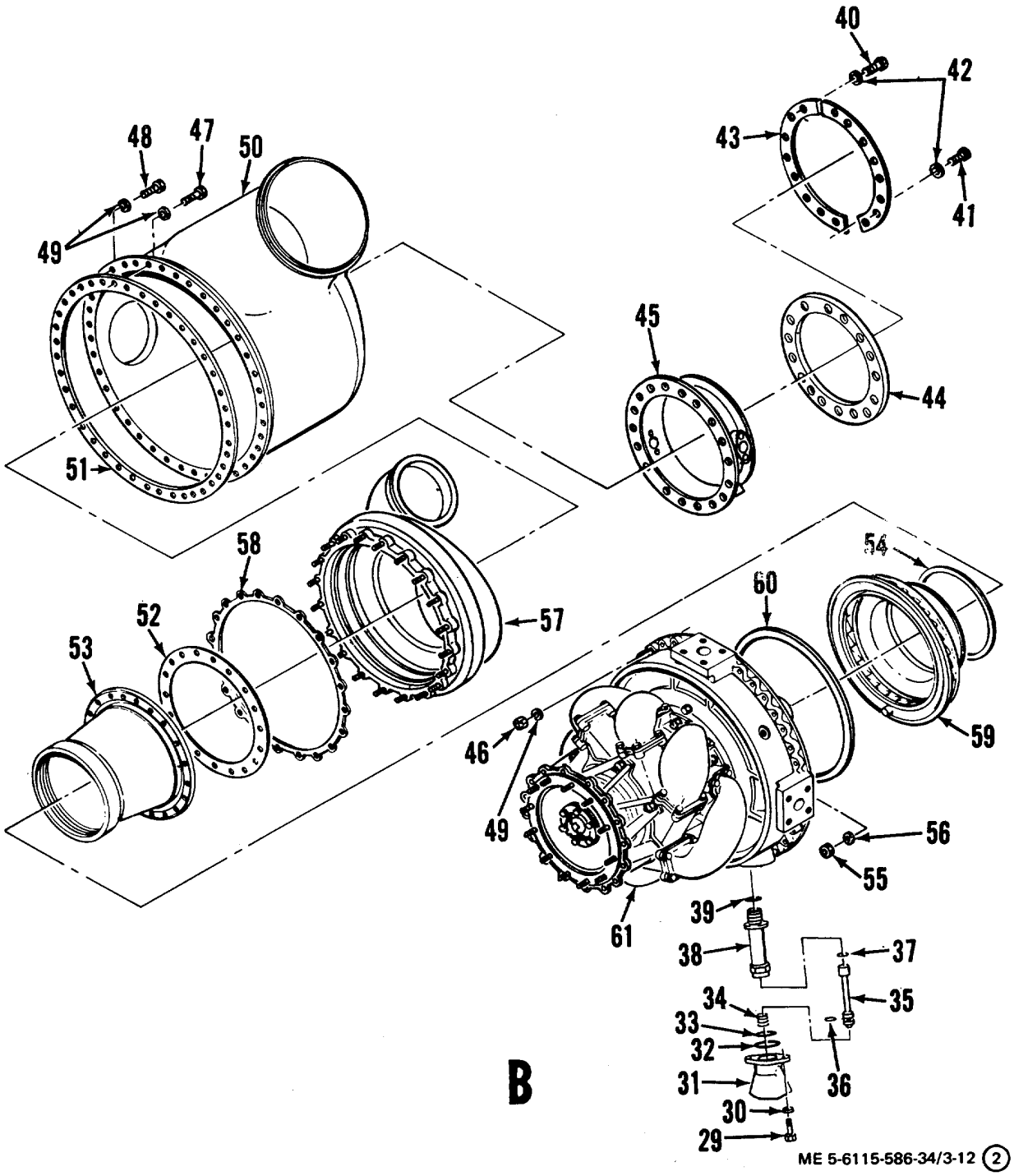
KEY to figure 3-12.

1. Nut
2. Washer
3. Dual pad accessory drive assy
4. Gasket
5. Shaft
6. Nut
7. Bolt
8. Washer
9. Accessory gearcase assembly
10. Packing
11. Shaft
12. Spring
13. Clamp
14. Screw
15. Washer
16. Inlet air plenum
17. Bolt
18. Washer
19. Atomizer
20. Packing
21. Bolt
22. Washer
23. Igniter
24. Gasket
25. Clamp
26. Combustor cap
27. Packing
28. Liner



ME 5-6115-586-34/3-12 (1)

Figure 3-12. Gas turbine engine assembly. (sheet 1 of 2)



29. Bolt
30. Washer
31. Fitting
32. Packing
33. Packing
34. Spring
35. Tube
36. Packing
37. Packing
38. Transfer tube
39. Gasket
40. Bolt
41. Bolt
42. Washer
43. Shim
44. Shim
45. Flange
46. Nut
47. Bolt
48. Bolt
49. Washer
50. Turbine plenum
51. Gasket
52. Shim
53. Exhaust pipe
54. Gasket
55. Nut
56. Washer
57. Torus
58. Shim
59. Nozzle
60. Shim
61. Compressor and turbine

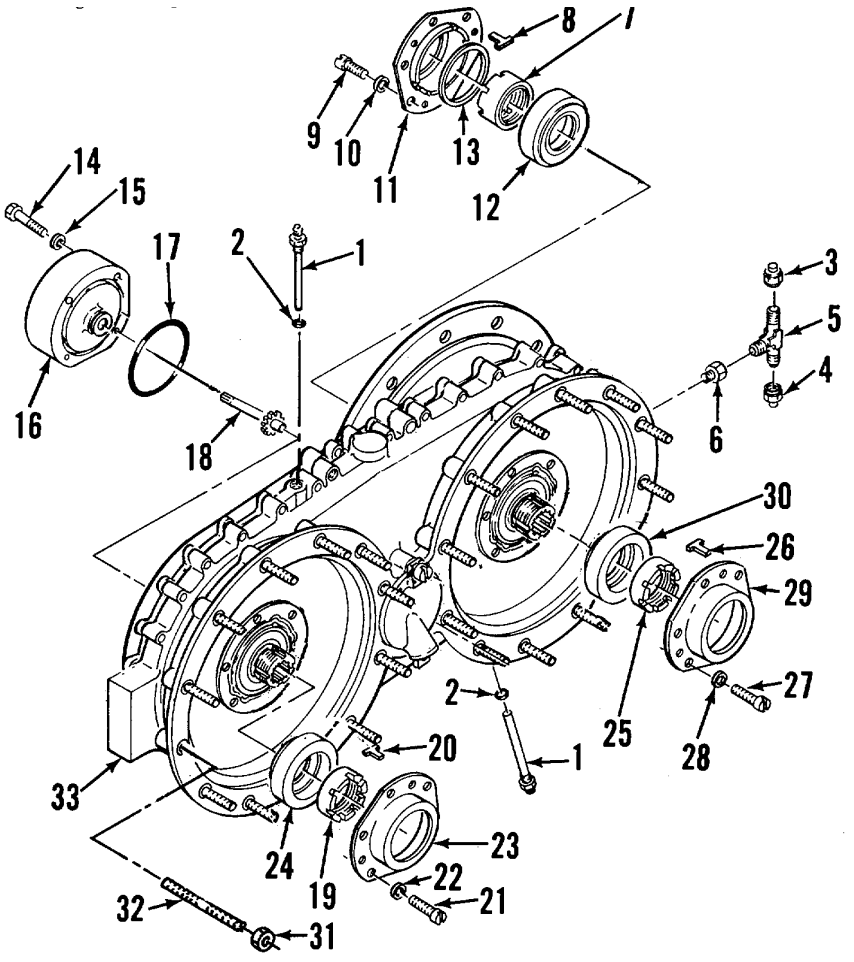
Figure 3-12. Gas turbine engine assembly. (sheet 2 of 2)

b. Disassemble the dual pad accessory drive assembly only as directed in the following instructions.

Note

Remove seals only if replacement is necessary due to leakage or damage that might lead to early failure.

(1) Remove two oil jets (1, fig. 3-13) from housing assembly (33), then remove packings from oil jets.



ME 5-6115-586-34/3-13

1. Oil jet
2. Packing
3. Cap
4. Cap
5. Tee
6. Reducer
7. Retainer nut
8. Key
9. Screw
10. Washer
11. Retainer
12. Seal
13. Shim
14. Bolt
15. Washer
16. Oil scavenge pump
17. Packing
18. Shaft
19. Retainer nut
20. Key
21. Screw
22. Washer
23. Retainer
24. Seal
25. Retainer
26. Key
27. Screw
28. Washer
29. Retainer
30. Seal
31. Lock ring
32. Stud
33. Housing assembly

Figure 3-13. Dual pad accessory drive assy.

(2) Remove caps (3 and 4) from tee (5). Remove tee from reducer (6), then remove from housing.

(3) Straighten key (8) and using adapter (special tool; see table 2-1), remove retainer nut (7) from gearshaft, then remove key (8).

(4) Remove screws (9), washers (10), and retainer (11) with stator of seal (12) and shims (13) installed. Remove rotor of seal (12) from gearshaft.

(5) Using arbor press, press seal (12) from retainer (11) and remove shims (13).

(6) Remove bolts (14), washers (15) and

remove the oil scavenge pump as an assembly (16, 17, and 18). Discard packing (17). Remove shaft (18) if inspection proves it to be damaged and it must be replaced.

(7) Straighten key (20) and using adapter, remove retainer nut (19) and key (20).

(8) Remove screws (211 and washers (22) and remove retainer (23) with stator of seal (24) installed. Remove rotor of seal from gearshaft and use arbor press to press stator of seal (24) from retainer (23).

(9) Straighten key (26) and using adapter, remove nut (25) and key (26) from gear shaft.

(10) Remove screws (27) and washers (28) and remove retainer (29) with stator of seal (30) installed. Remove rotor of seal from gearshaft and use arbor press to press stator of seal from retainer.

(11) Remove lock rings (31) and studs (32) from housing assembly (33) only if inspection reveals damage necessitating replacement.

3-12. Cleaning, Inspection and Repair

a. Cleaning and Inspection.

(1) Clean removed parts using dry cleaning solvent (Fed Spec P-D-680 or equivalent) and a soft bristle brush to facilitate removal of caked grease.

(2) Inspect all metallic parts for corrosion, wear, nicks, scratches, burrs and cracks.

(3) Inspect all threaded parts for worn, crossed. -tripped, or peened threads. Make certain all threaded parts turn freely on mating parts and do not bind.

(4) Inspect bearing oil jets (1, fig. 3-13) as follows:

(a) Check to ensure that oil tube and restrictor are unobstructed.

(b) Inspect for wear or damage to nozzle installation or oil inlet tube attachment threads.

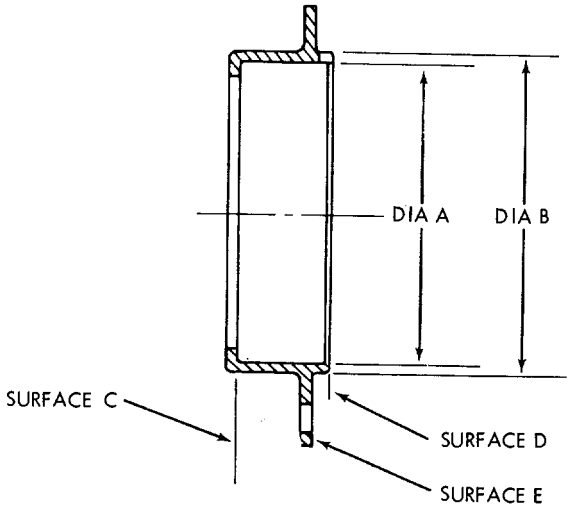
(c) Check security of brazed attachment of restrictor to oil tube and oil tube to oil jet body. Check diameter of restrictor hole. Restrictor hole shall be 0.035 to 0.040 inch diameter.

(5) Visually inspect retainers (11, 23, 29) as follows:

(a) Inspect for physical damage on exterior surfaces and for scratching, galling, or other defects on sealing surfaces.

(b) Inspect for damaged threads in tapped ejection holes in retainer mounting flange.

(c) Perform dimensional and parallelism inspections in accordance with figure 3-14.



SURFACE C AND D DIAMETER B ESTABLISH CENTERLINE.

SURFACES C AND D TO BE PARALLEL TO SURFACE E WITHIN 0.002 INCH TOTAL INDICATOR READING.

A	B
2.501 TO 2.503 IN.	2.675 TO 2.677 IN.

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Figure 3-14. Inspection of retainer.

(6) Inspect bearing retainer nuts (7, 19, 25, fig. 3-13) for damaged threads, distortion of spanner slots, and for evidence of scratching, galling, scoring, or binding on mating surfaces.

(7) Inspect seals (12, 24, 30) as follows:

(a) Visually inspect rotor for nicks, cuts, or scratches.

(b) Visually inspect seal for distortion, wear, or evidence of operational leakage.

(c) Perform dimensional, parallelism and finish inspection in accordance with figure 3-15.

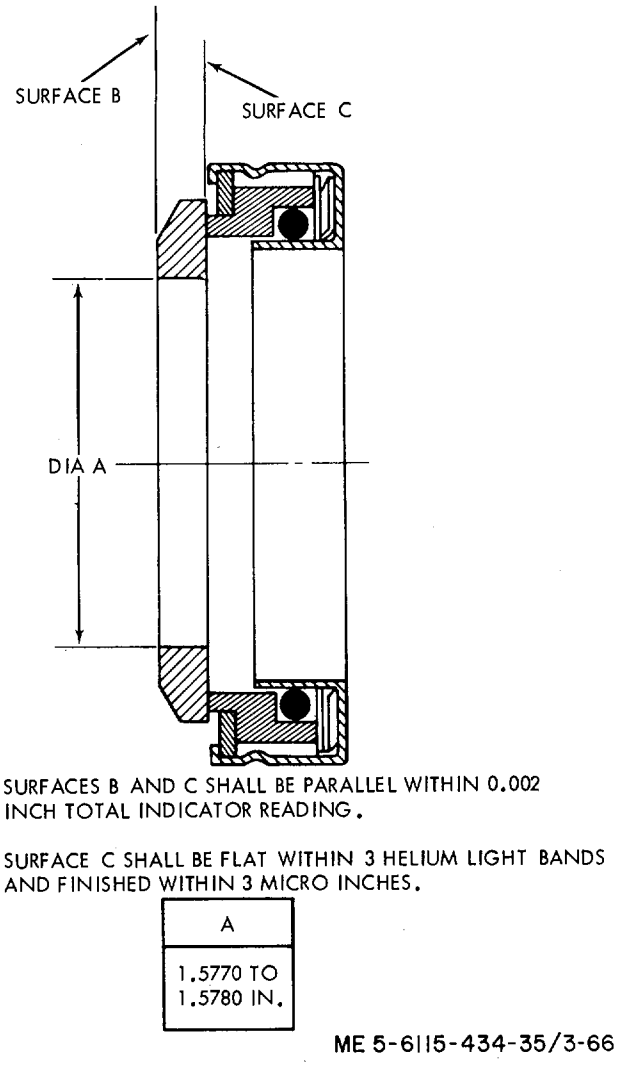


Figure 3-15. Inspection of seat.

(8) Inspect housing for loose, worn, or damaged studs and lock rings (32 and 31, fig. 3-13).

(9) Visually inspect assembled housing and gears for evidence of cracked housing, excessively worn or damaged bearings or gears, loose and misaligned parts. If any of these defects are noted, the dual pad accessory drive assembly must be overhauled at depot level.

b. Repair and Replacement.

(1) Repair or replace oil jet (1, fig. 3-13) if defects are noted at inspection, as follows:

(a) Remove obstructions from oil tube and restrictor by passing a length of 0.030 inch diameter piano wire through restrictor opening and blowing out with compressed air.

(b) Repair brazed joining of restrictor in oil tube or oil tube to body in accordance with established shop practices.

(c) Replace oil jet if threads are damaged or if oil tube is dented or collapsed, or if restrictor hole is damaged or enlarged. Restrictor hole shall be 0.035 to 0.040 inch diameter.

(2) Repair or replace retainers (11, 23, 29, fig. 3-13) as follows, if defects are noted at inspection described (para a(5) above)

(a) Repair minor surface defects.

(b) Replace retainer if worn or damaged beyond simple repair or beyond limits shown in figure 3-14.

(3) Repair or replace retainer nuts (7, 19, 25, fig. 3-13), if defects are noted at inspection as follows:

(a) Repair minor surface defects.

(b) Replace retainer nut if threads are damaged or if spanner slots are mutilated.

(4) If inspection reveals a damaged stud or insert, the damaged part shall be replaced as follows:

(a) Remove insert by drilling to a depth equal to the thickness of the lockring with a drill equal in diameter to that of the serrations between the lockring and insert. Then remove the insert with an "easy-out" tool.

(b) Remove stud by milling to a depth equal to the thickness of the lockring with a hollow mill equal in outside diameter to that of the root diameter of the outer serrations less 0.0156 inch, then unthread the stud.

(5) Replace shaft (18) if gear is damaged or excessively worn. If the oil scavenge pump (16) is defective, replace the oil scavenge pump.

(6) Replace all packing.

(7) Replace common hardware and fittings if threads are stripped or damaged.

3-13. Reassembly

a. Install seal rotor, a part of seal (30, fig. 3-13) onto gearshaft with chamfer next to bearing. Coat seal seating bore of retainer (29) with one coat of red Enamel (Glyptal No. 1201) and allow to dry. Using Arbor press and Fixture, press seal (30) into retainer (29). Install key (26) into gearshaft and install retainer nut (25). Using Adapter, tighten retainer nut to 145 to 155 inch-pounds, bend key (26) into retainer nut slot. Install retainer (29) with seal into housing assembly (33) and secure with screws (27) and washers (28). Tighten screws (27) to 40 to 60 inch-pounds.

b. Install seal rotor, a part of seal (24), onto gearshaft with chamfer next to bearing. Coat seal seating bore of retainer (23) with one coat of red Enamel (Glyptal No. 1201) and allow to dry. Using arbor press and fixture, press seal (24) into retainer (23). Install key (20) on gearshaft and install retainer nut (19). Tighten retainer nut (19) to 145 to 155 inch-pounds, bend key into retainer nut slot. Install retainer (23) with seal (24) into housing assembly (33) and secure with screws (21) and washers (22). Tighten screws (21) to 40 to 60 inch-pounds.

c. Determine shim requirements for seal (12) at input end of gearshaft as follows (fig. 3-16).

(1) Measure depth of retainer and record as dimension A.

(2) Measure height of lip on retainer and record as dimension B.

(3) Measure from mounting flange of bearing retainer to outer race of bearing and record as dimension C (fig. 3-16).

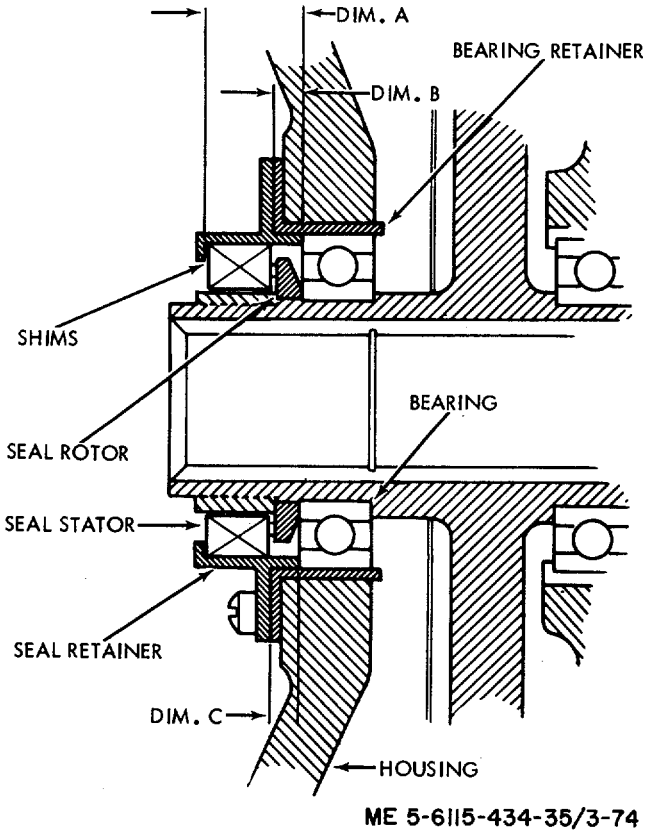


Figure 3-16. Determining shim requirements for input seal assembly.

(4) Subtract dimension B from dimension A and add dimension C to the result. Add shim thickness as required to obtain a dimension of 0.737 to 0.747 inch. This is the required thickness of shims (13, fig. 3-13).

d. Install amount of shims (13) determined above, into retainer (11). Coat seal bore of retainer with one coat of red Enamel (Glyptal No. 1201) and allow to dry. Using arbor press and fixture, press seal (12) into retainer (11).

e. Install rotor of seal (12) onto gearshaft with chamfer next to bearing. Install key (8) and retainer nut (7) onto gearshaft. Tighten retainer nut to 145 to 155 inch-pounds torque value., Bend key (8) into slot of retainer nut. Install retainer (11) with seal (12) and shims (13), assembled, into housing and secure with screws (9) and washers (10). Tighten screw (9) to 40 to 60 inch-pounds.

f. Install new packing (17) into oil scavenge pump (16). Install shaft (18) into the oil scavenge pump.

g. Install assembled scavenge pump into housing and secure with bolts (14) and washers (15). Tighten bolts (14) to 50 to 70 inch-pounds and lockwire in pairs.

h. Install reducer (6) into housing and install tee (5) into reducer (6). Install caps (3, 4) onto tee (5).

i. Install packings (2) onto oil jets (1) and install oil jets into housing assembly. Tighten oil jets to 40 to 60 inch-pounds.

3-14. Installation

a. Installation of Dual Pad Accessory Drive Assembly.

(1) Install shaft (5, fig. 3-12, Sheet 1 of 2) and gasket onto gearcase assembly (9).

(2) Install accessory drive (3) onto gearcase assembly (81) and secure with nuts (1) and washers (2). Tighten nuts to 100 to 110 inchpounds.

b. Installation of Generators. Refer to TM 56115-586-12 for 60 Hz, 400 Hz generator installation instructions.

Section IV. ACCESSORY GEARCASE ASSEMBLY

3-15. General

The accessory gearcase assembly consists of a two-piece gearcase, a spur gear train, and accessory mounting pads for the starter motor assembly, fuel control unit, centrifugal switch assembly, oil pump assembly, cooling fan assembly, and the dual pad accessory drive assembly that drives the 400 Hz and 60 Hz generators. The accessory gearcase assembly is driven by the gas turbine engine and the spur gear train transmits the power to the various accessory items at proper speed and direction of rotation.

3-16. Removal

a. Refer to TM 5-6115-586-12 and remove the 400 Hz and 60 Hz generators.

b. Refer to paragraph 3-10 band remove the dual pad accessory drive assembly.

c. Refer to TM 5-6115-586-12 and remove the accessory items: the starter motor assembly, the fuel control unit, the centrifugal switch assembly, the oil pump assembly, and the cooling fan assembly.

d. Remove the accessory gearcase assembly from the engine as follows:

(1) Support the accessory gearcase assembly (9, fig. 3-12, sheet I of 2) and remove the bolts (7) and washer (8) and the nuts (6) and washers (8) that attach it to the engine. Remove the accessory gearcase assembly (9) and packing (10) from the engine.

(2) Remove the shaft (11) and spring (12) from the engine.

3-17. Disassembly

a. Repair of the accessory gearcase assembly by direct support or general support maintenance personnel is confined to replacement of seals, starter jaw, studs and inserts, and related parts. If the housing or gear train are defective, the accessory gearcase assembly shall be overhauled at depot maintenance facilities.

b. Disassemble the accessory gearcase assembly as follows:

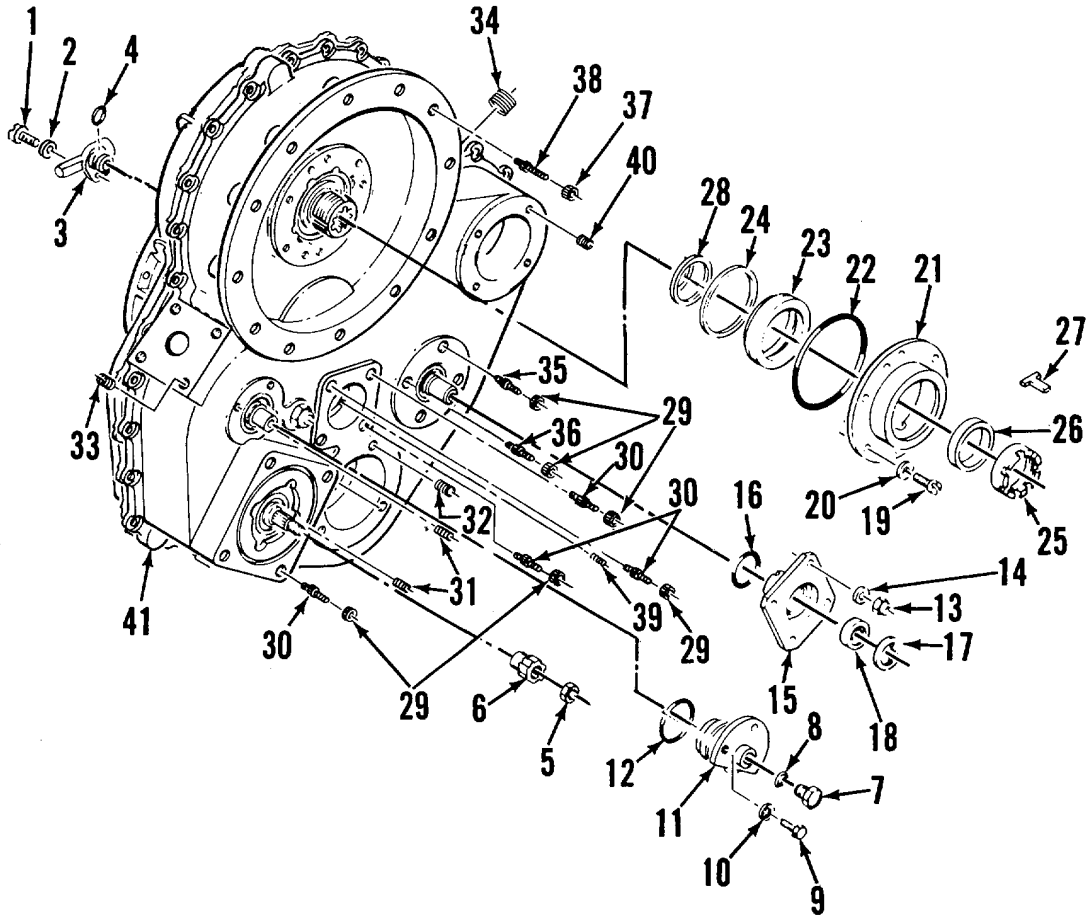
(1) Remove screw (1, fig. 3-17), washer (2) and nozzle (3) with packing (4).

(2) Remove nut (5) and starter jaw (6).

(3) Remove plug and bleeder (7), gasket (8), bolts (9) and washers (10), then remove retainer (11) with packing (12) from housing assy (41).

(4) Remove nuts (13), washers (14) and retainer (15) with packing (16) from housing assembly. Remove ring(17) and press seal (18) from retainer (15).

(5) Remove screws (19), washers (20) and retainer (21) with assembled parts. Press stator of seal (23) from retainer (21). Remove packing (22).



ME 5-6115-586-34/3-17

1. Screw
2. Washer
3. Nozzle
4. Packing
5. Nut
6. Starter jaw
7. Plug and bleeder
8. Gasket
9. Bolt
10. Washer
11. Retainer
12. Packing
13. Nut
14. Washer
15. Retainer
16. Packing
17. Ring
18. Seal
19. Screw
20. Washer
21. Retainer
22. Packing
23. Seal
24. Shim
25. Nut
26. Spacer
27. Key
28. Washer
29. Ring
30. Stud
31. Insert
32. Insert
33. Insert
34. Insert
35. Stud
36. Stud
37. Ring
38. Stud
39. Insert
40. Insert
41. Housing assembly

Figure 3-1 7. Accessory gearcase assembly.

(6) Remove nut (25), spacer (26), key (27) rotor of seal (23), shims (24) and washer (28).

(7) Do not remove rings, studs, and inserts (29 through 40) unless inspection shows that replacement is necessary.

3-18. Cleaning, Inspection, and Repair

a. Cleaning. Degrease parts with dry cleaning solvent (Fed Spec P-D-680 or equivalent) and dry thoroughly.

b. Inspection.

(1) Inspect all metallic parts for corrosion, wear, nicks, cracks, burrs, and scratches.

(2) Inspect all threaded parts for worn, crossed, stripped, or peened threads. Make certain that all threaded parts turn freely on their mating parts and do not bind.

(3) Inspect starter jaw for chips, breaks or cracks.

(4) Visually inspect housing assembly for evidence of cracked housing, defective gears or bearings. If these defects are present, the accessory gearcase assembly must be overhauled at depot maintenance facilities.

c. Repair.

(1) Replace packings and defective seals.

(2) Replace defective hardware and other parts found to be defective by inspection.

(3) If inspection reveals a damaged stud or insert, the damaged part shall be replaced as follows:

(a) Remove insert by drilling to a depth equal to the thickness of the lockring with a drill equal in diameter to that of the serrations between the lockring and insert. Then remove the insert with an "easy-out" tool.

(b) Remove stud by milling to a depth equal to the thickness of the lockring with a hollow mill equal in outside diameter to that of the root diameter of the outer serrations less 0.0156 inch, then unthread the stud.

3-19. Reassembly

Assemble the accessory gearcase assembly by reversing the disassembly sequence using figure 317 as a guide and observing the following:

a. When assembling seal (18) into retainer (15), refer to figure 3-18 and assemble as follows:

(1) Using arbor press, press seal (18, fig. 3-17) into retainer (15) and install ring (17) in retainer (15) to secure seal (18), then install packing (16) onto retainer (15).

(2) Install assembled retainer into housing and secure with washers (14) and nuts (13).

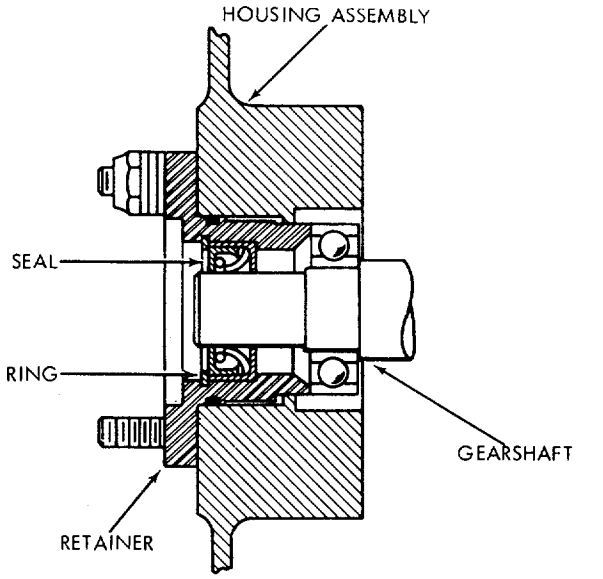
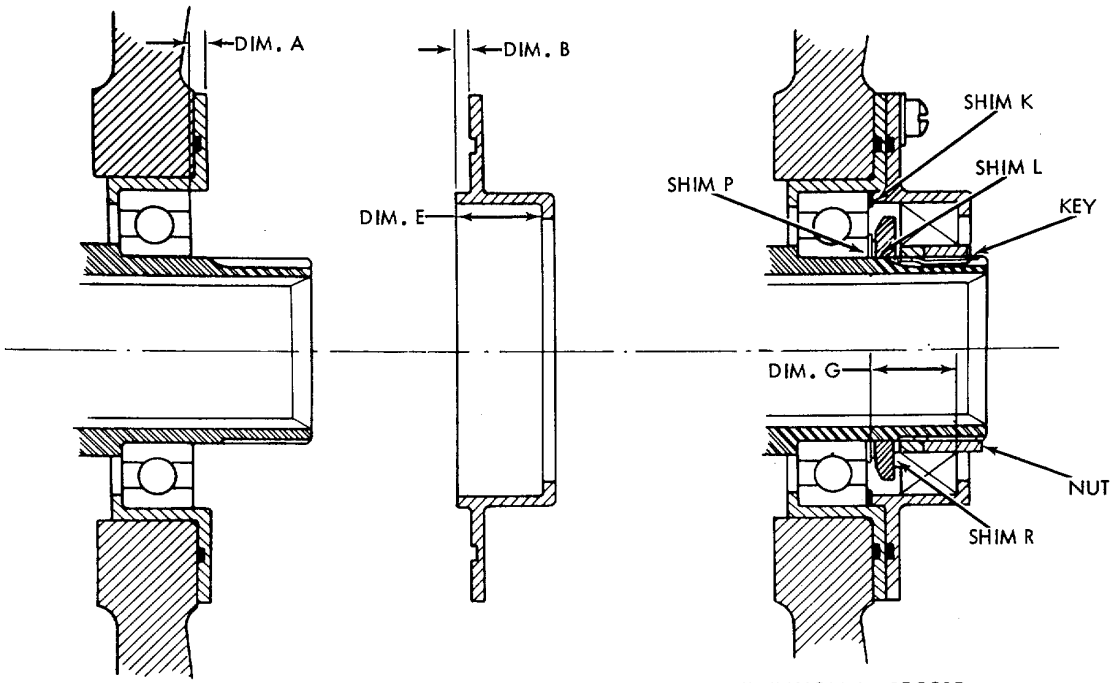


Figure 3-18. Installation of seal.

b. Before assembling retainer (21) and seal (23), make measurements described in figure 3-19 to determine amount of shims required for bearing pinch and seal length, and assemble as follows:



MEASURE DIMENSIONS A AND B. SUBTRACT DIMENSION B FROM DIMENSION A. RECORD DIFFERENCE AS DIMENSION C.

ADD REQUIRED PINCH ON OUTER RACE OF BEARING TO DIMENSION C. RECORD SUM AS DIMENSION D.

DIMENSION D EQUALS AMOUNT OF SHIMS K REQUIRED TO OBTAIN SPECIFIED PINCH ON OUTER RACE OF BEARING.

MEASURE DIMENSION E. ADD DIMENSION D AND DIMENSION E. RECORD SUM AS DIMENSION F.

SUBTRACT REQUIRED SEAL LENGTH (DIMENSION G) FROM DIMENSION F. RECORD DIFFERENCE AS DIMENSION H.

SUBTRACT 0.005 INCH (THICKNESS OF SHIM P) FROM DIMENSION H. RECORD DIFFERENCE AS DIMENSION J.

DIMENSION J EQUALS AMOUNT OF SHIMS L REQUIRED TO OBTAIN SPECIFIED SEAL LENGTH.

SHIMS R MAY BE INSTALLED AS REQUIRED TO POSITION NUT SO THAT KEY MAY BE INSTALLED.

G
0.734 TO 0.739 IN.

Figure 3-19. Installation seal.

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Note

If key slots in retainer nut (25, fig. 3-17) do not align with key (27) replace retainer nut (25). Do not add shims.

(1) Install shims (24, 28), determined above, and install rotor of seal (23), spacer (26) and retainer nut (25).

(2) Hold gearshaft using adapter. Using torque wrench, tighten retainer nut (25) to torque value of 145 to 155 inch-pounds. Check alignment of key lots in retainer nut (25) and mark aligned key slot.

(3) Remove retainer nut (25) and install key (27) on gearshaft. Apply a coat of Loctite to threads of nut and install nut, tighten to torque value of 145 to 155 inch-pounds. Bend key into slot in nut.

(4) Coat mating surfaces of seal (23) with adhesive. Using driver, install seal into retainer (21).

(5) Install required amount of shims (24), packing (22) and assembled retainer (21) into housing. Secure with washers screws (20) and screws (19). Tighten to torque value of 15 to 20 inch-pounds.

c. Install packing (4) on nozzle (3) and install nozzle into housing. Secure nozzle (3) using washers (2) and bolt (1).

3-20. Installation

a. Refer to figure 3-12, sheet I of 2, and install the accessory gearcase assembly as follows:

(1) Install spring (12) and shaft (11) into compressor and turbine shaft. Install packing (10) onto gearcase input flange.

(2) Position gearcase assembly (9) on output mounting flange studs. Secure gearcase to output mounting flange with washers (8), bolt (7) and nuts (6). Tighten nuts (6) and bolts (7) to torque value 75 to 85 inch-pounds.

b. Refer to TM 5-6115-586-12 for installation instructions for the cooling fan assembly, oil pump assembly, centrifugal switch assembly, fuel control unit, and starter motor assembly.

c. Refer to paragraph 3-14 and install the dual pad accessory drive assembly.

Section V. COMPRESSOR AND TURBINE ASSEMBLY

3-21. General

This section contains repair instructions for the air inlet plenum, the turbine plenum, the combustion liner, the torus, the exhaust pipe, and the turbine nozzle. These components with the compressor and turbine assembly, convert and direct the energy developed in the combustion area to rotational mechanical energy.

3-22. Removal

a. Refer to Chapter 2 of this manual for instructions regarding removal of the engine and skid assembly (para 2-11) and removal of the engine from the skid (para 2-12).

b. Remove wire harness (para 3-2 b) and plumbing (para 3-3b) as required to facilitate maintenance.

c. Remove the dual pad accessory drive assembly (para 3-10 b) and the accessory gearcase assembly (para 3-16 c).

3-23. Disassembly

Note

Tag shims as removed and keep them together so that they will be properly installed at assembly.

a. Remove clamp (13, fig. 3-12, sheet 1 of 2) screws (14) and washers (15) and remove inlet air plenum (16).

b. Remove bolts (17), and washers (18) and remove atomizer (19) and packing (20). Remove bolts (21) and washers (22) to remove igniter (23) and gasket (24). Then remove clamp (25) and remove combustor cap (26), packing (27) and liner (28).

c. Remove bolts (29), washers (30), and fitting (31), with packing (32) and spring (34) and packings (36, 37) installed. Remove gasket (39) and packing (33).

d. Remove bolts (40, 41, fig. 3-12, sheet 2 of 2), washers (42), shims (43, 44) and flange (45). Remove nuts (46), bolts (47, 48), and washers (49).

e. Remove plenum (50) and gasket (51) and shims (52). Using wrench (special tool; see table 21), remove exhaust pipe (53) and gasket (54).

f. Remove nuts (55), washers (56), torus (57), shims (58), nozzle (59) and shims (60).

g. Do not disassemble the compressor and turbine assembly (61). Refer repairs to depot maintenance.

3-24. Cleaning, Inspection, and Repair

a. Cleaning. Parts may be cleaned by using an approved solvent in a dip tank or use of spray in a positive outside ventilated spray booth. Vapor degreasing or soap cleaning solution may also be used if suitable equipment is available.

Warning

Fumes from spray or vapor are toxic and shall not be inhaled. Wear solvent-resistant gloves to prevent absorption of solvent through the skin. Fire precautions shall be observed and fire fighting equipment shall be available.

b. Inspection.

(1) Inspect torus (57, fig. 3-12, sheet 2 of 2) as follows: (fig. 3-20 and 3-21.)

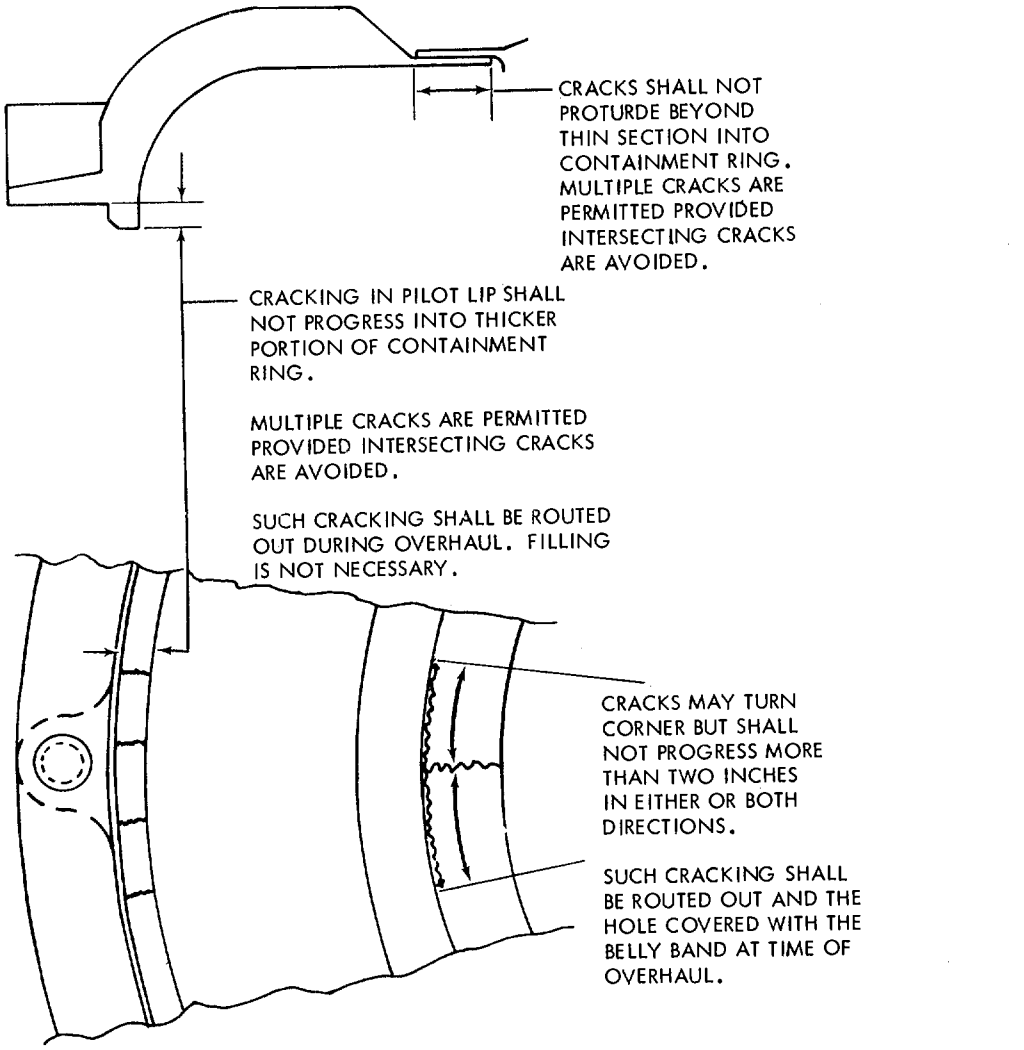
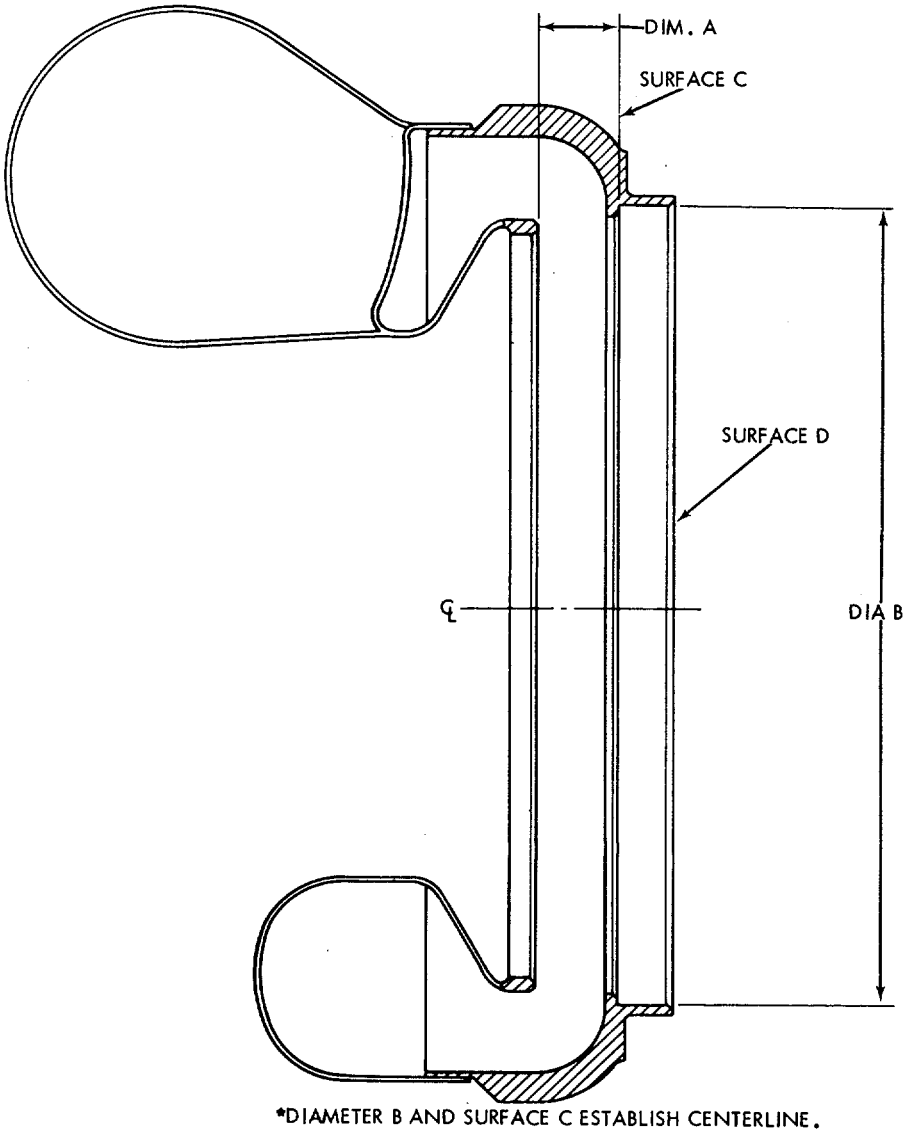


Figure 3-20. Inspection of torus.



*DIAMETER B AND SURFACE C ESTABLISH CENTERLINE.

*SURFACE D SHALL BE NORMAL TO CENTERLINE WITHIN 0.002 INCH TOTAL INDICATOR READING.

*A	*B
1.274 TO 1.294 IN.	12.129 TO 12.132 IN.

*REFERENCE DIMENSION

ALLOWABLE VARIATION

*A	*B
1.274 TO 1.340 IN.	12.135 IN. MAX.

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Figure 3-21. Inspection of torus.

(a) Check for loose or damaged studs.

(b) Check for wear on inside diameter of flange (diameter B, fig. 3-21).

(c) Check for cracks or holes in torus.

(2) Inspect exhaust pipe (53, fig. 3-12, sheet 2 of 2) for cracked welds, and damaged flanges or structural warpage.

(3) Inspect liner (28, fig. 3-12, sheet 1 of 2) for corrosion or wearing, cracks or other damage as shown in figure 3-22.

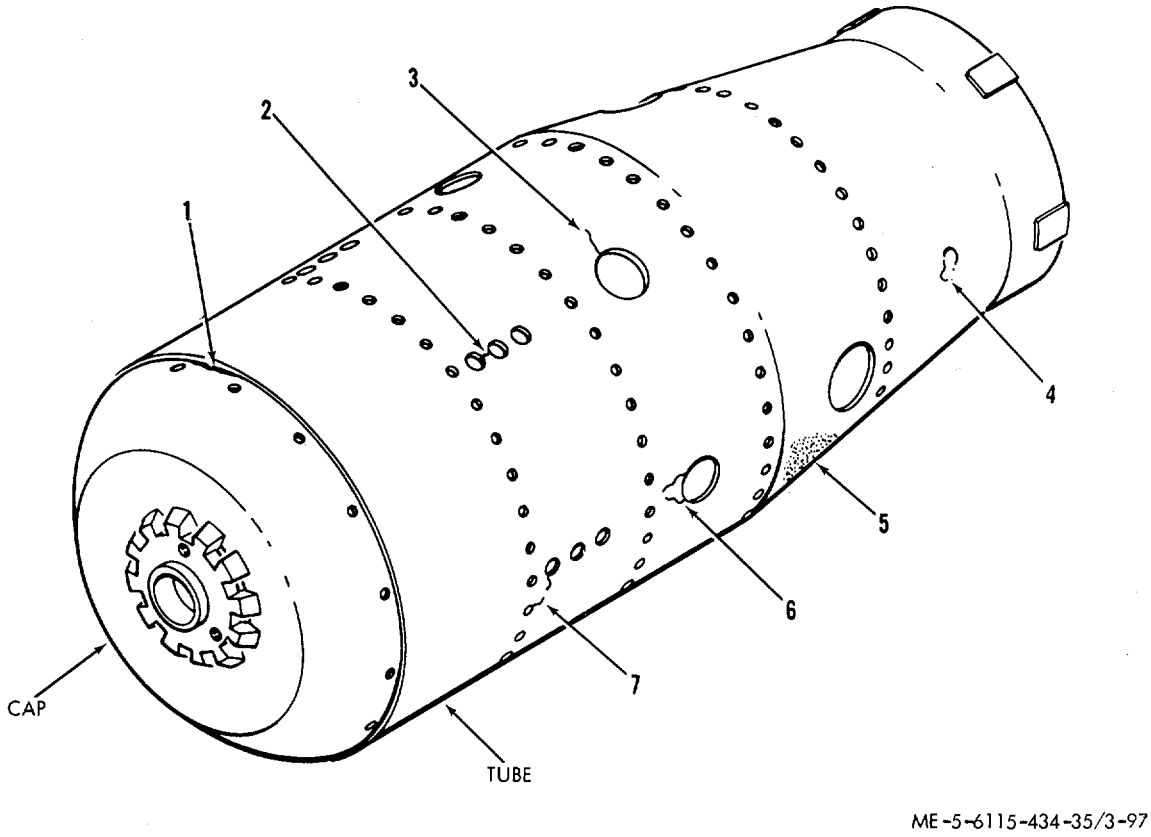
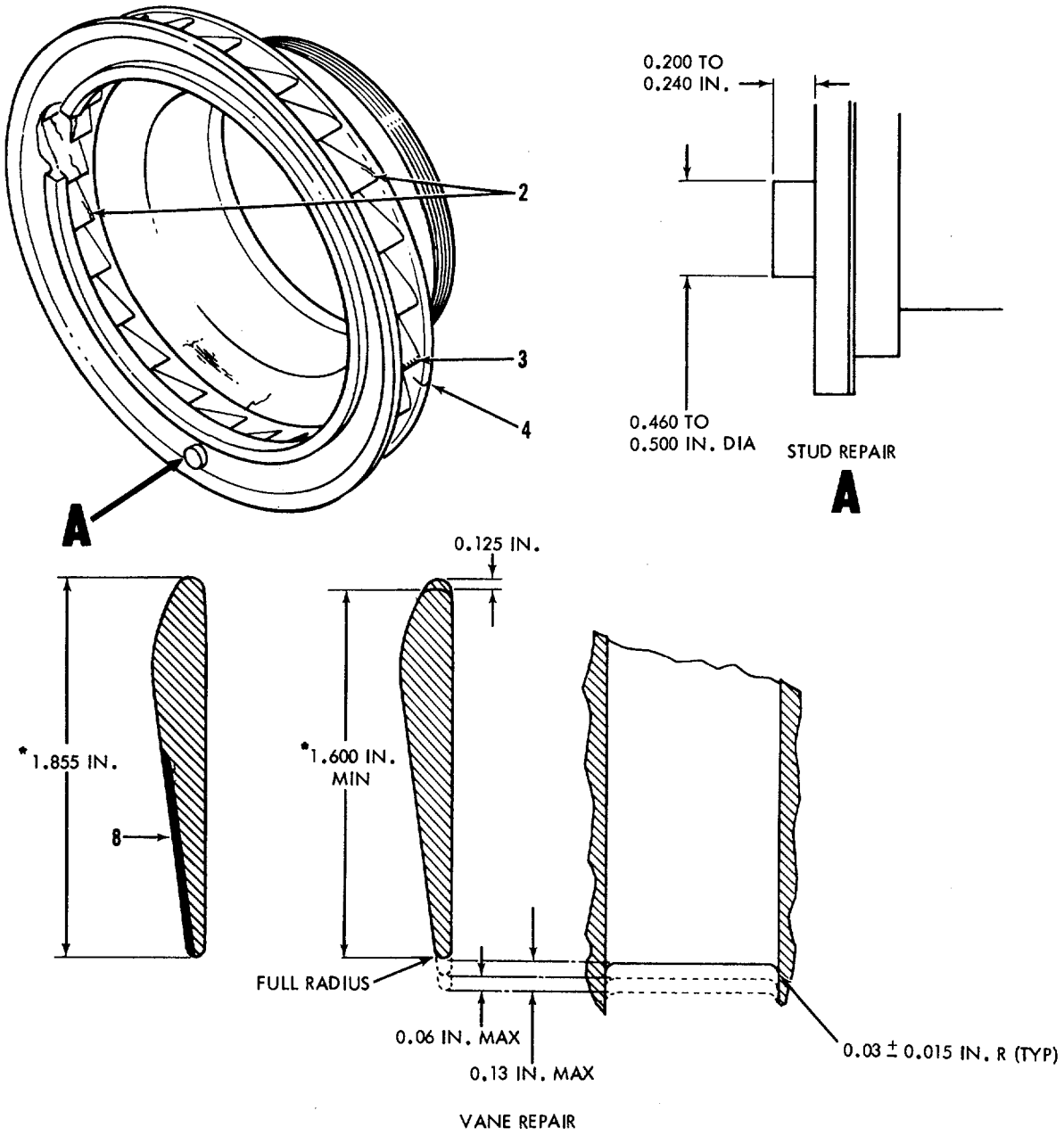


Figure 3-22. Inspection of liner.

(4) Perform fluorescent penetrant inspection in accordance with Military Specification MIL-L-6866 on nozzle (59, fig. 3-12, sheet 2 of 2). Nozzle must be repaired or replaced if damage exceeds the limits shown in figure 3-23.



NOTES:

A. REMOVE CRACKS OR FEATHERING NOT MORE THAN 0.060 INCH DEEP.

B. CUT BACK ALL VANES AN IDENTICAL AMOUNT, WHEN STOCK REMOVAL IS FROM 0.060 TO 0.130 INCH DEEP.

C. BLEND AND FAIR VANE EDGE DAMAGE LESS THAN 1/8 INCH DEEP TO BLEND CONTOUR.

D. BLEND SCORING LESS THAN 0.030 INCH DEEP TO SHROUD CONTOUR.

E. WELD STUD DAMAGE USING INERT SHIELDED TUNGSTEN ARC AND RENE 41 OR 718 WELD ROD.

*REFERENCE DIMENSION

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Figure 3-23. Inspection of nozzle.

c. Repair.

(1) Repair liner (28, fig. 3-12, sheet 1 of 2) as follows:

(a) All cracks are to be repaired by welding except as noted. Weld in accordance with Military Specification MIL-W-8611, using N-155 filler rod conforming to Military Specification MIL-R-5031, class 9.

(b) Weld cracks connecting any two holes in accordance with Military Specification MIL-W6858.

(c) Weld any cracks over 1/8 inch long in accordance with Military Specification MIL-W6858.

(d) Replace liner, if buckling is greater than 1/8 inch deformation.

(e) Replace liner, if metal thickness is less than 0.030 inch due to corrosion or wear.

(f) If practical, weld any group of cracks which could cause breaking away of material in accordance with Military Specification MIL-W6858, otherwise replace liner.

(g) Weld any cracks separated by less than ¼ inch of material in accordance with Military Specification MIL-W-6858.

(h) Remove and replace damaged cooling skirts. Weld cooling skirts in accordance with Military Specification MIL-W-6811, using N-155 filler rod conforming to Military Specification MIL-R-5031, Class 9.

(2) Repair nozzle (131) as follows.

(a) Remove cracks or feathering not more than 0.060 inch deep on trailing edge of vanes as shown in figure 3-22. Rework of one or more vanes may be performed without necessarily reworking all vanes. When cracks or feathering require removal of material of more than 0.060 to 0.130 inch deep on trailing edge of vane, all vanes shall be cut back an identical amount.

(b) Repair erosion of vane leading edge that is less than 1/8 inch deep by blending and fairing to blade contour.

(c) Repair scoring that is less than 0.030 inch deep on shroud by blending to shroud contour.

(d) Repair damaged or worn stud by building up with weld using inert gas shielded tungsten arc and Rene 41 or 718 welding rod. Grind to dimensions specified in figure 3-23.

(3) Repair exhaust pipe (53, fig. 3-12, sheet 2 of 2) as follows:

(a) Reweld cracked welds per Military Specification MIL-W,8611, using N-155 Weld rod.

(b) If threads of bolt holes are damaged beyond repair, plug weld using N-155 weld rod, drill new holes through plug weld 0.0211 to 0.219 inch. Counter sink 115° to 125° by 0.25 to 0.28 inch diameter. Tap with ¼ by 28 UNF-3B tap. Deburr and inspect.

(4) Repair turbine plenum (50, fig. 3-12, sheet 2 of 2) as described in figure 3-24.

NOTES:

A. WELD PER MIL-W-8611, REPAIR CRACKS AND PATCH. (MATERIAL 321 CRES PER SPECIFICATION MIL-S-6721 CONDITION A. USE 349 WELD ROD.)

B. CLEAN AND REWELD ANY CRACKS SHOWN IN ITEM 1.

C. ITEMS 2 AND 3 SHALL REQUIRE PATCHES. ITEMS 2 AND 3 ARE ILLUSTRATIVE OF THE TYPES OF CRACKS AND DO NOT INDICATE WHERE A CRACK MAY APPEAR.

D. MINIMUM PATCH THICKNESS 0.035 INCH. DO NOT OVERLAP PATCHES.

E. REMOVE ENOUGH MATERIAL SO AS TO ELIMINATE ALL TRACES OF CRACK.

F. ALL PATCHES ARE TO BE WELDED ON THE INNER AND OUTER SKIN OF THE PLENUM. NO NEGATIVE STEPS ARE ALLOWED INSIDE OF PLENUM. INSIDE FLOW SURFACES AND JOINTS TO BE FREE OF EXCESS WELD.

G. RESISTANCE SEAM WELD NOT PERMISSIBLE OTHER THAN TO HOLD PIECES FOR FUSION WELDING.

1. CRACK IN WELDED SEAM.

2. CRACK IN WELDED SEAM AND ADJOINING MATERIAL.

3. CRACK IN INTERSECTING WELDED SEAMS.

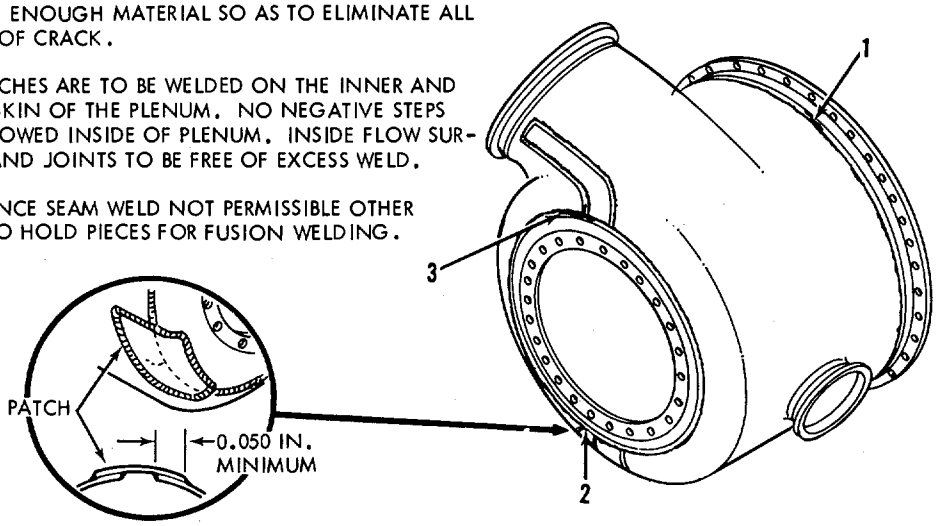

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Figure 3-24. Repair of turbine plenum.

(5) Repair inlet air plenum (16, fig. 3-12, sheet 1 of 2) as follows:

(a) Weld repair cracks to Military Specification MIL-W-8611.

(b) Weld patches per Military Specification MIL-W-8611. Patches shall be 0.040 inch minimum thickness and shall overlap the crack a minimum of 0.050 inch minimum, no patches allowed inside plenum. Do not overlap patches.

(6) Repair torus (57, fig. 3-12, sheet 2 of 2) as follows.

Note

Cracks within the forged portion of torus are not repairable. Condemn the torus if such damage is found.

(a) Repair cracks, such as item 1, figure 3-25, by stop drilling crack ends to prevent further progression of crack, then welding per Military Specification MIL-W-8611 using Inco 62 per AMS5679, Hasteloy W per AMS5786 or Inco 92A per AMS5676. All inside flow areas shall be free of excess weld.

(b) Repair cracks in nozzle mating flange (2, fig. 3-25), by machining to remove cracks. Material removal, not to exceed two inches in length, is permissible at one location only.

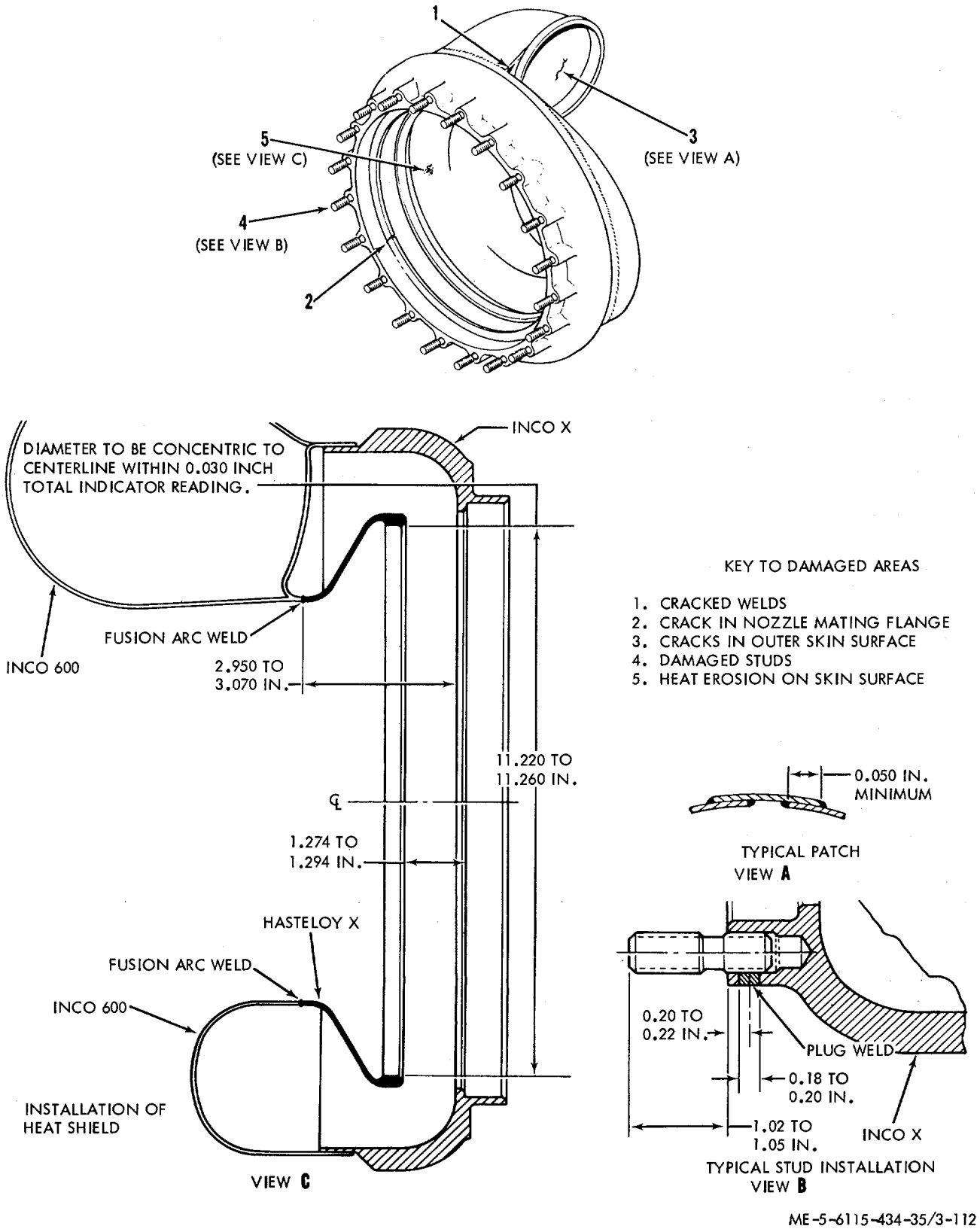


Figure 3-25. Repair of torus.

(c) Repair cracks in torus skin (3, fig. 325) by patching. Remove sufficient material to eliminate all trace of crack. Patch material shall be Inco 600 and shall be 0.043 inch (minimum). Weld patches on both the inner and outer skin surfaces per Military Specification MIL-W-8611, using weld rod as specified in (1) above. Do not overlap patches. Maintain minimum overlap of patch on torus skin, as shown in view A, figure 3-25. Inside flow surfaces and joints shall be free of excess weld.

Note

Recent versions of the torus contain 10 studs only. Consequently stud repair may be performed on alternating studs (20 stud version) and removal, if desired, of remainder.

(d) If inspection revealed damaged studs, cut off damaged studs flush with torus surface. Drill through remainder of old stud. Countersink 118 to 122 degrees by 0.530 inch diameter (maximum) to remove tack welds. Install new studs as shown in view B and plug weld per Military Specification MIL-W-8611, using Inconel 69 weld rod.

(7) Replace all packings and replace any hardware found to be stripped or damaged.

(8) Replace all other defective parts.

3-25. Reassembly

Note

Be certain that shims (58, 60, fig. 3-12, sheet 2) are installed exactly as removed. The determination of thickness of shims requires special tools and facilities not normally available to direct support and general support maintenance personnel.

a. Install nozzle (59) and shims (60).

b. Install torus (57) with shims (58). Secure with nuts (55) and washers (56). Tighten nuts, using wrench, to torque value of 50 to 70 inch-pounds. Coat threads of exhaust pipe (53) with high temperature compound.

c. Coat threads of transfer tube (38) with lubricating compound (Liqui-Moly, Grade NV) and install with new gasket (39). Tighten tube to torque value of 385 to 440 inch-pounds.

d. Install tube (35) with new packings (36, 37). Install fitting (31) with spring (34) and new packings (31, 32). Install bolts (29) and washers (30). Tighten bolts (29) to torque value of 50 to 70 inch-pounds.

e. Set turbine plenum (50) down onto support assembly and use tool to tighten tail pipe (53). Align turbine plenum. Remove turbine plenum and install gasket (51). Reinstall turbine plenum into previously aligned position. Use feeler gauge to measure gap from turbine plenum rear flange to tail pipe (53) rear flange. Subtract 0.015 to 0.025 inch from measurement and record for later shimming operation.

f. Remove turbine plenum and gasket. Install 2 alignment pins in rear flange of tail pipe, install shims (52) determined (para 3) above, over alignment pins. Apply a light coat of petrolatum to both sides of gasket, reinstall gasket and turbine plenum into previous orientation. Install flange (45) and shims (43, 44) to rear face of turbine plenum and on alignment pins.

g. Install bolts (47, 48), washers (49) and nuts (46). Torque bolts to a value of 50 to 70 inchpounds. Install bolts (40, 41) and washers (42) into flange (45). Torque bolts to a value of 90 to 110 inch-pounds.

h. Install liner (28, fig. 3-12, sheet 1 of 2). Install combustor cap (26) with packing (27).

i. Install igniter (23) and gasket (24) with bolts (21) and washers (22). Install packing (20) and atomizer (19) with bolts (17) and washers (18).

j. Install inlet air plenum (16) with screws (14), washers (15) and clamp (13).

3-26. Installation

a. Install accessory gearcase assembly (para 320a), dual pad accessory drive assembly (para 314), plumbing (3-3d) and wiring (3-2 h).

b. Refer to paragraphs 2-12 and 2-11 for instructions for installation of engine to skid and installation of engine and skid assembly respectively.

CHAPTER 4

REPAIR OF SKID ASSEMBLY

4-1. General

a. The major components of the skid assembly are the skid, oil tank, fuel tank, fuel filter, fuel pump, fuel float tank and plumbing installation.

b. Prior to performing any repair to the above listed items, remove the major components of the engine and skid assembly (para 2-12).

c. Refer to Chapter 5 of this manual for repair instructions on skid assembly electrical wire harnesses.

4-2. Hose and Tube Assemblies and Plumbing Fittings

a. General. The hose and tube assemblies and plumbing fittings provide interconnection of pneumatic, fuel, and oil systems components. The hose assemblies consist of metallic braid protected hoses with appropriate end fittings permanently secured to the hose and metallic braid. The tube assemblies consist of formed metal tubes with standard fittings to provide orientation of hose and tube assemblies to the components.

b. Removal. Refer to paragraph 3-3 of this manual for hose and tube assemblies removal instructions.

c. Cleaning, Inspection and Repair.

(1) Clean hose and tube assemblies and plumbing fittings with an approved cleaning solvent and dry thoroughly with filtered compressed air.

(2) Inspect all threaded parts for stripped, crossed, or peened threads. If threads are damaged beyond simple repair, replace the part.

(3) Inspect hose assemblies for cracks, breaks, chafing and damage to hose interior. If damaged, replace hose assembly.

(4) Inspect tube assemblies for kinks, bends, cracks, or other damage which might restrict flow or result in leakage. If damaged, replace tube assembly.

(5) Inspect plumbing fittings for cracks or clogged passages. Clean clogged passages and replace cracked fittings.

(6) Replace all gaskets and packings at each overhaul regardless of condition.

d. Installation. Refer to paragraph 3-3 of this manual for hose and tube assembly installation instructions.

4-3. Oil Tank Assembly

a. General. The oil tank assembly is mounted on the skid in a cradle. The oil tank is the oil supply reservoir for the power unit.

b. Removal. Refer to TM 5-6115.586-12 for oil tank removal instructions.

c. Cleaning, Inspection and Repair.

(1) Clean oil tank assembly with an approved solvent, drain thoroughly and dry with filtered compressed air.

(2) Inspect all threaded areas for stripped, crossed or peened threads. If threads are damaged beyond simple repair, replace part.

(3) Inspect tank for punctures, ruptures, broken welds and looseness of fittings.

(4) Reweld broken welds in accordance with Military Specification MIL-W-8604.

(5) Pressure test oil tank after repair at 5 psig controlled pressure for five minutes. No leakage is allowed.

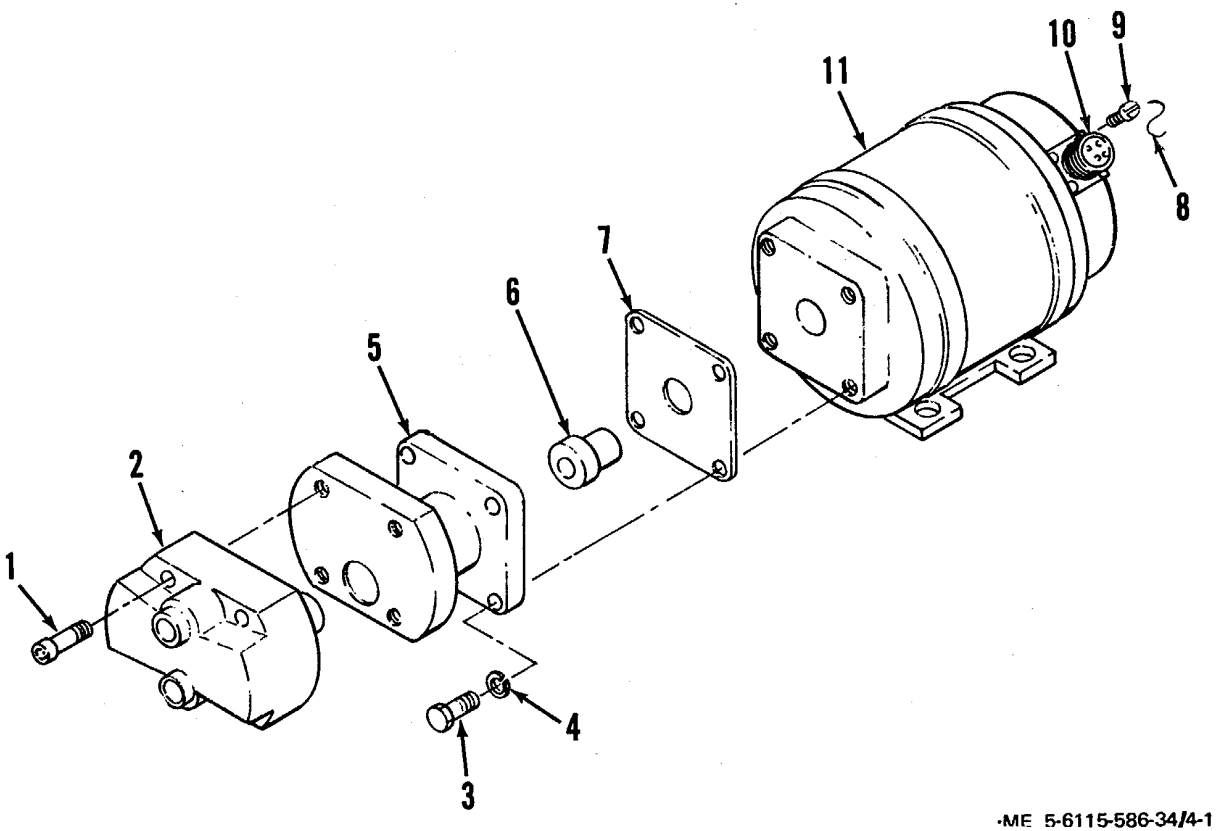
d. Installation. Refer to TM 5-6115-586-12 for oil tank installation instructions.

4-4. Fuel Boost Pump

a. General. The fuel boost pump furnishes fuel under pressure to the engine from the external source. The fuel boost pump is mounted on a mounting plate on the skid.

b. Removal. Refer to TM 5-6115-586-12 for fuel boost pump, removal instructions.

c. Disassembly. Remove the four screws (1, fig. 4-1) to remove the pump (2). Remove the four bolts (3) and washers (4) to remove the stator (5), coupling (6), and gasket (7) from motor (11). Do not remove receptacle (10) unless damaged. If damaged, remove the lockwire (8) and the four screws (9). Unsolder the electrical wires that connect to the receptacle and remove damaged receptacle (10).



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1. Screw
2. Pump
3. Bolt
4. Washer
5. Stator
6. Coupling
7. Gasket
8. Lockwire
9. Screw
10. Receptacle
11. Motor

Figure 4-1. Fuel boost pump, exploded view.

d. Cleaning, Inspection and Repair.

(1) Clean fuel boost pump parts using an approved solvent. Dry with filtered compressed air.

(2) Visually inspect all parts for breakage, wear, corrosion, or other forms of damage.

(3) Replace parts damaged beyond simple repair.

(4) If receptacle is damaged, replace with new receptacle and resolder electrical wiring in accordance with MIL-S-6872 using solder SN60-WRP2 per Fed Spec QQ-S-571. After reinstalling screws (9), install new lockwire (8) in accordance with MS33540.

e. Assembly. Assemble the fuel boost pump by reversing the disassembly sequence given in paragraph c, above while observing special instructions on soldering given in paragraph d, (4), above.

f. Installation. Refer to TM 5-6115-586-12 for fuel boost pump installation instructions.

4-5. Fuel Filter

a. The fuel filter is mounted on an upright bracket on the skid assembly. The fuel filter is located downstream of the skid mounted fuel tank in the fuel system.

b. Refer to TM 5-6115-586-12 for removal, disassembly, cleaning, inspection, repair, assembly, and reinstallation instructions.

4-6. Fuel Tank

a. General. The fuel tank is mounted in a cradle on the skid. The fuel tank acts as a reservoir and contains enough fuel to permit unit operation while switching from one external fuel source to another.

b. Removal. Refer to TM 5-6115-586-12 for fuel tank removal instructions.

c. Cleaning, Inspection and Repair.

(1) Flush fuel tank with an approved solvent and dry with filtered compressed air.

(2) Inspect fuel tank fitting bosses for crossed, stripped or peened threads.

(3) Inspect for cracks, ruptures or punctures.

(4) Repair bosses using simple repair, replace tank if damaged beyond simple repair or if inspection requirements are not met.

4-7. Air Inlet Duct and Screen Assembly

a. General.

(1) The screen assembly prevents large objects from entering the air inlet duct.

(2) The air inlet duct directs air from the enclosure air inlet to the air inlet plenum assembly.

b. Removal. Refer to paragraph 2-11 of this manual to remove the air inlet duct and screen assembly.

c. Disassembly. Do not disassemble the air inlet duct unless inspection reveals damage. If disassembly is required, follow sequence of index numbers I through 20 assigned to figure 4-2.

d. Cleaning, Inspection and Repair.

(1) Clean the air inlet duct using an approved solvent.

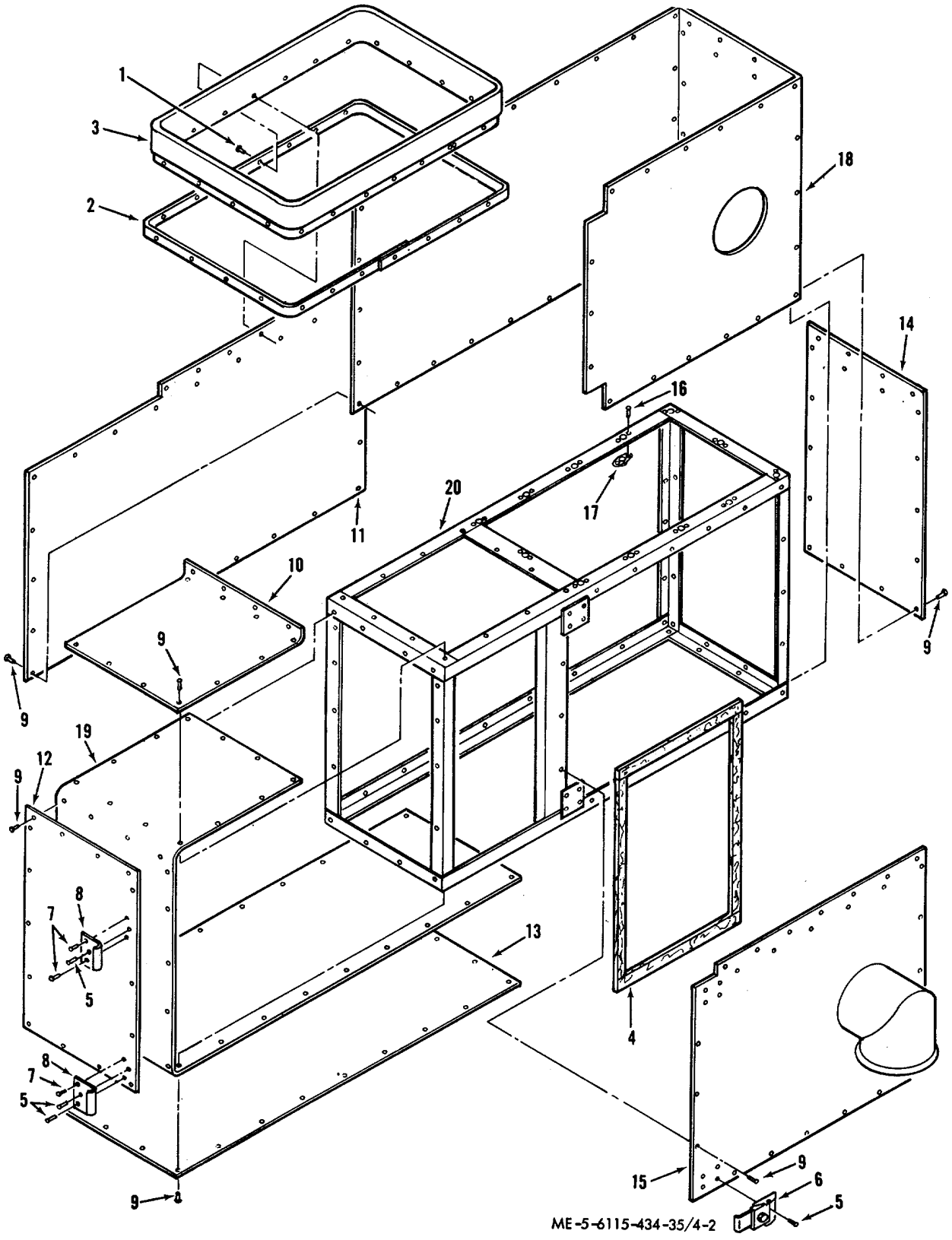
(2) Inspect for cracks, tears, holes or dents.

(3) Inspect riveted components for security and damage.

(4) Inspect seal for security and serviceability.

(5) Inspect nut plates for security and damage.

(6) Inspect screen for broken wires.



1. Rivet
2. Band
3. Seal
4. Seal
5. Rivet
6. Latch
7. Rivet
8. Latch
9. Rivet
10. Skin
11. Skin
12. Skin
13. Skin
14. Skin
15. Welded assembly
16. Rivet
17. Nut plate
18. Lining
19. Lining
20. Frame assembly

Figure 4-2. Air inlet duct assembly, exploded view.

(7) Inspect for screen separation, broken or cracked laminate.

(8) Replace screen assembly if damaged beyond simple repair.

(9) Repair cracks using simple shop repair.

(10) Patch holes and tears using simple shop repair.

(11) Replace loose or damaged rivets.

(12) Replace seals using adhesive.

(13) Replace damaged nut plates.

(14) If air inlet duct is damaged beyond simple repair, replace the entire assembly.

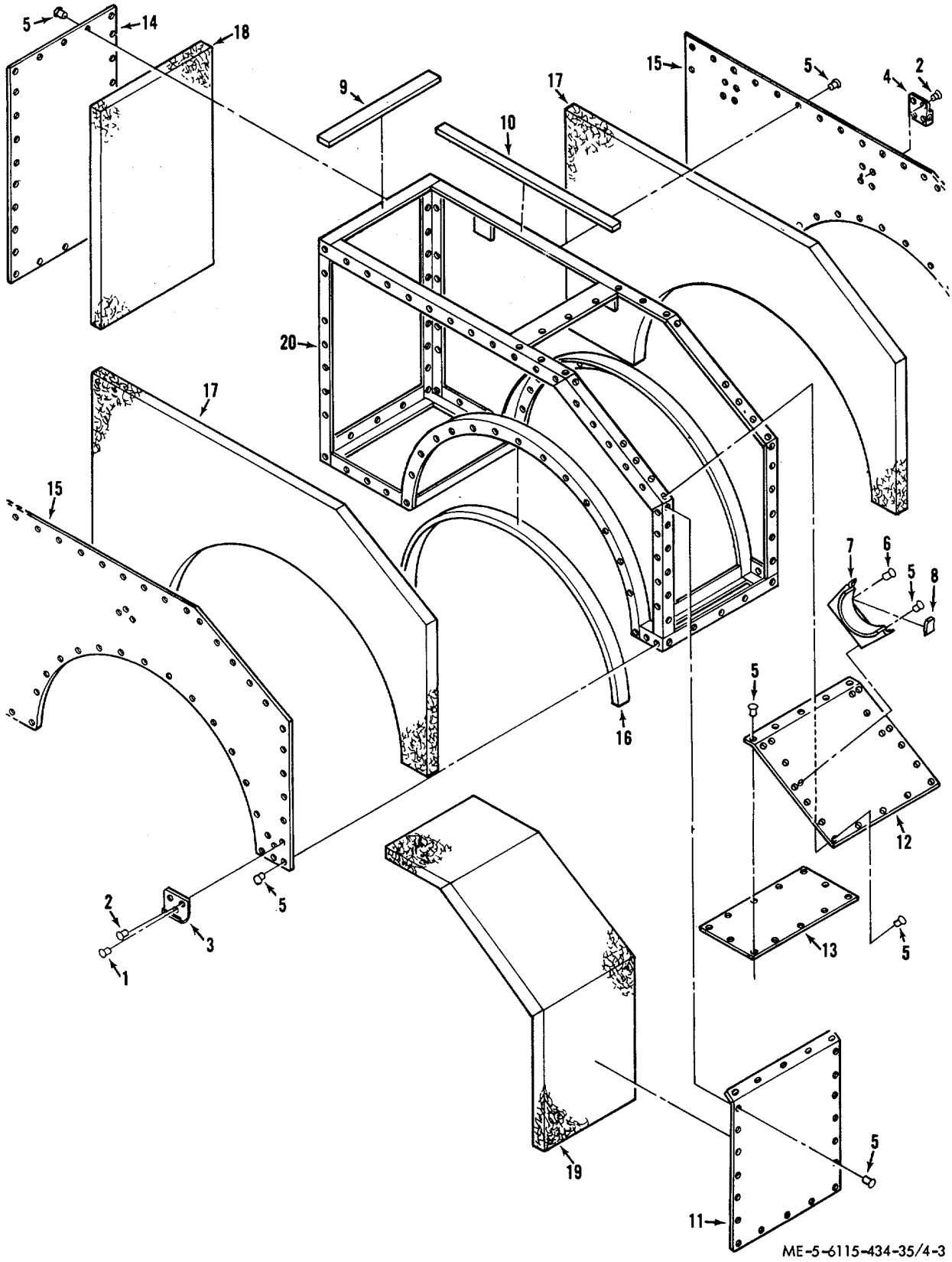
e. Assembly. Assemble air inlet duct assembly in reverse order of disassembly procedures given in paragraph 4-7 *c* above.

f. Reinstallation. Refer to paragraph 2-11 to reinstall the air inlet duct and screen assembly.

4-8. Air Inlet Plenum Assembly

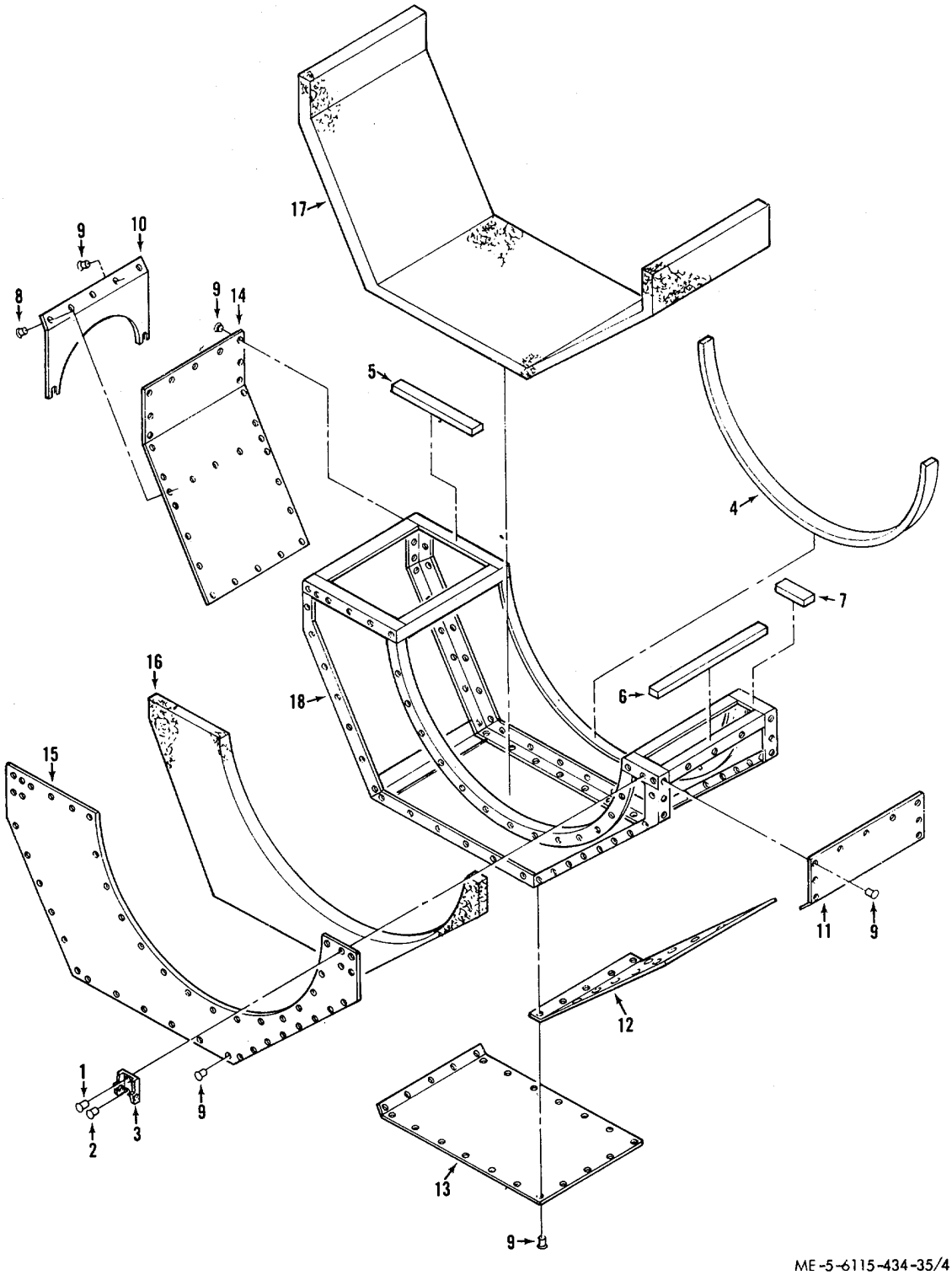
a. General. The air inlet plenum is skid mounted and directs air to the engine air inlet plenum assembly. To remove the lower portion, simply remove the hardware which attaches it to the skid.

b. Disassembly. Do not disassemble the air inlet plenum unless inspection reveals damage. If damage is indicated, disassemble by following sequence of index numbers, 1 through 20, assigned to figure 4-3, and 1 through 18, assigned to figure 4-4



1. Rivet	5. Rivet	9. Seal	13. Skin	17. Lining
2. Rivet	6. Rivet	10. Seal	14. Skin	18. Lining
3. Keeper	7. Support	11. Skin	15. Skin	19. Lining
4. Latch	8. Pad	12. Skin	16. Seal	20. Frame assembly

Figure 4-3. Air inlet plenum assembly, upper, exploded view.



1. Rivet
2. Rivet
3. Latch
4. Seal
5. Seal
6. Seal
7. Seal
8. Rivet
9. Rivet
10. Bracket
11. Bracket
12. Skin
13. Skin
14. Skin
15. Skin
16. Lining
17. Lining
18. Frame assembly

Figure 4-4. Air inlet plenum assembly, lower, exploded view

c. *Cleaning, Inspection and Repair.*

(1) Clean plenum using an approved solvent and a lint free rag.

(2) Visually inspect for cracks, holes, or dents.

(3! Inspect seals for security and abnormal wear.

(4) Inspect welds for breaks and cracks.

(5) Inspect riveted components for security and damage.

(6) Repair dents by cold working using good shop practice.

(7) Repair cracks using simple shop repair.

(8) Patch hole using simple shop repair.

(9) Replace loose or damaged rivets in accordance with good shop practice.

(10) Replace loose or damaged seals using adhesive.

d. *Assembly*. Assemble air inlet plenum assembly in reverse order of disassembly procedures (para 4-8 c. above).

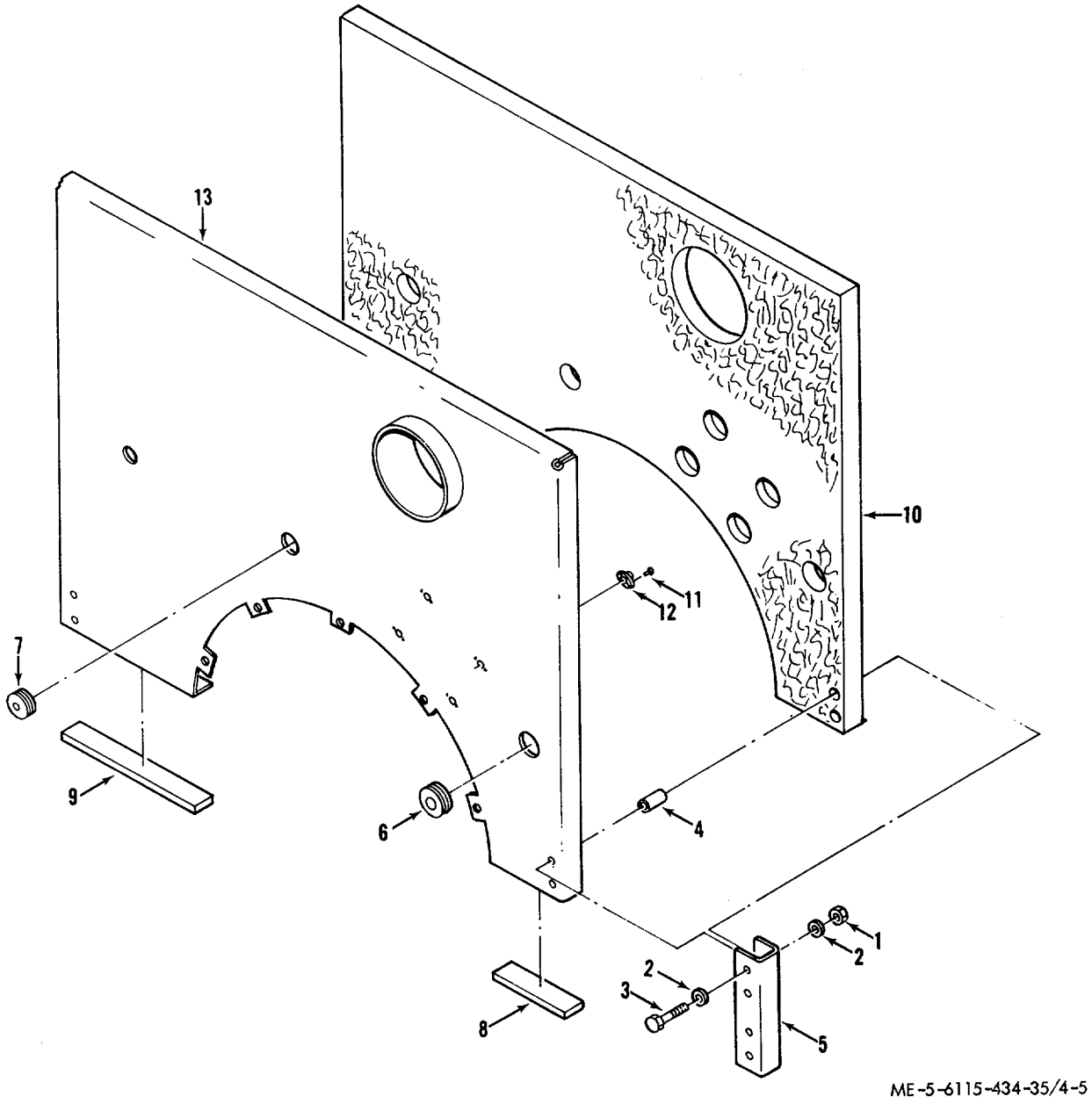
e. *Reinstallation*. Replace the lower portion by attaching it to the skid with its hardware. Attach the upper portion as instructed in paragraph 2-12.

4-9. Heat Shield Assembly

a. *General*. The heat shield assembly separates the engine hot section from the plenum inlet assembly.

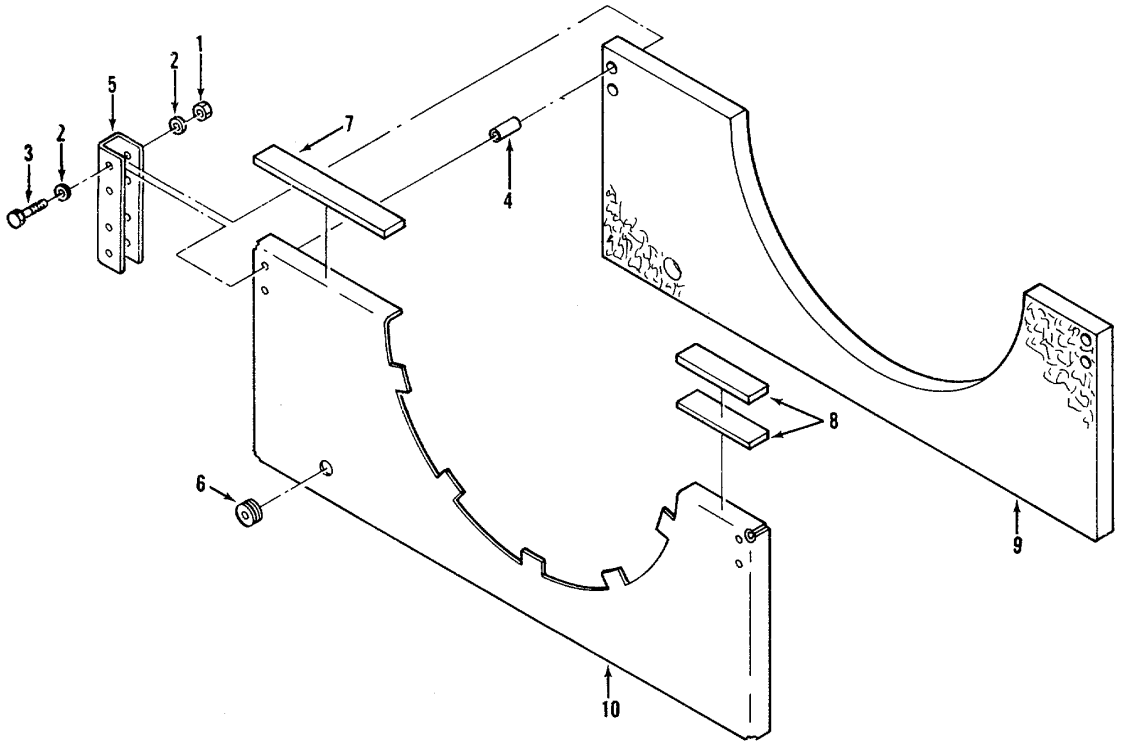
b. *Removal*. Refer to paragraph 2-12 to remove the upper portion of the heat shield. To remove the lower portion, simply remove the hardware which attaches it to the skid.

c. *Disassembly*. Do not disassemble the heat shields unless inspection reveals damage. If required, disassemble by following the sequence of index numbers, I through 13, assigned to figure 4-5 and 1 through 10, assigned to figure 4-6.



1. Nut
2. Washer
3. Bolt
4. Spacer
5. Channel
6. Grommet
7. Grommet
8. Seal
9. Seal
10. Insulation
11. Rivet
12. Nut plate
13. Panel

Figure 4-5. Heat shield assembly, upper, exploded view.



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1. Nut
2. Washer
3. Bolt
4. Spacer
5. Channel
6. Grommet
7. Seal
8. Seal
9. Insulation
10. Panel

Figure 4-6. Heat shield assembly, lower, exploded view.

d. Cleaning, Inspection and Repair.

(1) Clean heat shield using an approved solvent and a stiff bristled brush.

Note

Do not get solvent on insulation or seals.

(2) Inspect for cracks, tears or holes.

(3) Inspect bolt, spacers, washers and nuts securing channels for security of installation.

(4) Inspect grommets for security of installation.

(5) Inspect nut plates and all riveted components for loose rivets or damage to components.

(6) Repair cracks using simple shop repair.

(7) Patch hole or tears using simple shop rep air.

(8) Tighten loose bolts and nuts securing channels.

(9) Replace damaged grommets.

(10) Replace loose or damaged rivets and replace damaged riveted components.

(11) If heat shields are damaged beyond simple repair, replace the entire assembly.

e. *Assembly*. Assemble heat shield assembly in reverse order of disassembly procedures given in paragraph 4-9 c. above.

f. *Reinstallation*. Replace the lower portion by attaching it to the skid using the hardware that attaches it. Replace the upper portion as instructed in paragraph 2-12.

4-10. Skid Assembly

a. *General*. The skid assembly mounts the engine, oil tank, fuel boost pump, fuel filter, fuel tank and brackets supporting these units.

b. *Disassembly*. Do not disassemble skid assembly unless inspection reveals damage. If required, follow sequence of index numbers, 1 through 19 assigned to figure 4-7 and I through 11, assigned to figure 4-8 for disassembly.

c. Cleaning, Inspection and Repair.

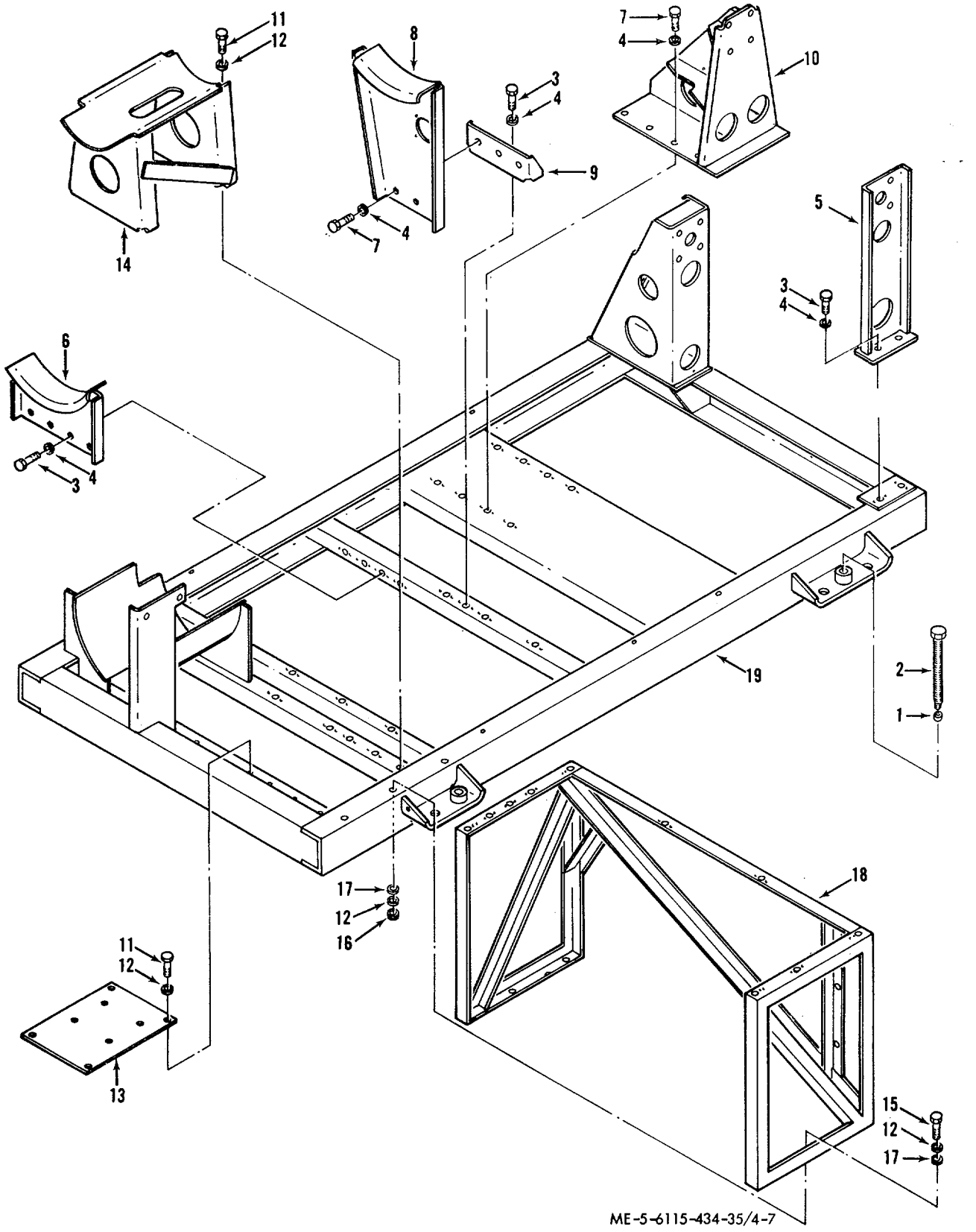
(1) Clean skid and component parts with an approved solvent. Dry thoroughly with filtered compressed air

.

(2) Inspect brackets for cracks and breaks.

(3) Inspect brackets for security and serviceability of cushioning material.

(4) Inspect supports for cracks and breaks. Inspect support (18, fig. 4-7) for security and serviceability of cushioning material.



1. Swivel
2. Screw
3. Screw
4. Washer
5. Bracket
6. Bracket
7. Screw
8. Bracket
9. Bracket
10. Bracket
11. Screw
12. Washer
13. Plate
14. Support
15. Screw
16. Nut
17. Washer
18. Support
19. Skid assembly

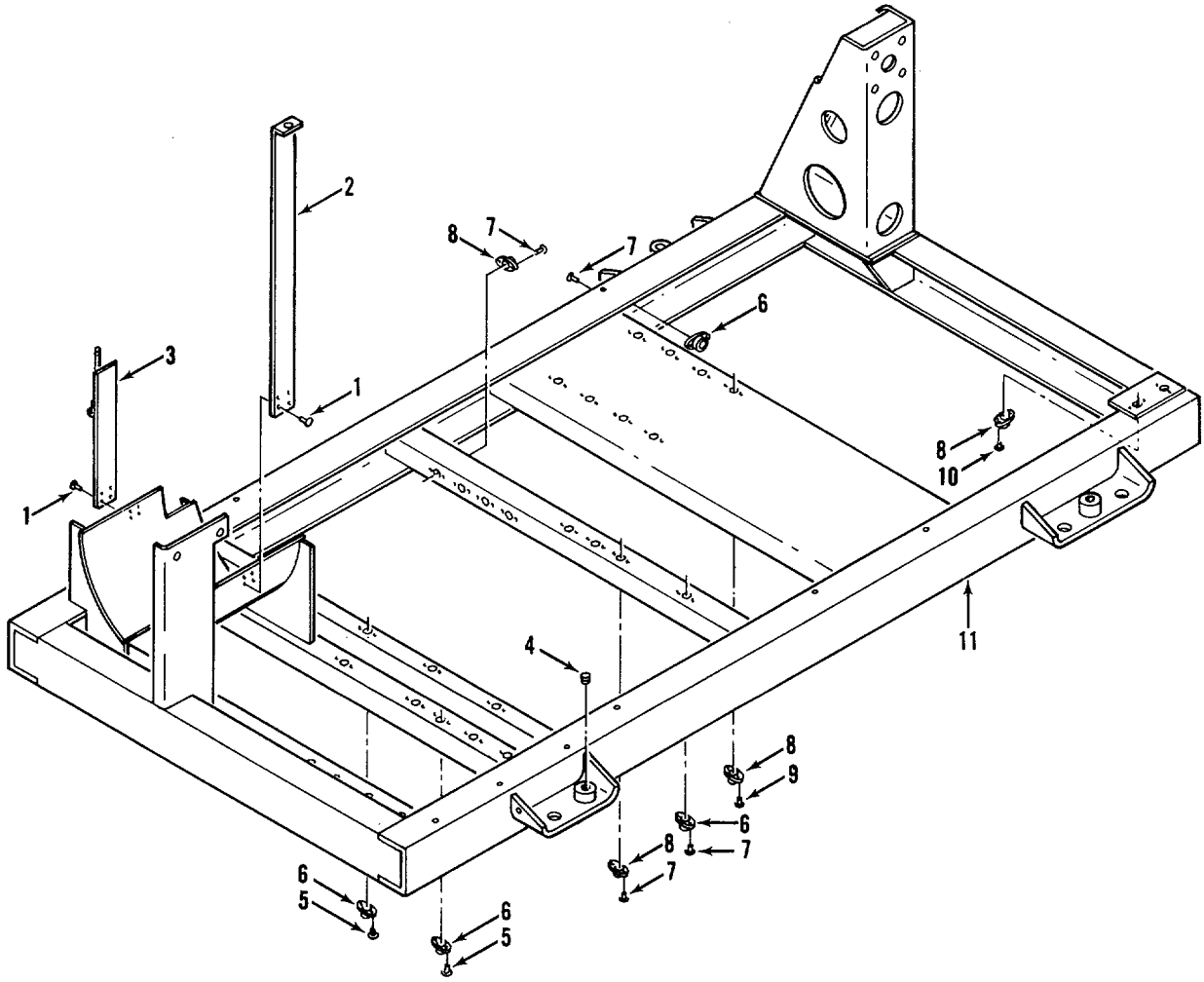
Figure 4-7. Engine skid assembly.

(5) Inspect the skid for cracked, broken or bent components, security and serviceability of nut plates and screws.

(6) Inspect pads and spacer for damage or abnormal wear.

(7) If skid parts are damaged beyond simple repair, replace the entire skid.

d. Assembly. Assemble skid assembly in reverse order of disassembly procedures (para 410 b. above).



1. Rivet
2. Strap
3. Strap
4. Insert
5. Rivet
6. Nut plate
7. Rivet
8. Nut plate
9. Rivet
10. Rivet
11. Machined assembly

Figure 4-8. Engine skid sub-assembly, exploded view.

CHAPTER 5
REPAIR OF ELECTRICAL COMPONENTS

Section I. POWER PLANT ELECTRICAL INSTALLATION

5-1. General

a The power plant electrical installation includes all wire harness assemblies (except those located on the engine and skid), the instrument panel, the conditioned air electrical components panel, the auxiliary power tray, the receptacle panel assembly, and the conditioned air temperature control panel. These components control and deliver power for the 400 Hz and 60 Hz AC electrical systems and the DC electrical system.

b. Paragraphs 5-2 through 5-25 contain repair instructions for the interconnecting wire harness assemblies. The panel wire harness assemblies are included in repair instructions for the panel where they are located. Repair instructions for all single wire electrical leads used in the unit are provided in paragraph 5-31.

c. Wiring diagrams for the wire harness and panel assemblies included in this section are provided in TM 5-6115-586-12. Refer to the wiring diagrams as an aid to testing, repair, and installation. Wire run charts are provided in this section for individual wire harness assemblies. Wires are identified in accordance with MIL-W5088. Refer also to TM 5-6115-586-12 for schematics of the electrical system.

Warning

Before maintenance is performed on any electrical component, the power plant shall be shut down and shall be disconnected from another power plant that is operating or from any other electrical power source. Failure to observe this warning may lead to serious injury or death to personnel.

5-2. DC Power Branched Wire Harness Assembly (13217E4147)

a. Removal. Refer to figure 5-1; tag and disconnect the DC power branched wire harness assembly as follows: (1) Remove the terminal board cover from terminal board (TB2) located on the inboard wall of the No. I system condenser compartment.

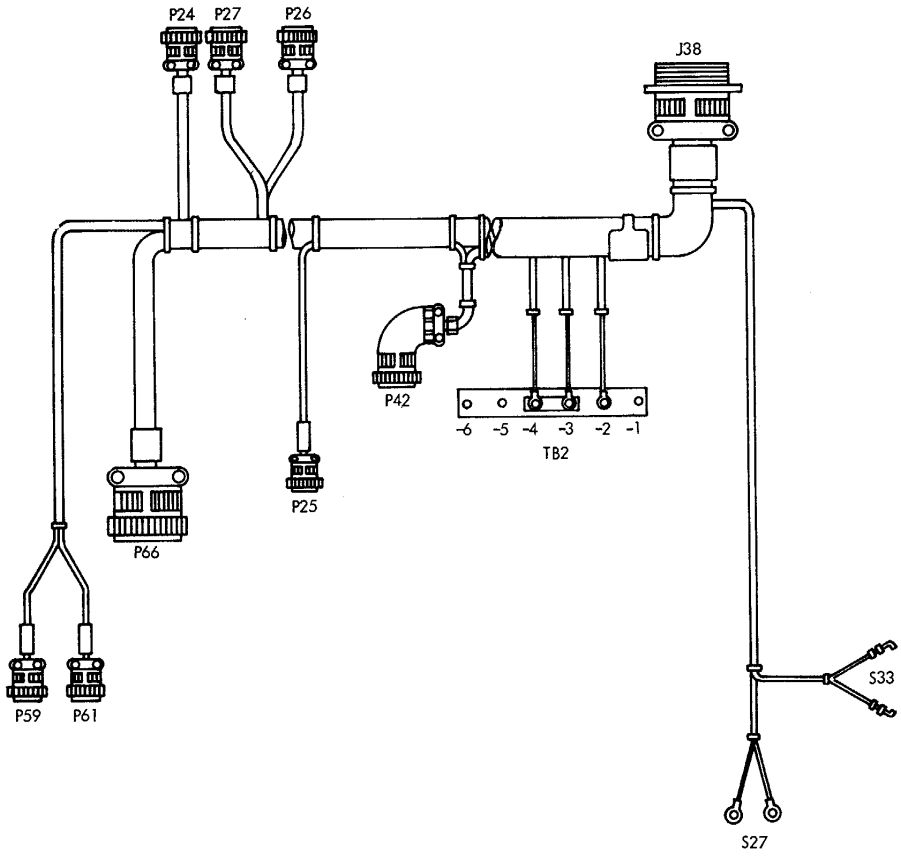
(1) Remove three nuts, screws, and washers and remove the terminal board.

(2) Remove lockwire and disconnect connector P38 (engine skid wire harness). Remove connector J38 from the floor of No. 1 system condenser compartment by removing four nuts and screws and eight washers.

(3) Disconnect wires to switches (S27 and S33). Remove lockwires and disconnect the eight "plug-type" wire harness connectors.

(4) Remove six wire harness clamps, noting the position of the clamps and routing of the wire harness.

(5) Remove the wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H2CC16N	P59-B	TB2-4	AN16	88.00
H2CD16N	P61-B	TB2-4	AN16	88.00
H300K16	J38-X	P66-H	AN16	92.00
H350F16	J38-U	P66-A	AN16	92.00
H351F16	J38-V	P66-B	AN16	92.00
H355C16	J38-W	P66-C	AN16	92.00
H356B16	P66-D	J38-N	AN16	92.00
H370J18	P66-E	P59-A	AN18	59.00
H371J18	P66-F	P61-A	AN18	59.00
H60D16	J38-M	P42-G	AN16	50.00
H61C16	J38-A	P42-D	AN16	50.00
H96C16	P66-K	P42-R	AN16	51.00
L8N16	J38-h	P66-S	AN16	92.00
M215B20	P42-K	J38-H	AN20	50.00
M217B20	P42-L	J38-J	AN20	50.00
M219B20	P42-M	J38-K	AN20	50.00
M220C20	P42-F	J38-E	AN20	50.00
M222C20	P42-G	J38-F	AN20	50.00
M224C20	P42-H	J38-G	AN20	50.00
M95B16	J38-D	P42-B	AN16	50.00
V2AW16N	J38-Y	TB2-3	AN16	15.75
V2CA16N	P25-B	TB2-3	AN16	65.00
V2DB16N	P24-B	TB2-3	AN16	74.50
V2CV16N	TB2-4	P66-J	AN16	88.00
V303A16	J38-d	S33	AN16	108.00
V336F16	P26-B	J38-P	AN16	78.00
V338A16	P26-A	P24-A	AN16	38.00
V339D16	J38-e	S33	AN16	108.00
V348C16	J38-S	S27 com	AN16	101.00
V357F16	P27-B	J38-R	AN16	78.00
V359A16	P27-A	P25-A	AN16	86.50
V372A16	J38-T	S27-NC	AN16	101.00
V391F18	J38-f	P66-G	AN18	92.00
V392B16	J38-b	P66-N	AN16	92.00
V394C16	J38-Z	P66-L	AN16	92.00
V395F18	J38-g	P66-R	AN18	92.00
V396B16	J38-i	P66-P	AN16	92.00
V398C16	J38-a	P66-M	AN16	92.00
X200T16N	J38-B	TB2-2	AN16	10.75
X200U20N	P42-J	TB2-2	AN20	46.50
X200X20N	P42-N	TB2-2	AN20	46.50

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Figure 5-1. DC power branched wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, terminals, and terminal board studs. Check for any evidence of burned areas indicating shorts. Inspect wiring for damaged insulation and loose connections. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-1 and check individual wires for continuity.

e. Repair. Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder type SN60OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-1.

(3) If replacement of connector J38 is necessary, remove potting compound and unsolder electrical leads. Solder electrical leads to replacement connector. Fill connector backshell with silicone rubber sealing compound (501 RTV and Catalyst 501A, Dow Corning Corp., Midland, Michigan, or equivalent).

(4) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at five inch intervals and all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors, safety wire in accordance with' MS33540 using lockwire MS20995C20.

5-3. Power Plant DC Power Branched Wire Harness Assembly 113217E4153)

a. Removal. Refer to figure 5-2; tag and disconnect the power plant DC power branched wire harness assembly as follows:

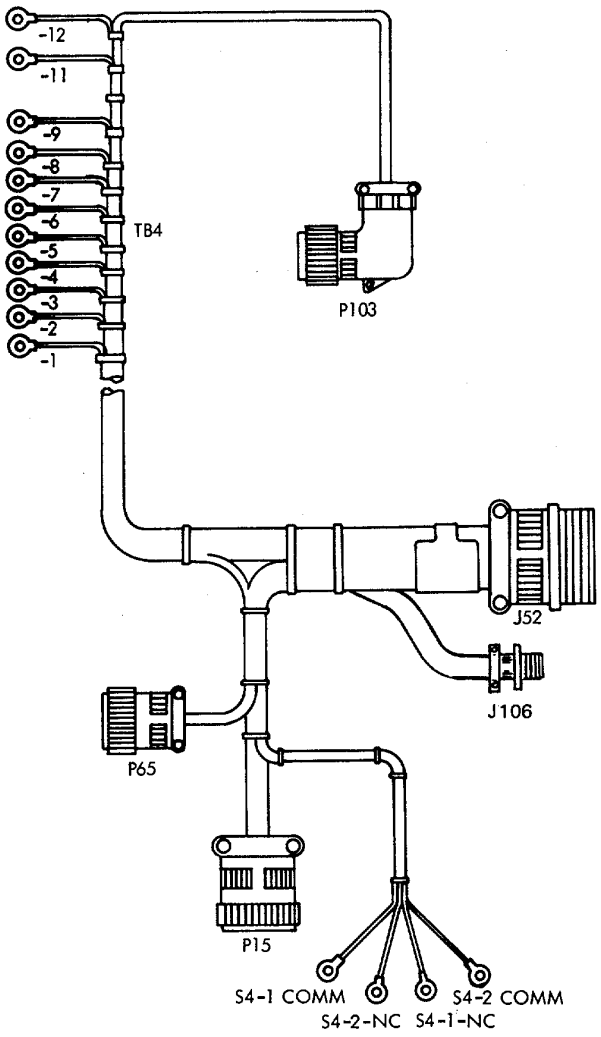
(1) Remove the terminal board cover from terminal board (TB4) and remove the wire harness electrical leads from the terminal board studs.

(2) Remove lockwire and disconnect P52 and P106, then remove connectors J52 and J106 from the inboard wall of the battery access and storage compartment by removing four nuts and screws and eight washers from each connector.

(3) Remove lockwires and disconnect the three remaining wire harness connectors. Disconnect the leads to the air intake door switch (S4).

(4) Remove the four cable clamps, noting the position of the clamps and routing of the wire harness.

(5) Remove the wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H81B10	J52-V	TB4-7	AN10	51.50
K2EA16A	P103-H	TB4-8	AN16	52.25
K275E16	P103-B	J106-B	AN16	92.00
K276C16	P103-E	J106-E	AN16	92.00
K277E16	P103-A	J106-A	AN16	92.00
K278C16	P103 D	J106-D	AN16	92.00
K280B16	P103-F	J106-F	AN16	92.00
K281B16	P103 G	J106-G	AN16	92.00
L13U18	J52-C	TB4-3	AN18	48.50
L279B16	P103-C	J106-C	AN16	92.00
L295B16	P103-J	J106-J	AN16	92.00
L347B16	J52-H	P15-D	AN16	44.00
L389B16	J52-v	P15-W	AN16	44.00
L4B18	J52-B	TB4-2	AN18	48.75
L8H16	J52-A	TB4-1	AN16	47.00
L8K16	P15-A	TB4-1	AN16	35.25
P2F12N	J52 t	TB4-9	AN12	53.00
P2H12N	J52 w	TB4-9	AN12	53.00
P35C16	J52-D	TB4-4	AN16	49.25
P38A16	J52-Y	S4-2-NC	AN16	67.50
P41E16	J52-m	TB4-6	AN16	50.75
P84F16	J52-E	TB4-5	AN16	50.00
V2AU16N	J52-b	TB4-9	AN16	53.00
V2CJ16N	P15-C	TB4-9	AN16	41.25
V302F16	J52-N	P15-N	AN16	44.00
V303C16	P15-J	J52-P	AN16	44.00
V304F16	J52-R	P15-R	AN16	44.00
V305B16	P15-K	P65-H	AN16	26.50
V336D16	J52-T	P15-U	AN16	44.00
V339B16	P15-P	J52-S	AN16	44.00
V349C16	J52-K	P15-F	AN16	44.00
V34B16	P15-X	P65-G	AN16	26.50
V357D16	J52-U	P15-V	AN16	44.00
V367C16	J52 a	P65-B	AN16	48.50
V368B16	J52-L	P15-G	AN16	44.00
V369C16	J52-M	P15-I	AN16	44.00
V372C16	J52-J	P15-E	AN16	44.00
V373B16	P15-H	P65-A	AN16	26.50
V378E16	J52-f	P15-T	AN16	44.00
V379B16	J52-n	TB4-11	AN16	54.50
V386D16	J52-p	TB4-12	AN16	55.25
V386G16	P15-S	TB4-12	AN16	42.75
V387C16	J52-F	P15-B	AN16	44.00
W36C16	J52-Z	S4-2-COMM	AN16 AN16	69.00 69.00
W6E16	J52-W	S4-1 COMM	AN16	69.00
W9A16	J52-X	S4-1-NC	AN16	69.00

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Figure 5-2. Power Plant DC power branched wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins and terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect wiring for damaged insulation and loose connections. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-2. and check individual wires for continuity.

e. Repair. Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder type SN60OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-2.

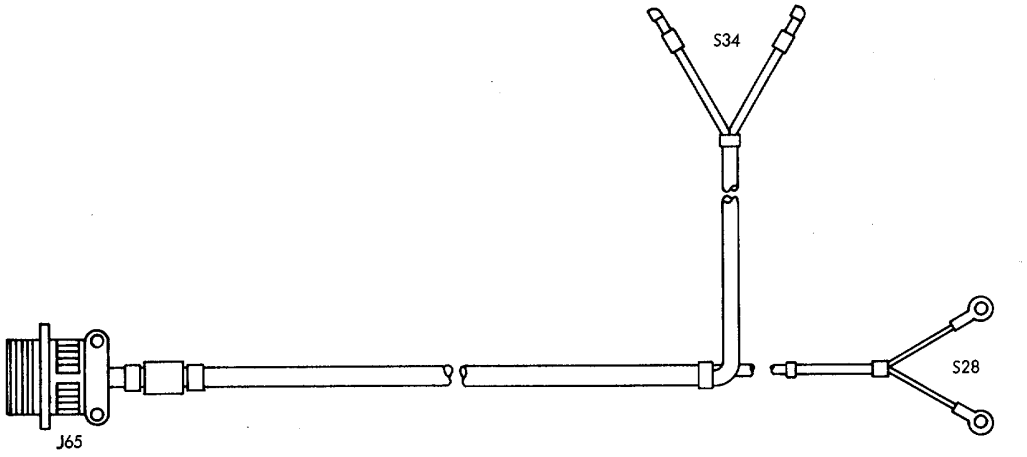
(3) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at two inch intervals and all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors, safety wire in accordance with MS33540 using lockwire MS20995C20.

5-4. DC Power Branched Wire Harness Assembly (13217E4149)

a. Removal. Refer to figure 5-3; tag and disconnect the DC power branched wire harness assembly as follows:

(1) Remove lockwire and disconnect P65; then remove connector J65 from the floor of the No. 2 system condenser compartment by removing four nuts and screws and eight washers.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
V305A16	J65-H	S34	AN16	75.00
V354C16	J65-G	S34	AN16	75.00
V367D16	J65-B	S28-COM	AN16	67.50
V373A16	J65-A	S28-NC	AN16	67.50

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(2) Disconnect leads to switches (S28 and S34).

(3) Remove four cable clamps; note the position of the clamps and routing of the wire harness.

(4) Remove the wire harness.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins and terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect wiring for damaged insulation and loose connections. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-3 and check individual wires for continuity.

e. Repair. Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder type SN60WiRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches in provided in figure 5-3.

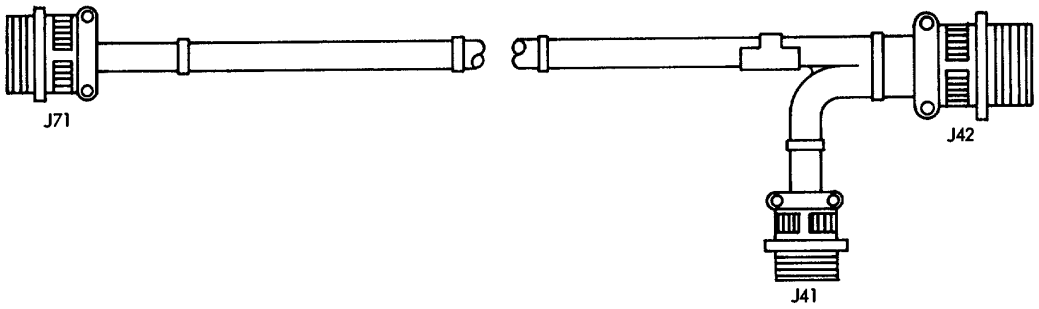
(3) If replacement of connector J65 is necessary, remove potting compound and unsolder electrical leads. Solder electrical leads to replacement connector. Fill connector backshell with silicone rubber sealing compound (501 RTV and Catalyst 501A, Dow Corning Corp., Midland, Michigan, or equivalent).

(4) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at five inch intervals and all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors J65 and P65, safety wire in accordance with MS33540 using lockwire MS20995C20.

a. Removal. Refer to figure 5-4; tag and remove the water system wire harness assembly by removing lockwire and disconnecting P41, P42 and Pill; then remove connectors J41, J42, and J71 by removing four nuts and screws and eight washers from each.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H60C16	J42-C	J71-C	AN16	19.00
H61B16	J42-D	J71-D	AN16	19.00
M95C16	J42-B	J71-B	AN16	19.00
H95G16	J41-J	J71-E	AN16	18.75
H96B16	J42-R	J41-K	AN16	12.00
M215C20	J42-K	J41-E	AN20	12.00
M217C20	J42-L	J41-F	AN20	12.00
M219C20	J42-M	J41-G	AN20	12.00
M220D20	J42-F	J41-A	AN20	12.00
M222D20	J42-G	J41-B	AN20	12.00
M224D20	J42-H	J41-C	AN20	12.00
X200V20N	J42-J	J41-D	AN20	12.00
X200Y20N	J42-N	J41-H	AN20	12.00

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Figure 5-4. Water system wire harness assembly.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Check for any evidence of burned areas indicating shorts. Inspect wiring for damaged insulation and loose connections. Inspect connectors for damaged or stripped threads and damaged or loose pins.

d. Testing. Refer to the wire run chart in figure 5-4 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder type SN60WRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-4.

(3) If replacement of connectors (J41, J42, J71) is necessary, remove potting compound and unsolder electrical leads. Solder electrical leads to

replacement connector. Fill connector backshell with silicone rubber sealing compound (.501 RTV and Catalyst 501A, Dow Corning Corp., Midland, Michigan, or equivalent).

(4) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at two inch intervals and all cable breakouts.

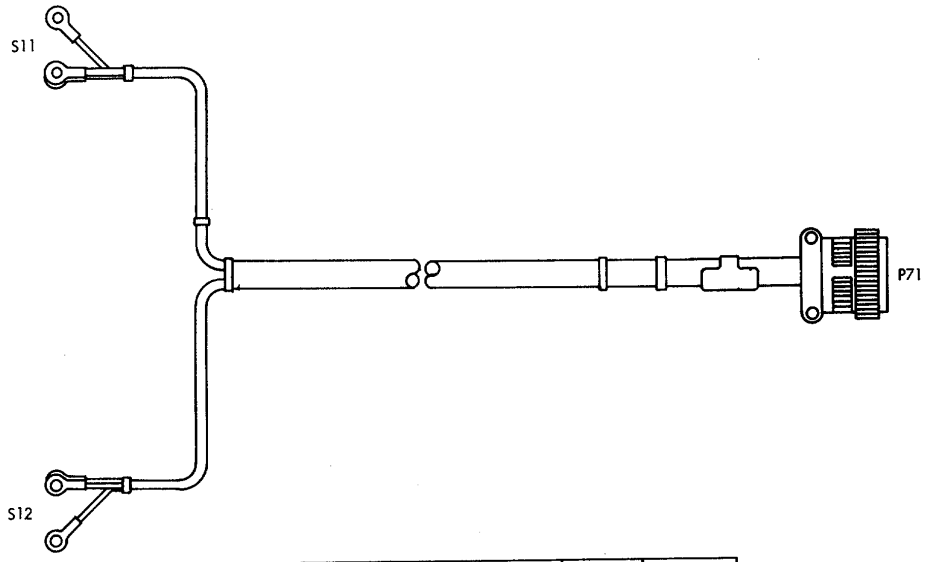
f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing the connectors, safety wire in accordance with MS33540 using lockwire MS20995C20.

5-6. Water System Branched Wire Harness Assembly (13217E4143)

a. Removal. Refer to figure 5-5; tag and disconnect the water system branched wire harness assembly as follows:

(1) Disconnect the wire harness electrical leads from switches (SII and S12) and disconnect the connector (P71).

(2) Remove the cable clamp; note the position of the clamp and routing of the wire harness. Remove the wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H60A16	S11-A	S12	AN16	18.25
H60B16	P71-C	S12	AN16	28.50
H61A16	P71-D	S12	AN16	28.50
H95F16	P71-E	S11-B	AN16	30.75
M95D16	P71-B	S11-B	AN16	30.75

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Figure 5-5. Water system branched wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins and terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-5 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder type SN6(0WRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-5.

(3) If self-clinching cable straps are removed

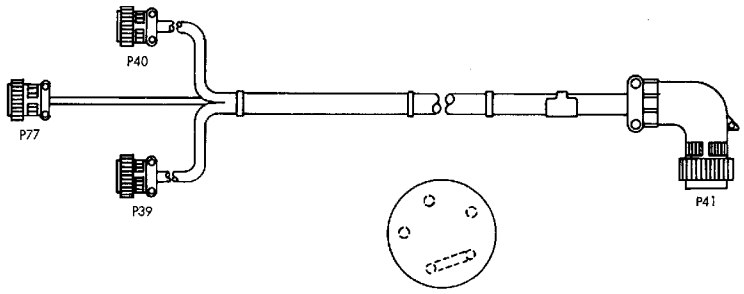
to facilitate repairs, install new cable straps at three inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure.

5-7. Water Pumps Wire Harness Assembly (13217E4142)

a. Removal. Refer to figure 5-6; tag and disconnect the water pumps wire harness assembly as follows: (11 Remove lockwires and disconnect the four wire harness connectors (P39, P40, P41, and P77).

(2) Remove the four cable clamps, noting their location and routing of the wire harness and remove the wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H95H16	P41-J	P77-A	AN16	68.00
H96A16	P41-K	P77-C	AN16	68.00
M215D20	P41-E	P40-A	AN20	73.00
M217D20	P41-F	P40-B	AN20	73.00
M219D20	P41-G	P40-C	AN20	73.00
M220E20	P41-A	P39-A	AN20	73.00
M222E20	P41-B	P39-B	AN20	73.00
M224E20	P41-C	P39-C	AN20	73.00
X200W20N	P41-D	P39-D	AN20	73.00
X200Z20N	P41-H	P40-D	AN20	73.00

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Figure 5-6. Water pumps wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-6 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder type SN60WRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-6.

(3) If replacement of connectors P39 and P40 is necessary, remove potting compound and unsolder electrical leads. Solder electrical leads to replacement connector. Fill connector potting boot with insulating compound, Type C per MIL-I-16923.

(4) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at two inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors, safety wire in accordance with MS33540 using lockwire MS20995C20.

5-8. Air Conditioning System Branched Wire Harness Assembly (13217E4146)

a. Removal. Refer to figure 5-7; tag and disconnect the air conditioning system branched wire harness assembly as follows:

(1) Remove the terminal board cover from terminal board (TB8); then remove three nuts and screws to remove the terminal board.

(2) To remove connector J67, remove lockwire and disconnect P67, then remove four nuts and screws and eight washers to remove connector J67.

(3) Remove lockwires and disconnect the remaining seven connectors.

(4) Remove eleven cable clamps; note position of clamps and routing of wire harness. Remove wire harness.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, terminal lugs, and terminal board studs. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H2DP16N	P62-B	TB8-4	AN16	49.50
H2DQ16N	P84-B	P62-C	AN16	46.50
H2DR16N	P83-B	TB8-4	AN16	42.50
H2DS18N	P89-E	TB8-3	AN18	33.50
H2DU18N	P89-K	TB8-4	AN18	34.00
H300L16	J67-D	P66-H	AN16	62.50
H350G16	J67-A	P66-A	AN16	62.50
H351G16	J67-H	P66-B	AN16	62.50
H355D16	J67-C	P66-C	AN16	62.50
H356A16	P63-C	P66-D	AN16	121.50
H370F18	J67-X	TB8-5	AN18	10.00
H370G18	P83-A	TB8-5	AN18	72.50
H370H18	P66-E	TB8-5	AN18	60.50
H371E18	J67-B	TB8-6	AN18	12.00
H371F18	P62-A	TB806	AN18	48.00
H371G18	P84-A	TB8-6	AN18	42.00
H371H18	P66-F	TB8-6	AN18	61.50
H394E18	P89-A	TB8-1	AN18	86.00
H398E18	P89-F	TB8-2	AN18	86.50
H414C18	J67-T	P89-B	AN18	83.50
H415C18	J67-U	P89-C	AN18	83.50
H416C18	J67-V	P89-D	AN18	82.50
H418C18	J67-d	P89-G	AN18	83.50
H419C18	J67-e	P89-H	AN18	83.50
H420C18	J67-f	P89-J	AN18	83.50
H421B16	J67-E	P63-A	AN16	65.00
H96D16	J67-F	P66-K	AN16	63.00
L8P16	J67-N	P66-S	AN16	63.00
V2CW16N	P66-J	TB8-3	AN16	59.00
V2CX16N	J67-S	TB8-3	AN16	9.50
V391G18	J67-G	P66-G	AN18	63.00
V392C16	J67-M	P66-N	AN16	63.00
V394D16	P66-L	TB8-1	AN16	57.50
V394G18	J67-K	TB8-1	AN18	8.50
V395G18	J67-J	P66-R	AN18	63.00
V396C16	J67-P	P66-P	AN16	63.00
V398D16	P66-M	TB8-2	AN16	56.00
V398G18	J67-L	TB8-2	AN18	9.00
V407C20	J67-Z	P86-A	AN20	79.00
V409B20	J67-a	P86-B	AN20	79.00
V410C20	J67-b	P86-C	AN20	79.00
V412B20	J67-c	P86-D	AN20	79.00

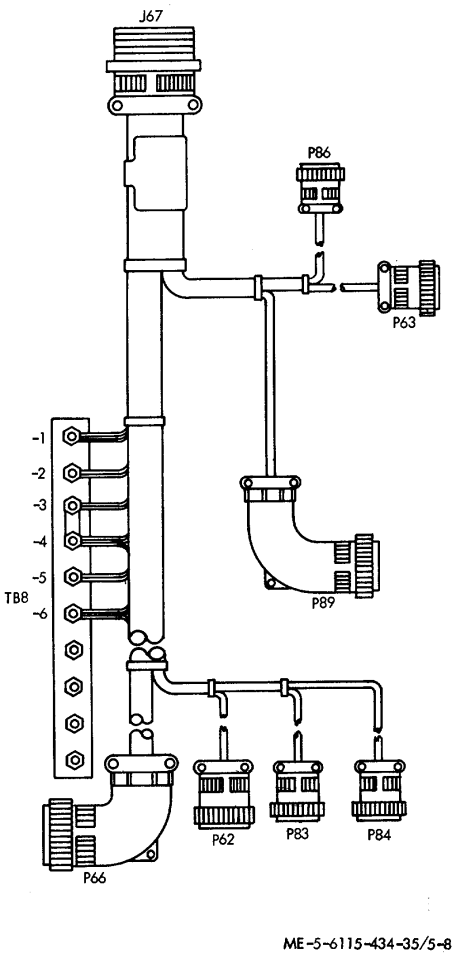


Figure 5-7. Air conditioning branched wire harness assembly.

d. Testing. Refer to the wire run chart in figure 5-7 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder type SN60OWRP2 per Fed Spec QQ-S-571.

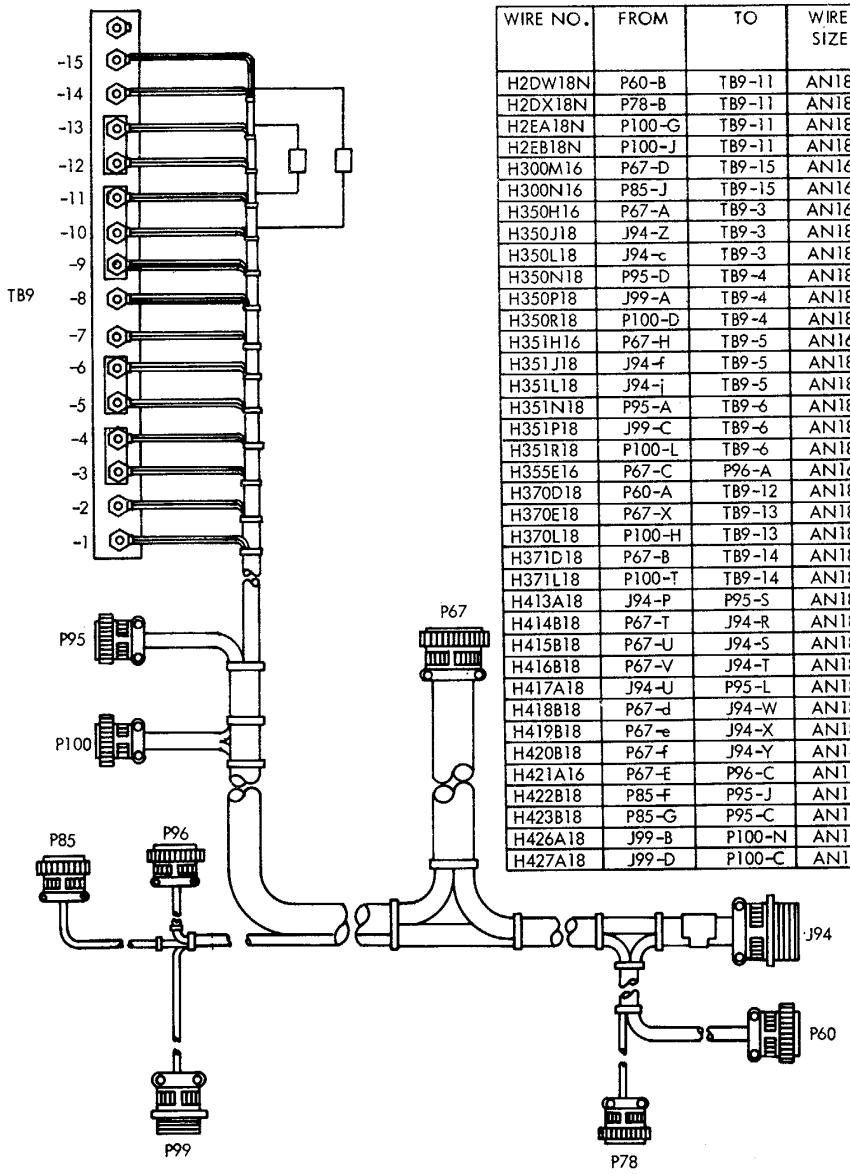
(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-7.

(3) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at three inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors. Safety wire in accordance with MS33540 using lockwire MS20995C20.

5-9. Air Conditioning System 'Wire Harness Assembly (13217E4145)

a. Removal. Refer to figure 5-8; tag and disconnect the air conditioning system wire harness assembly as follows: (1) Remove the terminal board cover from terminal board (TB91. Remove three nuts, screws, and washers and remove the terminal board.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H2DW18N	P60-B	TB9-11	AN18	50.50
H2DX18N	P78-B	TB9-11	AN18	57.50
H2EA18N	P100-G	TB9-11	AN18	
H2EB18N	P100-J	TB9-11	AN18	
H300M16	P67-D	TB9-15	AN16	25.25
H300N16	P85-J	TB9-15	AN16	60.75
H350H16	P67-A	TB9-3	AN16	14.25
H350J18	J94-Z	TB9-3	AN18	17.25
H350L18	J94-c	TB9-3	AN18	17.25
H350N18	P95-D	TB9-4	AN18	
H350P18	J99-A	TB9-4	AN18	60.50
H350R18	P100-D	TB9-4	AN18	
H351H16	P67-H	TB9-5	AN16	15.75
H351J18	J94-f	TB9-5	AN18	18.75
H351L18	J94-j	TB9-5	AN18	18.75
H351N18	P95-A	TB9-6	AN18	
H351P18	J99-C	TB9-6	AN18	62.00
H351R18	P100-L	TB9-6	AN18	
H355E16	P67-C	P96-A	AN16	33.00
H370D18	P60-A	TB9-12	AN18	51.25
H370E18	P67-X	TB9-13	AN18	22.75
H370L18	P100-H	TB9-13	AN18	
H371D18	P67-B	TB9-14	AN18	24.00
H371L18	P100-T	TB9-14	AN18	
H413A18	J94-P	P95-S	AN18	20.75
H414B18	P67-T	J94-R	AN18	14.50
H415B18	P67-U	J94-S	AN18	14.50
H416B18	P67-V	J94-T	AN18	14.50
H417A18	J94-U	P95-L	AN18	20.75
H418B18	P67-d	J94-W	AN18	14.50
H419B18	P67-e	J94-X	AN18	14.50
H420B18	P67-f	J94-Y	AN18	14.50
H421A16	P67-E	P96-C	AN16	33.00
H422B18	P85-F	P95-J	AN18	53.25
H423B18	P85-G	P95-C	AN18	53.25
H426A18	J99-B	P100-N	AN18	
H427A18	J99-D	P100-C	AN18	

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H96E16	P67-F	P78-A	AN16	48.75
L2DK18N	J94-q	TB9-10	AN18	22.50
L300Q20	J94-n	TB9-15	AN20	28.25
L8Q16	P67-N	J94-P	AN16	14.50
V2CY16N	P67-S	TB9-9	AN16	18.75
V2CZ18N	P95-G	TB9-9	AN18	8.50
V2DA18N	P95-N	TB9-9	AN18	8.50
V2DB18N	J94-B	TB9-9	AN18	21.75
V2DD18N	J94-J	TB9-10	AN18	22.50
V2DF18N	J94-a	TB9-10	AN18	22.50
V2DH18N	J94-g	TB9-10	AN18	22.50
V370B18	J94-b	TB9-12	AN18	24.00
V370C18	P95-H	TB9-12	AN18	10.75
V371B18	J94-h	TB9-14	AN18	27.00
V371C18	P95-B	TB9-14	AN18	13.75
V391H18	P67-G	T85-H	AN18	53.50
V392D16	P67-M	TB9-1	AN16	12.75
V392E18	J94-A	TB9-1	AN18	15.75
V392G18	J94-E	TB9-1	AN18	15.75
V393B18	J94-C	P95-R	AN18	20.75
V394H18	P67-K	TB9-7	AN18	17.25
V394J18	J94-D	TB9-7	AN18	20.25
V394L18	J94-Q	TB9-7	AN18	20.25
V394N18	P95-K	TB9-7	AN18	7.00
V395H18	P67-J	P85-E	AN18	53.50
V396D16	P67-P	TB9-2	AN16	13.50
V396E18	J94-H	TB9-2	AN18	16.50
V396G18	J94-M	TB9-2	AN18	16.50
V397B18	J94-K	P95-T	AN18	20.75
V398H18	P67-L	TB9-8	AN18	18.00
V398J18	J94-L	TB9-8	AN18	21.00
V398L18	J94-V	TB9-8	AN18	21.00
V398N18	P95-M	TB9-8	AN18	8.25
V401B20	J94-F	P85-A	AN20	56.50
V403B20	J94-G	P85-B	AN20	56.50
V404B20	J94-d	P85-C	AN20	56.50
V406B20	J94-e	P85-D	AN20	56.50
V407B20	P67-Z	J94-N	AN20	14.50
V409C20	P67-a	J94-O	AN20	14.50
V410B20	P67-b	J94-k	AN20	14.50
V412C20	P67-c	J94-m	AN20	14.50

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Figure 5-8. Air conditioning system wire harness assembly.

(2) Remove connectors J94 and J99 by removing lockwire from P99 and disconnecting P94 and P99; then remove J94 and J99 by removing four nuts and screws and eight washers from each.

(3) Remove lockwires and disconnect remaining seven connectors.

(4) Remove six cable clamps; note position of clamps and routing of the wire harness. Remove the wire harness.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, terminal lugs, and terminal board studs. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-8 and check individual wires for continuity. Check diodes CR21 and CR22 for shorts or open with an ohmmeter.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder type SN60OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-8.

(3) If self-clinching cable straps are removed to vacilitate repairs, install new cable straps at three inch intervals and at all cable breakouts.

(4) Diode assemblies (CR21 and CR22) may be repaired if diode checks good but wire, terminal lugs, or insulation is defective. Replace defective wires with wire Type E, MIL-W-16878 / 4, size E20. After crimping the splice for the wire to the diode lead, solder the splice in accordance with MIL-S-6872 with solder Type SN60WRP2 per Fed Spec QQ-S-57 1. Install insulation sleeving with new self-clinching cable straps.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors, safety wire in accordance(with MS33540 using lockwire MS20995C20.

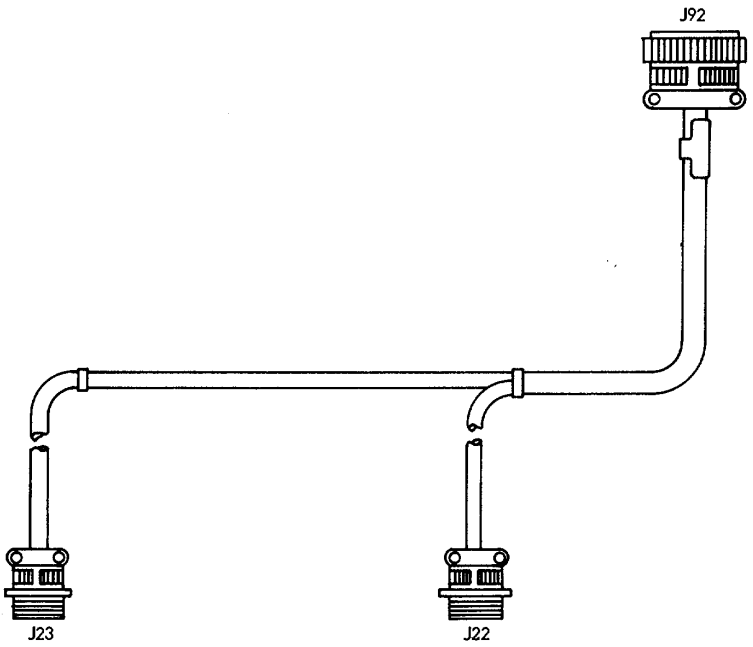
5-10. Recirculating Fans Wire Harness Assembly (13217E4165)

a. Removal. Refer to figure 5-9; tag and disconnect the recirculating fans wire harness assembly as follows:

(1) Remove connectors J22 and J23 by removing lockwire and disconnecting P22 and P23; then removing four nuts and screws, and eight washers to remove J22 and J23.

(2) Remove lockwire and disconnect connector P92.

(3) Remove five cable clamps. Note position of cable clamps and routing of wire harness and remove the wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200CH16N	P92-D	J22-D	AN16	26.00
X200CM16N	P92-H	J23-D	AN16	40.00
X318D16	P92-A	J22-A	AN16	26.00
X318H16	P92-E	J23-A	AN16	40.00
X319D16	P92-B	J22-B	AN16	26.00
X319H16	P92-F	J23-B	AN16	40.00
X320D16	P92-C	J22-C	AN16	26.00
X320H16	P92-G	J23-C	AN16	40.00

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Figure 5-9. Recirculating fans wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved cleaning solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-9 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder type SN60OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-9.

(3) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at five inch intervals and at all cable breakouts.

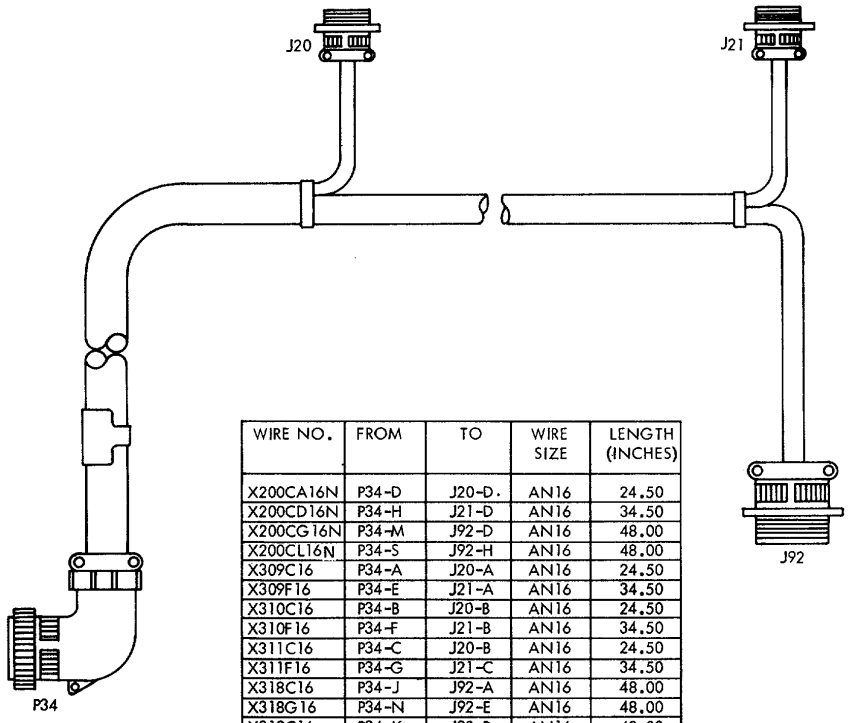
f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors, safety wire in accordance with MS33540 using lockwire MS20995C20.

5-11. Recirculating Fans Wire Harness Assembly (13217E4141)

a. Removal. Refer to figure 5-10; tag and remove the recirculating fans wire harness

assembly by removing lockwire and mating connectors and remove four nuts, four screws and eight washers from each connector (J20, J21 and J92).

Remove lockwire, disconnect connector P34, and remove the wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200CA16N	P34-D	J20-D.	AN16	24.50
X200CD16N	P34-H	J21-D	AN16	34.50
X200CG16N	P34-M	J92-D	AN16	48.00
X200CL16N	P34-S	J92-H	AN16	48.00
X309C16	P34-A	J20-A	AN16	24.50
X309F16	P34-E	J21-A	AN16	34.50
X310C16	P34-B	J20-B	AN16	24.50
X310F16	P34-F	J21-B	AN16	34.50
X311C16	P34-C	J20-B	AN16	24.50
X311F16	P34-G	J21-C	AN16	34.50
X318C16	P34-J	J92-A	AN16	48.00
X318G16	P34-N	J92-E	AN16	48.00
X319C16	P34-K	J92-B	AN16	48.00
X319G16	P34-P	J92-F	AN16	48.00
X320C16	P34-L	J92-C	AN16	48.00
X320G16	P34-R	J92-G	AN16	48.00

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b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-10 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN6OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-10.

(3) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at two inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure.

After installing connectors, safety wire to the attaching hardware in accordance with MS33540 using lockwire MS20995C20.

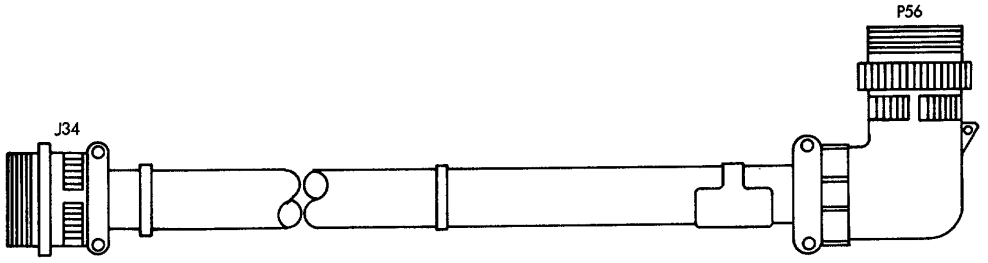
5-12. Recirculating Fans Wire Harness Assembly (13217E4148)

a. Removal. Refer to figure 5-11; tag and disconnect the recirculating fans wire harness as follows: Figure 5-10. Recirculating fans wire harness assembly.

(1) Remove connector J34 by removing the lockwire and disconnecting mating connector P34. Then remove four nuts, four screws and eight washers to remove J34.

(2) Remove lockwire and disconnect connector P56.

(3) Remove two cable clamps. Note position of the cable clamps and routing of the wire harness and remove the wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BZ16N	P56-D	J34-D	AN16	
X200CC16N	P56-H	J34-H	AN16	
X200CF16N	P56-M	J34-M	AN16	
X200CK16N	P36-S	J34-S	AN16	
X309B16	P56-A	J34-A	AN16	
X309E16	P56-E	J34-E	AN16	
X310B16	P56-B	J34-B	AN16	
X310E16	P56-F	J34-F	AN16	
X311B16	P56-C	J34-C	AN16	
X311E16	P56-G	J34-G	AN16	
X318B16	P56-J	J34-J	AN16	
X318F16	P56-N	J34-N	AN16	
X319B16	P56-K	J34-K	AN16	
X319F16	P56-P	J34-P	AN16	
X320B16	P56-L	J34-L	AN16	
X320F16	P56-R	J34-R	AN16	

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Figure 5-11. Recirculating fans wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-11 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60WRP2 per Fed Spec QQ-S-571.

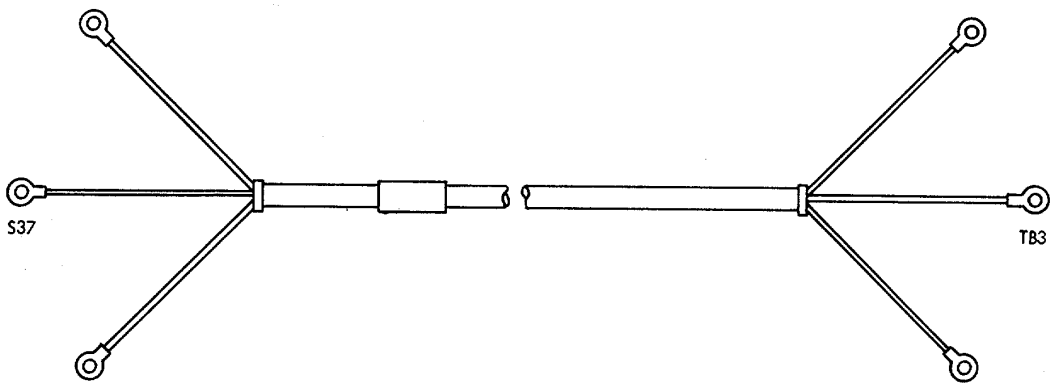
(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-11.

(3) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at three inch intervals.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors,, safety wire in accordance with MS33540 using lockwire MS20995C20.

5-13. 400 Hz Auxiliary Power Wire Harness Assembly (13217E4131)

a. Removal. Refer to figure 5-12; tag and disconnect the 400 Hz auxiliary power wire harness assembly by removing the electrical leads from switch (S37) and terminal board (TB3).



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X204L0	TB3-5	S37A-L1	ANO	91.0
X205L0	TB3-3	S37B-L1	ANO	85.25
X206L0	TB3-1	S37C-L1	ANO	84.50

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Figure 5-12. 400 Hz auxiliary power wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose terminal lugs, damaged or cut wire insulation. Check for any evidence of burned areas indicating shorts.

d. Testing. Refer to the wire run chart in figure 5-12 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-12.

(2) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at three inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure.

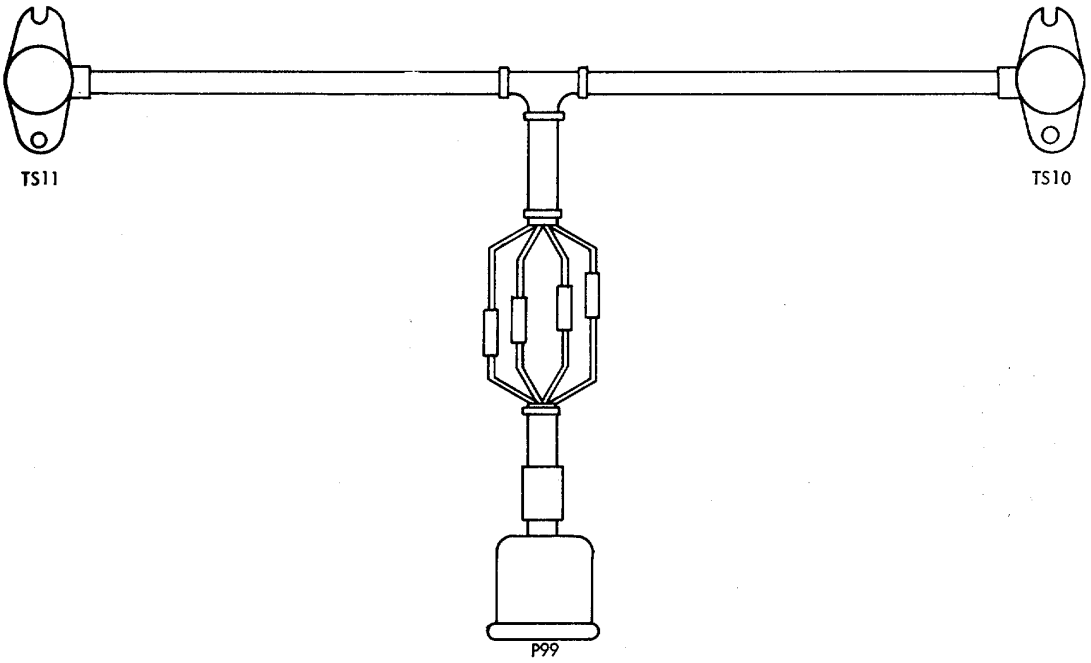
5-14. Anti-Ice Thermostat Wire Harness Assembly (13217E4133)

a. Removal. Refer to figure 5-13; tag and remove the anti-ice thermostat wire harness assembly as follows:

(1) Remove the thermostats (TS10 and TSI I from their mounting brackets by removing two nuts and screws and four washers from each.

(2) Disconnect the connector (P99) and remove the wire harness.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
350	P99-A	TS10		27.50
351	P99-C	TS11		32.00
426	P99-B	TS10		27.50
427	P99-D	TS11		32.00

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Figure 5-13. Anti-ice thermostat wire harness assembly.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. The thermostats operate through SPST contacts. TSIO contacts are terminated across pins A and B of connector P99; TSII contacts are terminated across pins C and D (fig. 513). Use an ohmmeter to check that circuits across these pins open and close at the following ambient temperatures: Open at 38° F ± 5°F on decreasing temperature and close at 470° F + 5° on increasing temperature.

e. Repair, Replacement and Reassembly.

(1) If thermostat fails the test in step d above, or connector must be replaced, remove the thermostat by removing self-clinching cable straps and unsoldering leads from the connector (P99). Cut leads of new thermostat to length (fig. 5-13 for approximate lengths).

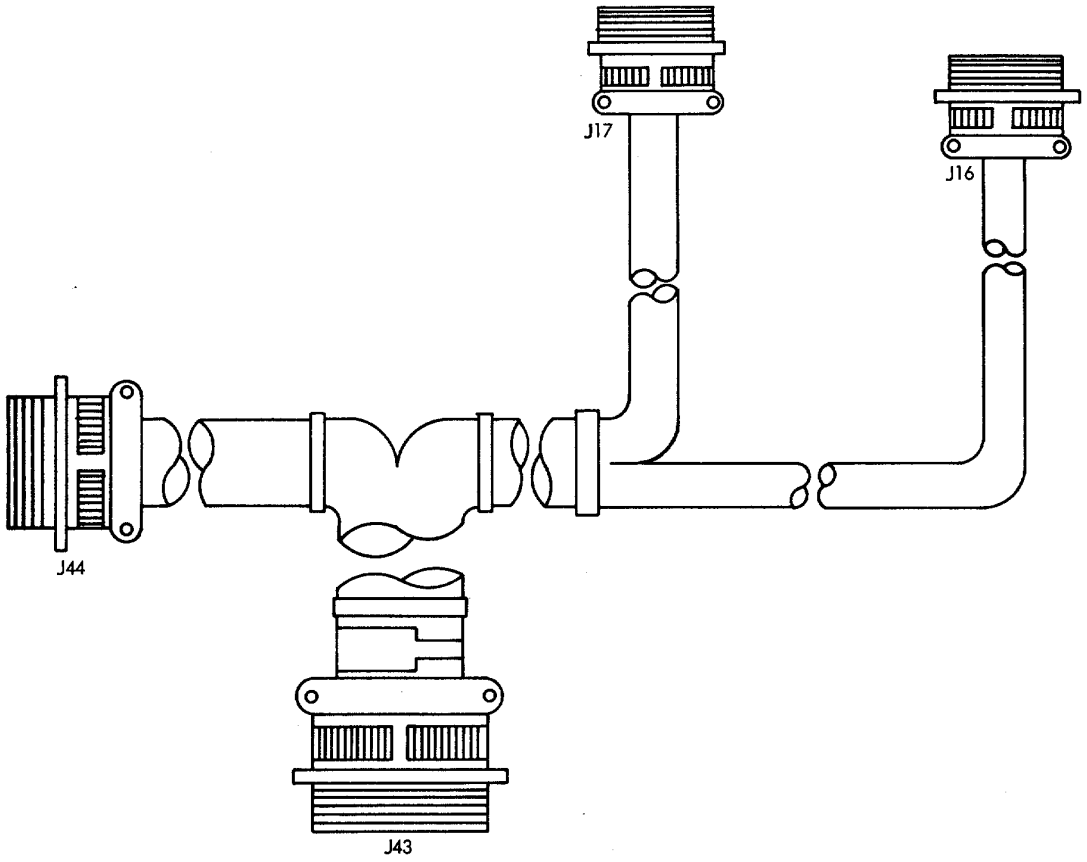
(2) Solder leads of thermostat(s) in accordance with MIL-S-6872 using solder type SN60WRP2 per Fed Spec QQ-S-571.

(3) Install new cable straps at three inch intervals and at cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure.

5-15. Condenser Fans Wire Harness Assembly 113217E4151)

a. Removal. Refer to figure 5-14; tag and disconnect the condenser fans wire harness assembly by removing lockwires, disconnecting connectors P16, P17, P43, and P44, then removing four nuts, four screws, and eight washers from each connector (J16, J17, J43, and J44).



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BD12N	J43-D	J44-D	AN12	12.50
X200BG12N	J43-J	J44-H	AN12	12.50
X200BK12N	J43-N	J16-D	AN12	55.00
X200BM12N	J43-T	J17-D	AN12	34.00
X327C12	J43-A	J44-A	AN12	12.50
X327G12	J43-E	J44-E	AN12	12.50
X328C12	J43-B	J44-B	AN12	12.50
X328G12	J43-F	J44-F	AN12	12.50
X329C12	J43-C	J44-C	AN12	12.50
X329G12	J43-H	J44-G	AN12	12.50
X333C12	J43-K	J16-A	AN12	55.00
X333F12	J43-P	J17-A	AN12	34.00
X334C12	J43-L	J16-B	AN12	55.00
X334F12	J43-R	J17-B	AN12	34.00
X335C12	J43-M	J16-C	AN12	55.00
X335F12	J43-S	J17-C	AN12	34.00

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Figure 5-14. Condenser fans wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, and damaged wires. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-14 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-14.

(3) If replacement of connector J43 is necessary, remove potting compound and unsolder electrical leads. Solder electrical leads to replacement connector. Fill connector backshell with silicone rubber sealing compound (501 RTV and Catalyst 501A, Dow Corning Corp., Midland, Michigan, or equivalent).

(4) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at three inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors, safety wire in accordance with MS33540 using lockwire MS20995C20.

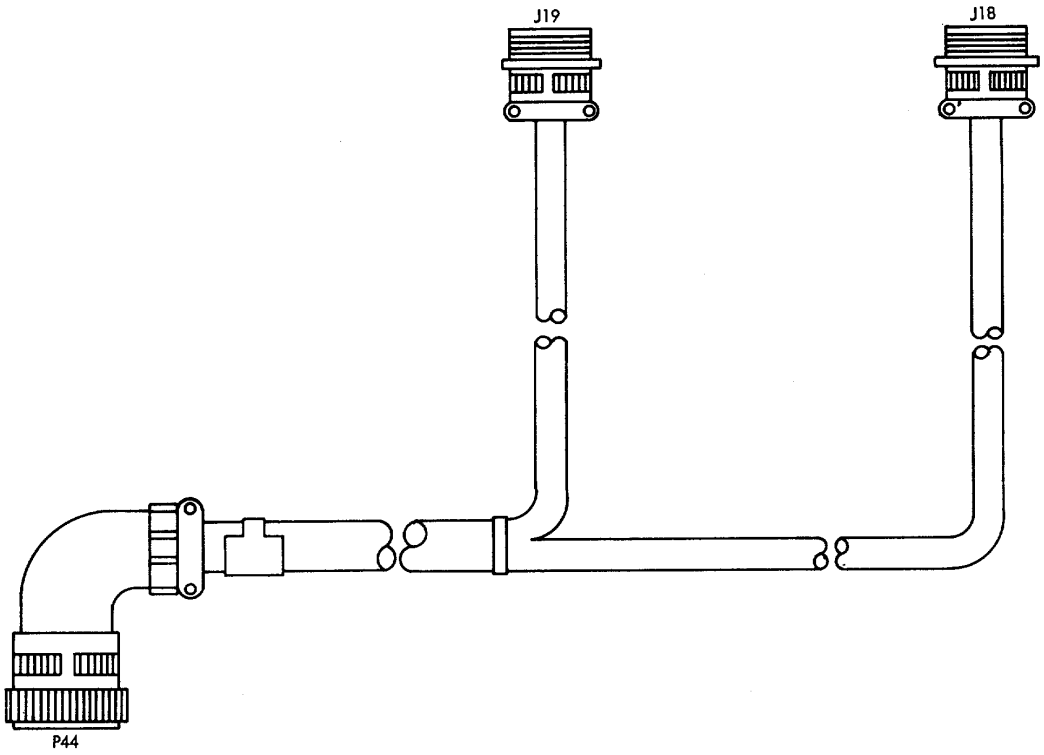
5-16. Condenser Fans Wire Harness Assembly (13217E4150)

a. Removal. Refer to figure 5-15. tag and disconnect the condenser fans wire harness assembly as follows:

(1) Remove lockwire and connectors P18 and P19; then remove four nuts, eight washers, and four screws from each connector J18 and J19.

(2) Disconnect connector P44. Remove the wire harness.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BE12N	P44-D	J18-D	AN12	51.00
X200BH12N	P44-H	J19-D	AN12	26.50
X327D12	P44-A	J18-A	AN12	51.00
X327H12	P44-E	J19-A	AN12	26.50
X328D12	P44-D	J18-B	AN12	51.00
X328H12	P44-F	J19-B	AN12	26.50
X329D12	P44-C	J18-C	AN12	51.00
X329H12	P44-G	J19-C	AN12	26.50

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Figure 5-15. Condenser fans wire harness assembly.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins and damaged wires. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 515 and check individual wires for continuity.

e. Repair. Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN)OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086,Type II. Wire size and

approximate length in inches is provided in figure 5-15.

(3) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at three inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors, safety wire in accordance with MS35540 using lockwire MS20995C20.

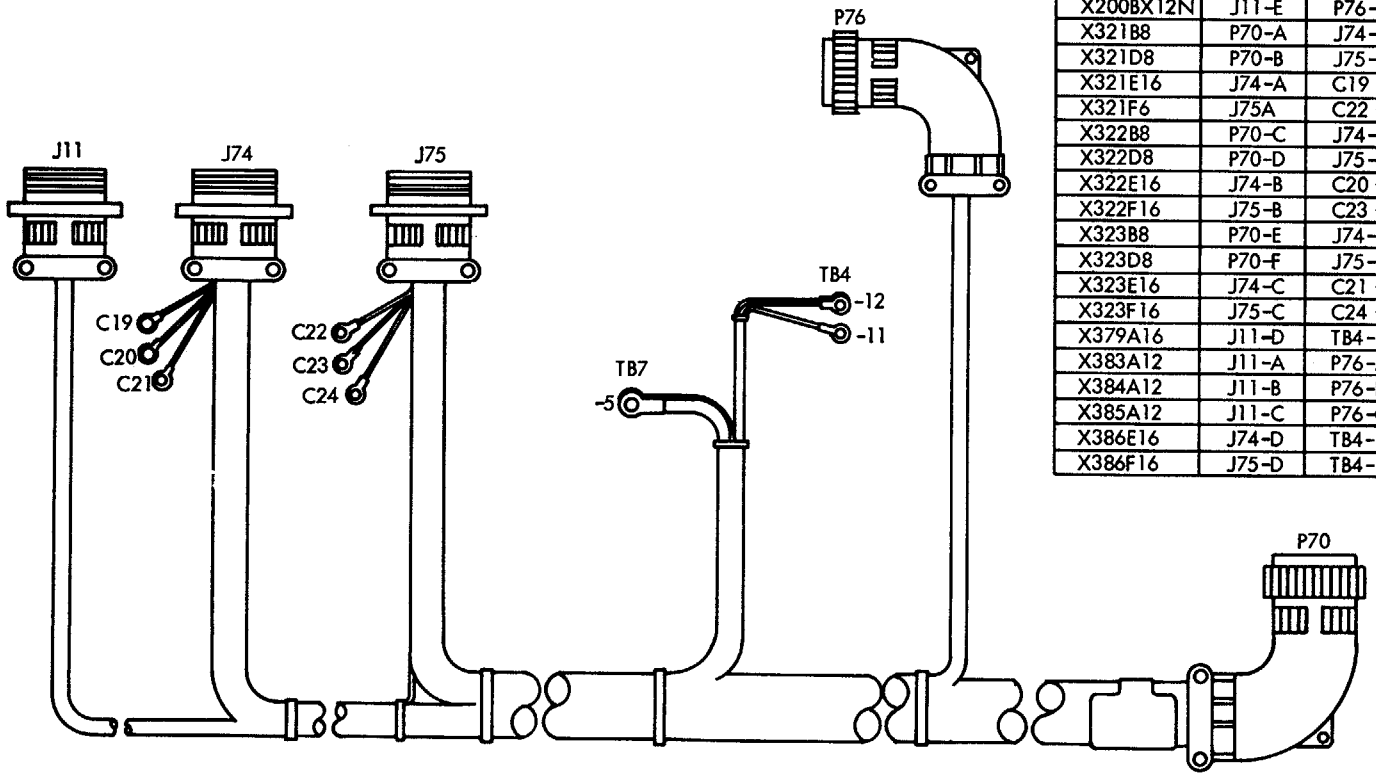
5-17. Remote Power Output Wire Harness Assembly (13217E4156)

a. Removal. Refer to figure 5-16; tag and disconnect the remote power output wire harness assembly as follows:

(1) Remove lockwire and connectors PII, P74, and P75; then remove nuts, washers and screws from connectors J 1, J74, and J75. Remove wire lead connections to capacitors (C19, C20, C21, C22, C23, C24) near J74 and J75.

(2) Remove wire lead connections to terminal boards (TB4, TB7).

(3) Disconnect connectors P70 and P76. Remove the wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BA8N	J74-E	TB7-5	AN8	30.00
X200BB8N	J75-E	TB7-5	AN8	26.75
X200BX12N	J11-E	P76-D	AN12	43.00
X321B8	P70-A	J74-A	AN8	42.75
X321D8	P70-B	J75-A	AN8	39.50
X321E16	J74-A	C19 +	AN6	5.50
X321F6	J75A	C22 +	AN6	5.50
X322B8	P70-C	J74-B	AN8	42.75
X322D8	P70-D	J75-B	AN8	39.50
X322E16	J74-B	C20 +	AN16	5.50
X322F16	J75-B	C23 +	AN16	5.50
X323B8	P70-E	J74-C	AN8	42.75
X323D8	P70-F	J75-C	AN8	39.50
X323E16	J74-C	C21 +	AN16	5.50
X323F16	J75-C	C24 +	AN16	5.50
X379A16	J11-D	TB4-11	AN16	37.00
X383A12	J11-A	P76-A	AN12	43.00
X384A12	J11-B	P76-B	AN12	43.00
X385A12	J11-C	P76-C	AN12	43.00
X386E16	J74-D	TB4-12	AN16	33.00
X386F16	J75-D	TB4-12	AN16	29.75

Figure 5-16. Remote power output wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, damaged wires, and loose or damaged terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 516 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60WRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-16.

(3) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at five inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors, safety wire in accordance with MS35540 using lockwire MS20995C20.

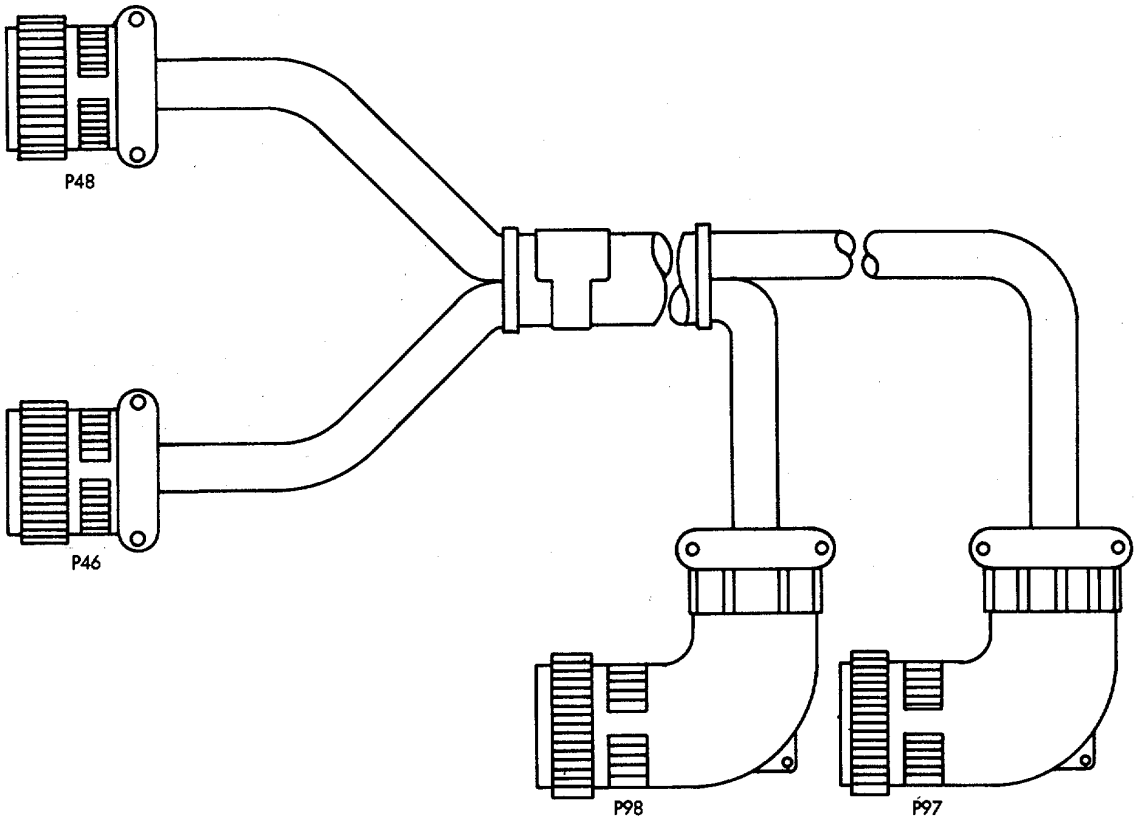
5-18. Compressor Wire Harness Assembly (13217E4157)

a. Removal. Refer to figure 5-17; tag and disconnect the compressor wire harness assembly by removing lockwire and disconnecting the four connectors (P46, P48, P97, and P98).

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BR6N	P48-D	P97-D	AN6	32.00
X200BV6N	P46-D	P98-D	AN6	19.00
X344D6	P48-A	P97-A	AN6	32.00
X345D6	P48-B	P97-B	AN6	32.00
X346D6	P48-C	P97-C	AN6	32.00
X364D6	P46-A	P98-A	AN6	19.00
X365D6	P46-B	P98-B	AN6	19.00
X366D6	P46-C	P98-C	AN6	19.00

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Figure 5-17. Compressor wire harness assembly.

(2) Inspect for damaged or loose connector pins and damaged wires. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 517 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-17.

(3) If replacement of connectors P97 and P98 is necessary, install sleeving over exposed threads of connector backshell as new connector is assembled to the wire harness.

(4) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at five inch intervals and at all cable breakouts.

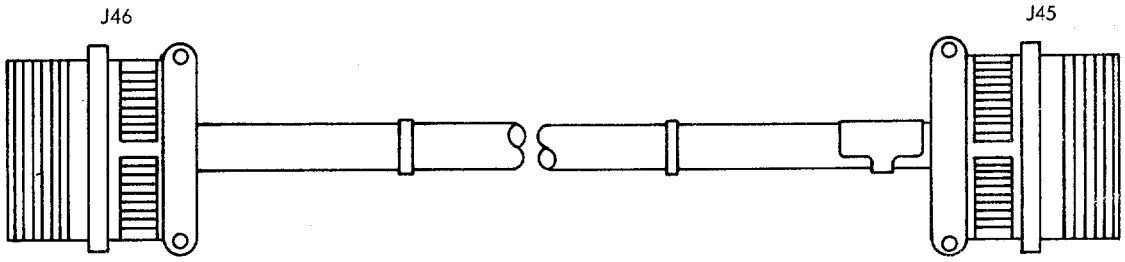
f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connector, safety wire in accordance with MS35540 using lockwire MS20995C20.

5-19. Compressors Wire Harness Assemblies (13217E3796 and 13217E41551

a. Removal. Refer to figure 5-18 or 5-19 as applicable: tag and disconnect the compressors ,wire harness assembly as follows: (I) Remove lockwire and disconnect con

nectors (P45 and P46 for 13217E3796 assembly or P47 and P48 for 13217E4155 assembly).

(2) Remove nuts, washers, and screws that attach the two connectors (J45, J46 and J47, J4,lt for each assembly and remove the wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BU6N	J45-D	J46-D	AN6	9.00
X364C6	J45-A	J46-A	AN6	9.00
X365C6	J45-B	J46-B	AN6	9.00
X366C6	J45-C	J46-C	AN6	9.00

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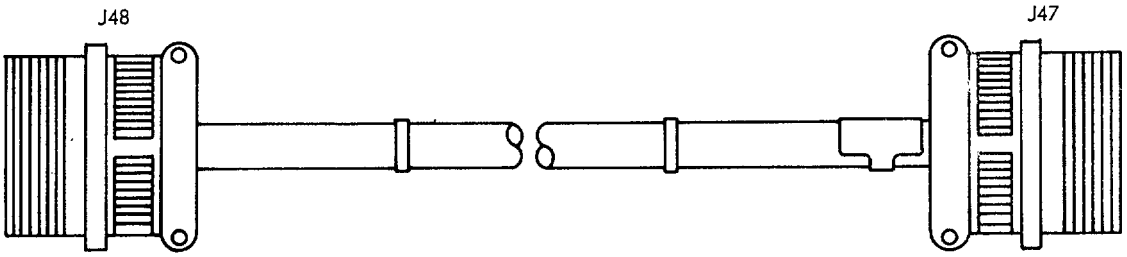
Figure 5-18. Compressors wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BQ6N	J47-D	J48-D	AN6	15.00
X344C6	J47-A	J48-A	AN6	15.00
X345C6	J47-B	J48-B	AN6	15.00
X346C6	J-47-C	J48-C	AN6	15.00

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Figure 5-19. Compressors wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harnesses only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean. lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins. damaged wires. and loose or damaged terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 518 or 5-19 as applicable and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-18 and 5-19.

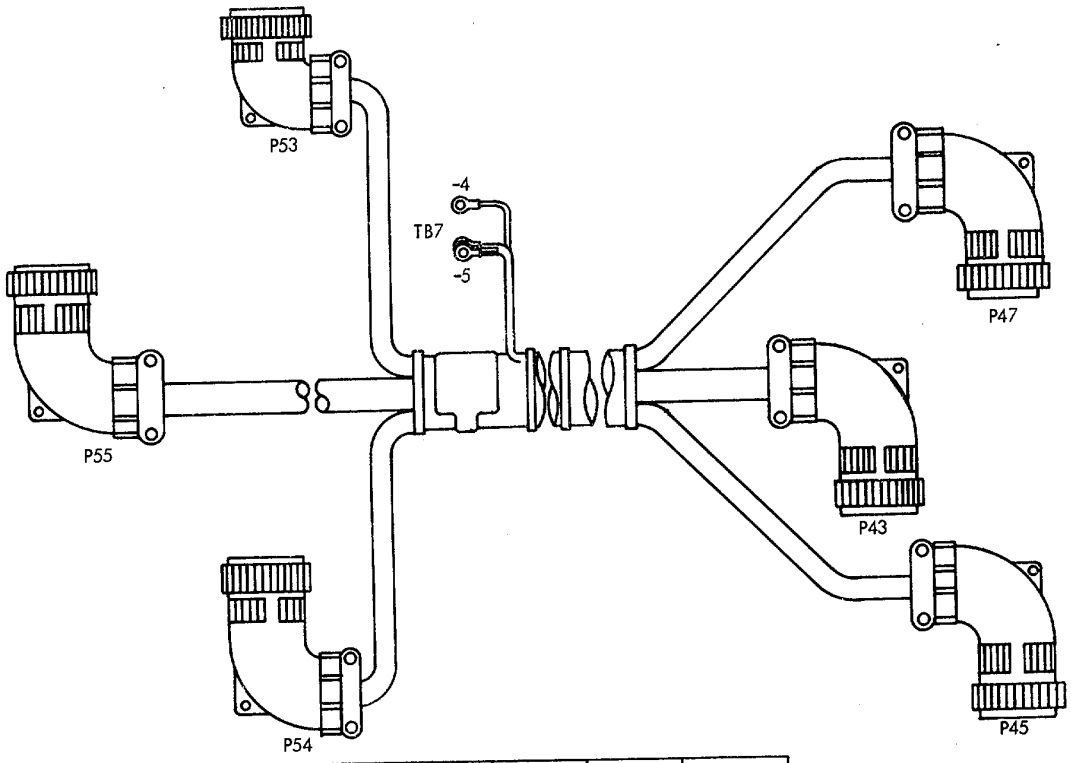
(3) If replacement of connector J45 or J47 is necessary. remove potting compound and unsolder electrical leads. Fill connector backshell with silicone rubber sealing compound (510 RTV and Catalyst 501A. Dow Corning Corp., Midland, Michigan, or equivalent) at reassembly.

(4) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at five inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assemblies in reverse order of removal procedure. After installing connectors. safety wire in accordance with MS35540 using lockwire MS20995C20.

5-20. Compressor and Exhaust Fans Wire Harness Assembly 113217E4152)

a. Removal. Refer to figure 5-20; tag and disconnect the compressor and exhaust fans wire harness assembly as follows.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BC12N	P43-D	TB7-5	AN12	71.00
X200BF12N	P43-J	TB7-5	AN12	71.00
X200BJ12N	P43-N	TB7-4	AN12	72.50
X200BL12N	P43-T	TB7-5	AN12	71.00
X200BP6N	P47-D	P53-D	AN6	81.00
X200BT6N	P45-D	P54-D	AN6	93.00
X327B12	P55-H	P43-A	AN12	95.00
X327F12	P55-L	P43-E	AN12	95.00
X328B12	P55-J	P43-B	AN12	95.00
X328F12	P55-M	P43-F	AN12	95.00
X329B12	P55-K	P43-C	AN12	95.00
X329F12	P55-N	P43-H	AN12	95.00
X333B12	P55-A	P43-K	AN12	95.00
X333E12	P55-D	P43-P	AN12	95.00
X334B12	P55-B	P43-L	AN12	95.00
X334E12	P55-E	P43-R	AN12	95.00
X335B12	P55-C	P43-M	AN12	95.00
X335E12	P55-F	P43-S	AN12	95.00
X344B6	P47A	P53-A	AN6	81.00
X345B6	P47-B	P53-B	AN6	81.00
X346B6	P47-C	P53-C	AN6	81.00
X364B6	P45-A	P54-A	AN6	93.00
X365B6	P45-B	P54-B	AN6	93.00
X366B6	P45-C	P54-C	AN6	93.00

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Figure 5-20. Compressor and exhaust fans wire harness assembly.

(1) Disconnect wire lead assemblies to terminal board TB7.

(2) Remove cable clamp.

(3) Remove lockwire, disconnect connectors P43, P45, P47, P53, P54, and P55 and remove the wire harness.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, damaged wires, and loose or damaged terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-2f) and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60(!WRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-2 0.

(3) If self-clinching cable straps are removed to) facilitate repairs, install new cable straps at two :,;l' internals and at all cable breakouts.

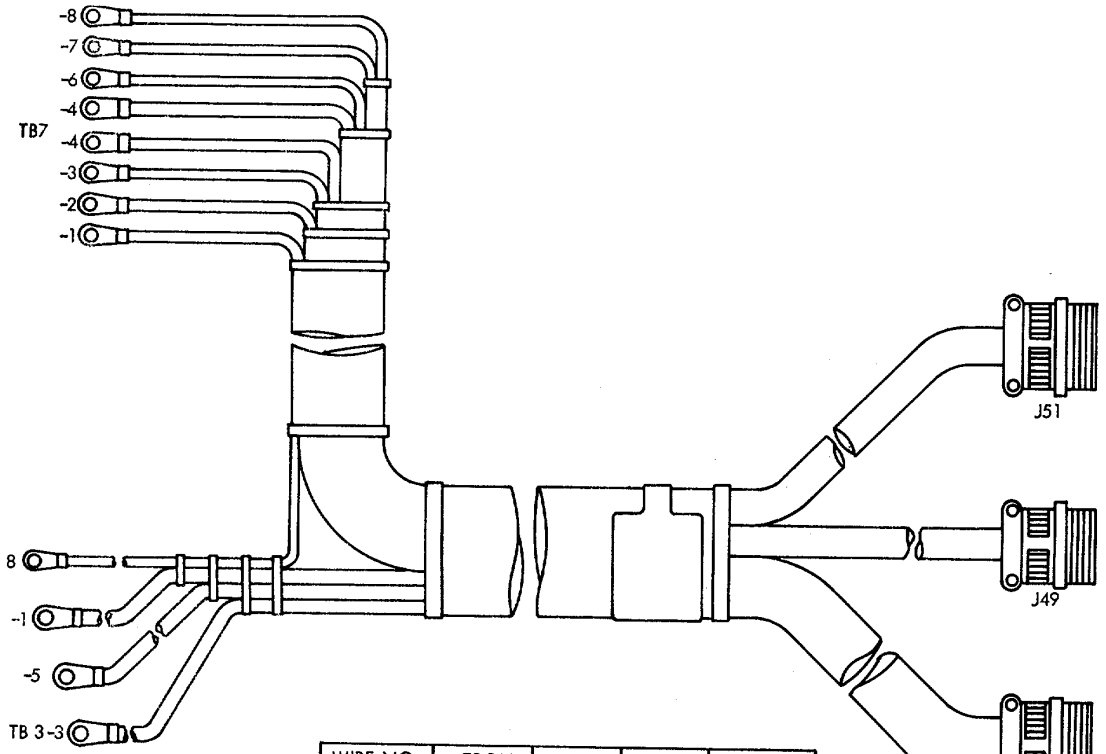
f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connector, safety wire in accordance with MS35540 using lockwire MS20995C20.

5-21. AC Power Wire Harness Assembly (13217E4158)

a. Removal. Refer to figure 5-21; tag and disconnect the AC power wire harness assembly as follows:

(1} Remove terminal board covers from terminal boards (TB3 and TB7) and disconnect wire leads to the boards.

(2) Remove lockwire; disconnect connectors P49, P50, and P51; remove nuts, washers, and screws that attach connectors J49, J50, and J51; remove wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200B0N	J50-D	TB7-4	AN0	50.50
X200D2N	TB7-4	TB3-8	AN2	32.00
X204B0	J50-A	TB3-5	AN0	53.00
X205B0	J50-B	TB3-3	AN0	50.00
X206B0	J50-C	TB3-1	AN0	49.00
X207B4	J51-A	TB7-3	AN4	45.50
X208B4	J51-B	TB7-2	AN4	45.00
X209B4	J51-C	TB7-1	AN4	43.50
X254B6	J49-A	TB7-8	AN6	52.50
X255B6	J49-B	TB7-7	AN6	50.00
X256B6	J49-C	TB7-6	AN6	49.00

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Figure 5-21. AC power wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, damaged wires, and loose or damaged terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-21 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60WRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-21.

(3) If replacement of connector J50 is necessary, remove potting compound and unsolder electrical leads. Fill connector backshell with silicone rubber sealing compound (501 RTV and Catalyst 501A, Dow Corning Corp., Midland, Michigan, or equivalent) at reassembly.

(4) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at three inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connector, safety wire in accordance with MS35540 using lockwire MS20995C20.

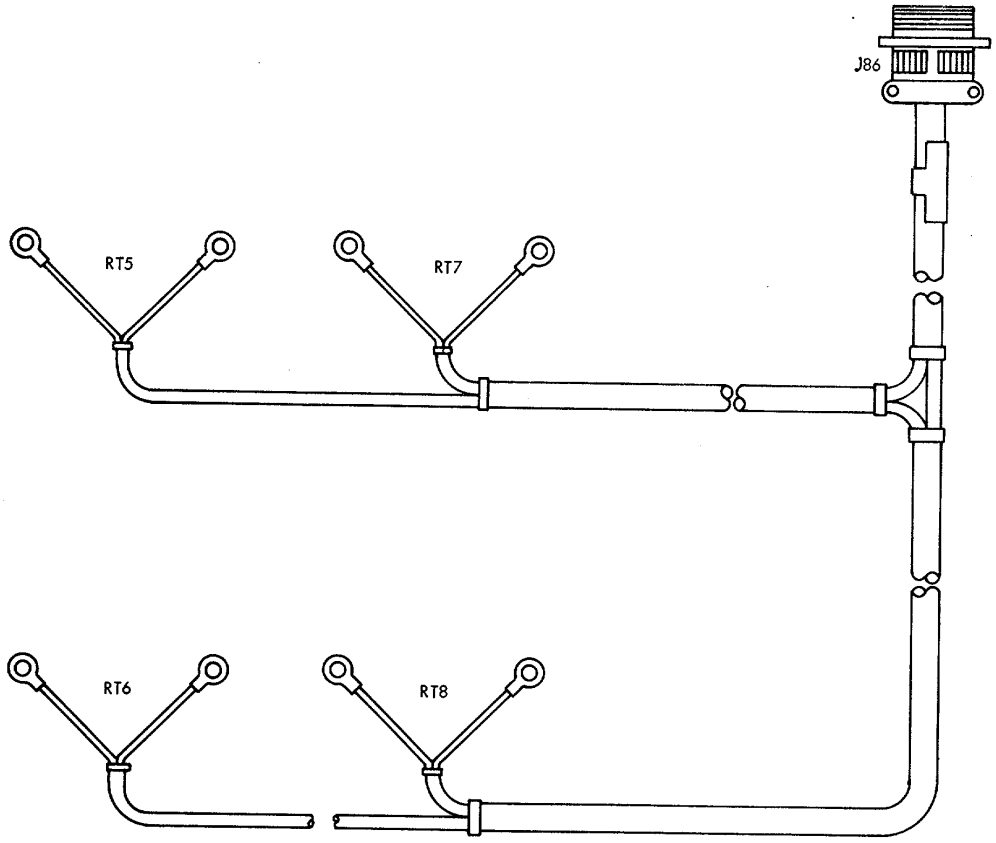
5-22. Temperature Sensors Wire Harness Assembly (13217E4159)

a. Removal. Refer to figure 5-22; tag and disconnect the temperature sensors wire harness assembly as follows.

(1) Remove lockwire; disconnect connector P86; then remove nuts, lockwashers, and screws that attach connector J86.

(2) Disconnect wire leads at temperature sensors (RT5, RT6, RT7, and RT8).

(3) Remove seven loop-type cable clamps and remove the wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
V407D20	J86-A	RT5-1	AN20	28.00
V408A20	RT5-2	RT6-1	AN20	49.00
V409A20	J86-B	RT6-2	AN20	43.00
V410D20	J86-C	RT7-1	AN20	23.00
V411A20	RT7-2	RT8-1	AN20	40.00
V412A20	J86-D	RT8-2	AN20	49.00

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Figure 5-22. Temperature sensors wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, damaged wires, and loose or damaged terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect connector for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-22 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60WRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-22.

(3) If self-clinching cable straps are removed Figure 5-22. Temperature sensors wire harness assembly.

to facilitate repairs, install new cable straps at five inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connector, safety wire in accordance with MS35540 using lockwire MS20995C20.

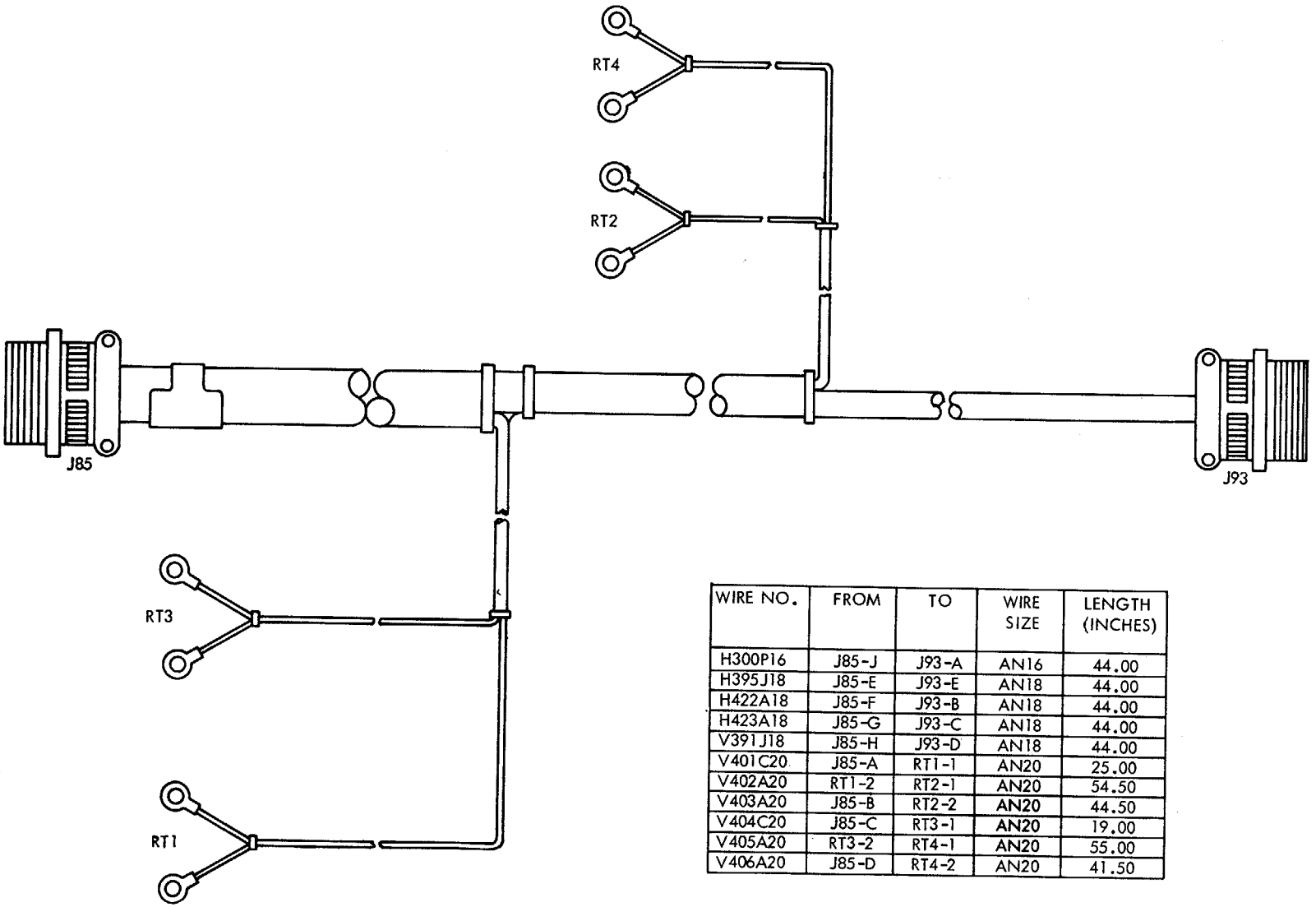
5-23. Temperature Sensors Wire Harness Assembly (13217E4160)

a. Removal. Refer to figure 5-23; tag and disconnect the temperature sensors wire harness assembly as follows:

(1) Remove lockwires and disconnect connectors P85 and P93; then remove nuts, washers and screws that attach connectors J85 and J93.

(2) Disconnect wire leads to temperature sensors (RT1, RT2, RT3, and RT4). Remove sensors from mounts by removing nuts, washers and screws.

(3) Remove seven loop-type cable clamps and remove wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H300P16	J85-J	J93-A	AN16	44.00
H395J18	J85-E	J93-E	AN18	44.00
H422A18	J85-F	J93-B	AN18	44.00
H423A18	J85-G	J93-C	AN18	44.00
V391J18	J85-H	J93-D	AN18	44.00
V401C20	J85-A	RT1-1	AN20	25.00
V402A20	RT1-2	RT2-1	AN20	54.50
V403A20	J85-B	RT2-2	AN20	44.50
V404C20	J85-C	RT3-1	AN20	19.00
V405A20	RT3-2	RT4-1	AN20	55.00
V406A20	J85-D	RT4-2	AN20	41.50

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Figure 5-23. Temperature sensors wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, damaged wires, and loose or damaged terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-23 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-23.

(3) Replace defective or inoperative sensors.

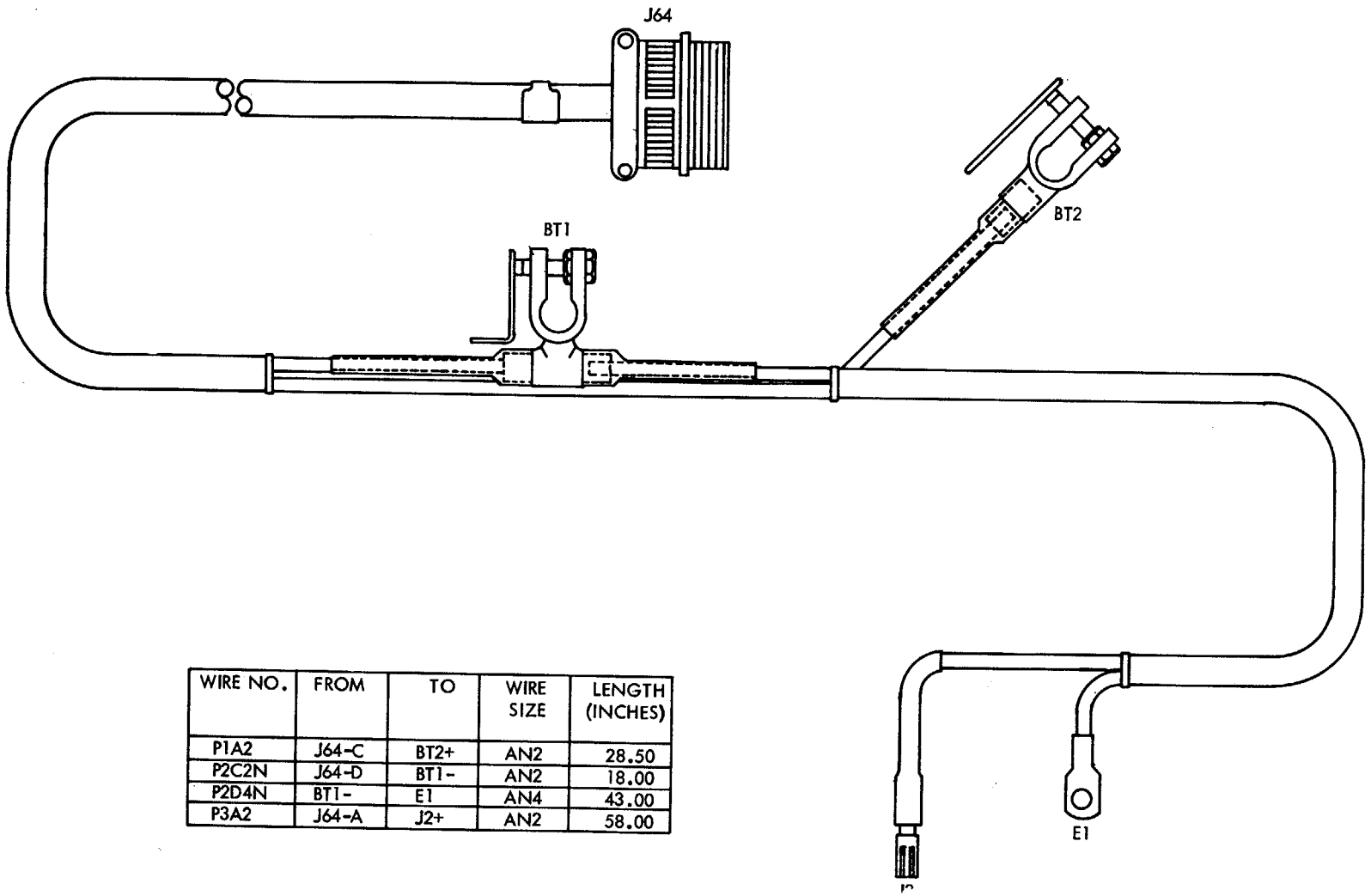
(4) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at five inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connector, attach safety wire in accordance with MS35540 using lockwire MS20995C20.

5-24. Battery Wire Harness Assembly (13217E4168)

a. Removal. Refer to figure 5-24; tag and disconnect the battery wire harness assembly as follows:

(1) Remove the battery clamps. Observe polarity of leads for correct installation after repair.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
P1A2	J64-C	BT2+	AN2	28.50
P2C2N	J64-D	BT1-	AN2	18.00
P2D4N	BT1-	E1	AN4	43.00
P3A2	J64-A	J2+	AN2	58.00

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Figure 5-24. Battery wire harness assembly.

(2) Disconnect wire leads to ground terminal El and to connector J2.

(3) Disconnect connector P64 and remove nuts, washers, and screws that attach connector J64. Then remove the wire harness.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, damaged wires, and loose or damaged terminal lugs and battery clamps. Check for any evidence of burned areas indicating shorts. Inspect connector for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 524 and check individual wires for continuity.

e. Repair, Replacement and Reassembly

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60OWRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-24.

(3) If replacement of connector J64 is necessary, remove potting compound and unsolder electrical leads. Fill connector backshell with silicone rubber sealing compound (501 RTV and Catalyst 501A, Dow Corning Corp., Midland, Michigan, or equivalent) at reassembly.

(4) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at five inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connector, safety wire in accordance with MS35540 using lockwire MS20995C20.

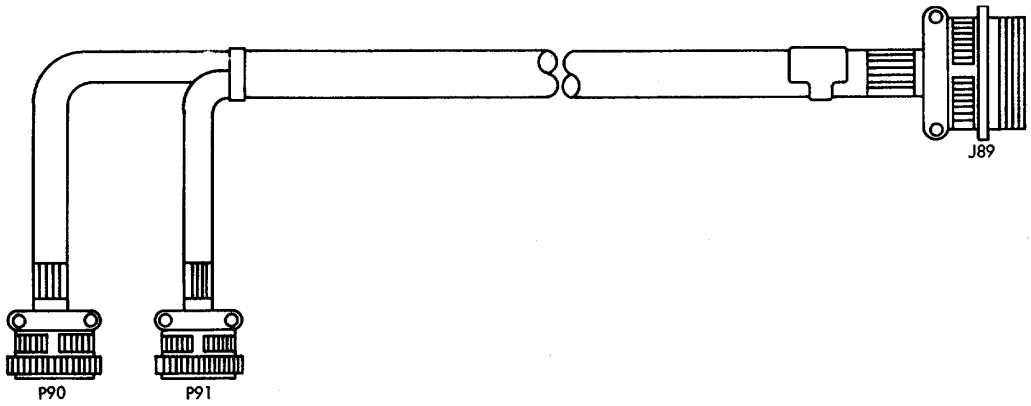
5-25. Heat Valves Wire Harness Assembly (13217D4163)

a. Removal. Refer to figure 5-25; tag and disconnect the heat valves wire harness assembly as follows:

(1) Remove lockwire and disconnect connector P89; then remove nuts, washers, and screws that attach connector J89.

(2) Remove lockwire and disconnect connectors P90, P91.

(3) Remove five loop-type cable clamps and remove the wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H2DT18N	J89-E	P90-E	AN18	62.00
H2DV18N	J89-K	P91-E	AN18	50.00
H394F18	J89-A	P90-A	AN18	62.00
H398F18	J89-F	P91-A	AN18	50.00
H414D18	J89-B	P90-B	AN18	62.00
H415D18	J89-C	P90-C	AN18	62.00
H416D18	J89-D	P90-D	AN18	62.00
H418D18	J89-G	P91-B	AN18	50.00
H419D18	J89-H	P91-C	AN18	50.00
H420D18	J89-J	P91-D	AN18	50.00

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Figure 5-25. Heat valves wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins and damaged wires. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 525 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60WRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-25.

(3) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at two inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connectors, safety wire in accordance with MS35540 using lockwire MS20995C20.

5-26. Instrument Panel Assembly

a. Removal, Disassembly, Cleaning and Inspection. Refer to TM 5-6115-586-12 for these instructions.

b. Repair, Testing, and Adjustments.

(1) Test and repair the panel wire harness assembly as follows.

(a) Refer to the wire run chart in figure FO-1 (located in back of manual) and check individual wires for continuity.

(b) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure FO-1.

(c) Solder connections in accordance with MIL-S-6872 using solder Type SN60WRP2 per Fed Spec QQ-S-571.

(d) If self-clinching cable straps are removed to facilitate repairs, install new straps at two inch intervals and all cable breakouts.

(2) Meters may be electrically tested by comparison with calibrated standard meters. Adjust meters by turning adjustment screw, located in face of meter, until meters read the same as the calibrated standard meters. If synchronization of meters is unobtainable, replace inoperative meter.

(3) Test ammeters before replacement as incorrect readings during operation may be caused by defective current transformers. Both 60 Hz and 1400 Hz ammeters read full scale for 100 ma. Check alumel-chromel leads, resistor, and exhaust gas thermocouple at the engine before replacement of the exhaust gas temperature indicator.

(4) Test switches and relays by. continuity check. Refer to the power plant schematic and wiring diagram in TM 5-6155-586-12 for switch and relay contact arrangement.

(5) Replace all parts that are damaged beyond simple repair and all parts that are proven defective by testing.

c. Reassembly and Installation. Refer to TM 56115-586-12 for reassembly and installation instructions.

5-27. Conditioned Air System Electrical Components Panel

a. Removal and Disassembly. Refer to TM 56115-586-12 for removal and disassembly instructions.

b. Cleaning and Inspection. Refer to TM 56115-586-12 and perform cleaning and inspection procedures as instructed.

c. Testing.

(1) Test time delay (K17, K18) as follows:

(a) Connect the negative side of a 24 VDC source to pin E of the relay connector.

(b) Connect +24 VDC to pin C; then check for closed circuit between pin D and pin H, and an open circuit between pin D and pin G.

(c) Connect +24 VDC to pin A (-24 VDC lead remains at pin E); then check that circuit opens between pin D and pin H, and closes between pin I) and pin G.

(d) Check the time delay by connecting ohmmeter across pin A and pin F. The ohmmeter should indicate an open circuit. Connect -24 VDC lead to pin B and +24 VDC lead to pin D and check the ohmmeter indicates closing of pin A to pin F circuit within 30 ± 3 seconds for K17 and within 60 ± 6 seconds for K18.

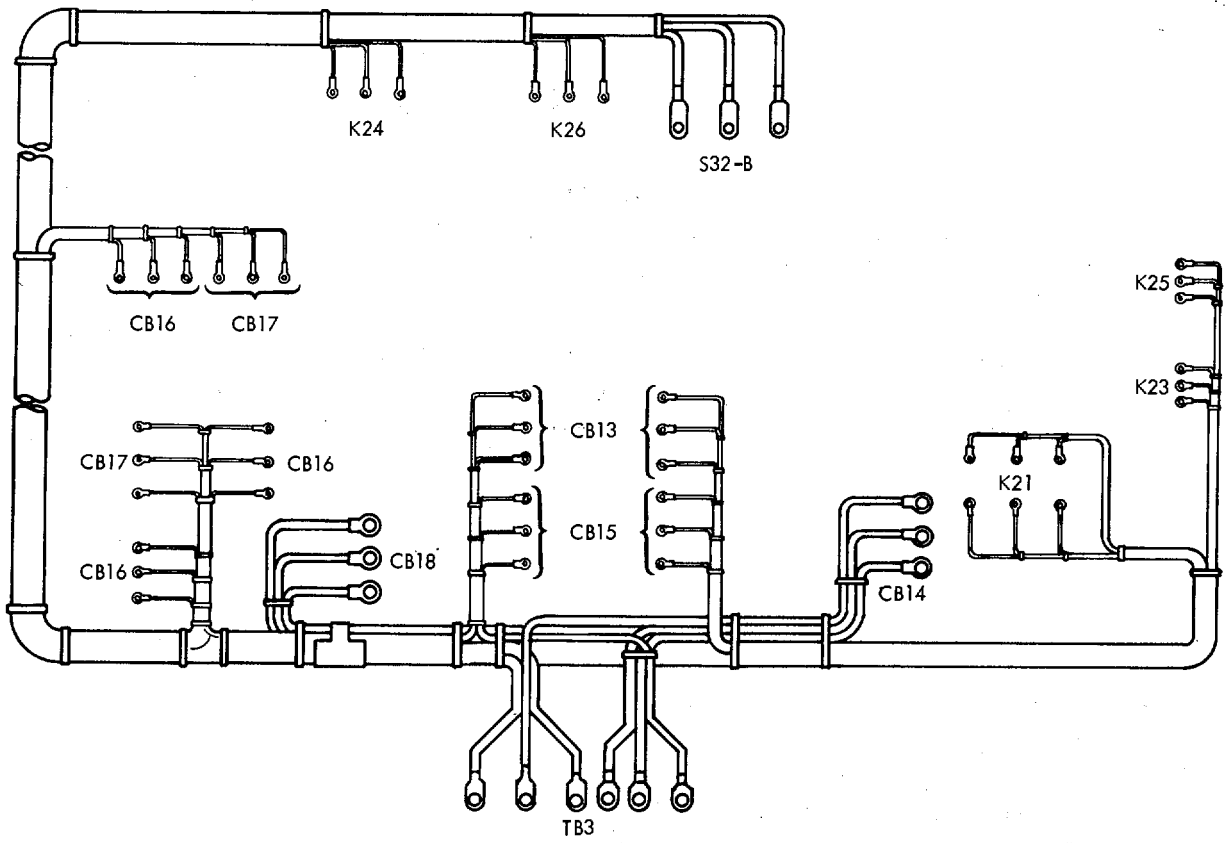
(e) If the relay does not operate properly in any of the above tests, it is defective and must be replaced.

(2) Test relays K23, K24, K25 and K26 by applying a source of 24 VDC across the coil (observe polarity: positive to terminal X 1; negative to terminal X2) and checking that the three sets of N.O. contacts (L1-T1, L2-T2, and L3-T3) close with power applied and that there are no short circuits between them. Check that circuits open when 24 VDC source is disconnected.

(3) Test relays K19, K20, K27 with 24 VDC source across the coil (observe polarity, positive to terminal X1; negative to NEG). Contact arrangement is A1-A2 N.O., B1-B2 N.O., CI-C2 N.O., 11-12 N.O. and 12-13 N.C.

(4) Test relay K21 and 24 VDC across the coil (positive to X1 and negative to X2). Contact arrangement is: A1-A3 N.O., A2-A3 N.C., T1-L1 N.O., T1-L11 N.C., T2-L2 N.O., T2-L12 N.C., T3-L3 N.O., T3-L13N.C.

(5) Refer to wire run chart in figure and check continuity of individual wires in. the air conditioning power wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X204C6	TB3-5	CB14-1	AN6	20.50
X204D6	TB3-6	CB18-1	AN6	14.00
X204E8	TB3-5	CB13-A1	AN8	17.00
X204F10	CB13-A1	CB17-A1	AN10	22.50
X204G12	TB3-6	K21-L11	AN12	17.00
X204H4	TB3-6	S32-A-L1	AN4	37.50
X205C6	TB3-3	CB14-1	AN6	19.00
X205D6	TB3-4	CB18-1	AN6	20.00
X205E8	TB3-3	CB13-B1	AN8	27.00
X205F10	CB13-B1	CB17-B1	AN10	28.00
X205G12	TB3-4	K21-L12	AN12	17.00
X205H4	TB3-4	S32-B-L1	AN4	37.50
X206C6	TB3-1	CB14-1	AN6	12.00
X206D6	TB3-2	CB18-1	AN6	15.50
X206E8	TB3-1	CB13-C1	AN8	22.00
X206F10	CB13-C1	CB17-C1	AN10	31.00
X206G12	TB3-2	K21-L13	AN12	17.00
X206H4	TB3-2	S32-C-L1	AN4	37.50

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X306A12	CB15-A2	K25-T1	AN12	40.50
X307A12	CB15-B2	K25-T2	AN12	41.50
X308A12	CB15-C2	K25-T3	AN12	42.50
X315A12	CB16-A2	K26-T1	AN12	36.00
X316A12	CB16-B2	K26-T2	AN12	36.00
X317A12	CB16-C2	K26-T3	AN12	36.00
X324A10	CB17-A2	K24-T1	AN10	31.50
X325A10	CB17-B2	K24-T2	AN10	31.50
X326A10	CB17-C2	K24-T3	AN10	31.50
X330A10	CB13-A2	K23-T1	AN10	37.50
X331A10	CB13-B2	K23-T2	AN10	38.50
X332A10	CB13-C2	K23-T3	AN10	39.50
X380A12	CB16-A1	K21-T1	AN12	30.50
X380B12	CB16-A1	CB15-A1	AN12	25.50
X381A12	CB16-B1	K21-T2	AN12	30.00
X381B12	CB16-B1	CB15-B1	AN12	30.00
X382A12	CB16-C1	K21-T3	AN12	29.50
X382B12	CB16-C1	CB15-C1	AN12	28.00

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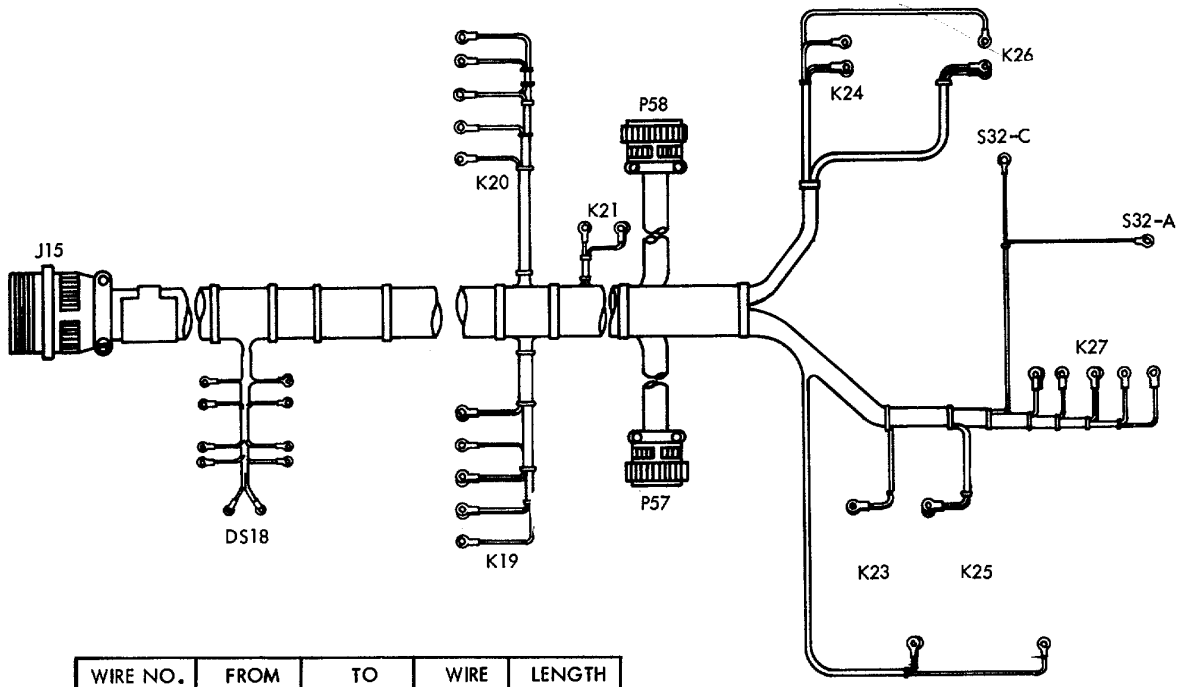
Figure 5-26. Air conditioning power wire harness assembly.

(6) Refer to wire run chart in figure 5-27 and check continuity of individual wires in the DC power wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
D2CM18N	M10-	K26-X2	AN18	38.00
D352A20	CB19-2	M10+	AN20	2.75
D375A20	M11+	CB10-2	AN20	2.75
L2CN20N	M10-	DS18-2	AN20	7.00
L2CT20N	M11-	DS18-2	AN20	7.00
L347A18	J15-D	P57-G	AN18	35.25
L368A18	J15-G	P58-G	AN18	35.00
L389A16	J15-W	K27-13	AN16	47.50
L8L18	J15-A	DS18-1	AN18	32.50
V2CK16N	J15-C	K26-X2	AN16	43.50
V2CL18N	P58-E	K26-X2	AN18	21.00
V2CP16N	K25-X2	K26-X2	AN16	20.75
V2CQ16N	K21-X2	K27-NEG	AN16	23.75
V2CR16N	K21-X2	K25-X2	AN16	20.00
V2CS18N	K25-X2	P57-E	AN18	23.25
V302G16	J15-N	K25-X1	AN16	49.00
V303D18	J15-J	K19-13	AN18	31.50
V304G16	J15R	K26-X1	AN16	47.00
V305C18	J15-K	K20-13	AN18	30.50
V336A18	K19-12	K23-X2	AN18	25.75
V336B18	K19-12	P57-A	AN18	20.50
V336C18	K23-X2	J15-U	AN18	42.00
V337A18	P57-H	K23-X1	AN18	22.50
V337B18	K19-X1	K23-X1	AN18	26.00
V337C18	CB19-1	K19-X1	AN18	34.25
V339A18	P57-B	J15-P	AN18	35.25
V340A18	P57-F	K19-11	AN18	19.75
V340B18	K19-11	K19-NEG	AN18	2.75
V349D18	J15-F	P57-C	AN18	35.25
V354A18	P58-B	J15-X	AN18	35.00
V357A18	K20-12	K24-X2	AN18	24.75
V357B18	P58-A	K20-12	AN18	19.00
V357C18	K24-X2	J15-V	AN18	40.50
V358A18	P58-H	K24-X1	AN18	18.00
V358B18	K20-X1	K24-X1	AN18	28.20
V358C18	CB10-1	K20-X1	AN18	29.25
V360A18	P58-F	K20-11	AN18	19.75

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
V360B18	K20-11	K20-NEG	AN18	2.75
V369D18	J15-I	P58-C	AN18	35.00
V372D18	J15-E	P57-D	AN18	35.25
V373C18	J15-H	P58-D	AN18	35.00
V378F16	J15-T	K21-X1	AN16	33.00
V386H16	J15-S	K27-12	AN16	48.00
V387D16	J15-B	K27-11	AN16	49.00
V387E16	S32C-S1	K27-11	AN16	10.50
V388A16	S32A-S2	K27-X1	AN16	20.25

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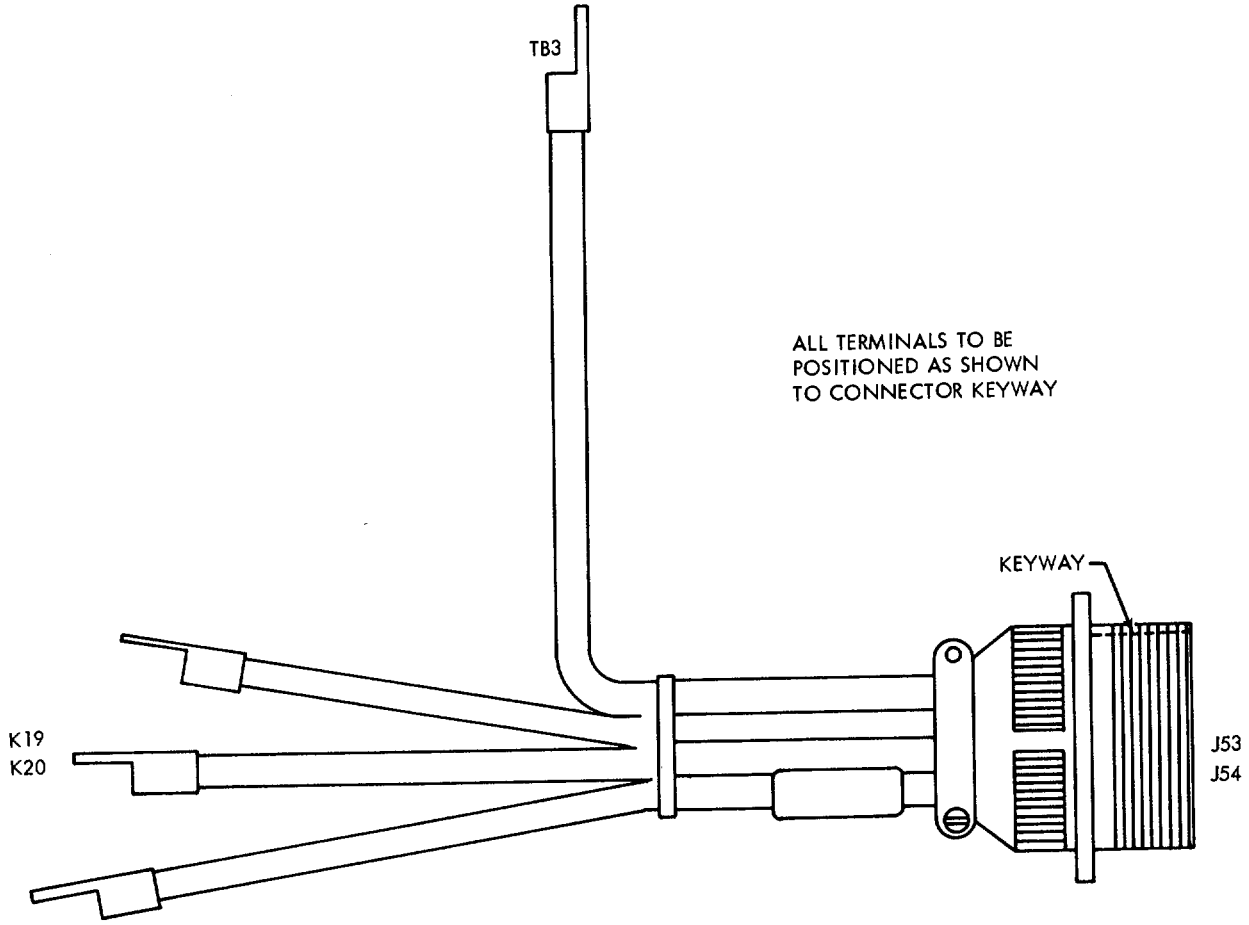
Figure 5-27. DC power wire harness assembly.

(7) Refer to wire run chart in figure 5-28 and check continuity of individual wires in the two compressors wire harness assemblies.



-1 ASSEMBLY

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BN6N	J53-D	TB3-7	AN6	23.00
X344A6	J53-A	K19-A2	AN6	6.50
X345A6	J53-B	K19-B2	AN6	6.50
X346A6	J53-C	K19-C2	AN6	7.00

-2 ASSEMBLY

WIRE NO	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BS6N	J54-D	TB3-8	AN6	27.00
X364A6	J54-A	K20-A2	AN6	6.50
X365A6	J54-B	K20-B2	AN6	6.50
X366A6	J54-C	K20-C2	AN6	6.50

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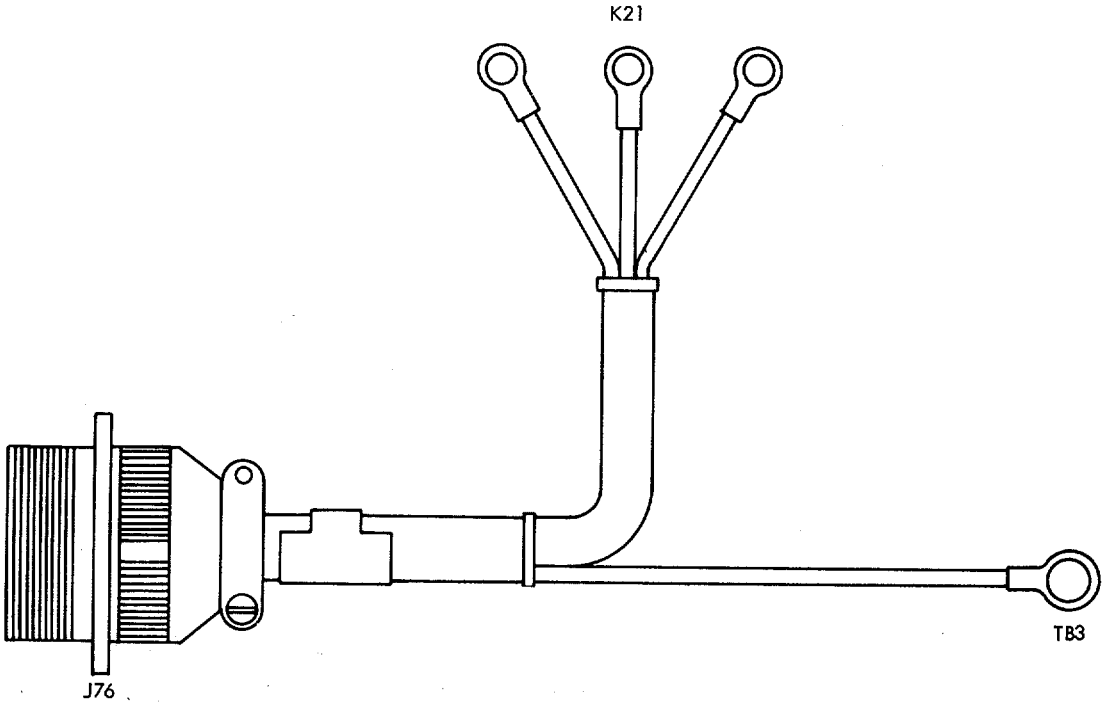
Figure 5-28. Compressors wire harness assembly.

(8) Refer to wire run chart in figure 5-29 and check continuity of individual wires in the remote fans wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BW12N	J76-D	TB3-7	AN12	31.00
X383B12	J76-A	K21-L1	AN12	9.00
X384B12	J76-B	K21-L2	AN12	9.00
X385B12	J76-C	K21-L3	AN12	9.00

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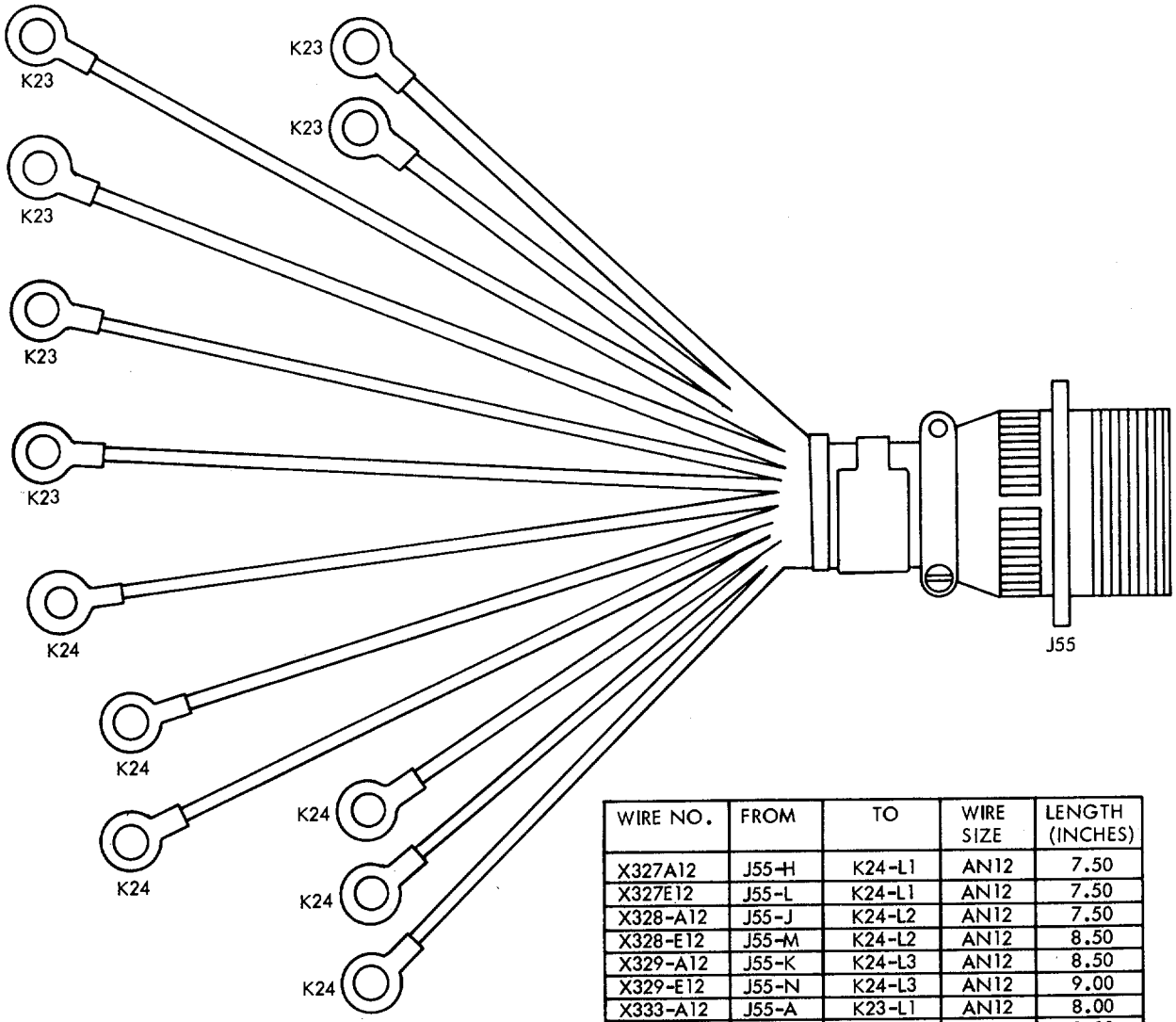
Figure 5-29. Remote fans wire harness assembly.

(9) Refer to wire run chart in figure 5-30 and check continuity of individual wires in the condenser fans wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X327A12	J55-H	K24-L1	AN12	7.50
X327E12	J55-L	K24-L1	AN12	7.50
X328-A12	J55-J	K24-L2	AN12	7.50
X328-E12	J55-M	K24-L2	AN12	8.50
X329-A12	J55-K	K24-L3	AN12	8.50
X329-E12	J55-N	K24-L3	AN12	9.00
X333-A12	J55-A	K23-L1	AN12	8.00
X333-D12	J55-D	K23-L1	AN12	8.00
X334-A12	J55-B	K23-L2	AN12	8.00
X334-D12	J55-E	K23-L2	AN12	8.00
X335-A12	J55-C	K23-L3	AN12	7.50
X335-D12	J55-F	K23-L3	AN12	7.50

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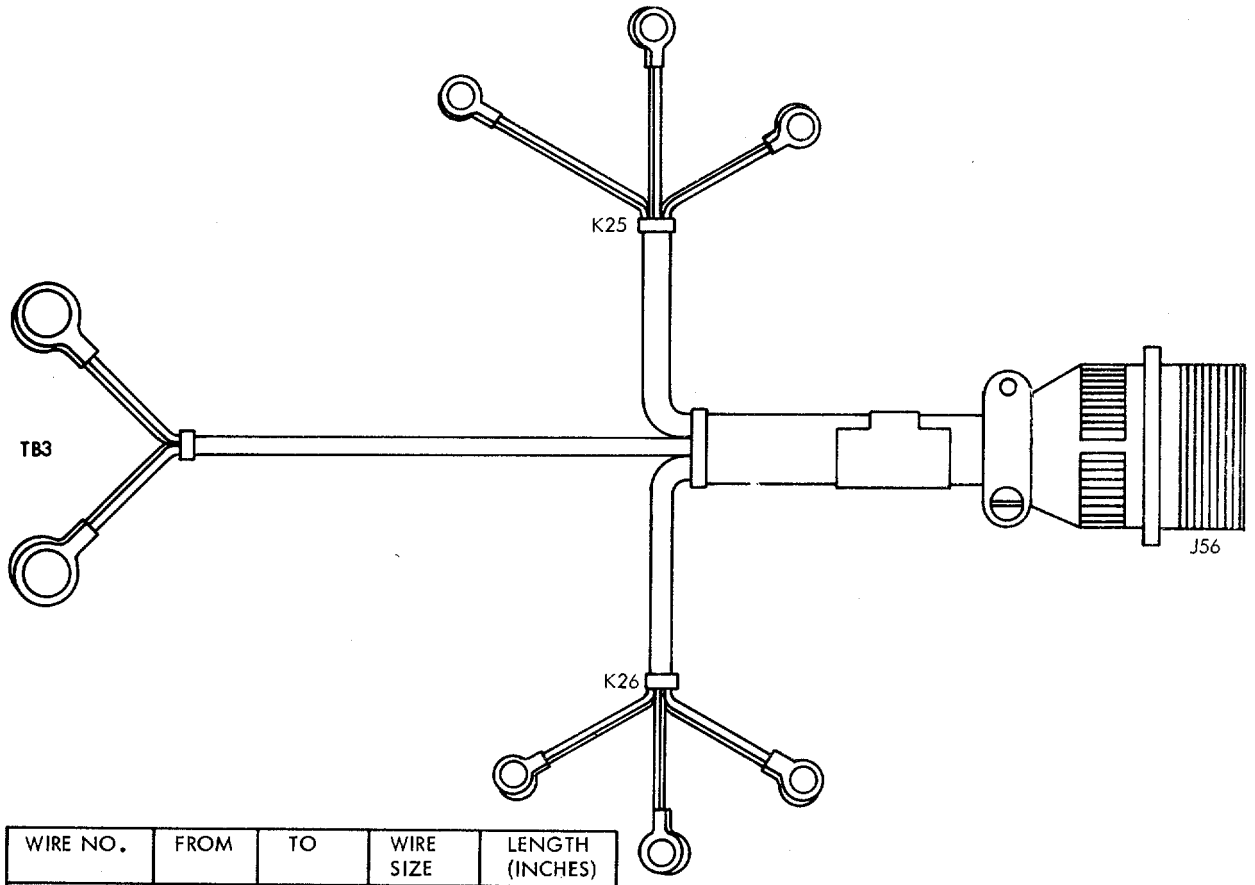
Figure 5-30. Condenser fans wire harness assembly.

(10) Refer to wire run chart in figure 5-31 and check continuity of individual wires in the recirculating fans wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200BY16N	J56-D	TB3-8	AN16	38.50
X200CB16N	J56-H	TB3-8	AN16	38.50
X200CE16N	J56-M	TB3-7	AN16	37.00
X200CJ16N	J56-S	TB3-7	AN16	37.00
X309 A16	J56-A	K25-L1	AN16	8.50
X309 D16	J56-E	K25-L1	AN16	8.50
X310 A16	J56-B	K25-L2	AN16	8.00
X310 D6	J56-F	K25-L2	AN16	8.00
X311 A16	J56-C	K25-L3	AN16	7.00
X311 D16	J56-G	K25-L3	AN16	7.00
X318 A16	J56-J	K26-L1	AN16	7.00
X318 E16	J56-N	K26-L1	AN16	7.00
X319 A16	J56-K	K26-L2	AN16	8.00
X319 E16	J56-P	K26-L2	AN16	8.00
X320 A16	J56-L	K26-L3	AN16	8.50
X320 E16	J56-R	K26-L3	AN16	8.50

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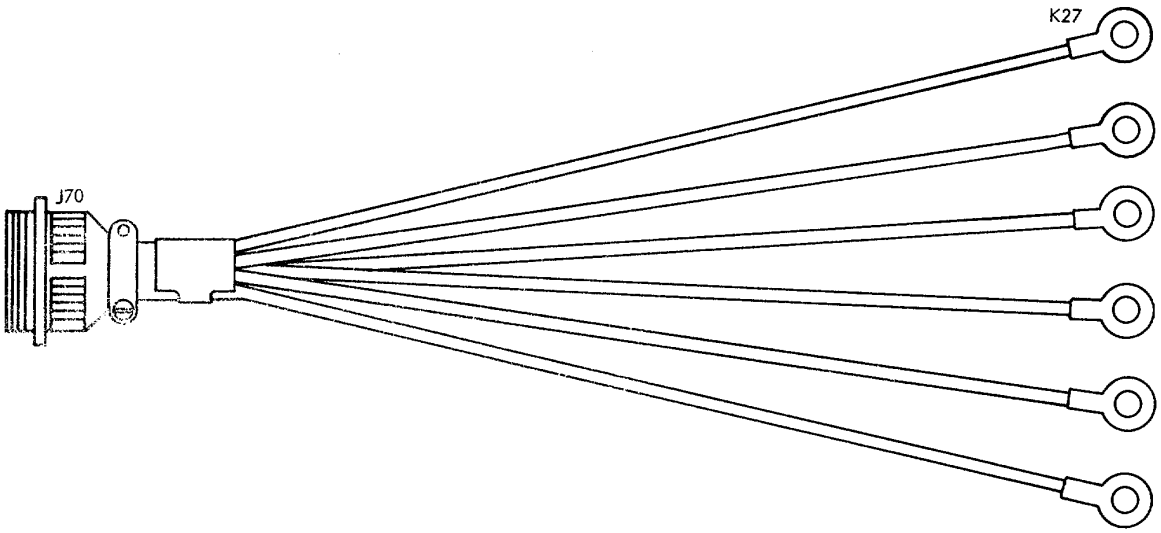
Figure 5-31. Recirculating fans wire harness assembly.

(11) Refer to wire run chart in figure 5-32 and check continuity of individual wires in the remote power wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X321A8	J70-A	K27-A2	AN8	6.50
X321C8	J70-B	K27-A2	AN8	6.50
X322A8	J70-C	K27-B2	AN8	6.50
X322C8	J70-D	K27-B2	AN8	6.50
X323A8	J70-E	K27-C2	AN8	6.50
X323C8	J70-F	K27-C2	AN8	6.50

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Figure 5-32. Remote power wire harness assembly.

d. Repair and Replacement.

(1) Replace all parts that are damaged beyond simple repair; replace all missing or defective hardware. Replace damaged nut plates or loose rivets on the panel.

(2) Repair wire harness assemblies as follows:

(a) Disassemble the wire harness assemblies only as required for repair or replacement.

(b) Solder connections shall be made in accordance with MIL-S-6872 using solder Type SN60WRP2 per Fed Spec QQ-S-571.

(c) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in applicable wire run charts.

(d) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at three inch intervals on all wire harness assemblies except compressors wire harness assemblies and recirculating fans wire harness assembly where they shall be installed at two inch intervals. Cable straps shall also be installed at all cable breakouts.

e. Reassembly and Installation. Refer to TM 56115-586-12 for reassembly and installation instructions.

5-28. Auxiliary Power Tray Assembly

a. Removal. Refer to paragraph 2-13 a of this manual for removal instructions.

b. Disassembly. Refer to figure 5-33 and disassemble the auxiliary power tray assembly as follows: (I) Disconnect leads 'of 400 Hz auxiliary power wire harness (4) from relays K43A and K43B (27). and from thermal relays S37A, S37C, S38A. and S38C (26).

(2) Remove nuts (1), washers (2) and screws (31 that attach wire harness connector. Carefully pull disconnected wire harness (4) through grommets (28) and remove the harness.

(3) Remove the leads of the 400 Hz auxiliary wire harnesses (16 and 17) from relays K43A and K43B. Remove nuts (5), three washers (6), and screw (7) to remove each of the six capacitors (8 and 9) from the capacitor mounting brackets (15). Push insulated sleeving (10) back far enough to disconnect wire harness leads from the capacitors.

(4) Remove nuts (11), washers (12 and 13) and screws (14) to remove capacitor mounting brackets (15), wire harnesses (16 and 17) and gaskets (18).

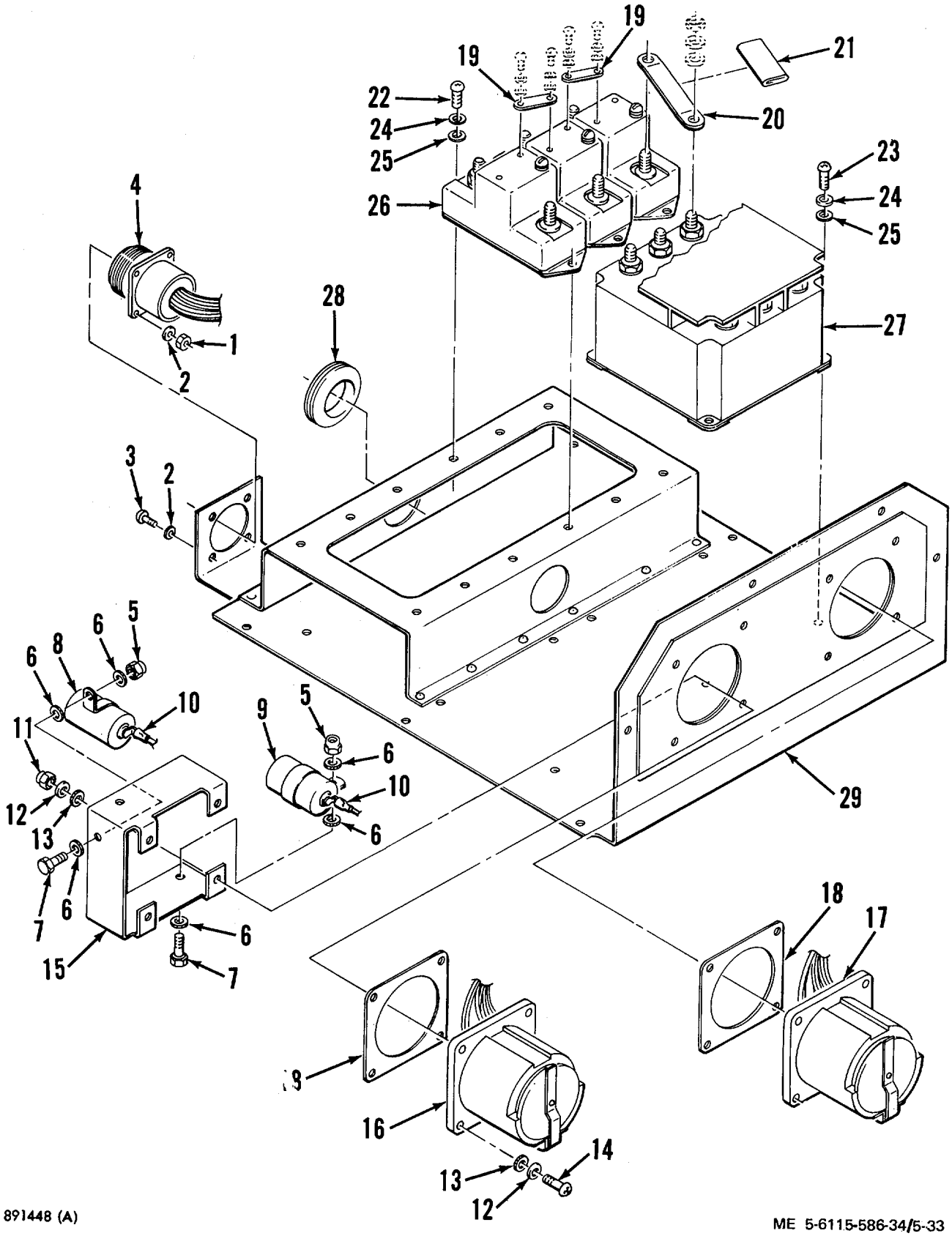


Figure 5-33. Auxiliary power tray assembly.

KEY to figure 5-33.

1. Nut
2. Washer
3. Screw
4. 400 Hz auxiliary power wire harness
5. Nut
6. Washer
7. Screw
8. Capacitor (C26. C29)
9. Capacitor (C25, C27, C28, C30)
10. Insulated Sleeving
11. Nut
12. Washer
13. Washer
14. Screw
15. Capacitor mounting bracket
16. 400 Hz auxiliary output wire harness
17. 400 Hz auxiliary output wire harness
18. Gasket
19. Bus bar
20. Bus bar
21. Insulated sleeving
22. Screw
23. Screw
24. Washer
25. Washer
26. Thermal relay (S37A, S37B, S37C, S38A, S38B, S38C}
27. Armature relay (K43A, K43B)
28. Grommet
29. Panel

(5) Note connection points, then remove four bus bars (19) from the thermal relays (26) and six bus bars (20) that connect thermal relays to armature relays (27). Do not remove insulation sleeving (21) unless replacement is required.

(6) Remove screws (22 and 23) with washers (24 and 25) to remove six thermal relays (26) and two armature relays (27) from the panel (29).

(7) If replacement is necessary, remove two grommets (28) from the panel.

c. Cleaning, Inspection and Testing.

(1) Clean electrical components with a clean rag dampened with solvent approved for electrical components.

(2) Inspect relays for damaged terminal studs, cracked cases, signs of overheating or short circuit.

(3) Test capacitors for leakage with a capacitor tester, if available.

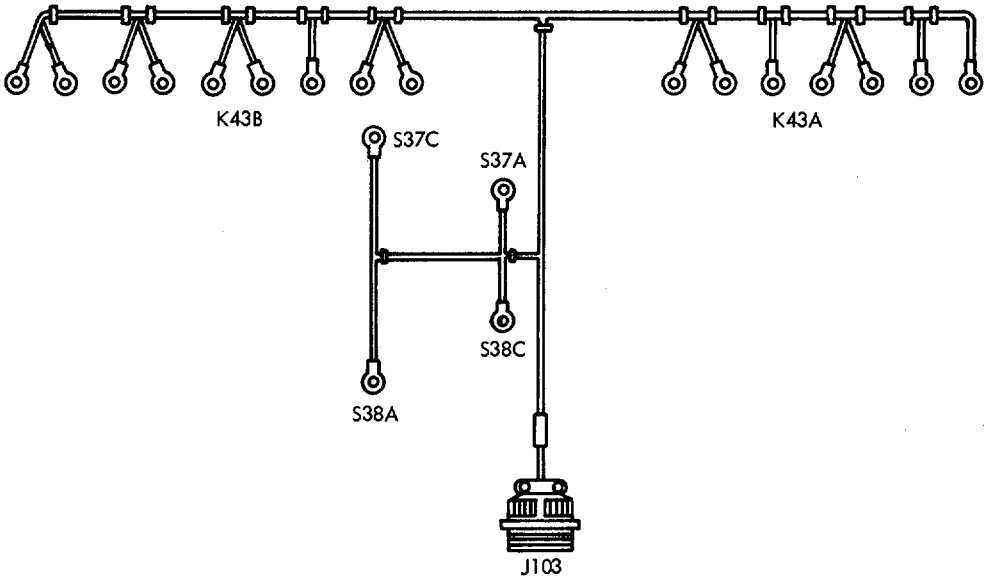
(4) Inspect gaskets and grommets for damage or deterioration.

(5) Inspect wire harness assemblies for dam aged or loose connector pins and terminal lugs, damaged wires, any burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

(6) Refer to the wire run chart in figure 5-34 for 400 Hz auxiliary power wire harness, figure 535 for 400 Hz auxiliary output 1 wire harness, and figure 5-36 for 400 Hz auxiliary output 2 wire harness, and check individual wires for continuity.

d. Repair and Replacement.

(1) Repair wire harness assemblies as follows, disassembling only as necessary.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
K2EB16N	J103-H	K43B-NEG	AN16	
K2EC16N	K43A-NEG	K43B-NEG	AN16	
K275F16	J103-B	K43B-12	AN16	
K276D16	J103-E	K43B-11	AN16	
K276F16	S38C-S1	K43B-11	AN16	
K277F16	J103-A	K43A-12	AN16	
K278D16	J103-D	K43A-11	AN16	
K278E16	S37C-S1	K43A-11	AN16	
K280C16	J103-F	K43A-X1	AN16	
K280D16	S37A-S2	K43A-X1	AN16	
K281C16	J103-G	K43B-X1	AN16	
K281D16	S38A-S2	K43BX1	AN16	
L295A16	J103-J	K43B-13	AN16	
L279B16	J103-C	K43B-13	AN16	

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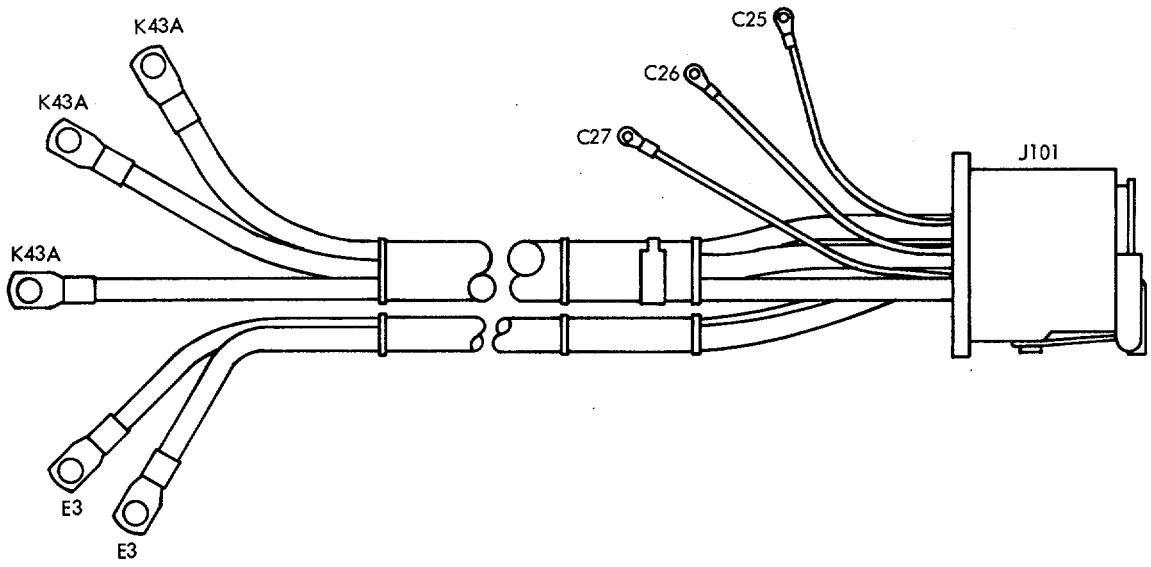
Figure 5-34. 400 Hz auxiliary power wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200AG4N	J101-D	E3	AN4	37.50
X200AH8N	J101-E	E3	AN8	37.50
X285A4	J101-A	K43A-A2	AN4	6.50
X285B16	J101-A	C25+	AN16	4.37
X286A4	J101-B	K43AB2	AN4	6.13
X286B16	J101-B	C26+	AN16	4.37+
X287A4	J101-C	K43A-C2	AN4	6.50
X287B16	J101-C	C27+	AN16	4.37

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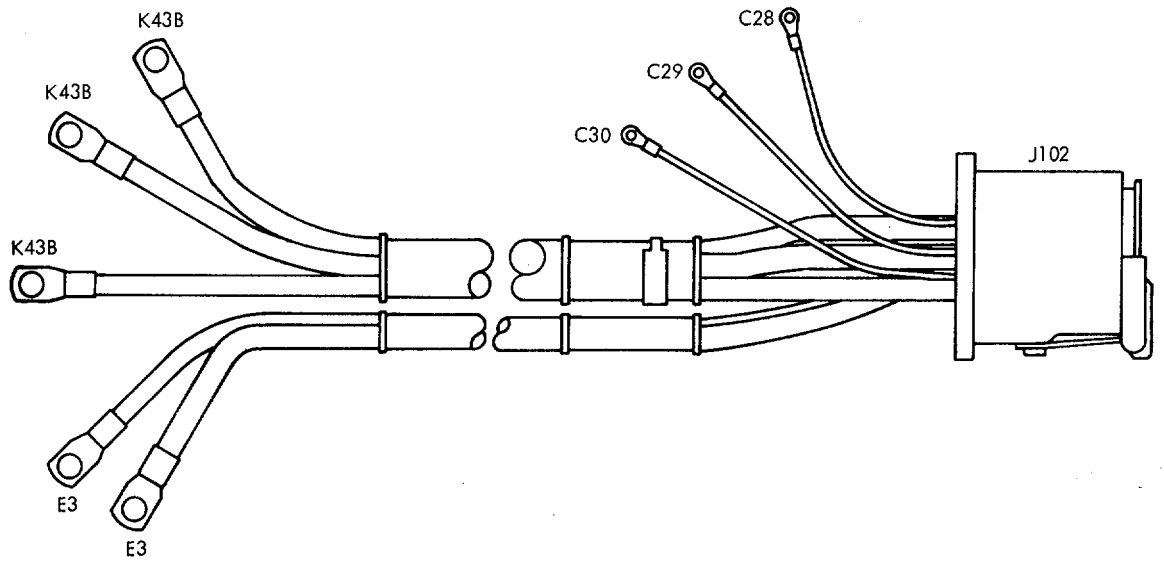
Figure 5-35. 400 Hz auxiliary output 1 wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH
X200AJ4N	J102-D	C3	AN4	37.50
X200AK8N	J102-E	C3	AN8	37.50
X292A4	J102-A	K43B-A2	AN4	6.50
X292B16	J102-A	C28+	AN16	4.37
X293A4	J102-B	K43B-B2	AN4	6.13
X293B16	J102-B	C29+	AN16	4.37
X294A4	J102-C	K43B-C2	AN4	6.50
X294B16	J102-C	C30+	AN16	4.37

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Figure 5-36. Hz auxiliary output 2 wire harness assembly

(a) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60OWRP2 per Fed Spec QQ-S-571.

(b) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in wire run charts (fig. 5-34 through 5-36).

(c) If self clinching cable straps are removed to facilitate repair, replace them with new cable straps.

(2) Replace all components found to be dam aged or defective.

(3) Replace damaged nut plates and loose rivets on panel. Repair bent panel and capacitor mounting brackets by simple shop repair.

e. Reassembly. Reassemble the auxiliary, power tray assembly by reversing disassembly sequence given in paragraph 5-28 b. above.

f. Installation. Refer to paragraph 2-13 of this manual for installation instructions.

5-29. Receptacle Panel Assembly

a. Removal and Disassembly. Refer to TM 56115-586-12 for instructions regarding removal and disassembly of receptacle panel assembly.

b. Cleaning and Inspection. Refer to TM 561 15-586-12 for cleaning and inspection procedures for receptacle panel assembly components.

c. Testing.

(1) Test capacitors for shorts and leakage with capacitor tester.

(2) Refer to wire run chart in figure 5-37 and test individual wires for continuity in the water heater wire harness.

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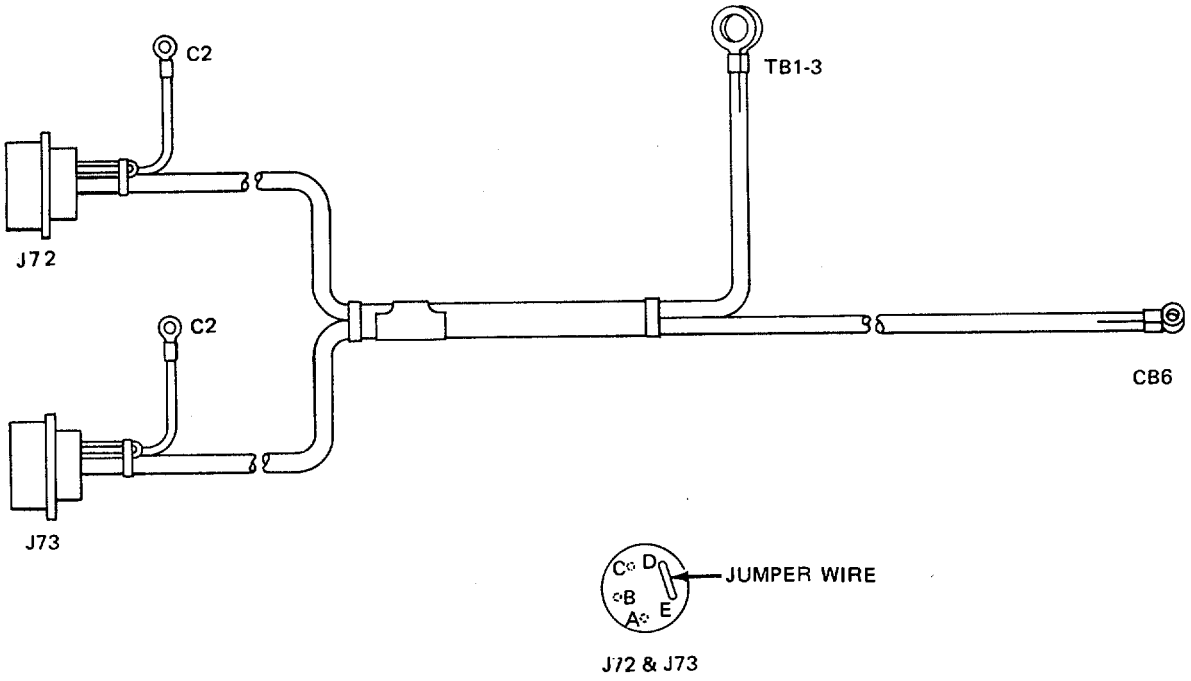

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200K16N	J73-D	TB1-3	AN16	11.00
X200L16N	J72-D	TB1-3	AN16	10.00
X226A16	J72-C	CB6-LOAD	AN16	27.50
X226B16	J73-C	CB6-LOAD	AN16	28.50
X226C20	J73-C	C2+	AN20	4.00
X226D20	J72-C	C2+	AN20	4.00

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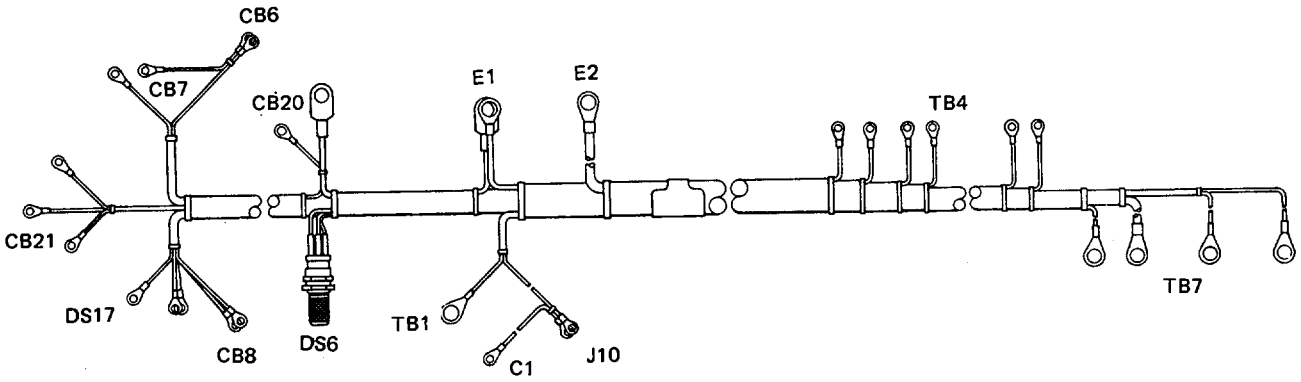
Figure 5-37. Water heater wire harness assembly.

(3) Refer to wire run chart in figure 5-38 and test individual wires for continuity in the receptacle panel wire harness.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
H81A10	TB4-7	CB21-LOAD	AN10	36.00
L13V20	TB4-3	DS6-3	AN20	32.00
L2BD16N	TB1-1	DS17	AN16	15.00
L2BE20N	DS6-1	DS17	AN20	9.50
L4C20N	TB4-2	DS6-2	AN20	30.50
L8J16	TB4-1	DS17	AN16	35.50
P2BA2N	E1	CB20-LOAD	AN2	13.00
P84D10	CB20-LINE	CB21-LINE	AN10	12.00
P84E16	TB4-5	CB21-LINE	AN16	37.50
V2E10N	TB4-8	E1	AN10	30.00
X200C0N	TB7-4	E2	AN01	41.00
X207G12	TB7-3	CB6-LINE	AN12	43.50
X207H16	CB6-LINE	CB7-LINE	AN16	4.50
X227A16	J10-WH.	CB7-LOAD	AN16	25.00
X227B16	J10-WH.	C1+	AN16	1.50
X254G16	TB7-8	CB8-LINE	AN16	52.50
X256G16	TB7-6	CB8-LINE	AN16	49.50

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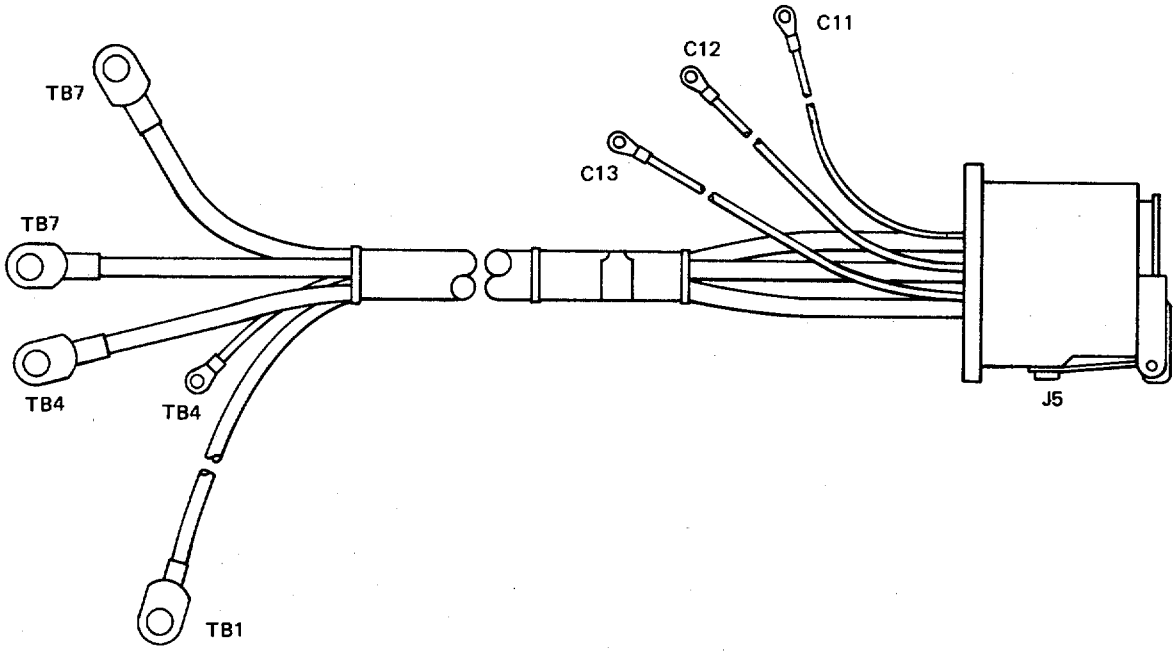
Figure 5-38. Receptacle panel wire harness assembly.

{4) Refer to wire run chart in figure 5-39 and test individual wires for continuity in 60 Hz output wire harness assembly (13217E4199).



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
P41F16	J5-A	TB4-6	AN16	26.50
X200AD10N	J5-E	TB1-2	AN10	15.25
X254C6	J5-B	TB7-8	AN6	22.00
X254D16	J5-B	C11+	AN16	4.37
X255C6	J5-D	TB7-7	AN6	24.75
X255D16	J5-D	C12+	AN16	4.37
X256C6	J5-C	TB7-6	AN6	24.75
X256D16	J5-C	C13+	AN16	4.37

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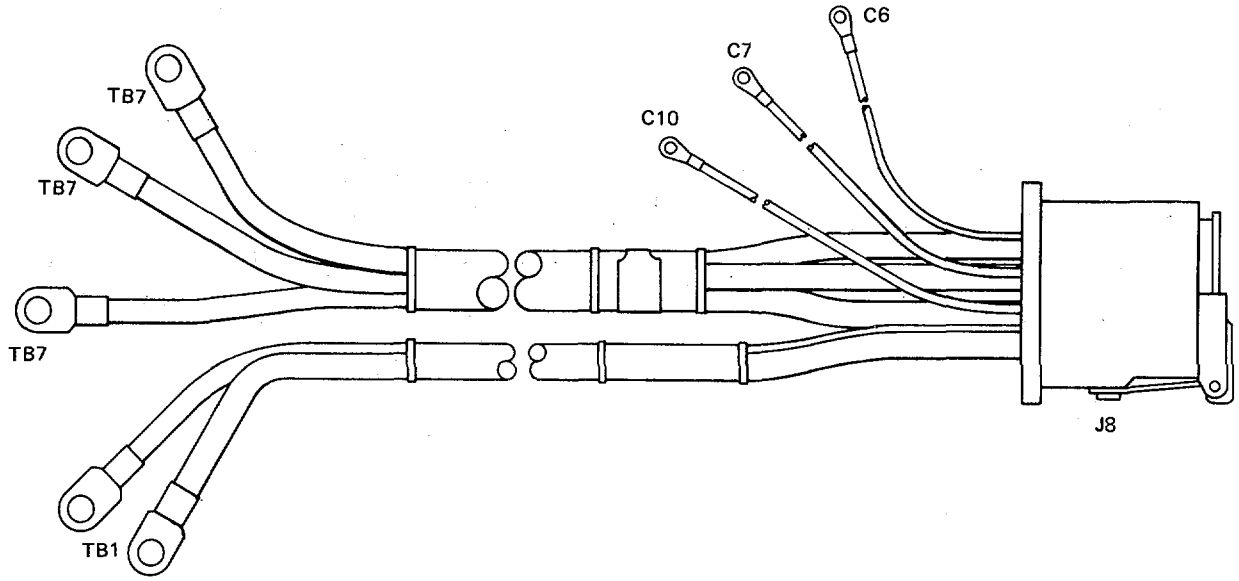
Figure 5-39. 60 Hz output wire harness assembly.

(5) Refer to wire run charts in figure 5-40 and 5-41 and test individual wires for continuity in the 400 Hz output wire harness assemblies (13217E4200 and 13217E4201, respectively).



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200G4N	J8-D	TB1-3	AN4	16.25
X200H8N	J8-E	TB1-3	AN8	16.50
X207E4	J8-A	TB7-3	AN4	30.50
X207F16	J8-A	C6+	AN16	4.37
X208E4	J8-B	TB7-2	AN4	28.75
X208F16	J8-B	C7+	AN16	4.37
X209E4	J8-C	TB7-1	AN4	27.50
X209F16	J8-C	C10+	AN16	4.37

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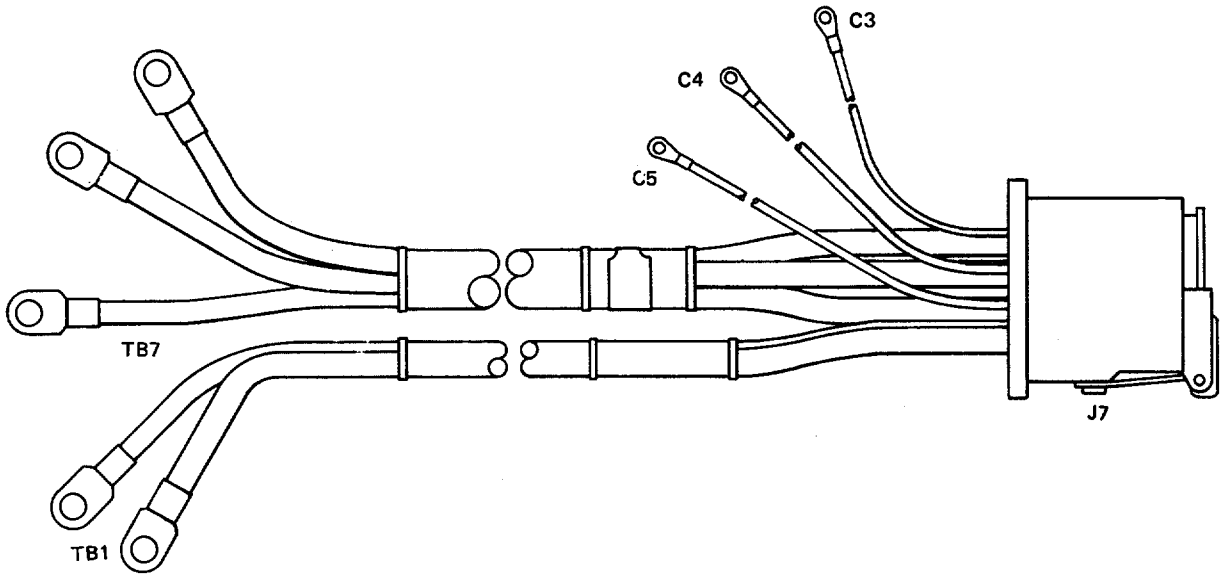
Figure 5-40. 400 Hz output wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200E4N	J7-D	TB1-2	AN4	16.25
X200F8N	J7-E	TB1-2	AN8	16.50
X207C4	J7-A	TB7-3	AN4	30.00
X207D16	J7-A	C3+	AN16	4.37
X208C4	J7-B	TB7-2	AN4	28.75
X208D16	J7-B	C4+	AN16	4.37
X209C4	J7-C	TB7-1	AN4	27.50
X209D16	J7-C	C5+	AN16	4.37

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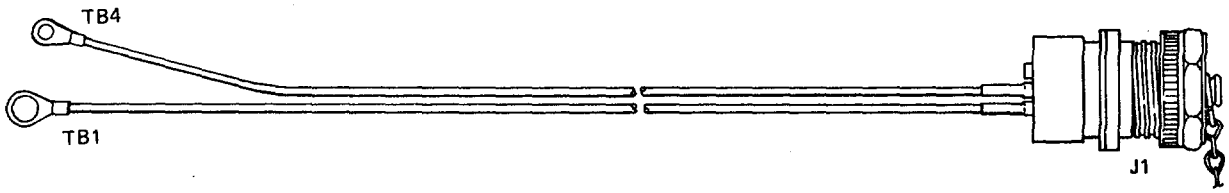
Figure 5-41. 400 Hz output wire harness assembly.

(6) Refer to wire run chart in figure 5-42 and test individual wires for continuity in the DC standby wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
P2BC16N	TB1-1	J1-2	AN16	18.50
P35D16	TB4-4	J1-1	AN16	17.00

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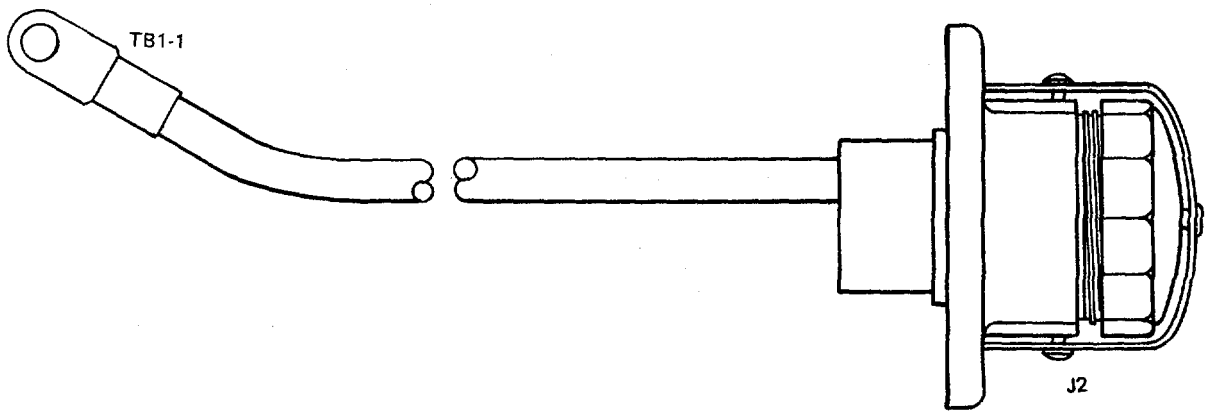
Figure 5-42. DC standby wire harness assembly.

(7) Refer to figure 5-43 and check slave receptacle cable assembly.

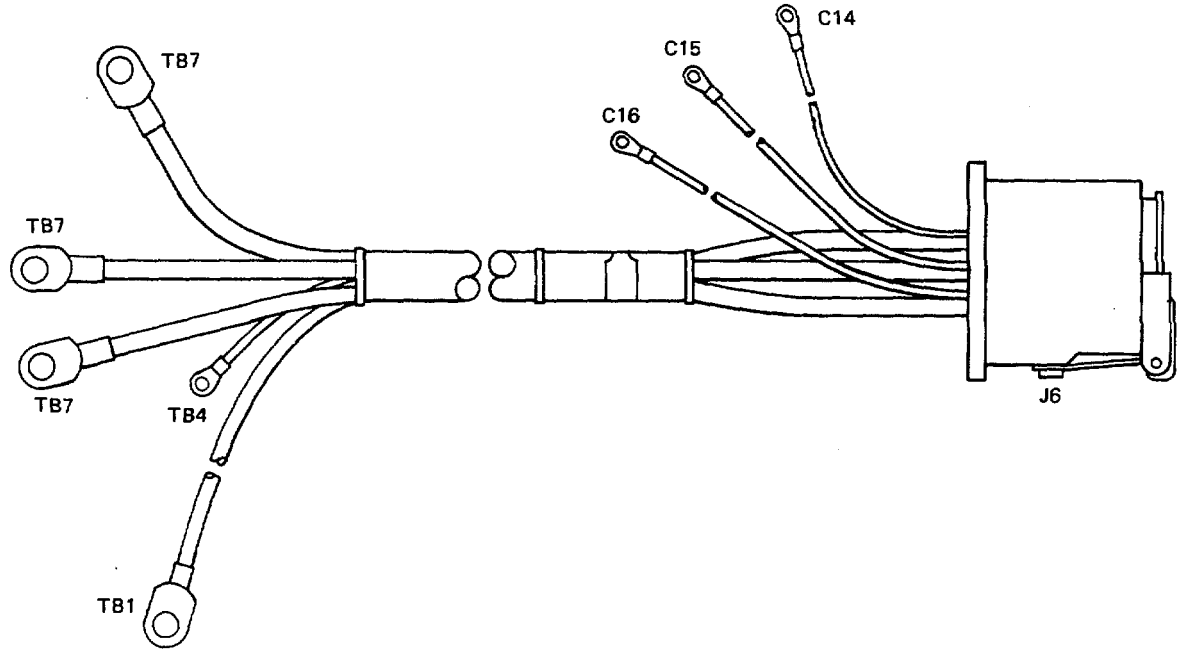


WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
P2BB2N	J2	TB1-1	AN2	11.00

ME 5-6115-586-34/5-43

Figure 5-43. Slave receptacle cable assembly.

(8) Refer to wire run chart in figure 5-44 and test individual wires for continuity in the 60 Hz output wire harness assembly (13217E4358).



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
P41C16	J6-A	TB4-6	AN16	32.75
X200AE10N	J6-E	TB1-2	AN10	15.00
X254E6	J6-B	TB7-8	AN6	28.75
X254F16	J6-B	C14+	AN16	4.37
X255E6	J6-D	TB7-7	AN6	31.00
X255F16	J6-D	C15+	AN16	4.37
X256E6	J6-C	TB7-6	AN6	31.00
X256F16	J6-C	C16+	AN16	4.37

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Figure 5-44. 60 Hz output wire harness assembly.

d. Repair and Replacement.

(1) Repair wire harness and cable assemblies as follows:

(a) Disassemble cable only as necessary for repair.

(b) Replace wires found to be defective in tests (step f. above) or that were noted to be dam aged during inspection with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in the wire run charts in the illustrations referenced for testing.

(c) Solder connections will be in accordance with MIL-S-6872 using solder Type SN60WRP2 per Fed Spec QQ-S-571.

(d) If self-clinching cable straps are removed to facilitate repairs, replace them with new cable straps at same interval and at cable breakouts.

(e) Replace connectors with defective or missing covers or any defect which would prevent proper weather-seal of connector covers.

(2) Replace receptacle covers that do not provide proper weather-seal.

(3) Repair bent panel by simple shop repair.

(4) Replace all other components found to be defective through inspection or testing.

e. Reassembly and Installation. Refer to TM 56115-586-12 for reassembly and installation instructions.

5-30. Conditioned Air Temperature Control Panel Assembly

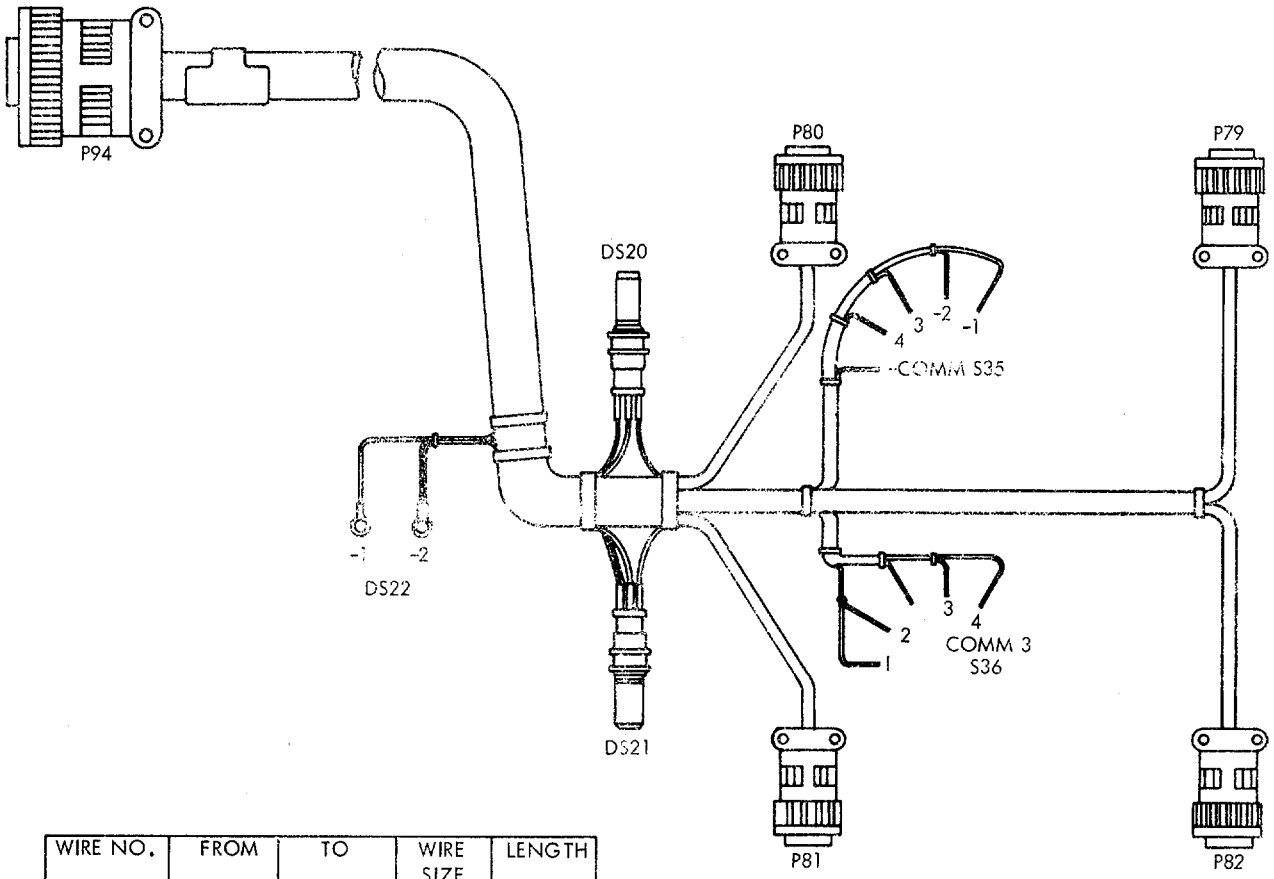
a. Removal, Disassembly, Cleaning and Inspection. Refer to TM 5-6115-586-12 for instructions regarding removal and disassembly of the temperature control panel, and cleaning and inspection of components.

b. Testing.

(1) The heat range selector switches are rotary, 2 pole, 4 position, non-shorting switches. An ohmmeter check of open and closed circuits in each position may be made to determine if switch is serviceable.

(2) The air temperature control switches operate with the temperature sensors. Incorrect operation may be due to failure of either the switch or the sensor. As two conditioned air systems are used, there are two heat temperature control switches and two cooled air temperature control switches. If one system is not operating properly. interchanging the like switches is a simple test. if the same system continues to malfunction, the sensor or wiring is defective. If the opposite system malfunctions instead, the switch is defective.

(3) Refer to the wire run chart in figure 5-45 and test individual wires for continuity for the air conditioning and heat control panel wire harness assembly. Lamps are 24 VDC.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH
H350K18	P94-Z	P80-A	AN18	30.00
H350M18	P94-c	P80-E	AN18	30.00
H351K18	P94-f	P81-A	AN18	30.50
H351M18	P94-j	P81-E	AN18	30.50
H394M18	P94-Q	S35-1A	AN18	41.75
H398M18	P94-V	S36-1A	AN18	39.25
H413B18	P94-P	S35-COM	AN18	41.75
H414A18	P94-R	S35-2A	AN18	41.75
H415A18	P94-S	S35-3A	AN18	41.75
H416A18	P94-T	S35-4A	AN18	41.75
H417B18	P94-U	S36-COM	AN18	39.25
H418A18	P94-w	S36-2A	AN18	39.25
H419A18	P94-X	S36-3A	AN18	39.25
H420A18	P94-y	S36-4A	AN18	39.25
L2DL18N	P94-q	DS22-2	AN18	26.00
L2DM20N	DS22-2	DS-21-1	AN20	5.00
L2DN20N	DS20-1	DS21-1	AN20	13.25
L300Q20	P94-n	DS21-3	AN20	31.00
L300R20	DS20-3	DS21-3	AN20	13.25
L424A20	DS20-2	P80-D	AN20	12.25
L425A20	DS21-2	P81-D	AN20	11.00
L8R16	P94-p	DS22-1	AN16	26.00
V2DC18N	P94-B	P79-B	AN18	38.00
V2DE18N	P94-J	P82-B	AN18	38.00
V2DG18N	P94-u	P80-B	AN18	30.00
V2DJ18N	P94-g	P81-B	AN18	30.50
V370A18	P94-b	P80-c	AN18	30.00
V371A18	P94-h	P81-c	AN18	30.50

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH
V392F18	P94-A	P79-A	AN18	38.00
V392H18	P94-E	P79-E	AN18	38.00
V393A18	P94-C	P79-C	AN18	38.00
V394K18	P94-D	P79-D	AN18	38.00
V396F18	P94-H	P82-A	AN18	38.00
V396H18	P94-M	P82-E	AN18	38.00
V397A18	P94-K	P82-C	AN18	38.00
V398K18	P94-L	P82-D	AN18	38.00
V401A20	P94-F	P79-F	AN20	38.00
V403C20	P94-G	P79-G	AN20	38.00
V404A20	P94-d	P80-F	AN20	30.00
V406C20	P94-e	P80-G	AN20	30.00
V407A20	P94-N	P82-F	AN20	38.00
V409D20	P94-O	P82-G	AN20	38.00
V410A20	P94-k	P81-F	AN20	30.50
V412D20	P94-m	P81-G	AN20	30.50

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Figure 5-45. Air conditioning and heat control panel wire harness assembly.

c. Repair and Replacement.

(1) Repair the wire harness assembly as follows:

(a) Solder connections will be made in accordance with MIL-S-6872 using solder Type SNL'60WRP2 per Fed Spec per QQ-S-571.

(b) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-4/i.

(c) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at five inch intervals and at all cable breakouts.

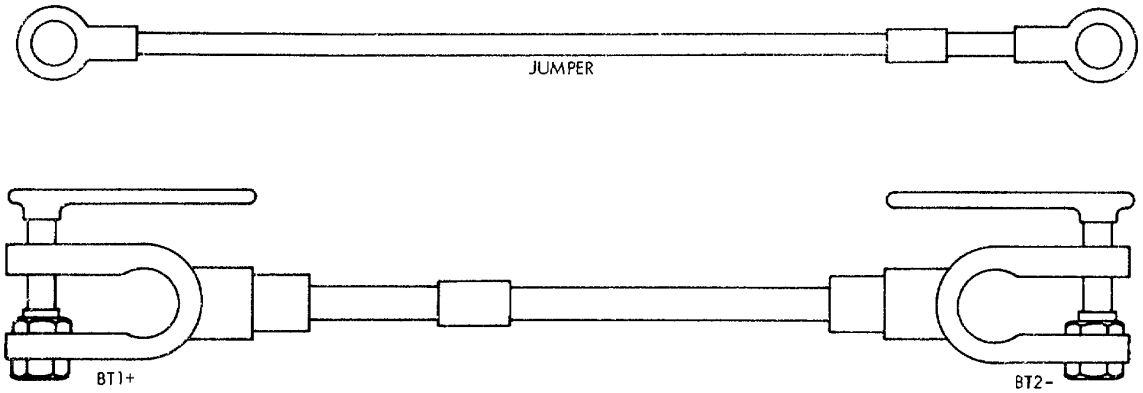
(2) Bent panel may be repaired by simple shop repair.

(3) Replace all other parts found to be defective through inspection or testing.

d. Reassembly and installation. Refer to TM 5611 5-586-12 for reassembly and installation instructions.

5-31. Electrical Leads and Jumpers

a. General. This paragraph contains repair instructions for all single wire electrical leads and jumpers used in the power plant, including the battery interconnecting lead. The chart in figure 546 lists wire numbers. terminations, and assembly where the lead is used. Locate the wire to be repaired in the listing and then follow the general instructions in this paragraph.



WIRE NO.	FROM	TO	LENGTH (INCHES)	WIRE SIZE	WIRE LEAD PART NUMBER	ASSEMBLY WHERE USED	QUANTITY USED
JUMPER			4.00	AN16	13217E3973-21	RECEPTACLE PANEL	4
K27A2	B1+	K1-A2	8.50	AN2	13217E3973-2	ENGINE & SKID ELEC. INSTALLATION	1
P1G2	K1-A1	K33-A1	3.25	AN2	13217E3973-1	POWER PLANT ELEC. INSTALLATION	1
X200AC16N	J10-BRASS	J10-GND	4.00	AN16	13217E3973-4	RECEPTACLE PANEL	1
X200AF16N	J9-GND	C18-NEG	3.62	AN16	13217E3973-22	RECEPTACLE PANEL	1
X200AF4N	TB1-3	E3	25.50	AN4	13217E3973-23	POWER PLANT ELEC. INSTALLATION	1
X200J16	J10-GND	TB1-3	8.00	AN16	13217E3973-3	RECEPTACLE PANEL	2
X201A2	G1-T1	K10-A1	34.75	AN2	13217E3973-5	ENGINE & SKID ELEC. INSTALLATION	2
X202A2	G1-T2	K10-B1	30.00	AN2	13217E3973-6	ENGINE & SKID ELEC. INSTALLATION	2
X203A2	G1-T3	K10-C1	25.00	AN2	13217E3973-7	ENGINE & SKID ELEC. INSTALLATION	2
X204M4	S37A-L1	S38A-L1	10.75	AN4	13217E3973-24	POWER PLANT ELEC. INSTALLATION	1
X205M4	S37B-L1	S38B-L1	10.75	AN4	13217E3973-25	POWER PLANT ELEC. INSTALLATION	1
X206M4	S37C-L1	S38C-L1	10.75	AN4	13217E3973-26	POWER PLANT ELEC. INSTALLATION	1
X251A6	G2-T1	K11-A1	16.50	AN6	13217E3973-8	ENGINE & SKID ELEC. INSTALLATION	1
X252A6	G2-T2	K11-B1	12.50	AN6	13217E3973-9	ENGINE & SKID ELEC. INSTALLATION	1
X253A6	G2-T3	K11-C1	6.00	AN6	13217E3973-10	ENGINE & SKID ELEC. INSTALLATION	1
X257A16	J9-WHITE	CB8-LOAD	5.50	AN16	13217E3973-11	RECEPTACLE PANEL	1
X257B16	J9-WHITE	C18+	4.00	AN16	13217E3973-12	RECEPTACLE PANEL	1
X258A16	J9-BRASS	CB8-LOAD	7.50	AN16	13217E3973-13	RECEPTACLE PANEL	1
X258B16	J9-BRASS	C17+	4.00	AN16	13217E3973-14	RECEPTACLE PANEL	1
X341A6	CB14-2	K19-A1	6.50	AN6	13217E3973-15	CONDITIONED AIR SYSTEM ELEC. PANEL	1
X342A6	CB14-2	K19-B1	6.50	AN6	13217E3973-16	CONDITIONED AIR SYSTEM ELEC. PANEL	1
X343A6	CB14-2	K19-C1	6.25	AN6	13217E3973-17	CONDITIONED AIR SYSTEM ELEC. PANEL	1
X361A6	CB18-2	K20-A1	7.00	AN6	13217E3973-18	CONDITIONED AIR SYSTEM ELEC. PANEL	1
X362A6	CB18-2	K20-B1	6.50	AN6	13217E3973-19	CONDITIONED AIR SYSTEM ELEC. PANEL	1
X363A6	CB18-2	K20-C1	6.25	AN6	13217E3973-20	CONDITIONED AIR SYSTEM ELEC. PANEL	1
JUMPER	BT1+	BT2		AN2	13217E3791	POWER PLANT ELEC. INSTALLATION	1

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Figure 5-46. Electrical leads.

b. Removal and Disassembly. Tag and disconnect electrical lead. Disassemble only for repair.

c. Inspection and Repair.

(1) Inspect electrical lead for damaged or loose terminals, damaged wire or insulation.

(2) Repair leads by replacing defective wire and terminals. S' ire size and approximate length in inches is provided.

(3) If lugs on battery electrical lead must be replaced, unscrew them from adapter and install new lugs. If adapter must be replaced, solder to wire in accordance with MIL-S-6872 using solder Type SN60OWRP2 per Fed Spec QQ-S-571.

d. Installation. Reconnect electrical leads in locations as tagged or utilize termination data in wire run chart in figure 5-46.

Section II. ENGINE AND SKID ELECTRICAL INSTALLATION

5-32. General

The engine and skid electrical installation consists of the upper electric power chassis assembly, the lower electric power chassis assembly and interconnecting wire harness assemblies. There are four wire harness assemblies in the installation, the engine skid wire harness on the lower power chassis, the power wire harness, and the battery wire harness. The engine wire harness repair instructions are provided in paragraph 3-2 of this manual. Electrical leads and jumpers are included in -paragraph 5-31 above.

5-33. Upper Electric Power Chassis Assembly

a. Removal and Disassembly. Refer to TM 561 11 5-586-12 for instructions regarding removal of the upper electric power chassis assembly and removal of components.

b. Cleaning, Inspection and Testing. Cleaning, inspection, and testing instructions are provided in TM 5-6115-586-12. Also refer to figure FO-2 located in back of manual) for a wire run chart for the engine skid power unit wire harness as an aid to testing. Test diodes on wire harness ICR through CR20) with an ohmmeter; a serviceable diode will indicate a low resistance in one direction (forward biased! and a significantly higher resistance when ohmmeter lead connections are reversed (reverse bias). A diode that indicates an open circuit or near the same resistance in both directions is defective.

c. Repair and Replacement.

(1) Repair the wire harness assembly as follows:

(a) When replacing diodes, use a pair of pliers or a clip as a "heat sink" to avoid damage to the new-diode when soldering it to the wire harness lead. Be certain that bushings and mica washers are correctly installed on diodes at assembly.

(b) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60OWRP2 per Fed Spec QQ-S-571.

(c) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure FO-2.

(d) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at reassembly.

(2) Replace damaged nut plates and loose or missing rivets on chassis. Repair bent chassis by simple shop repair.

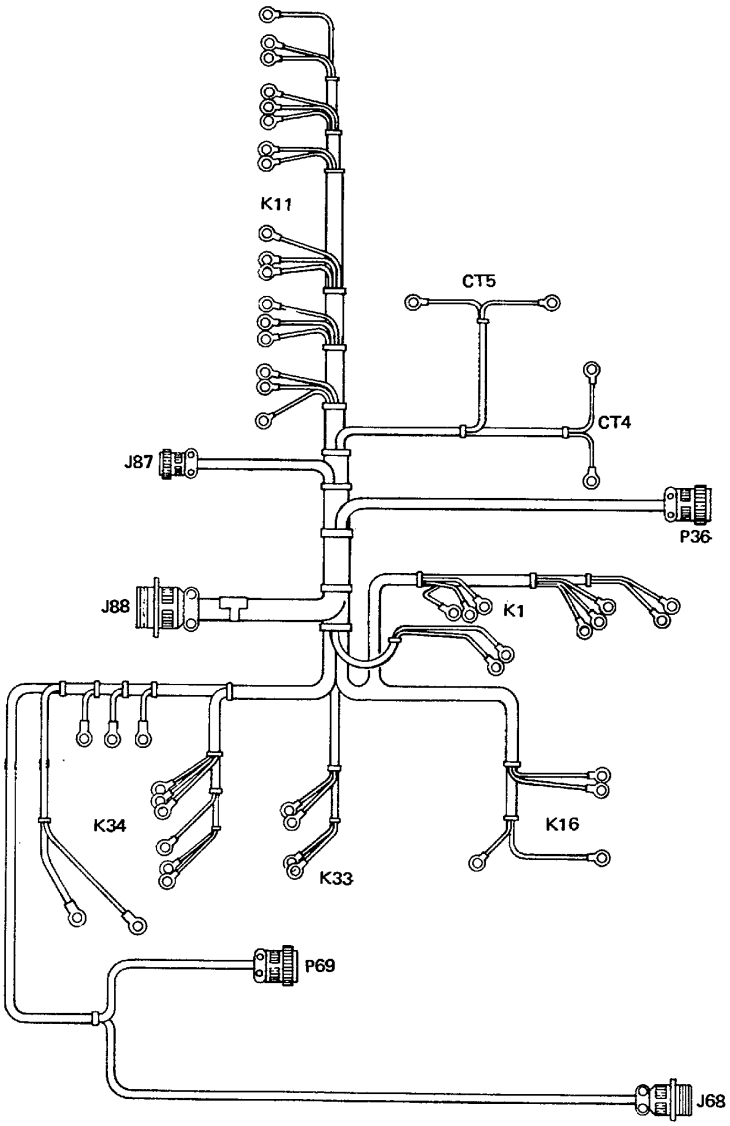
(3) Replace all other parts found to be defective through inspection or testing. Defective battery charger and voltage regulators shall be replaced and defective units sent to depot maintenance facilities for repair.

d. Reassembly and Installation. Refer to TM 56115-586-12 for reassembly and installation instructions.

5-34. Lower Electric Power Chassis Assembly

a. Removal and Disassembly. Refer to TM 56115-586-12 for removal and disassembly instructions.

b. Cleaning, Inspection and Testing. Cleaning, inspection, and testing instructions are provided in TM 5-6115-586-12. Also refer to figure 5-47 for a wire run chart for the engine skid wire harness as an aid to testing.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
AL-GREEN	J88-q	P36-L	AWG16	21.00
CR-WHITE	J88-r	P36-M	AWG16	21.00
H2DU12N	J87-C	P69-C	AN12	30.50
H2DW16N	J88-f	J68-C	AN16	37.50
H356D16	J88-t	P36-T	AN16	21.00
H61E16	J88-s	P36-W	AN16	21.00
H75A16	P36-X	K34-L3	AN16	37.00
H76C16	J88-6	K33-X1	AN16	10.50
H76D16	J88-c	K33-X1	AN16	10.50
H77D16	J88-Z	K34-A2	AN16	15.50
H77E16	J68-A	K34-A2	AN16	30.00
H77F16	P69-B	K34-A2	AN16	19.50
H78A16	J68-B	K34-X1	AN16	30.00
H78B16	P69-D	K34-X1	AN16	19.50
H81D10	J87-D	K34-T1	AN10	22.00
H82A16	J68-D	K34-L1	AN16	30.00
H83A12	P69-A	K34-L2	AN12	19.00
J2AL16N	P36-H	K16-NEG	AN16	16.50
J32B16	J88-p	P36-G	AN16	21.00
J74B16	J88-m	P36-E	AN16	21.00
K15F16	J88-u	P36-U	AN16	21.00
K15K16	J88-v	P36-V	AN16	21.00
K16B16	J88-h	P36-B	AN16	21.00
K17C16	J88-V	K1-X1	AN16	9.50
K17D16	K1-X1	K1-B1	AN16	4.00
K17E16	J88-W	K1-X1	AN16	9.50
K18A16	J88-X	K1-B2	AN16	10.00
K18C16	J88-Y	K1-B2	AN16	10.00
K19B16	J88-j	P36-C	AN16	21.00
K24C16	J88-g	P36-A	AN16	21.00
K28C16	J88-k	P36-D	AN16	21.00
K30B16	J88-n	P36-F	AN16	21.00
L53C16	J88-D	K11-13	AN16	19.00
L79A16	J88-a	K34-A3	AN16	20.00
P1C12	J87-A	K1-A1	AN12	13.00
P1H12	J87-B	K1-A1	AN12	13.00
P2AJ16N	K1-X2	K11-NEG	AN16	12.00
P2AK16N	K16-NEG	K1-X2	AN16	16.50
P2AM16N	K33-X2	K16-NEG	AN16	10.00
P2AN16N	K33-X2	K34-X2	AN16	10.00
P3C16	J88-d	K16-GEN	AN16	10.00
P5A16	J88-e	K16-SW	AN16	12.00
P51C16	J88-A	K11-12	AN16	19.50
P51D16	J88-B	K11-12	AN16	19.50
P51F16	J88-C	K11-12	AN16	19.50
V2AH16N	J88-P	K11-NEG	AN16	20.00
V52A16	J88-Q	K11-X1	AN16	20.50
V53A16	J88-E	K11-13	AN16	19.00
X249A16	J88-R	CT4-X1	AN16	13.00
X250A16	J88-T	CT5-X1	AN16	14.50
X251B16	J88-F	K11-A1	AN16	13.00
X251D16	J88-G	K11-A1	AN16	13.00
X251F16	J88-H	K11-A1	AN16	13.00
X252B16	J88-J	K11-B1	AN16	14.00
X252D16	J88-K	K11-B1	AN16	14.00
X252F16	J88-L	K11-B1	AN16	14.00
X253B16	J88-M	K11-C1	AN16	15.00
X253D16	J88-N	K11-C1	AN16	15.00
X253F16	J88-O	K11-C1	AN16	15.00
X259A16	J88-S	CT4-X2	AN16	13.00
X260A16	J88-U	CT5-X2	AN16	14.50

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Figure 5-47. Engine skid power unit wire harness assembly.

c. Repair and Replacement.

(1) Repair the wire harness assembly as follows:

(a) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60OWRP2 per Fed Spec QQ-S-57 1.

(b) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-4li.

(c) If self-clinching cable straps are removed to facilitate repairs, replace with new straps at same interval and at all cable breakouts.

(2) Replace damaged nut plates and loose or missing rivets on chassis. Repair bent chassis by simple shop repair.

(3) Replace all other parts found to be defective through inspection or testing. Defective battery charger and voltage regulators shall be replaced and defective units sent to depot maintenance facilities for repair.

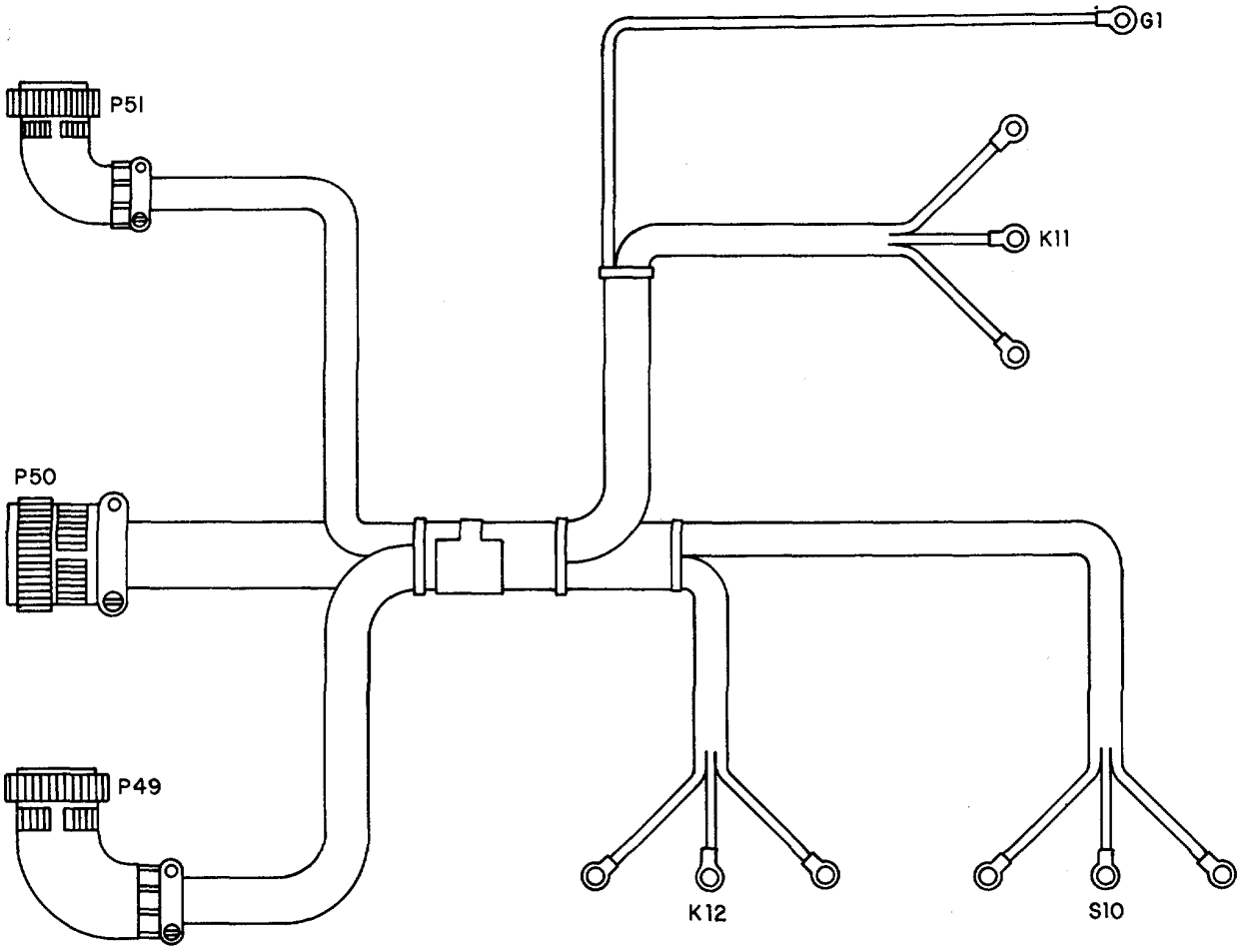
d. Reassembly and Installation. Refer to TM 5-6115-586-12 for reassembly and installation instructions.

5-35. Power Wire Harness Assembly (13217E4001)

a. Removal. Refer to figure 5-48; tag and disconnect the power wire harness assembly as follows:

(1) Disconnect the wire harness leads to GI, KII. K12, and SI0.

(2) Remove lockwires and disconnect the three connectors (P49, P50 and P51); then remove the w ire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X200AON	P50-D	G1-T4	ANO	54.00
X204AO	P50-A	S10-A-L1	ANO	51.00
X205AO	P50-B	S10-B-L1	ANO	50.00
X206AO	P50-6	S10-C-L1	ANO	48.00
X207A4	P51-A	K12-A2	AN4	39.00
X208A4	P51-B	K12-B2	AN4	37.00
X209A4	P51-C	K12-C2	AN4	37.00
X254A6	P49-A	K11-A2	AN6	51.00
X255A6	P49-B	K11-B2	AN6	48.00
X256A6	P49-C	K11-C2	AN6	47.00

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Figure 5-48. Power wire harness assembly

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, damaged wires, and loose or damaged terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-48 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60WRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-48.

(3) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at same intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connector, safety wire in accordance with MS35540 using lockwire MS20()995C20.

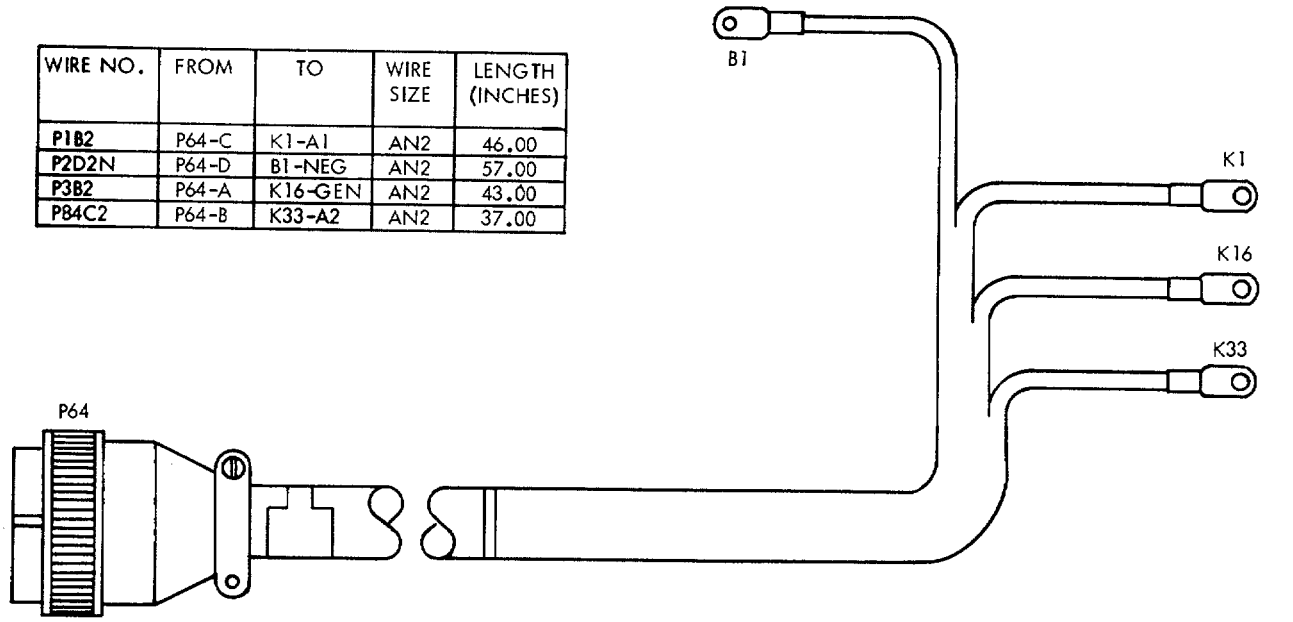
5-36. Battery Wire Harness Assembly 13217E41.54)

a. Removal. Refer to figure 5-49; tag and disconnect the battery wire harness assembly as follows:

(1) Disconnect wire leads from BI, KI, K16, and K33.

(2) Remove lockwire; disconnect connector P64 and remove wire harness assembly.

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
P1B2	P64-C	K1-A1	AN2	46.00
P2D2N	P64-D	B1-NEG	AN2	57.00
P3B2	P64-A	K16-GEN	AN2	43.00
P84C2	P64-B	K33-A2	AN2	37.00



ME-5-6115-434-35/5-25

Figure 5-49. Battery wire harness assembly.

b. Disassembly. After inspection and testing, disassemble the wire harness only as required for repair or replacement.

c. Cleaning and Inspection.

(1) Clean wire harness with a clean, lint-free cloth moistened with an approved solvent and dry thoroughly.

(2) Inspect for damaged or loose connector pins, damaged wires, and loose or damaged terminal lugs. Check for any evidence of burned areas indicating shorts. Inspect connectors for damaged or stripped threads.

d. Testing. Refer to the wire run chart in figure 5-49 and check individual wires for continuity.

e. Repair, Replacement and Reassembly.

(1) Solder connections will be made in accordance with MIL-S-6872 using solder Type SN60WRP2 per Fed Spec QQ-S-571.

(2) Replace defective wires with wire in accordance with MIL-W-5086, Type II. Wire size and approximate length in inches is provided in figure 5-49.

(3) If self-clinching cable straps are removed to facilitate repairs, install new cable straps at two inch intervals and at all cable breakouts.

f. Installation. Install the wire harness assembly in reverse order of removal procedure. After installing connector, safety wire in accordance with MS35540 using lockwire M S20()995C20.

CHAPTER 6

REPAIR OF CONDITIONED AIR COOLING SYSTEM

Section I. TUBE ASSEMBLIES AND PLUMBING FITTINGS

6-1. General

The conditioned air cooling systems consists of two separate air conditioning refrigeration systems. Each separate system consists of compressor, evaporator, condenser, receiver, and tubing interconnecting these components.

6-2. Tube Assemblies, Fittings, and Solenoid Valves

a. Removal. Remove the tube assemblies, fittings, and valves by following the ascending numerical sequence, of the index numbers I through 187 assigned to figure 6-1.

Note. Each tube assembly is independent of the others and it is not necessary to completely disassemble the system to repair or replace any one tube assembly. Only the tube requiring such repair need be removed.

b. Cleaning, Inspection and Repair.

(1) Clean tube assemblies and fittings with kerosene and degrease with trichlorethylene IMILT-7003) heated to 1600 to 1800 F in a vapor degreaser.

Warning: **Trichlorethylene (MIL-T-7003) is toxic and should be used only in a well ventilated area. Failure to observe this warning may result in serious harm or death to personnel.**

(2) Inspect flared tube fittings and hardware for stripped, crossed, peened, or otherwise damaged threads.

(3) Inspect tube assemblies for cracks, dents, corrosion, or other obvious damage.

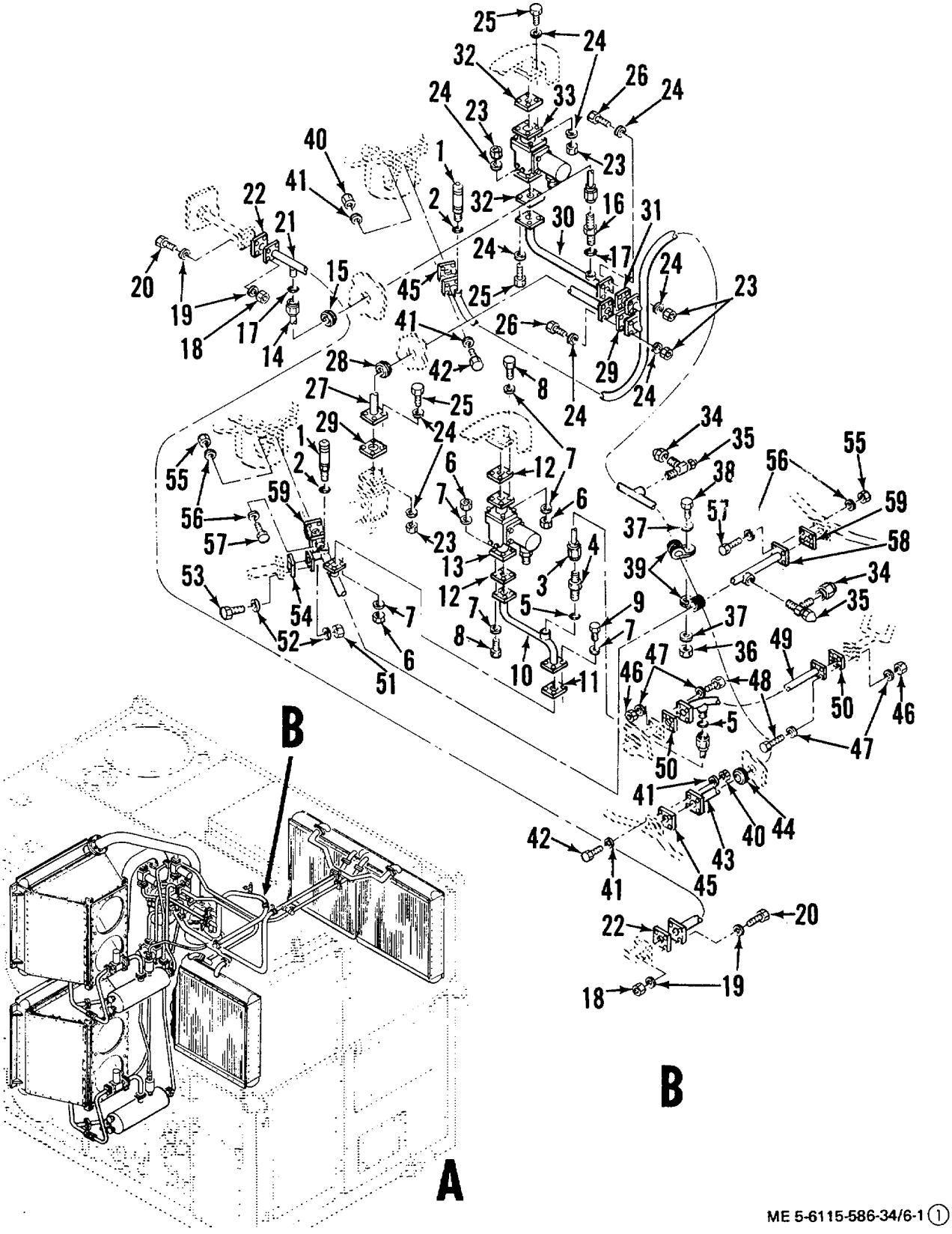
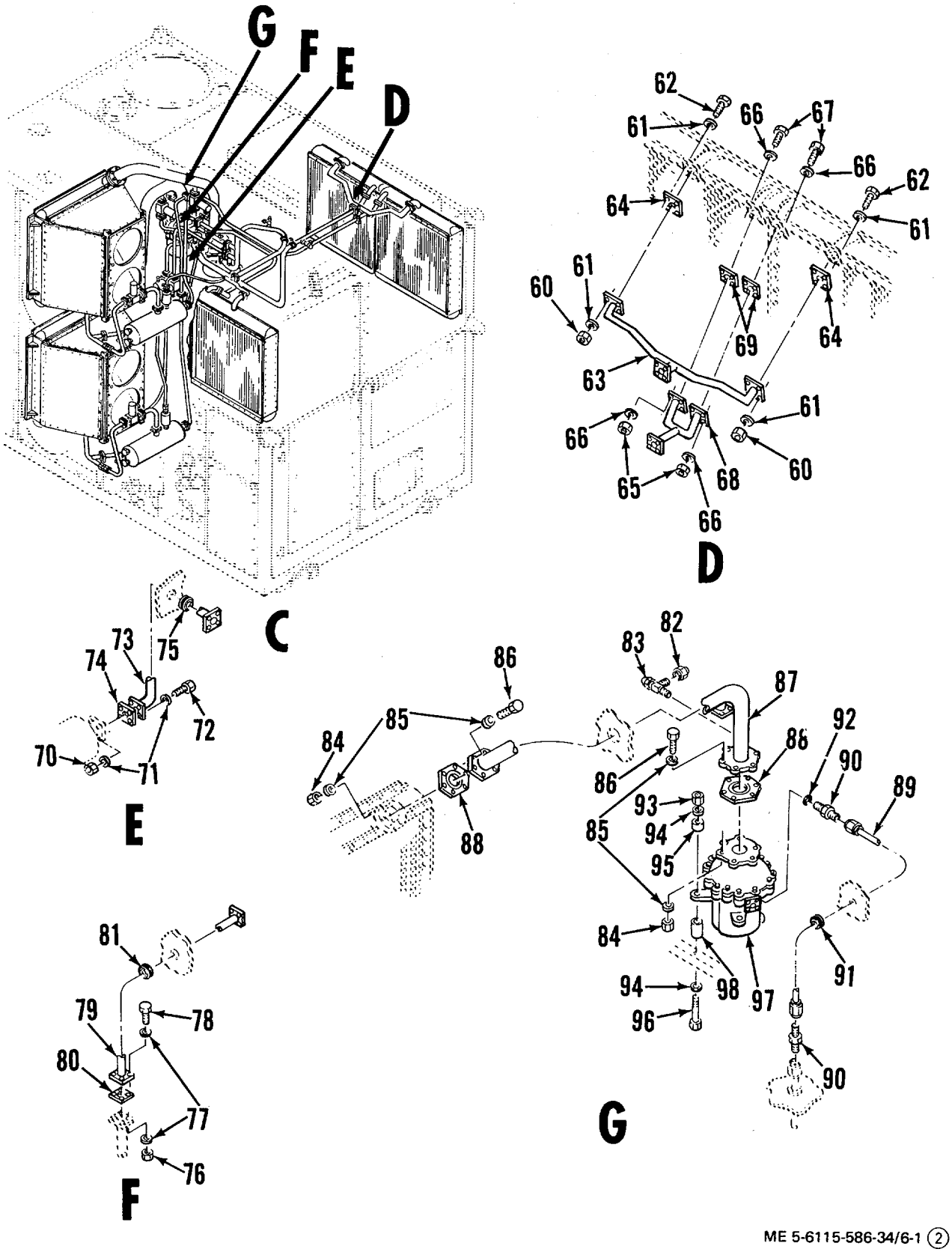


Figure 6-1. Conditioned air cooling system, exploded view. (sheet 1 of 6)

Key to figure 6-1.

1. Pressure switch
2. Gasket
3. Tube assembly
4. Union
5. Gasket
6. Nut
7. Flatwasher
8. Bolt
9. Bolt
10. By-pass tube
11. Rubber seal
12. Rubber seal
13. Solenoid valve
14. Tube assembly
15. Grommet
16. Union
17. Gasket
18. Nut
19. Flatwasher
20. Bolt
21. Tube assembly
22. Rubber seal
23. Nut
24. Flatwasher
25. Bolt
26. Bolt
27. Tube assembly
28. Grommet
29. Rubber seal
30. Tube assembly
31. Rubber seal
32. Rubber seal
33. Solenoid valve
34. Cap
35. Valve
36. Nut
37. Flatwasher
38. Bolt
39. Tube clamp
40. Nut
41. Flatwasher
42. Bolt
43. Tube assembly
44. Grommet
45. Rubber seal
46. Nut
47. Flat washer
48. Bolt
49. Tube assembly
50. Rubber seal
51. Nut
52. Flat washer
53. Bolt
54. Rubber seal
55. Nut
56. Flat washer
57. Bolt
58. Tube assembly
59. Rubber seal



ME 5-6115-586-34/6-1 (2)

Figure 6-1. Conditioned air cooling system, exploded view. (sheet 2 of 6)

Key to figure 6-1-Continued:

69. Rubber seal
60. Nut
61. Flat washer
62. Bolt
63. Tube assembly
64. Rubber seal
65. Nut
66. Flat washer
67. Bolt
68. Tube assembly
69. Tube assembly
70. Nut
71. Flat washer
72. Bolt
73. Tube assembly
74. Rubber seal
75. Grommet
76. Nut
77. Flat washer
78. Bolt
79. Tube assembly
80. Rubber seal
81. Grommet
82. Cap
83. Valve
84. Nut
85. Flat washer
86. Bolt
87. Tube assembly
88. Rubber seal
89. Tube Assembly
90. Union
91. Grommet
92. Gasket
93. Nut
94. Flat washer
95. Spacer
0)6. Bolt
97. Compressor
98. Spacer

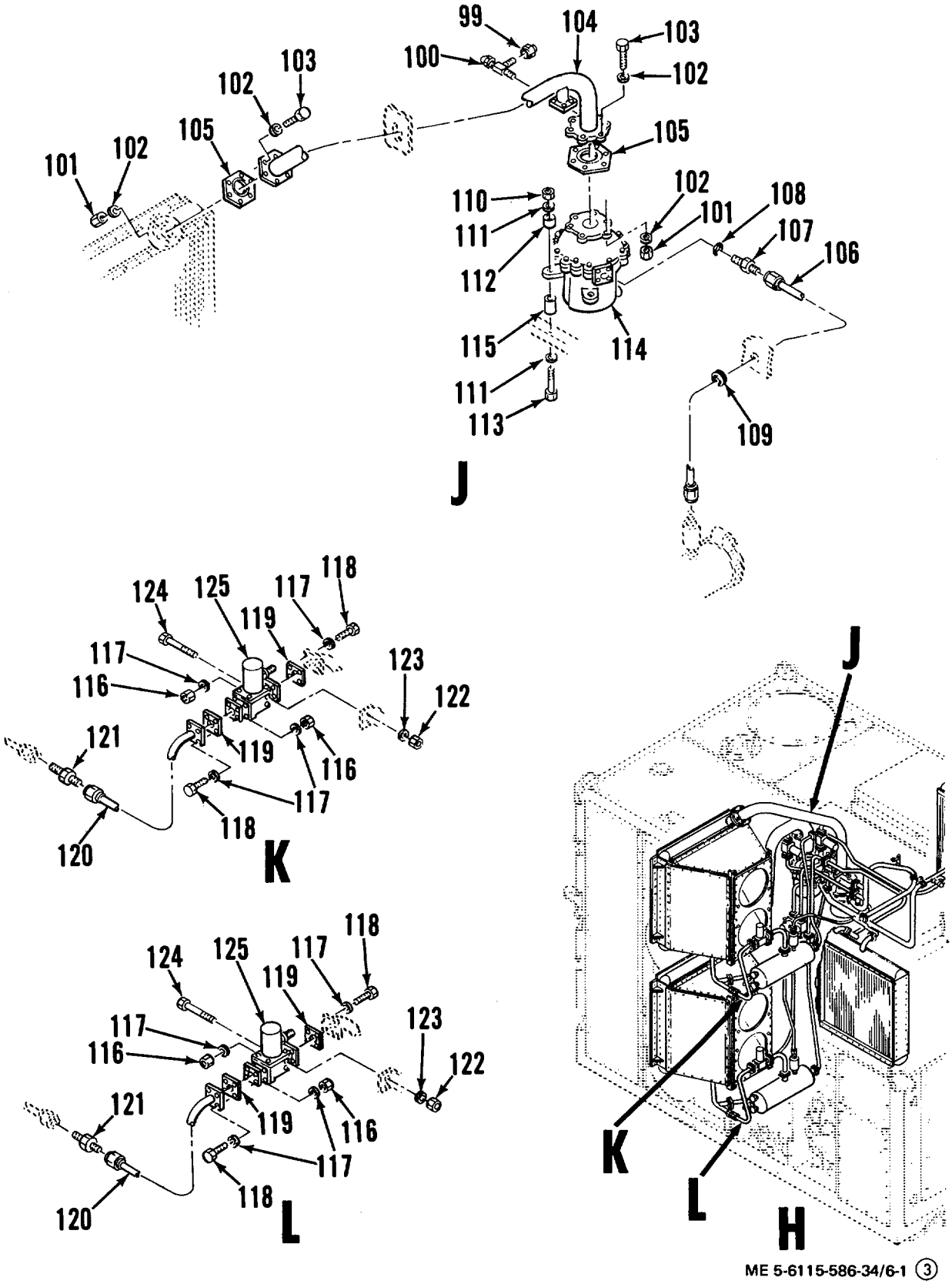
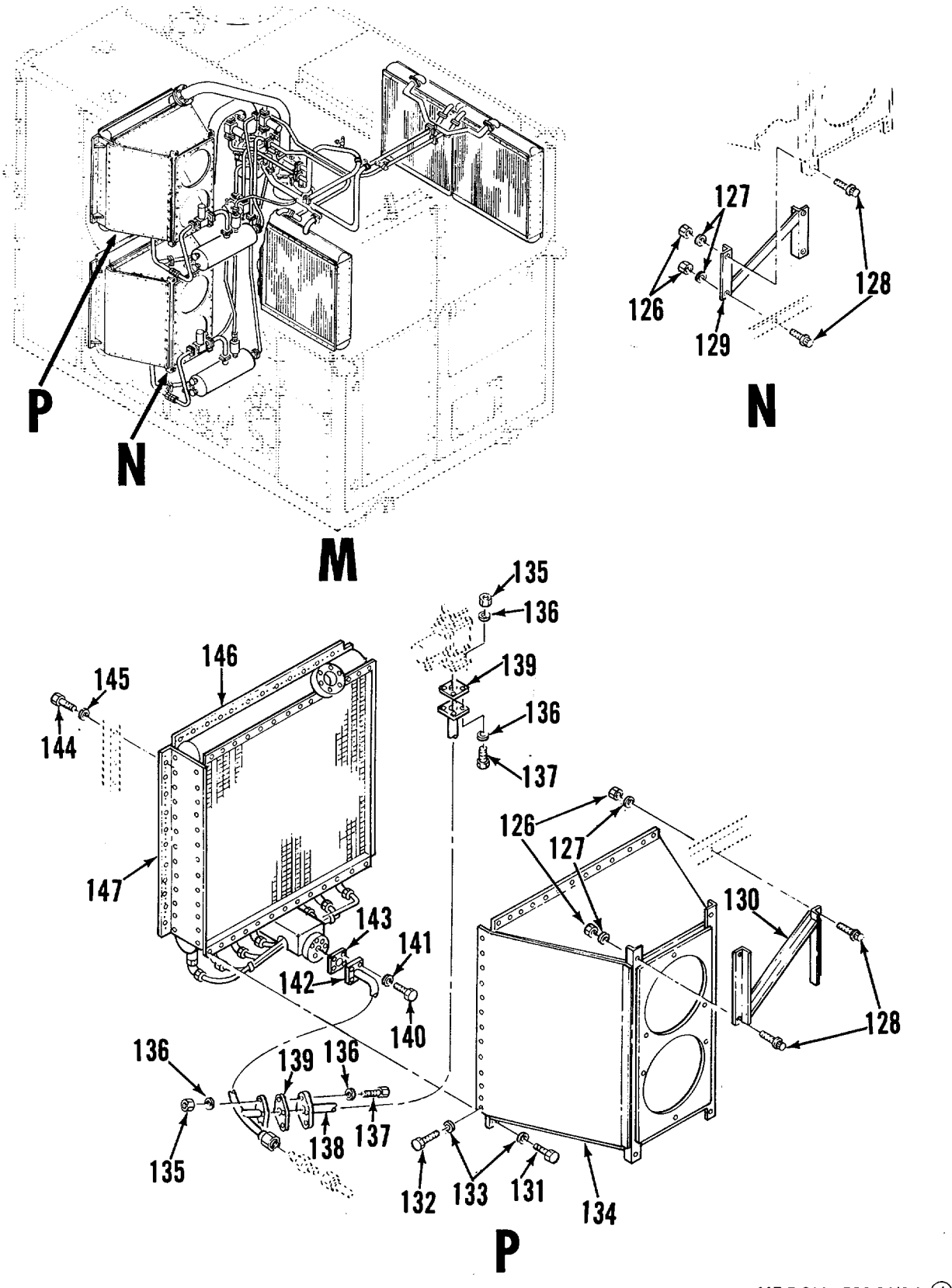


Figure 6-1. Conditioned air cooling system, exploded view. (sheet 3 of 6)

Key to figure 6-1-Continued:

99. Cap
100. Valve
101. Nut
102. Flat washer
103. Bolt
104. Tube assembly
105. Rubber seal
106. Tube assembly
107. Union
108. Gasket
109. Grommet
110. Nut
111. Flat washer
112. Spacer
113. Bolt
114. Compressor
115. Spacer
116. Nut
117. Flat washer
118. Bolt
119. Rubber seal
120. Tube assembly
121. Check valve
122. Nut
123. Flat washer
124. Bolt
125. Solenoid valve

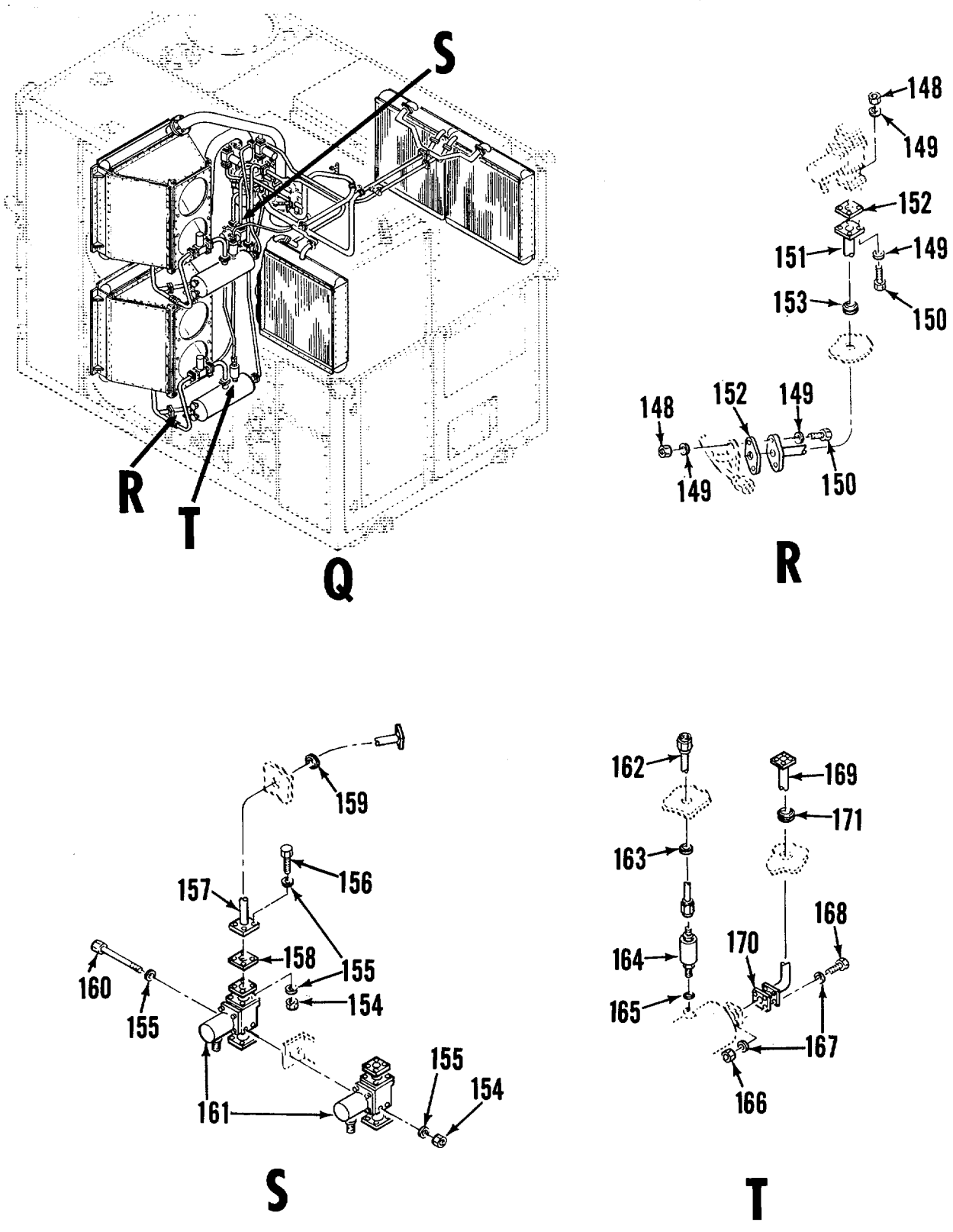


ME 5-6115-586-34/6-1 (4)

Figure o-1. Conditioned air cooling system, exploded view. (sheet 4 of 6)

Keyto figure 6-1-Continued:

126. Nut
127. Flat washer
128. Bolt
120. Brace
130. Brace
131. Bolt
132. Bolt
133. Flat washer
1:34. Fan housing
135. Nut
136. Flat washer
137. Bolt
138. Tube assembly
139. Rubber seal
140. Bolt
141. Flat washer
142. Tube assembly
143. Rubber seal
144. Bolt
145. Flat washer
146. Rubber strip
147. Evaporator



ME 5-6115-586-34/6-1 (5)

Figure 6-1. Conditioned air cooling system, exploded view. (sheet 5 of 6)

KEY to figure 6-1-Continued:

148. Nut
149. Flat washer
150. Bolt
151. Tube assembly
152. Rubber seal
153. Grommet
154. Nut
155. Flat washer
156. Bolt
157. Tube assembly
158. Rubber seal
159. Grommet
160. Bolt
161. Solenoid valve
162. Tube assembly
163. Grommet
164. Dehydrator
165. Gasket
166. Nut
167. Lockwasher
168. Bolt
169. Tube assembly
170. Rubber seal
171. Grommet

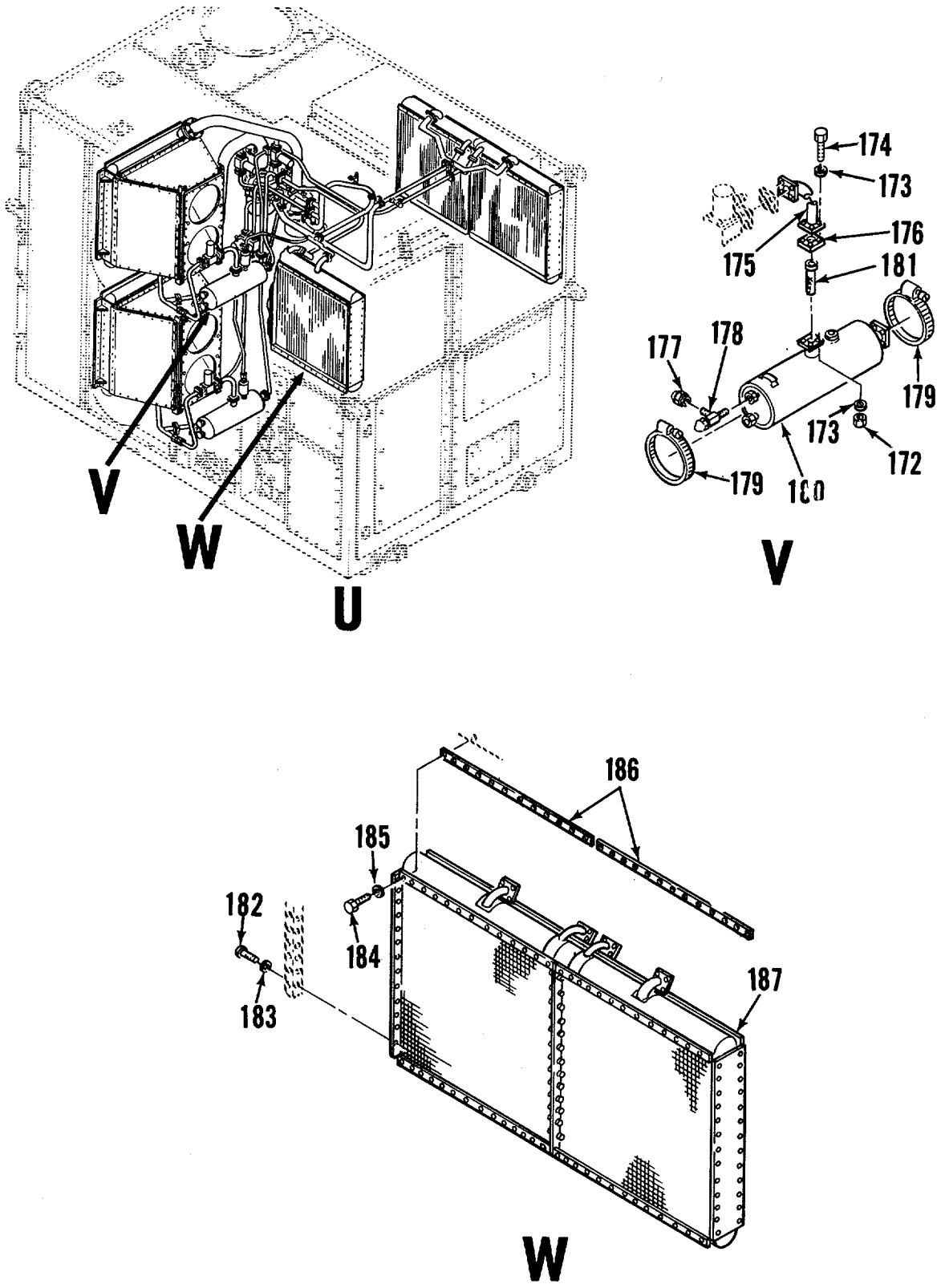


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Figure 6-1. Conditioned air cooling system, exploded view. (sheet 6 of 6)

KEY to figure 6-1-Continued:

172.	Nut	180.	Receiver
173.	Flat washer	181.	Screen
174.	Bolt	182.	Screw
175.	Tube assembly	183.	Flat washer
176.	Rubber seal	184.	Bolt
177.	Cap	185.	Flat washer
178.	Valve	186.	Foam tape
179.	Hose clamp	187.	Condenser

(4) Replace all rubber seals and gaskets each time tube assemblies are removed.

(5) Replace valves found to be defective through troubleshooting and testing.

(6) Replace all other parts damaged beyond simple repair.

c. Installation. Install the tube assemblies and fittings by reversing the procedures required to remove them.

Section II. COMPRESSORS, CONDENSER, AND EVAPORATORS

6-3. General

No major repairs on the compressors, condensers, and evaporators shall be performed at this maintenance level. It, however, is the responsibility of Direct Support Maintenance to test and replace the condensers and evaporators as necessary. Also, minor services to the compressors shall be performed at this level in addition to replacement of the entire assembly.

6-4. Compressors

a. Removal.

(1) Tag the electrical wire harnesses to facilitate reinstallation. Disconnect the wire harnesses.

(2) Tag the tube assemblies prior to removal to facilitate reinstallation. Disconnect all tubing that connects to the compressor.

(3) Remove the nuts (93, fig. 6-1, sheet 2 of 6), washers (94), spacers (95), and bolts (96). Remove the compressor (97) from the mount and remove the spacers (98). Remove the other compressor (114, fig. 6-1, sheet 3 of 6) in the same manner.

b. Installation.

(1) Position the spacers (98, figure 6-1, sheet 2 of 6) and the compressor (97) on the mount. After aligning the holes, insert bolts (96) and washers (94) through the bottom. Replace the spacers (95) and secure the compressor using the nuts (93) and washers (94).

(2) Install the tube assemblies.

Note. Prior to installing tube assemblies, observe the instructions given in paragraph 6-2b for the cleaning, inspection, and repair of tube assemblies and fittings with the emphasis on sub-paragraph (4) which requires the replacement of seals and gaskets.

(3) Install all electrical wire harnesses.

c. Service

(1) Refrigerant filter. This filter is located on the bottom of the compressor motor housing and is designed to filter the refrigerant entering the compressor. The filter should be replaced periodically as some foreign material will accumulate within it. The gaskets must also be replaced each time the filter is replaced.

(2) Thermostatic switch.

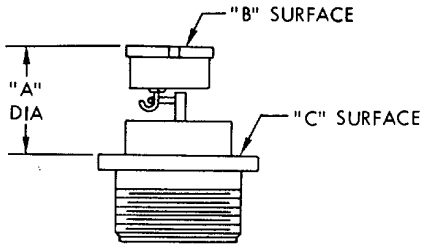
(a) This switch assembly is located in a well at the lower portion of the motor housing assembly. The switch assembly consists of a shield, thermostat, and an electrical connector.

(b) The switch is designed to open (break the circuitry to the compressor) when the motor housing reaches 225° ± 15° F (107.2° ± 9.4° C). When the compressor housing cools down to 165° ± 15°,F (73.9° ± 9.4 C, the switch will close again to allow the compressor to resume operation.

(c) If the switch should fail to close after the compressor housing has cooled to the required temperature, remove the switch and inspect it in accordance with requirements shown in figure 6-2. Check also for damage to the pins of the connector.

(d) Replace a switch found to have damaged pins.

(e) Replace a switch that does not meet the requirements shown in figure 6-2.



"B" AND "C" SURFACES MUST BE PARALLEL TO EACH OTHER WITHIN 0.020 INCH TOTAL INDICATOR READING.

A
0.86 0.88 IN.

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Figure 6-2. Thermostatic switch assembly inspection requirements.

6-5. Condensers

a. Removal.

(1) Disconnect the tube assemblies that connect to the condensers.

(2) Remove the screws (182, fig. 6-1, sheet 6 of 6) and washers (183) at the sides of the condensers. Remove the bolts (184) and washers (185) at the top of the condensers. Remove the foam tape (186) and condensers (187) from the power plant.

b. Testing.

(1) Pressure test condenser as follows:

(a) Attach end seal plates (see Special Tools, table 2-1) to condenser ports.

(b) Apply compressed air at refrigerant vapor inlet duct seal, pressurize condenser to 148 ± 2.0 psig, and immerse condenser in water for five minutes. There must be no leakage indicated by bubbles, or evidence of permanent deformation of condenser as a result of pressure applied during test.

(c) Dry condenser as thoroughly as possible with compressed air, and complete drying by heating in an oven for at least one hour at 250° F (121.1° C) maximum.

(2) Test condenser for refrigerant leakage as follows.

(a) Seal condenser as instructed (para b (1) (a)) above.

(b) Connect unit refrigerant inlet to refrigeration system in service unit (para 2-4 b) as shown in figure 6-3. Use synthetic rubber tubing in test setup.

(c) Open valve connecting condenser to vacuum pump and evacuate condenser for at least 15 minutes at maximum pressure of 0.5 inch of mercury absolute.

(d) Shut off valve to vacuum pump and charge condenser by permitting refrigerant gas to flow into condenser until no more flow occurs.

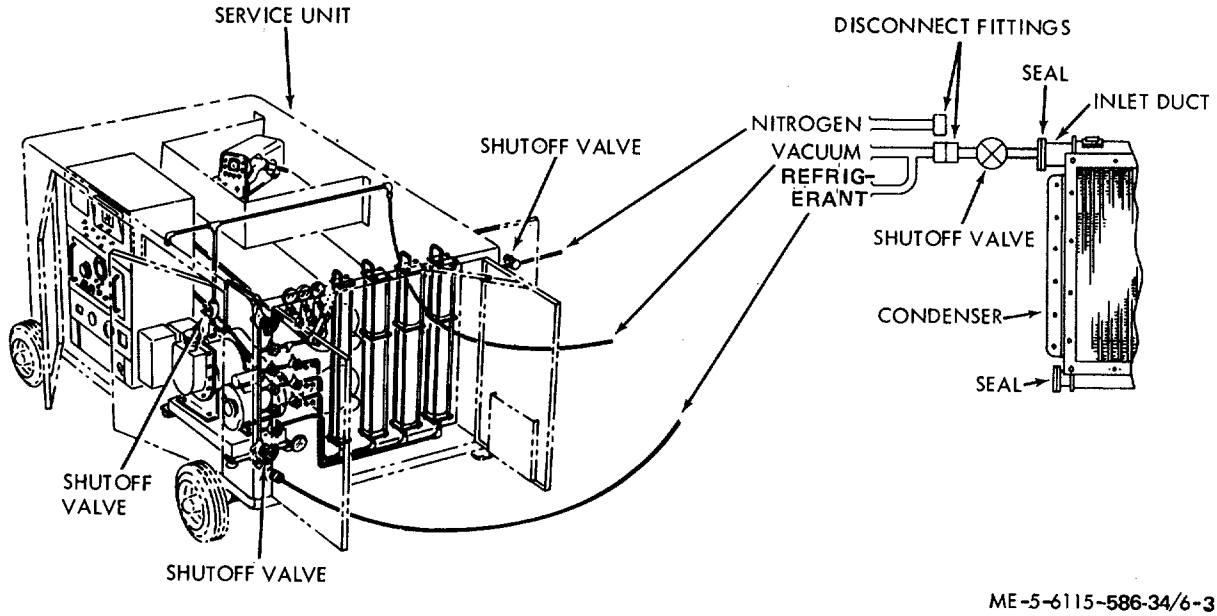

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Figure 6-3. Refrigerant leakage test setup.

(e) Shut off source of refrigerant gas and pressurize condenser with nitrogen until mixture of refrigerant gas plus nitrogen reaches 100 psig. Shut off source of nitrogen, close shutoff valve near disconnect fitting, and separate the disconnect fitting. Use leak detector to check for leakage from condenser through disconnect fitting.

(f) Fabricate an air-tight box large enough to contain one unit at a time. Locate hole for leak detector probe on side of air-tight box near the bottom, and seal hole with tape. Use leak detector to check for residual refrigerant gas in bottom of air-tight box. If any is detected, blow out with compressed air and recheck with leak detector. When no refrigerant gas remains, seal charged and pressurized condenser inside air-tight box so that no refrigerant gas can escape.

(g) After 30 minutes, remove tape, insert leak detector probe, and check for any refrigerant gas that has leaked from condenser and settled to bottom of air-tight box. Remove condenser from box.

(h) If no leakage is detected during either check, permit refrigerant gas and nitrogen to escape from condenser.

Note. Remove condenser from test area if there is a possibility that escaping refrigerant gas may affect other test in area.

(i) If leakage is detected, release refrigerant gas and nitrogen from condenser and replace faulty condenser with a known good one.

c. Installation.

(1) Position the condenser (187, fig. 6-1, sheet 6 of 6) and new tape (186) in the power plant and secure using the bolts (184), screws (182) and washers (183, 185).

Note. Observe cleaning, inspection and repair instructions for tube assemblies given in paragraph 6.2b. Also, use new foam tape each time condenser is replaced.

(2) Install the tube assemblies. 6-6. Evaporators

a. Removal.

(1) Disconnect the tube assemblies that connect to the evaporators.

(2) Remove the bolts (144, fig. 6-1, sheet 4 of 6) and washers (1451 to remove the evaporators (147) and rubber strips (146) from the power plant.

b. Testing.

(1) Pressure test evaporators.

(a) Attach adapter flange plates (see Special Tools, table 2-1) to evaporator ports.

(b) Apply compressed air at refrigerant inlet flange, pressurize evaporator to 148 $\pm$ 2.0 psi gauge, and immerse in water for five minutes. There must be no leakage indicated by complete absence of bubbles, or evidence of permanent deformation of evaporator as a result of pressure applied during test.

(c) Dry evaporators as thoroughly as possible with compressed air and complete drying by heating in an oven for at least one hour at 250° F (121.1° C) maximum.

(2) Test evaporator for refrigerant leakage.

(a) Seal evaporator as outlined in paragraph (1) above.

(b) Connect refrigerant inlet to the refrigeration system service unit (para 2-4b) as shown in figure 6-4.

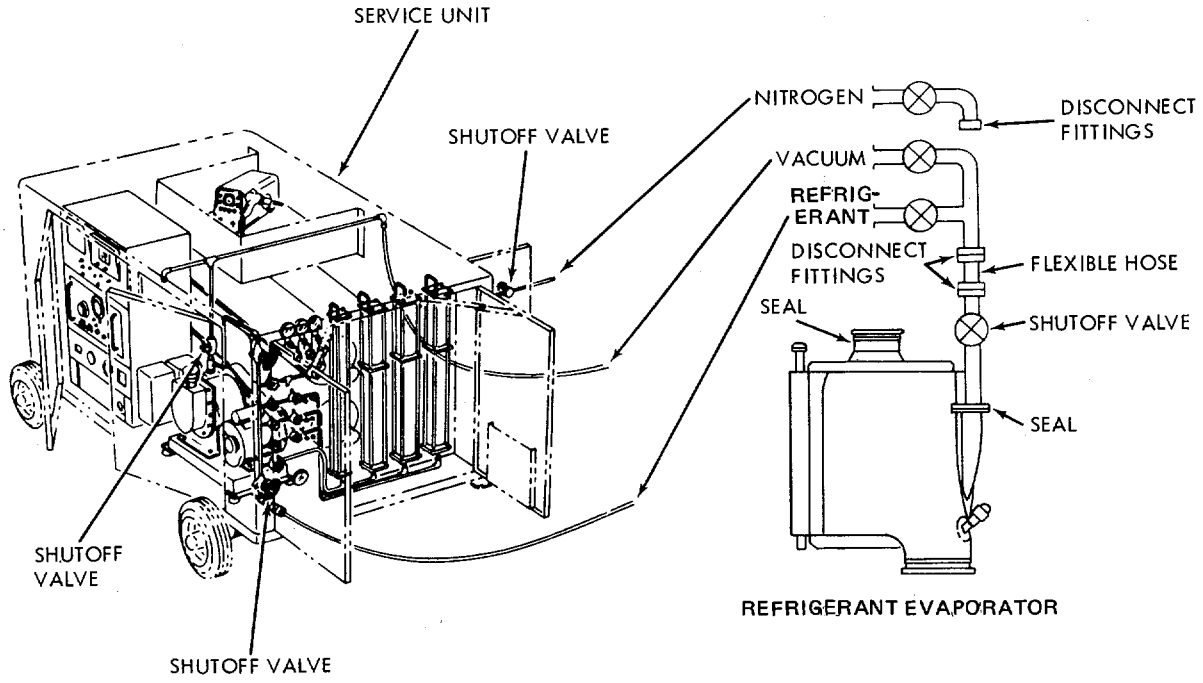
(c) Open valve connecting evaporator to vacuum pump-and evacuate evaporator for at least 15 minutes at maximum pressure of mercury absolute.

(d) Shut off valve to vacuum pump and charge evaporator to 60 $\pm$ 5 psi with refrigerant.

(e) Shut off source of refrigerant and pressurize evaporator with nitrogen until mixture of refrigerant plus nitrogen reaches 100 psi gauge. Shut off source of nitrogen, close shutoff valve near disconnect fitting, and separate disconnect fitting. Use leak detector to check for leakage from evaporator through disconnect fitting.

(f) Fabricate an air-tight box large enough to contain evaporator. Locate hole for leak detector probe on side of air-tight box near the bottom, and seal hole with tape. Use leak detector to check for residual refrigerant in bottom of air-tight box. If gas is detected, blow out with compressed air and recheck with leak detector. When no refrigerant remains, seal charged and pressurized evaporator inside air-tight box so that no refrigerant can escape.

Note. Remove evaporator from test area if there is a possibility that escaping refrigerant may affect other tests in area.



ME-5-6115-586-34/6-4

Figure 6-4. Refrigerant leakage test setup.

(g) After 30 minutes, remove tape, insert leak detector probe, and check for any refrigerant that has leaked from evaporator and settled to bottom of air-tight box. Remove evaporator from air-tight box.

(h) If no leakage is detected, permit refrigerant and nitrogen to escape from evaporator.

(i) If leakage is detected, release refrigerant and nitrogen from evaporator and replace faulty evaporator with a known good one.

c. Installation.

(1) Position new rubber strips (146, fig. 6-1, sheet 4 of 6) and evaporators (147) in the power plant and secure it to the same using bolts (144) and washers (145).

Note. Observe cleaning, inspection and repair instructions for tube assemblies given in paragraph 6-2b. Also, use new rubber strips each time evaporator is replaced.

(2) Install the tube assemblies.

Section III. RECEIVERS

6-7. General

The receivers are mounted in the refrigerant compartment. The receivers discharge refrigerant received from the condensers.

a. Removal.

(1) Disconnect tube assemblies that directly connect to the receiver.

(2) Remove clamps (179, fig. 6-1,sheet 6 of 6) to remove the receiver (180). Remove the screen

b. Disassembly (fig. 6-5).

(1) Before proceeding with disassembly, complete pressure test, and refrigerant leakage test para e) below.

(2) Disassemble in sequence of index numbers I through 20 assigned to figure 6-5, observing the following.

(3) Do not remove inserts (8) from cap (10) unless required after inspection.

c. Cleaning, Inspection and Repair.

(1) Wipe all parts, except receiver (20), with a clean, dry cloth.

(2) Thoroughly wash interior and exterior of receiver (20) with kerosene and drain. Degrease with trichlorethylene heated to 160° to 180° F (71.1° to 82.2° C).

Warning: Trichlorethylene (MIL-T70031 is toxic, and should be used only in a well

ventilated area. Failure to observe this warning may result in serious harm or death to personnel.

(3) Check all parts for damage and stripped or crossed threads.

(4) Check nameplate (2) for damage and illegibility.

(5) Check valve (4) for damage and freedom of operation.

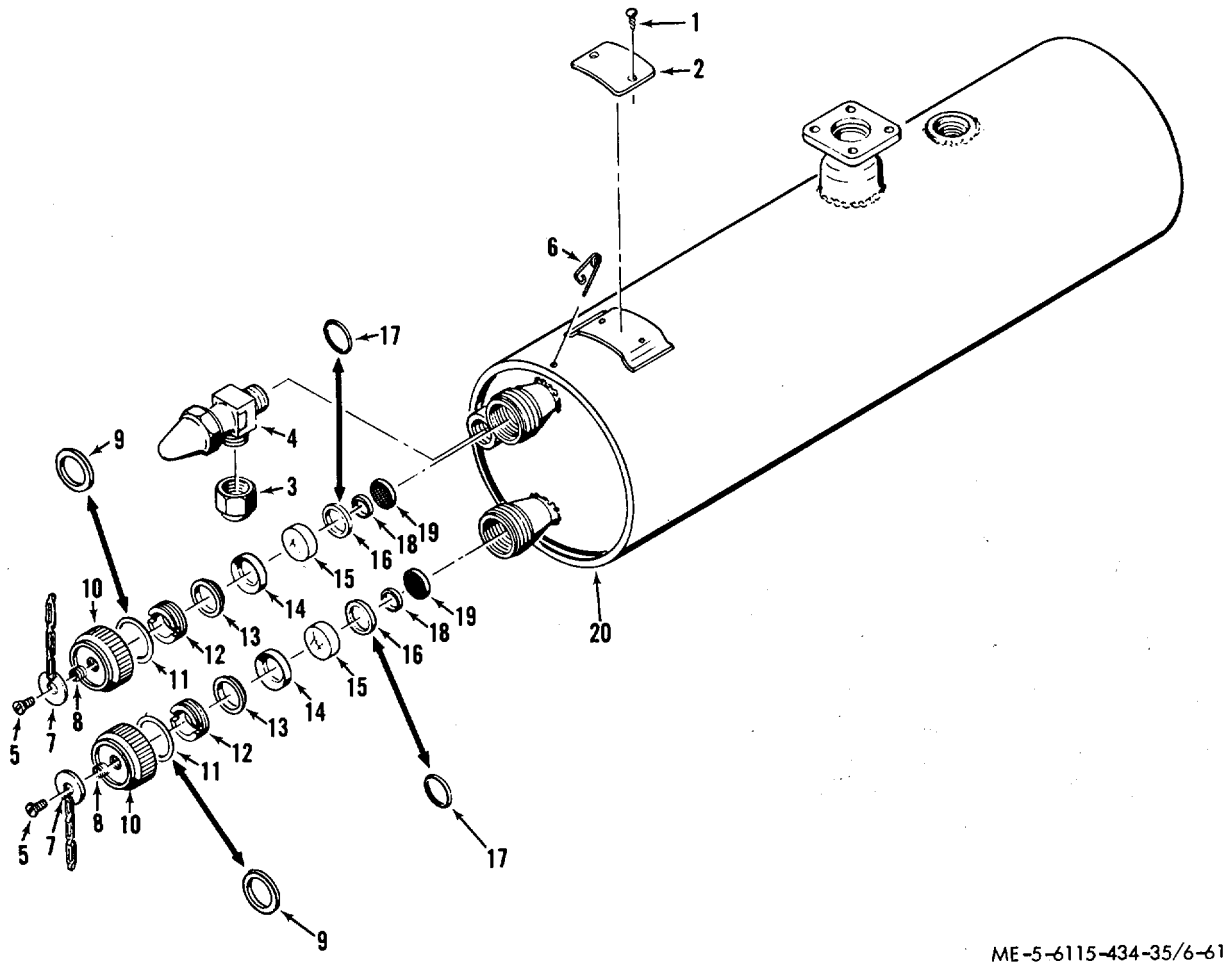
(6) Check disks (15) for chips and cracks.

(7) Check receiver (20) for cracks, dents, and distortion. Check flange surfaces for burrs.

(8) Check painted surfaces for damage or deterioration.

(9) Replace all parts that do not pass inspection and are damaged beyond repair. Replace packings (14, 17) and gaskets (16), at each overhaul.

(10) Replace damaged or inoperative valve (4).



ME-5-6115-434-35/6-61

1. Screw
2. Name plate
3. Nut
4. Valve
5. Screw
6. Pin
7. Chain
8. Insert
9. Washer
10. Cap
11. Washer
12. Ring
13. Washer
14. Packing
15. Disk
16. Gasket
17. Packing
18. Washer
19. Reflector
20. Receiver

Figure 6-5. Liquid refrigerant receiver, exploded view.

(11) Repair receiver (20) by torch brazing in accordance with Military Specification MIL-W6858) as applicable. Remove burrs from flange surfaces and recut damaged threads.

(12) If insert (8) is damaged, remove and install new insert 3/4 to 1 3/4 turns below countersink and break off tang.

(13) Touch up defective painted surfaces with one coat of primer mixed one part primer to one part catalyst thinner; allow to air dry for at least two hours or bake for one-half at 150° to 275° F (65.6° to 135° C). Cover primer coat with one coat of black wrinkle enamel Military Specification MIL-E-5558 and bake for one hour at 250° to 300° F (121.1° to 148.9° C).

d. Assembly. Assemble in reverse order of disassembly procedures (para 6-7 b. above).

e. Testing.

(1) Pressure test receiver as follows.

(a) Attach and secure end plate seals (see Special Tools, table 2-1 to the ports of the receiver.

(b) Remove cap from valve (4, fig. 6-5) and close valve (4); replace cap.

(c) Apply compressed air at liquid inlet port seal, pressurize receiver to 165 ± 2.0 psi gauge, and immerse receiver in water for five minutes. There must be no leakage (indicated by complete absence of bubbles) and no evidence of permanent deformation of receiver as a result of pressure applied during test. Exhaust air and remove unit from test setup.

(d) Dry receiver as thoroughly as possible with compressed air and complete drying by heating in an oven for at least one hour at 250° F (12'1.10° C) maximum.

(2) Test receiver for refrigerant leakage as follows.

(a) Seal receiver as instructed (para e (1) (a)) above.

(b) Connect liquid inlet of unit to refrigeration system service unit as shown in figure

(c) Open valve connecting receiver to vacuum pump, and evacuate receiver for at least 15 minutes at maximum pressure of 0.5 inch of mercury absolute.

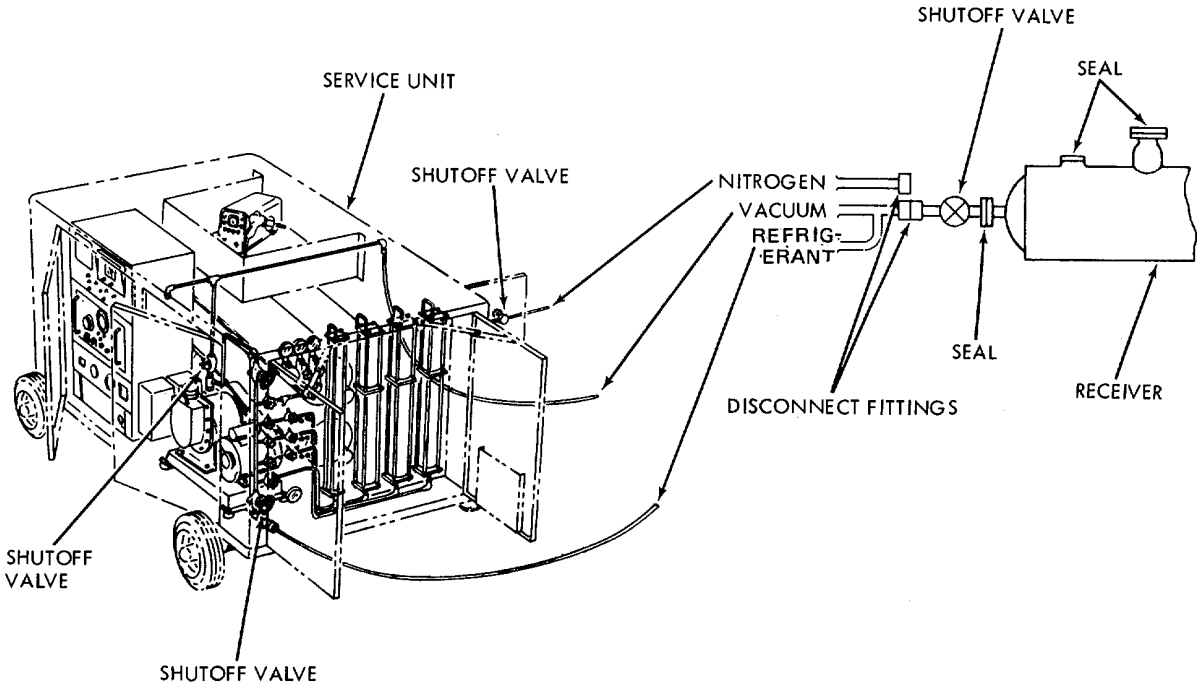


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Figure 6-6. Refrigerant leakage test setup.

(d) Shut off valve to vacuum pump and charge receiver by permitting refrigerant gas to flow into receiver until no more flow occurs.

(e) Shut off source of refrigerant gas and pressurize receiver with nitrogen until mixture of refrigerant gas plus nitrogen reaches 100 psi gauge. Shut off source of nitrogen, close the shutoff valve near the disconnect fitting, and separate the disconnect fitting. Use leak detector to check for leakage from receiver through disconnect fitting.

(f) Fabricate an airtight box large enough to contain one unit at a time. Locate hole for leak detector probe on side of air-tight box near the bottom, and seal hole with tape. Use leak detector

to check for residual refrigerant gas in bottom of air-tight box. If any is detected, blow out with compressed air and recheck with leak detector. When no refrigerant gas remains, seal charged and pressurized receiver inside air-tight box so that no refrigerant gas can escape.

(g) After 30 minutes, remove tape, insert leak detector probe, and check for any refrigerant gas that has leaked from receiver and settled to bottom of air-tight box. Remove receiver from air-tight box.

Note

Remove receiver from test area if there is a possibility that escaping refrigerant gas may affect other tests in area.

(h) If no leakage is detected by either check, permit refrigerant gas and nitrogen to. escape from receiver.

(i) If leakage is detected, find approximate area of leak with leak detector. Use detergent to find exact location, and wipe detergent from receiver, and eliminate leakage, using methods outlined (para c) above, then repeat leak detection procedure.

f. Installation.

(1) Position receiver (180, fig. 6-1, sheet 6 of 6) on mount and secure using clamps (179). Replace screen (181).

(2) Install tube assemblies.

Section IV. MOTOR DRIVEN TUBE AXIAL FAN (Recirculating)

6-8. General

This motor driven fan essentially consists of a cylindrical housing assembly, a motor rotor, two end bell assemblies, a fan impeller, and a thermal protector. The housing assembly includes a motor stator. The fan is used to circulate the flow of air through the environmental system.

a. Removal. Refer to TM 5-6115-586-12 for recirculating fans removal instructions.

b. Disassembly.

(1) Disassemble according to sequence of item numbers I through 30 assigned to figure 6-7 observing the following.

(2) Do not remove plates (2, 3) or label (4) unless required after inspection.

(3) Unsolder wires for connector (5). Do not cut wires.

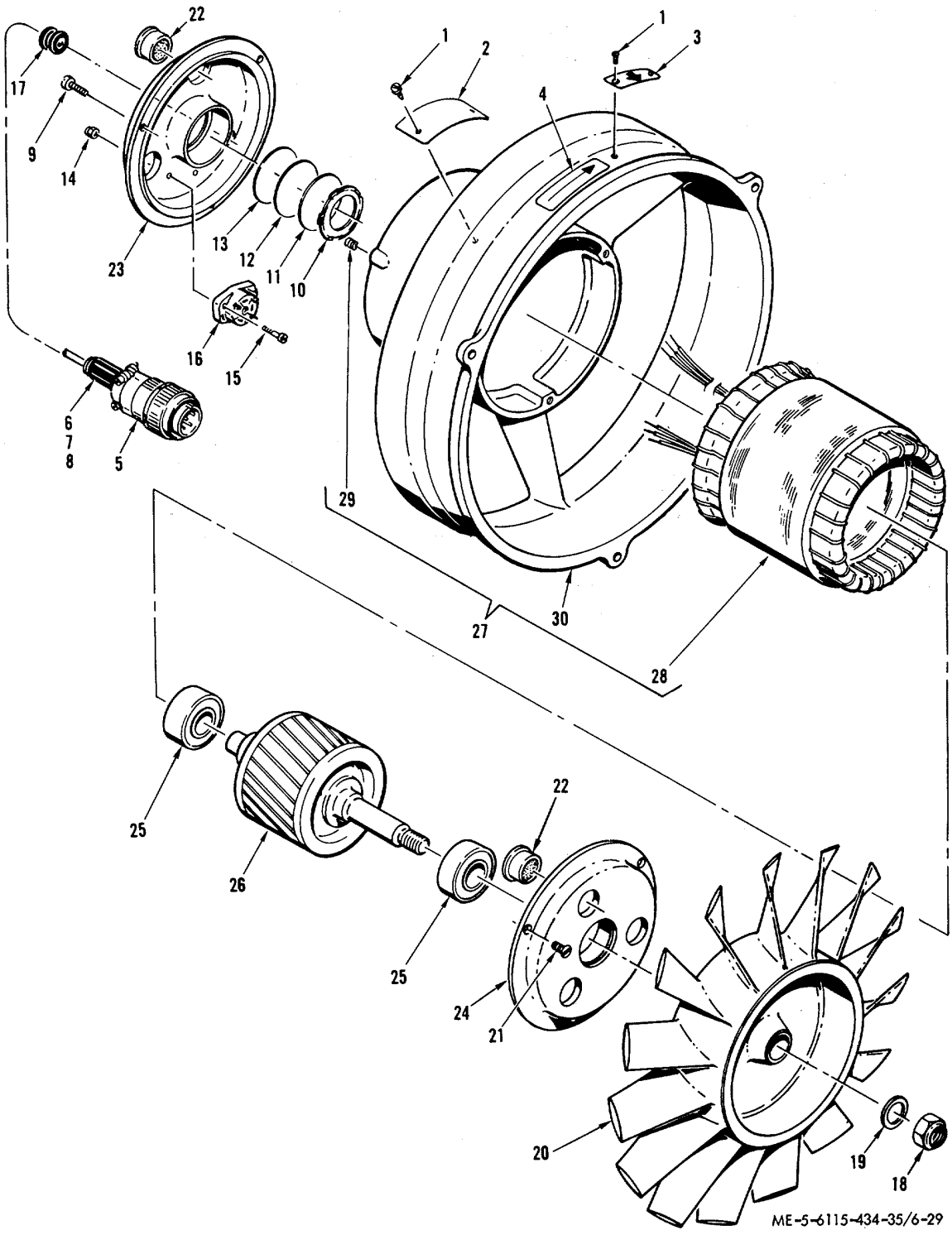


Figure 6-7. Tube axial motor driven fan, part no. 605370-1-2, exploded view.

KEY to figure 6-7.

1. Screw
2. Plate
3. Plate
4. Label
5. Connector
6. Bushing
7. Bushing
8. Bushing
9. Screw
10. Washer
11. Disc
12. Disc
13. Disc
14. Nut
15. Screw
16. (Protector
17. Grommet
18. Nut
I 9. Washer
20. Impeller
21. Screw
22. Plug
23. End bell
24. End bell
25. Bearing
26. Rotor
27. Housing assy
28. Stator
29. Insert
30. Housing

(4) Remove screws (9); then remove end bell 123) with assembled parts attached. Unsolder wires from thermal protector (16); then remove thermal protector from end bell (23).

(5) Remove nut (18) using holding fixture torque wrench (see Special Tools, table 2-1), as shown in figure 6-8.

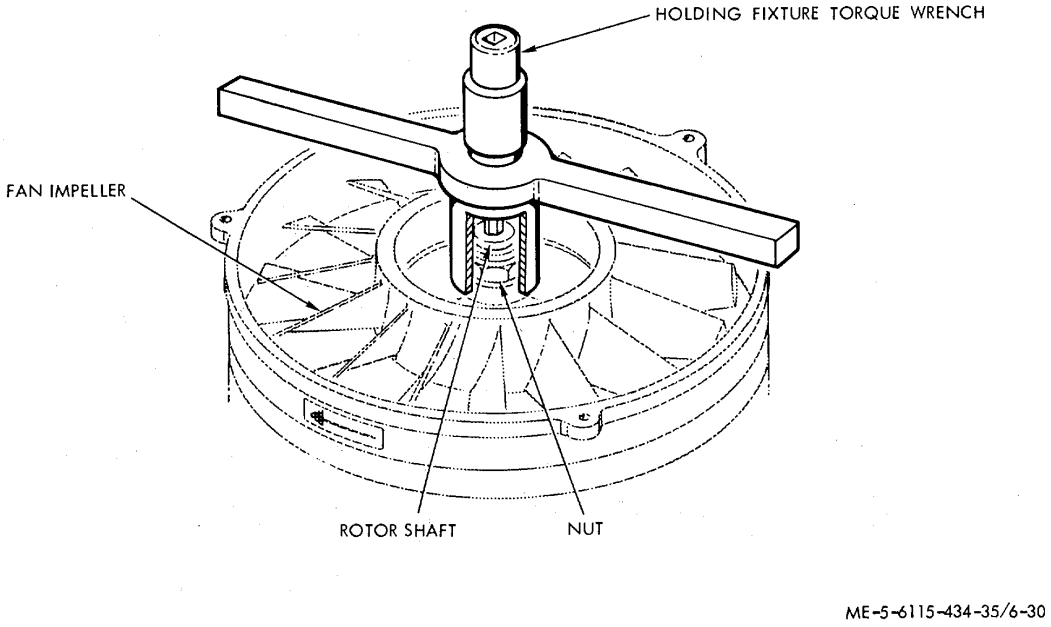


Figure 6-8. Holding fixture torque wrench.

(6) Do not remove plugs (22, fig. 6-7) from end bell (23, 24) unless required after inspection.

(7) Remove rotor (26}) from housing (27); then remove bearings (25) from rotor (26).

(8) Do not remove stator (28) from housing (30).

c. Cleaning, Inspection and Repair.

(1) Cleaning.

(*a*) Check thermal protector (16), rotor (26) and stator (28) in housing (30) using a soft bristle brush.

Warning

Varnish on stator (28) is soluble in solvent. Do not allow solvent to contact stator. Use solvent in a well-ventilated area. Avoid breathing fumes. Keep away from flame.

(*b*) Clean exterior surface of housing (30) with a clean, lintfree cloth moistened with an approved cleaning solvent and dry thoroughly.

(*c*) Wash all other parts in dry-cleaning solvent and dry thoroughly.

(2) *Inspection*.

(*a*) Inspect all parts and wiring for damage. Check bearing surfaces; bearing surfaces must have no discoloration indicative of overheating.

(*b*) Inspect all threaded parts for stripping or cross-threading.

(i) Inspect plates (2, 3) and label (4) for legibility and for security of attachment.

(*d*) Inspect connector (5) for loose, bent, or broken pins and for evidence of arc-over between pins and shell.

(*e*) Connect thermal protector (16) to a test circuit (fig. 6-9) which monitors opening and closing of the contacts, and check operation at the following temperatures.

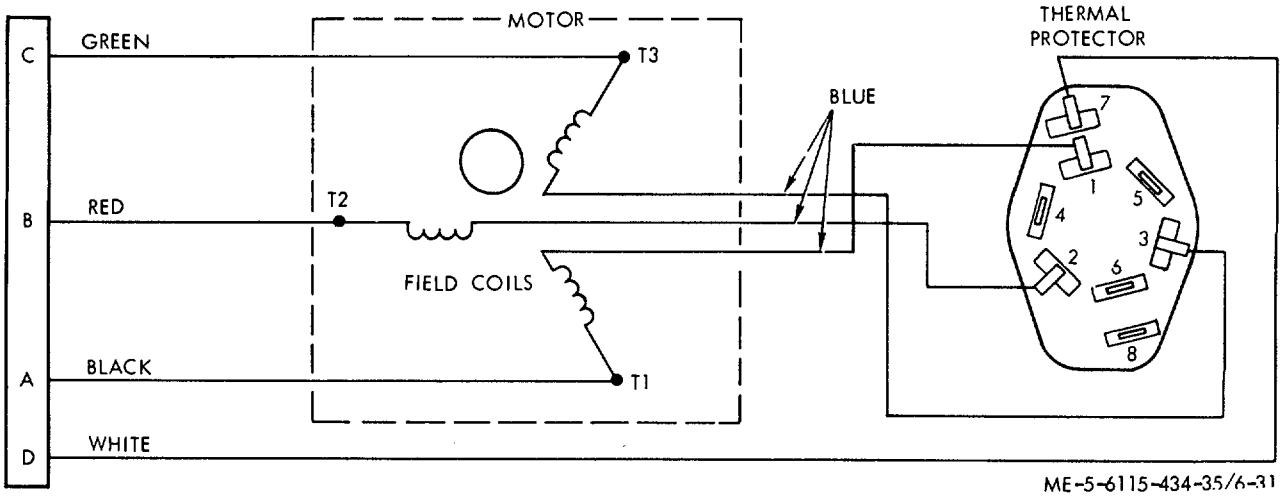


Figure 6-9. Schematic wiring diagram.

1. With the temperature of thermal protector at 77° F (25° C), pass a current of 25 amperes of 115 vac through protector within one minute contacts must close.

2. Heat thermal protector to 307° to 333° F (152.8° to 166.7° C); contacts must be open.

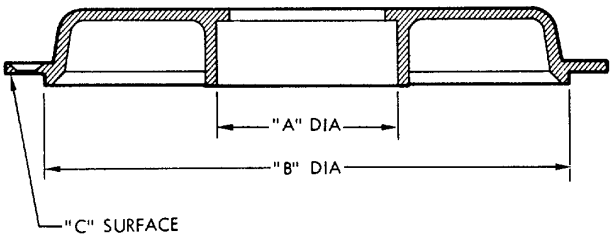
3. Remove thermal protector from test circuit.

(*f*) Inspect end bell (23, 24) in accordance with requirements shown in figure 6-10. Check plugs (22, fig. 6-7) in each end bell (23, 24) for security of attachment and damage.

(*g*) Dimensionally inspect the rotor as illustrated in figure 6-11.

(*h*) Inspect housing (30, fig. 6-7) in accordance with requirements in figure 6-12.

(*i*) Inspect stator (28, fig. 6-7) for broken leads. Check the dc resistance of each coil; resistance of each coil must be 0.50 to 0.62 ohm.



"A" DIAMETER AND "C" SURFACE ESTABLISH CENTER-LINE.
"B" DIAMETER MUST BE CONCENTRIC WITH "A" DIAMETER WITHIN 0.001 INCH TOTAL INDICATOR READING.

A	B
1.5750 IN. 1.5754	4.561 IN. 4.562

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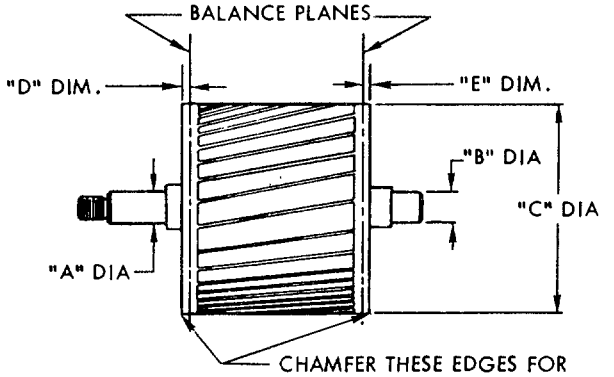
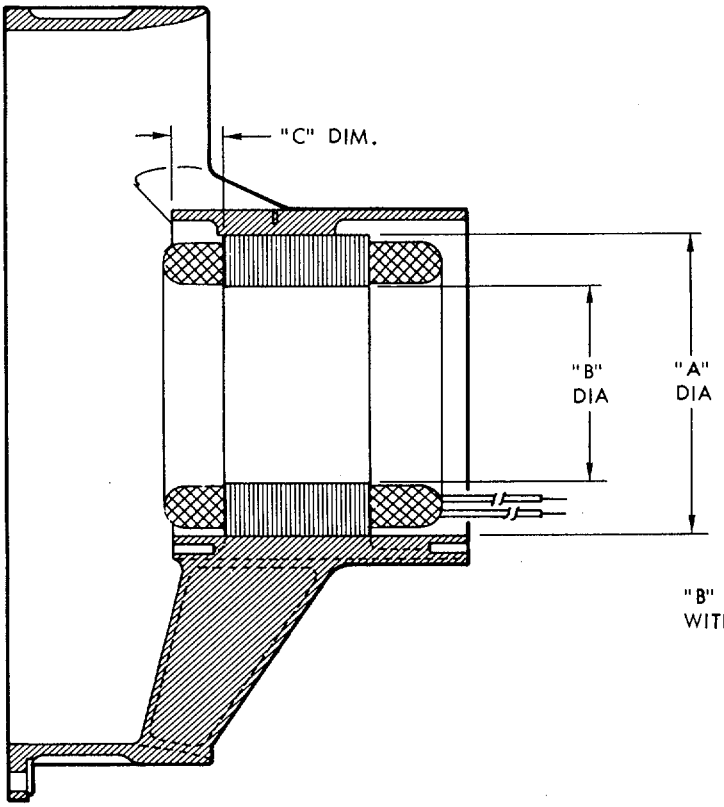
Figure 6-10. End bell inspection requirements.



"A" AND "B" DIAMETERS MUST BE CONCENTRIC WITH "C" DIAMETER WITHIN 0.001 INCH TOTAL INDICATOR READING.

A	B	C	D	E
0.6691 / 0.6694 IN.	0.6691 / 0.6694 IN.	2.975 / 2.976 IN.	0.090 IN. (REF)	0.090 IN. (REF)

ME 5-6115-434-35/6-35



"B" DIAMETER MUST BE CONCENTRIC WITH "A" DIAMETER WITHIN 0.002 INCH TOTAL INDICATOR READING.

A	B	C
4.563 / 4.565 IN.	3.000 / 3.001 IN.	0.70 / 0.74 IN.

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Figure 6-12. Fan housing assembly inspection requirements.

(*j*) Inspect blades of impeller (20, fig. 6-7) and outside diameter of hub for nicks, cracks, erosion. Inspect blade tips and interior of housing (27) for evidence of scraping.

(3) *Repair*.

(*a*) Replace all parts that do not pass inspection requirements and are damaged beyond repair.

(*b*) Replace washer (10, fig. 6-7), grommet (17), and bearings (25) regardless of condition. Use bearing press fixture to press bearing (25) onto rotor (26) shaft, as shown in figure 6-13.

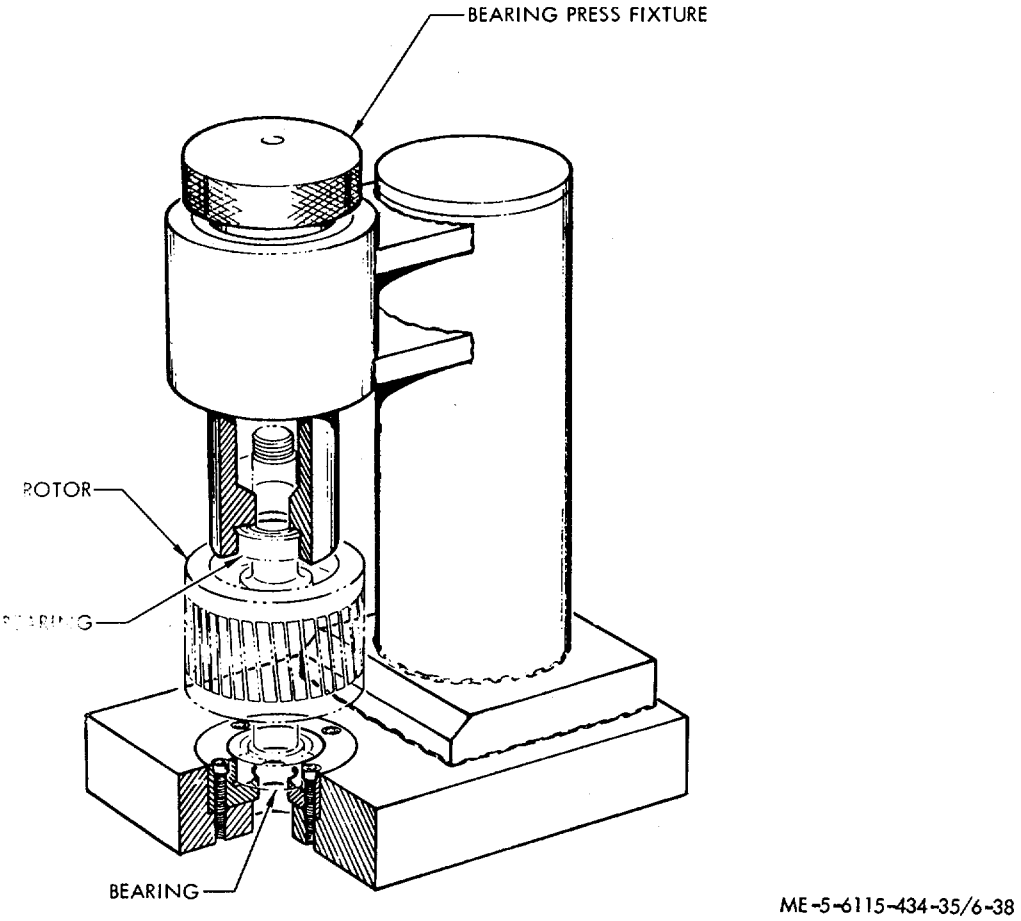

Figure 6-13. Bearing installation.

(*c*) Replace rotor if dimensional requirements are not met.

(*d*) If impeller appears to be damaged or faulty, replace. Report damaged impeller to depot maintenance for repair.

(*e*) If inserts (29) are defective, remove defective insert and install new insert 3/4 to 1 1/2 pitches below surface of housing (30). Remove tangs.

d. *Assembly.*

(1) Assemble in reverse order of removal procedures (para 6-8 b.) observing the following.

(2) Install rotor (26) with bearings (25) into housing assembly (27).

(3) Install end bell (24) with plugs (22) and secure with screws (21). Coat threads of screws with sealant (Military Specification MIL-S-22473, class 40) and install screws while sealant is wet.

(4) Install impeller (20) on shaft of rotor (26), observing direction of rotation. Apply anti- seize compound (Federal Specification JAN-A- 669) to threaded shaft of rotor (26); then install washer (19) and nut (18). Tighten nut (18) to 230 to 270 pound-inches torque, using holding fixture torque wrench. (fig. 6-8)

(5) Install thermal protector (16, fig. 6-7) on end bell (23). Temporarily install end bell (23) on housing (27). Measure rotor (26) end play, using end play measuring fixture (fig. 6-14). Install discs (11, 12, 13, fig. 6-7) as required to obtain shaft end play of 0.055 to 0.065 inch.

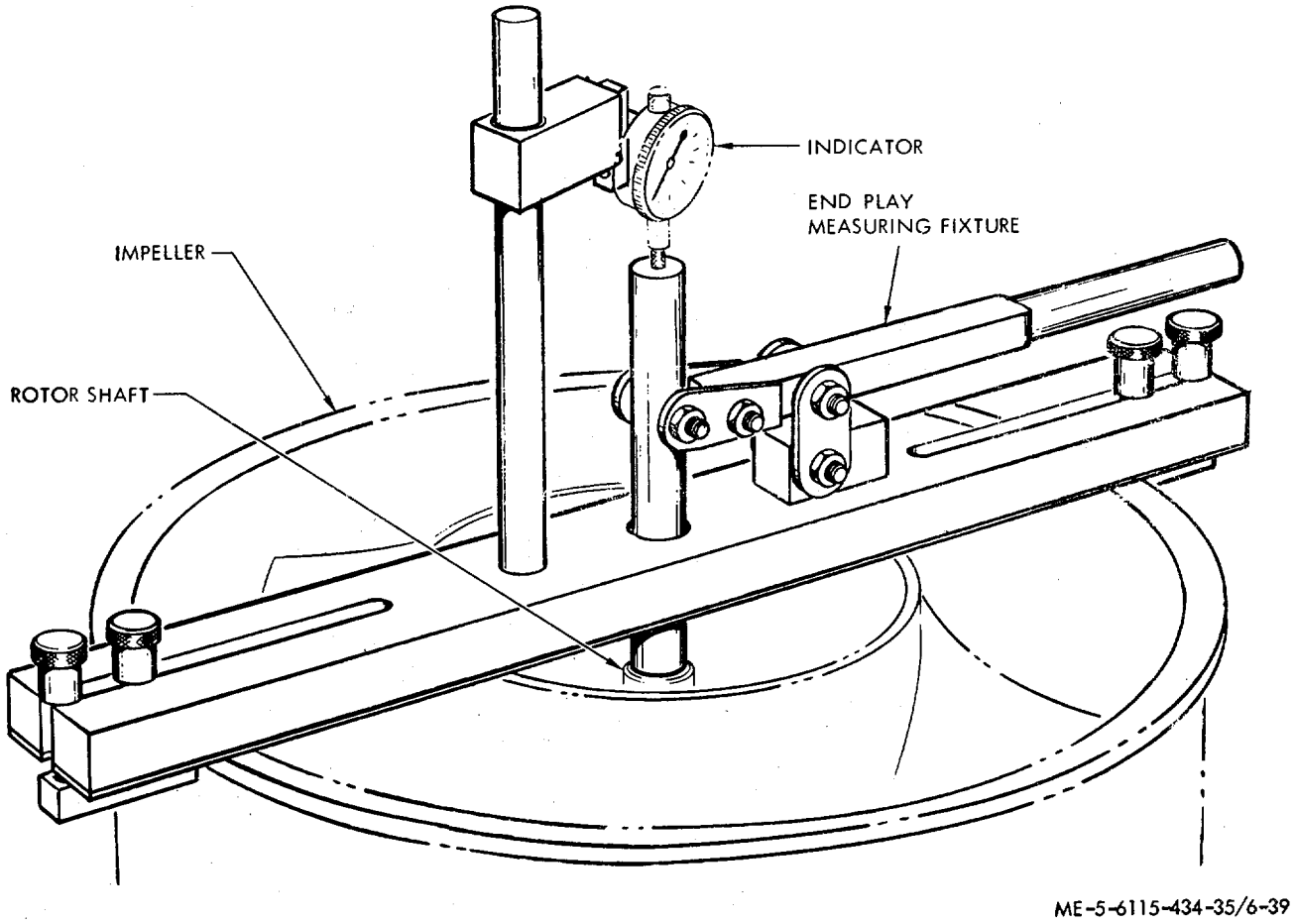

Figure 6-14. End play measurement.

(6) Remove end bell (23, fig. 6-7) and connect electrical wiring in accordance with figure 6-9. Make electrical connections, using solder (Federal specification QQ-S-571, Type SN60WRAP2).

(7) Reinstall end bell (23, fig. 6-7), discs (1, 12, 13) and washer (10). Install washer (10) with tang ends against bearing outer race.

(8) After assembly, paint end of rotor (26) shaft, hex hole in shaft, and nut (18) with one coat of primer (Cati-Coat E42GP15 mixed equal parts by volume with Catalyst V66KP15) and air-dry for 15 to 30 minutes; then bake at 150° to 175° F (65.6° to 79.4° C) for one hour.

e. Installation. Refer to TM 6-115-586-12 for recirculating fans installation instructions.

Section V. MOTOR DRIVEN TUBE AXIAL FAN (CONDENSER)

6-9. General

This motor driven fan consists essentially of a cylindrical housing assembly, a motor rotor, and end bell assembly, a fan fairing, and a thermal protector. The housing assembly includes a motor stator. The fan is used to force the flow of ambient cooling air through the condenser of the air- conditioning system.

a. *Removal*. Refer to TM 5-6115-586-12 for condenser fans removal instructions.

b. Disassembly.

(1) Disassembly according to sequence of item numbers I through 30 assigned to exploded view (fig. 6-15) observing the following.

(2) Do not remove plates (2,3), or label (4) unless required after inspection, Unsolder -wires from connector (5).

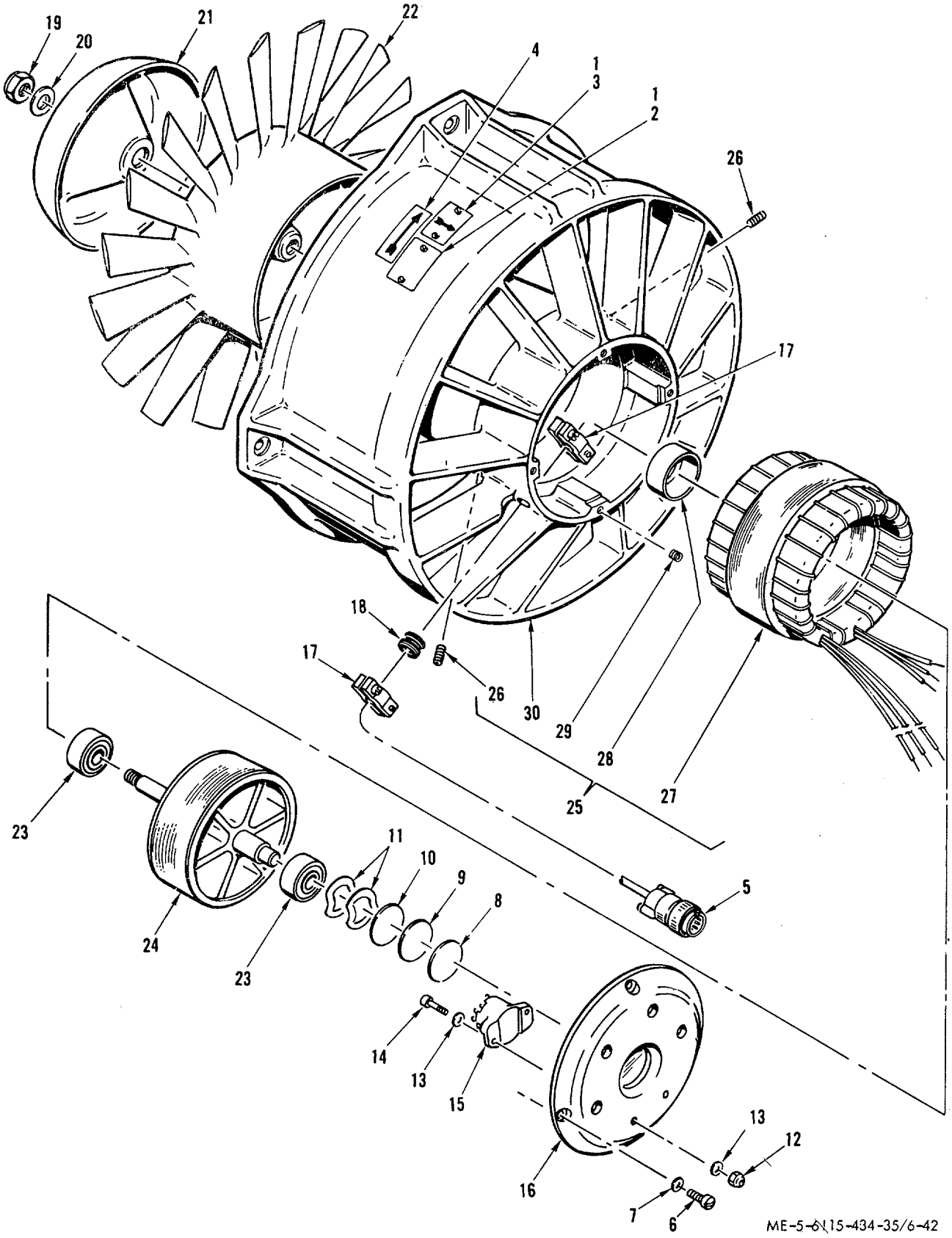

Figure 6-15. Tube axial motor driven fan, exploded view.

KEY to figure 6-15.

1. Screw
2. Plate
3. Plate
4. Label
5. Connector
6. Screw
7. Washer
8. Disc
9. Disc
10. Disc
11. Washer
12. Nut
13. Washer
14. Screw
15. Protector, thermal
16. End bell
17. Clamp
18. Grommet
19. Nut
20. Washer
21. Fairing
22. Impeller
23. Bearing
24. Rotor
25. Housing assy
26. Set screw
27. Stator
28. Retainer
29. Insert
30. Housing

(3) Remove screws (6) and washers (7); then remove end bell 16) with thermal protector (15) attached. Unsolder wires from thermal protector; then remove thermal protector from end bell. Do not disassemble end bell (16).

(4) Remove nut (19), using holding fixture torque wrench as illustrated in figure 6-16.

(5) Remove rotor (24, fig. 6-15) with bearings (23).

(6) Do not remove stator (27) from housing (30).

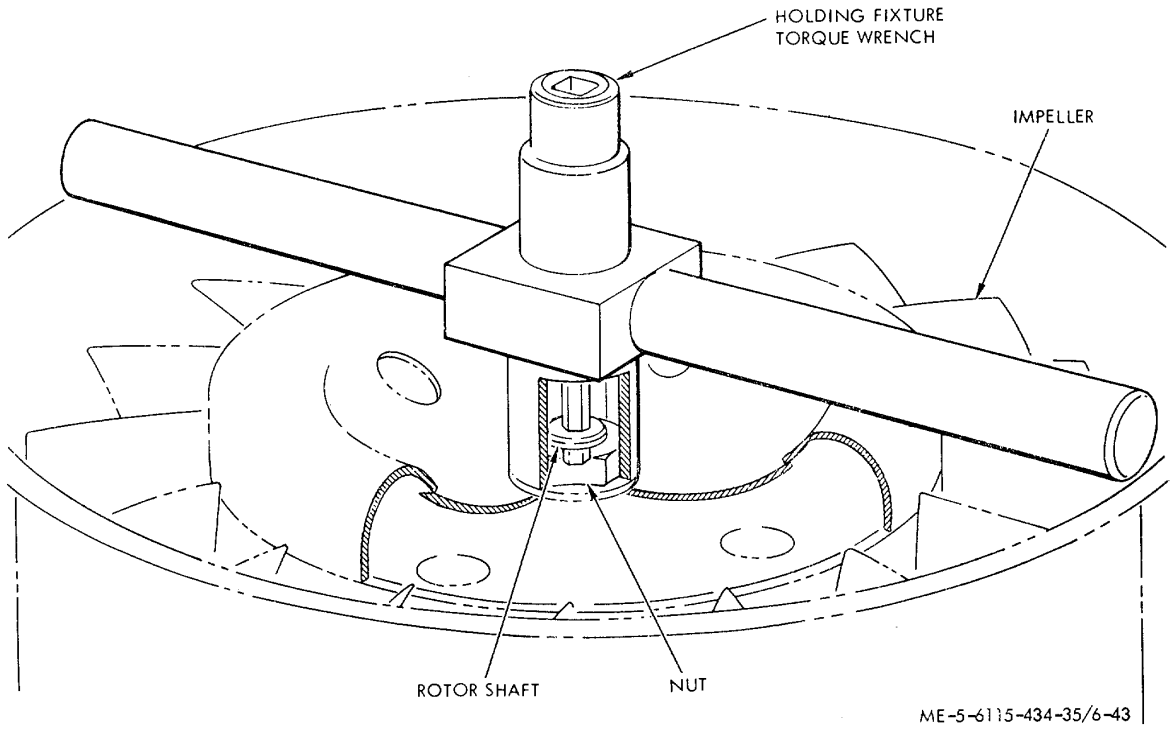

Figure 6-16. Holding fixture torque wrench.

c. *Cleaning, Inspection and Repair*.

(1) *Cleaning*.

(*a*) Clean thermal protector (15), motor rotor (24), and motor-stator (27) in fan housing (30), using a soft bristle brush.

Warning Varnish on stator (27) is soluble in solvent. Do not allow solvent to contact stator. Use solvent in well ventilated area. Avoid breathing fumes. Keep away from flame.

(*b*) Clean exterior surfaces of housing (30) with a clean, lint-free cloth moistened with dry cleaning solvent (Federal Specification P-D-680).

(*c*) Wash all other parts in dry cleaning solvent and dry thoroughly.

(2) *Inspection*.

(*a*) Inspect all parts and wiring for damage. Check bearing surfaces; bearing surfaces must have no discoloration, indicative of overheating.

(*b*) Inspect all threaded parts for stripping or cross-threading.

(*c*) Inspect plates (2,3) and label (4) for legibility and for security of attachment.

(*d*) Inspect connector (5) for loose, bent. o0 broken pins and for evidence of arc-over between pins and shell.

(*e*) Connect thermal protector (15) to a test circuit as shown in figure 6-17 which monitors opening and closing of the contacts. and check operation at the following temperatures:

1. With the temperature of thermal protector at (77°F (25° C). pass a current of 60 amperes at 115 vac through protector; contacts must open between 10 and 20 seconds. Remove current from protector; within one minute contacts must close.

2. Heat thermal protector 290° to 315° F (143.3° to 157.2°C); contact must be open.

3. Remove thermal protector from test circuit.

(*f*) Inspect end bell (16) in accordance with figure 6-18.

(*g*) Inspect fairing (21, fig. 6-15) for cracks and distortion.

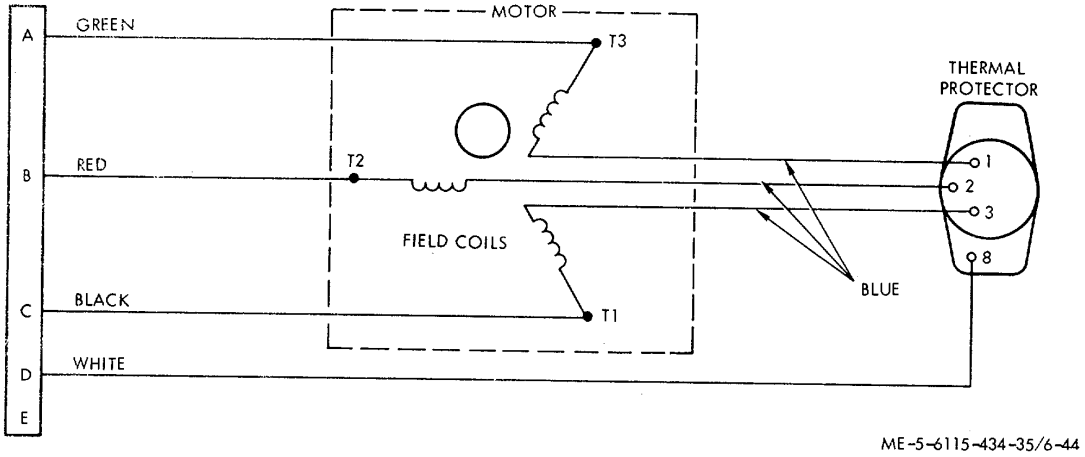

Figure 6-17. Schematic wiring diagram.

B	C	D
7.8968	2.000	1.8505
IN.	IN.	IN.
7.8978	2.002	1.8510

CENTERLINE IS NORMAL TO 'A" SURFACE AT CENTER OF " B" DIAMETER.

'C" DIAMETER MUST BE CONCENTRIC WITH CENTER-LINE WITHIN 0.003 INCH TOTAL INDICATOR READING.

"D" DIAMETER MUST BE CONCENTRIC WITH CENTER- LINE WITHIN 0.001 INCH TOTAL INDICATOR READING.

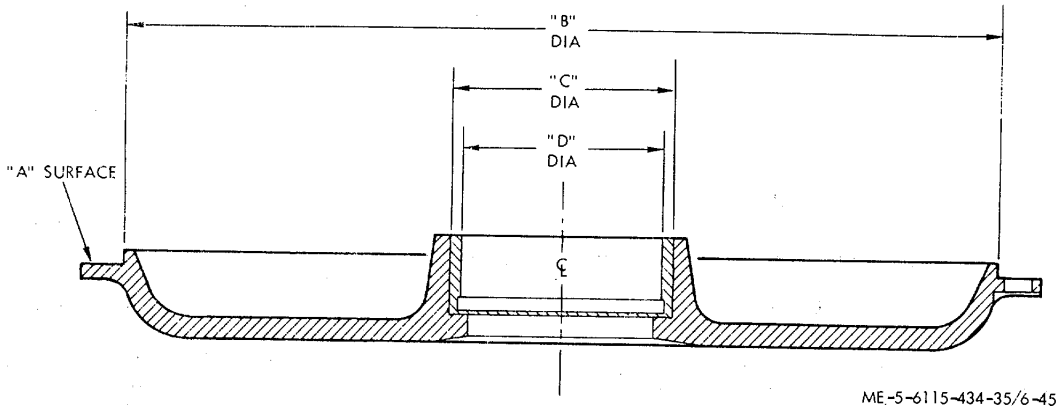

Figure 6-18. End bell inspection requirements.

(*h*) 1)Dimensionally inspect rotor as illustrated in figure 6-19.

(*i*) Inspect housing assembly (25, fig. 6-15) in accordance with figure 6-20.

(*j*) Inspect stator (27, fig. 6-15) for broken leads. Check the resistance of each coil (fig. 6-17). Resistance of each coil must be 0.29 to 0.36 ohm.

(*k*) Inspect blades of impeller (22. fig. 6-15) and outside diameter of hub for nicks, cracks, erosion. Inspect blade tips and interior of housing 13()1 for evidence of scraping.

A	B	C
0.7872 / 0.7875 IN.	5.970 / 5.972 IN.	0.7872 / 0.7875 IN.

D	E
0.080 IN. MAX	0.010 IN. MIN

"A", "B", AND "C" DIAMETERS MUST BE CONCENTRIC TO EACH OTHER WITHIN 0.002 INCH TOTAL INDICATOR READING.

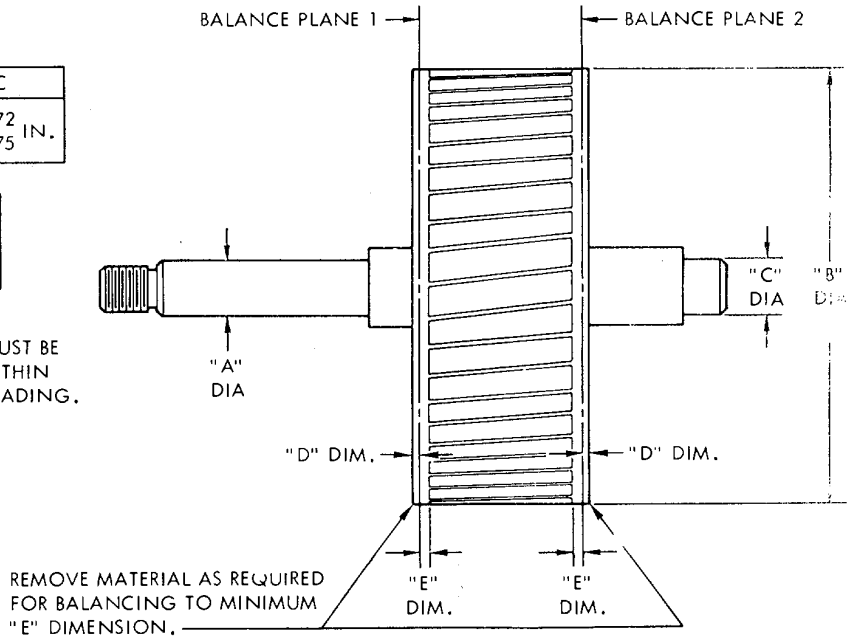

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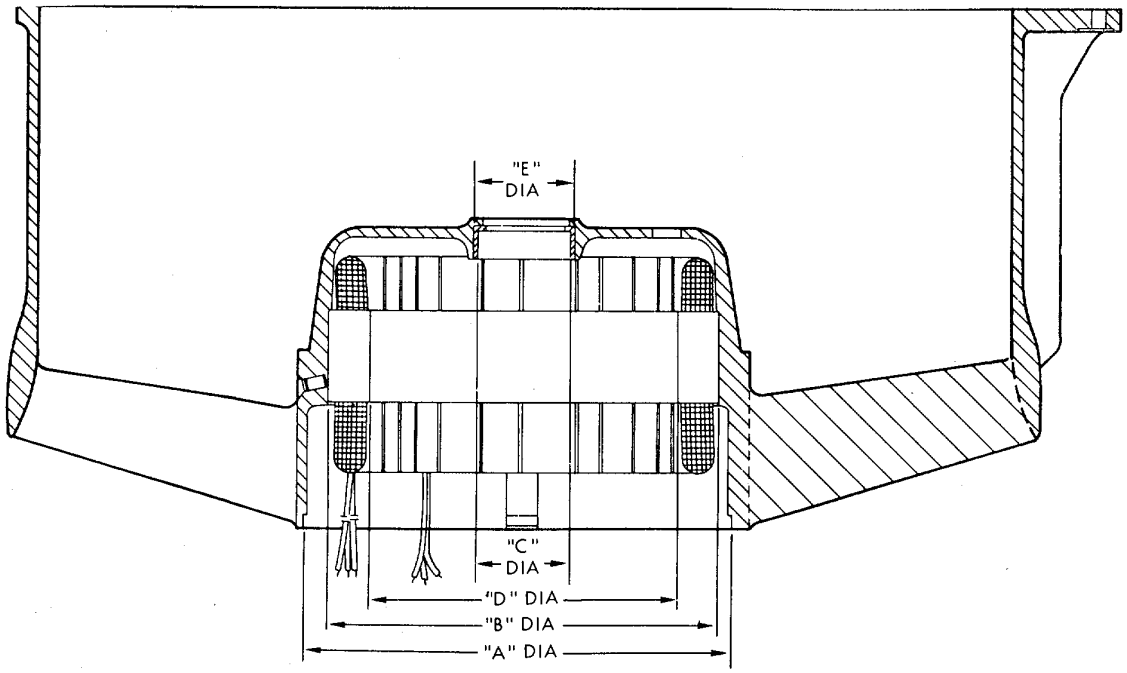
Figure 6-19. Rotor assembly inspection requirements.



A	B	C	D	E
7.898 / 7.900 IN.	7.4810 / 7.4830 IN.	1.8505 / 1.8510 IN.	6.0000 / 6.0015 IN.	2.000 / 2.002 IN.

"B" AND "D" DIAMETERS MUST BE CONCENTRIC TO "A" DIAMETER WITH TOTAL INDICATOR READING.

"C" DIAMETER MUST BE CONCENTRIC TO "A" DIAMETER WITHIN 0.001 INDICATOR READING.

-434-6

Figure 6-20. Fan housing assembly inspection requirements.

(3) *Repair*.

(*a*) Replace all parts that do not pass inspection and are damaged beyond repair.

(*b*) Replace washers (11, fig. 6-15), grommet 118), and bearings (231 regardless of condition. Use bearing press fixture to install new bearings (fig. 6-21 .

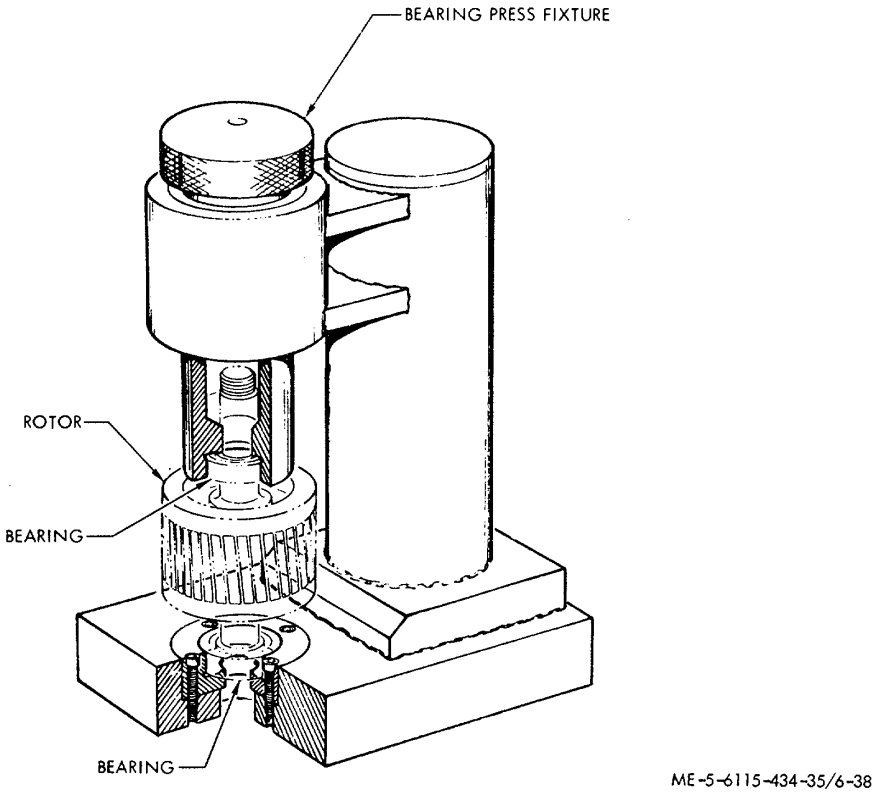


Figure 6-21. Bearing installation.

(*c*) If retainer in end bell (16, fig. 6-15) requires replacement, replace complete end bell assembly.

(*d*) If impeller appears to be damaged or faulty, replace. Report damaged impeller to depot maintenance for repair.

(*e*) Replace rotor if dimensional requirements are not met.

(*f*) If finish on outside of end bell (16) or housing (25) is defective, protect unpainted areas from sanding residue and new paint. Smooth defective areas with abrasive cloth (Federal Specification P-C-451, No. 320 Grit) and clean thoroughly. Apply one coat of primer (Military Specification MIL-P8585) and air-dry for 8 hours or bake for 3/4 hour at 250° F (121°C).

(*g*) If inserts (29) are defective, remove defective insert and install new insert 3/4 to :1 1/2 pitches below surface of housing (30). Remove tangs.

d. Assembly.

(1) Assemble in reverse order of disassemble procedures (para 6-9 b. above) observing the following.

(2) Install rotor (24, fig. 6-15) with bearing (23) into housing assembly (25).

(3) Install impeller (22) on shaft or rotor (24), observing direction of rotation. Apply anti-seize compound (Specification JAN-A-669) to threaded shaft of rotor (24) before installing nut (19) to 460 to 480 pound-inches torque, using holding fixture torque wrench (fig. 6-16).

(4) Install thermal protector (15, fig. 6-16) on end bell (16). Temporarily install end bell (16) on housing assembly (25). Measure rotor (24) shaft end play, using end play measuring fixture (fig. 6- 22). Install discs (8, 9, 10, fig. 6-16) as required to obtain a total rotor (24) shaft end play of 0.080 to 0.084 inch.

(5) Remove end bell (16) and connect electrical wiring in accordance with figure 6-17. Make electrical connections, using solder (Federal Specification QQ-S-571, Type SN60-W-RA-P2).

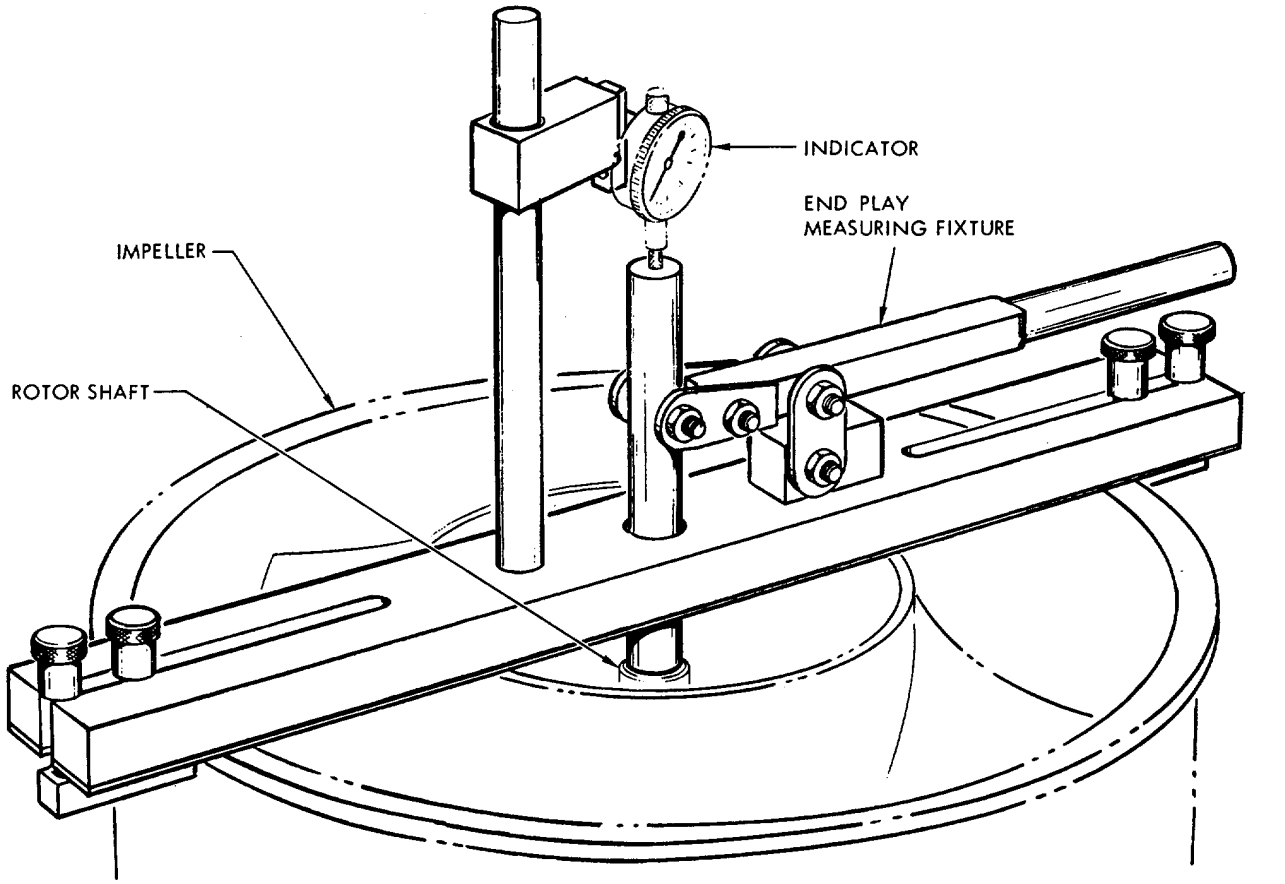


Figure 6-22. End play measurement.

(6) Coat threads of clamps (17, fig. 6-15) with surface primer to dry. Coat threads with sealant (Military Specification MIL-S-224373, Class 10) and install screws while sealant is wet.

(7) Tighten screws on clamp (17) inside housing (25). Install end bell (16), washers (11), and discs (8, 9, 10), then tighten screws on clamp (17) on outside of housing assembly (25).

(8) After assembly, paint end of rotor (24) shaft, hex hole in shaft, and nut (19) with one coat of primer (Cati-Coat E42GP15, mixed equal parts by volume with Catalyst V66KP15) and air-dry for 15 to 30 minutes; then bake at 150° to 175° F (65.° to 79.4°) for one hour.

e. Installation. Refer to TM 5-6115-586-12 for condenser fans installation instructions.

CHAPTER 7

REPAIR OF BLEED AIR AND EXHAUST HEATING INSTALLATION

7-1. General

The bleed air and exhaust heating installation supplies heated air upon user demand. The installation consists of an engine mounted unloading air shutoff valve, ducting, two hot air flow control valves, temperature sensors and controls mounted on the air conditioning control panels. The exhaust system portion of this installation consists of a diffuser, bellows, box, plenum and stack assembly. A heat exchanger, mounted on the box next to the stack, is also included in this installation. Tubing hoses and plumbing fittings provide interconnection of these components and connection to the power plant.

7-2. Ducting, Tubing, and Plumbing Fittings

a. General. The ducting, tube assemblies and plumbing fittings interconnect the heating system components.

b. Removal. Remove ducting, tube and plumbing fittings only as required and feasible by following the sequence of index numbers, 1 through 30, assigned to figure 7-1, sheet I of 3.

c. Cleaning, Repair and Inspection.

(1) Clean ducting, tubes and plumbing fittings with an approved solvent and thoroughly dry with filtered compressed air.

(2) Visually inspect ducting for dents, cracks, damage to mating flanges or other damage.

(3) Inspect tubes for cracks, dents. damaged threads or other damage.

(4) Replace all parts damaged beyond simple repair.

d. Installation. Install ducting, tube assemblies and plumbing fittings in reverse order of removal procedures.

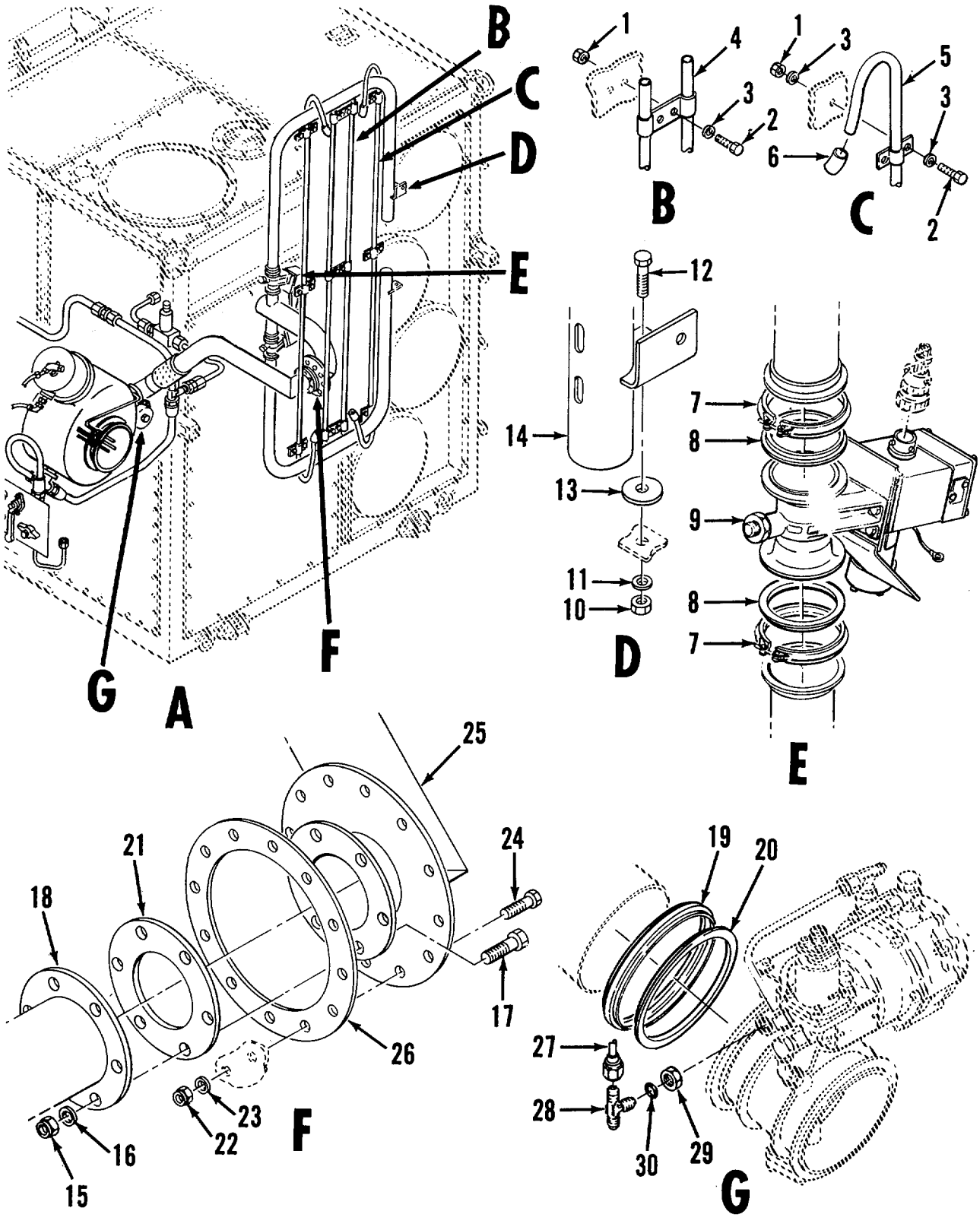
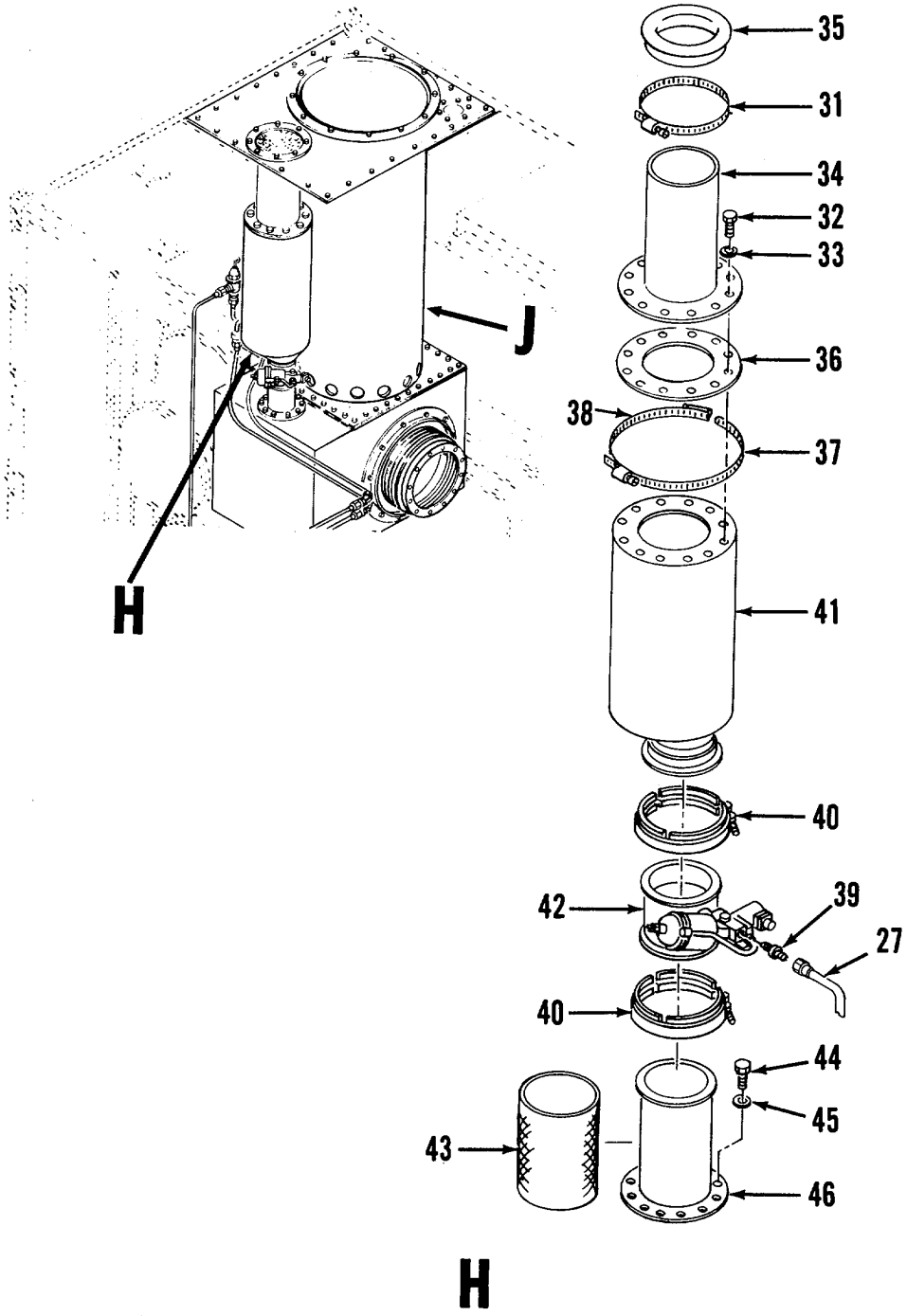


Figure 7-1. Bleed air and exhaust heating installation, exploded view. (sheet 1 of 3)

KEY to fig. 7-1.

1. Nut
2. Bolt
3. Flat washer
4. Shielding support
5. Shielding tube
6. Sleeving
7. Coupling-clamp
8. Metal gasket
9. Butterfly valve
10. Nut
11. Flat washer
12. Bolt
13. Washer
14. Metal tube
15. Nut
16. Plain washer
17. Bolt
18. Flexible pipe
19. Coupling-clamp
20. Gasket
21. Gasket
22. Nut
23. Plain washer
24. Bolt
25. Heat manifold duct
26. Gasket
27. Tube assembly
28. Tee
29. Nut
30. Packing



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31. Clamp
32. Bolt
33. Flat washer
34. Muffler
35. Seal
36. Gasket
37. Clamp
38. Clamp
39. Union
40. Coupling
41. Heat exchanger
42. Valve
43. Insulation
44. Bolt
45. Plain washer
46. Support

Figure 7-1. Bleed air and exhaust heating installation, exploded view. (sheet 2 of 31

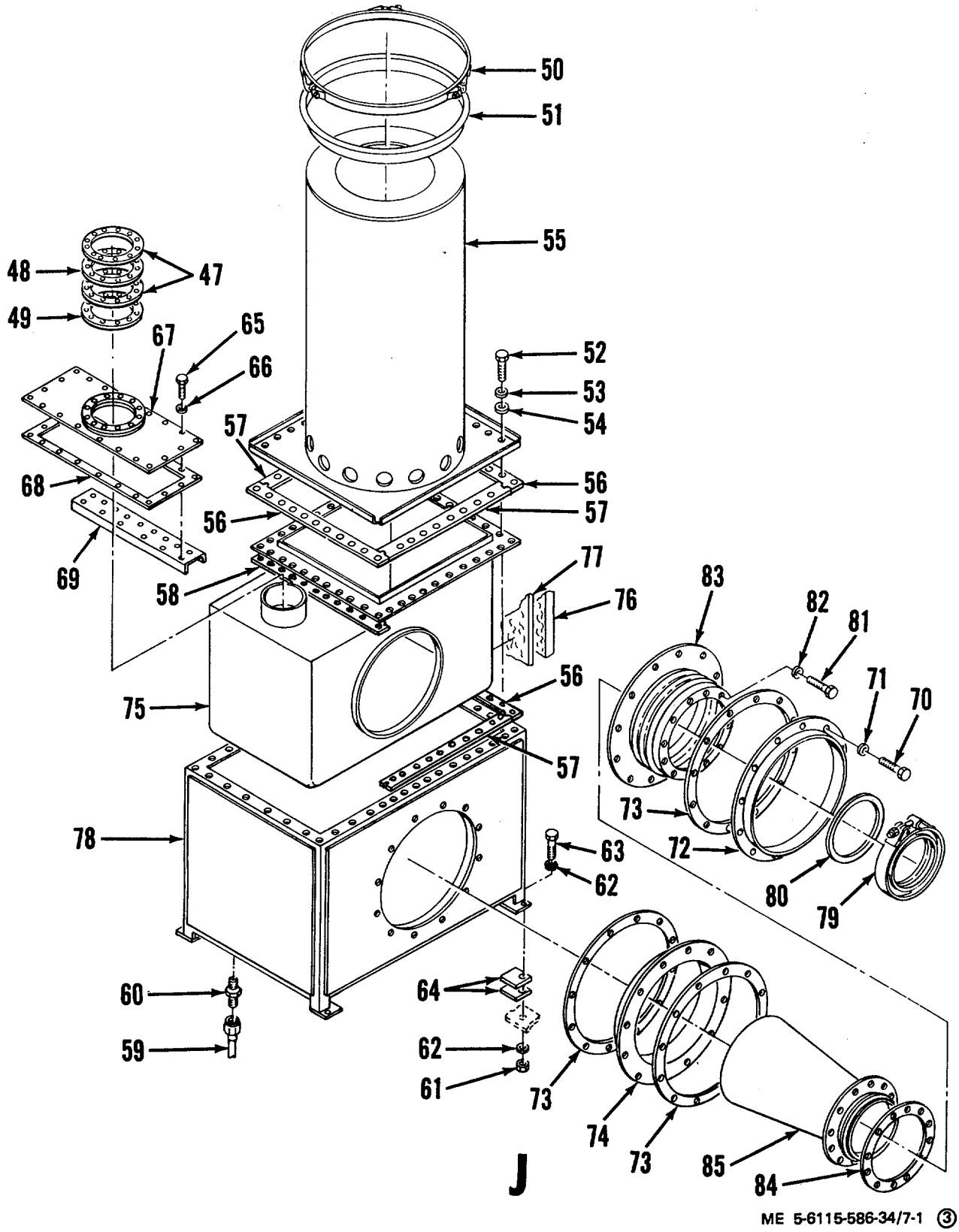


Figure 7-1. Bleed air and exhaust heating installation, exploded view. (sheet 3 of 3)

KEY to figure 7-1--Continued:
47. Gasket
48. Gasket
49. Gasket
50. Clamp
51. Seal
52. Bolt
53. Washer
54. Washer
55. Exhaust stack
56. Gasket
57 . Gasket
58. Gasket
59. Tube assembly
60. Union
61. Nut
62. Flat washer
63. Bolt
64. Spacer
65. Bolt
66. Flat washer
67. Skin
68. Gasket
69. Channel
70. Bolt
71. Flat washer
72. Flange
:73. Gasket
74. Flange
.75. Plenum
76. Insulation
77. Insulation
78. Frame
79. Coupling clamp
80. Gasket
81. Bolt
82. Flat washer
83. Bellows
84. Gasket
85. Diffuser

7-3. Heat Exchanger

a. Removal.

(1) Remove clamp (31, fig. 7-1, sheet 2 of 3), bolts (32), and washers (33), then remove muffler (341, seal (35) and gasket (36) from exchanger (41).

(2) Loosen and remove clamp (37, 38), upper coupling (40) and exchanger (41) from outlet flange of valve (42). Remove tube (27) from union (3:9 1.

(3) Remove lower coupling (40), and valve (42).

(4) Remove insulation (43) from around support (46), then remove bolts (44) and washers (45) securing support (46). Remove support (46) and gaskets (47, 48, 49, fig. 7-1, sheet 3 of 3) from exhaust box.

(5) Discard gaskets (47, 48, 49, 36) and seal (35) at each overhaul.

b. Cleaning, Inspection and Repair.

(1) Clean all parts with a rag moistened in an approved cleaning solvent.

(2) Inspect parts for cracks, dents or other obvious damage.

(3) Inspect all threaded parts for stripped, crossed, or peened threads.

(4) Repair minor cracks and dents using simple shop repair practices.

(5) Replace all parts damaged beyond simple repair.

(6) Replace gaskets and seals at each overhaul.

c. Installation.

(1) Install insulation (43, fig. 7-1, sheet 2 of 3), around support (46). Install gasket (47 through 49) onto exhaust box, then install support (46) with insulation (43) onto gaskets (47 through 49) and secure with washers (45) and bolts (44).

(2) Install valve (42) onto support (46) and secure with one coupling (40).

(3) Install exchanger (41) onto valve (42) and secure with coupling (40) and clamps (37 and 38).

(4) Position gasket (36) onto exchanger (41), position seal (35) and slide exhaust (34) in on top of exchanger (41) with gasket (36) and secure with washers (33) and bolts (32), secure (35) to exhaust 134) with clamp (31).

(5) Install plumbing connections.

7-4. Exhaust System

The exhaust system consists of a ring assembly mounted to the enclosure, exhaust box, and a bellows and diffuser interconnecting the engine exhaust to the exhaust box.

a. Disassembly.

(1) Loosen and remove clamp (50, fig. 7-1, sheet 3 of 3), remove bolts (52), washers (53, 54) from exhaust stack (55).

(2) Remove exhaust stack (55) from top of plenum (75), then remove gaskets (56, 57, 58) from top of frame (78) and seal (51) from top of exhaust stack (55).

(3) Remove tube assembly (59) from union (60) on bottom of frame (78).

(4) Remove water system heat ducting from top of frame (78).

(5) Remove coupling clamp (79), gasket (80), bolts (70), washers (71), flange (72) and gasket (73) from frame (78) inlet.

(6) Remove bellows (83), gaskets (73) and flange (74) from frame (78).

(7) Remove bolts (81), washers (82), and diffuser (85) with gasket (84) from frame (78).

(8) Remove bolts (65), washers (66), skin (67), gasket (68) and channel (69) from frame (78).

(9) Lift plenum (75) from frame (78), then remove insulation (76, 77). Remove nuts (61), washers (62), bolts (63), and frame (78), then remove spacers (64).

b. Cleaning, Inspection and Repair.

(1) Clean exhaust system components with an approved solvent and stiff bristled brush.

(2) Inspect components for cracks, broken welds or other damage.

(3) Replace any part damaged beyond simple repair.

(4) Replace gaskets (56, 57, 58, 68, 73), and seal (51) at each overhaul regardless of condition.

c. Assembly.

(1) Wrap plenum (75,fig. 7-1,sheet 3 of 3) in insulation (77).

(2) Fill void between plenum (75) and frame (78) with insulation (76).

(3) Install spacers (64), frame (78), and secure with bolts (63), washers (62) and nuts (61).

(4) Install channel (69), gasket (68) and skin (67). Secure with washers (66) and bolts (65).

(5) Install gasket (84) and diffuser (85) and secure to bellows (83) with washers (82) and bolts (81).

(6) Position gaskets (73), flange (74) and flange (7-2); secure with bolts (70) and washers

(7) Install gasket (80) and coupling clamp 179) onto diffuser (85).

(8) Install tube assembly (59) onto union (60). then install new seal (51) to top of exhaust stack (55), and position gasket (56, 57, 58) on top of frame (78).

(9) Install exhaust stack (55) on top of previously installed gasket (56, 57, 58) on top of frame (78) and secure with bolts (52), washers (53, 54).

(10) Install clamp (50) over seal (51) and secure clamp (50).

7-5. Bleed Air Lines and Fittings

a. Removal. Refer to TM 5-6115-586-12 for removal procedures.

b. Cleaning, Inspection and Repair.

(1) Clean all parts with an approved cleaning solvent and dry thoroughly with filtered com- pressed air.

(2) Inspect tube assemblies for kinks, bends, cracks or other damage which might restrict flow or result in leakage. Inspect nuts and sleeves on tube assemblies for loose sleeves or. damage to nuts.

(3) Install handles on manual valves and operate valve to ensure freedom of moving parts and absence of binding.

(4) Repair minor damage to tube assemblies using simple shop repair practices. If tube assemblies are damaged beyond simple repair practices, replace the damaged assembly.

(5) Repair any minor damage to manual valves using simple shop repair. Replace frozen, damaged or otherwise inoperative valves.

c. Installation. Refer to TM 5-6115-586-12 for installation procedures.

CHAPTER 8

REPAIR OF WATER SYSTEM PLUMBING INSTALLATION

Section I. TUBE ASSEMBLIES, FITTINGS, AND MANUAL VALVES

8-1. General

This section contains repair instructions for the tube assemblies and fittings that interconnect water system components and for the manually operated valves utilized to control water flow and vent the system.

8-2. Removal and Disassembly

Refer to TM 5-6115-586-12 for instructions regarding removal of tube assemblies, fittings, and valves.

8-3. Cleaning, Inspection and Repair

a. Cleaning. Clean tube assemblies, fittings and valves with soft bristle brush and hot, soapy water. Rinse thoroughly and dry with filtered, compressed air.

Note

Do not use solvent for cleaning as plumbing must carry potable water. If necessary, the ends of tube assemblies may be sealed and the external surfaces cleaned with a rag moistened with solvent.

b. Inspection.

(1) Inspect fittings for stripped, crossed or peened threads. Inspect plumbing fittings for cracks or clogged passages.

(2) Inspect tube assemblies for cracks, bends or crimps which might restrict flow or result in leakage. Inspect connection nuts and sleeves on tube assemblies for loose sleeves or damage to nuts.

(3) Inspect check valves for crossed, stripped or peened threads.

(4) Inspect hot and cold water shutoff valves, hot water return / drain valve, and hot water tank vent valve for crossed, stripped, or peened threads or other visible damage. Check valves for ease of operation and absence of binding.

c. Repair.

(1) Replace all fittings damaged beyond simple repair of threads.

(2) Replace defective tube assemblies.

(3) Replace check valves if they do not operate properly or if threads are damaged beyond simple repair.

(4) Replace leaking or binding valves and valves with damaged threads.

8-4. Reassembly and Installation

Refer to TM 5-6115-586-12 for instructions on installation of tube assemblies, fittings, and valves.

Section II. SURGE TANK AND PRESSURE SWITCH

8-5. General

The surge tank dampens pressure surges in the water system. It is mounted to a bracket in the water system compartment by two clamps. The pressure switch, mounted to fittings at the top of the tank, actuates the hot water pump contactor (K 15).

8-6. Removal

Refer to TM 5-6115-586-12 for removal instructions.

8-7. Cleaning, Inspection and Repair

a. Cleaning.

Note

Cap openings prior to cleaning tank externally with solvent. Do not get solvent inside tank.

(1) Clean external portions of the tank using an approved solvent and a stiff bristled brush.

(2) Back flush tank with clean hot water.

b. Inspection and Testing.

(1) Inspect threaded areas for crossed, stripped or peened threads.

(2) Inspect tank for cracks, breaks in welds and dents. Tank shall not leak when tested at 150 PSIG minimum.

(3) Inspect switch body for dents, cracks, or other damage.

(4) Check continuity across switch terminal posts. Contact arrangement is single pole, double throw: common to one post should be open and common to the other post should be closed.

(5) Apply adjustable pressure to pick up area of switch and check that the closed set of contacts open and the open set closes at 10-1 PSIG. Contacts should return to normal positions at 5 PSI differential on decreasing pressure.

c. Repair.

(1) Repair damaged threads. If threads cannot be repaired, replace the part.

(2) Welding repair of corrosion resistant steel surge tank shall be attempted only by properly certified welder. (Refer to MIL-T-5021, Class A, Group II).

(3) Replace pressure switch found to be defective through inspection or testing.

8-8. Installation

Refer to TM 5-6115-586-12 for installation instructions.

Section III. HOT WATER TANK, THERMOSTATIC SWITCH AND RELIEF VALVES

8-9. General

This section contains repair instructions for the hot water storage tank, the thermostatic switch and the relief valve, mounted to the hot water tank fittings, and the safety relief valve mounted to the heat exchanger fittings.

8-10. Removal of Components

Refer to TM 5-6115-586-12 for instructions on removal of the hot water tank, thermostatic switch and relief valve.

8-11. Hot Water Tank

a. Cleaning and Inspection.

Note

Cap all ports on tank. Do not allow solvent to get into tank.

(1) Clean tank externally using an approved cleaning solvent and a stiff bristled brush.

(2) Clean tank internally by back flushing with clean hot water.

(3) Inspect threaded areas for crossed, stripped or peened, threads.

(4) Inspect tank for cracks, dents or other dam age.

b. Repair.

(1) Repair defective threads. If threads cannot be repaired, replace the tank.

(2) Welding repair of the hot water tank shall be attempted only by a certified welder (per MIL-T-5021, Class A, Group II).

8-12. Thermostatic Switch

a. Clean thermostatic switch with a cloth dampened in an approved solvent.

b. Inspect threaded areas for crossed, stripped or peened threads.

c. Inspect switch body for dents, cracks or other damage.

d. Check continuity across terminal posts; circuit shall be closed.

e. Apply heated water to pick up area of switch; as heat reaches 160° ± 4-5°F, circuit across terminal posts shall open.

f. Replace switch if damaged beyond simple repair or if switch fails to meet test requirements.

8-13. Pressure and Temperature Relief Valve

a. Clean relief valve using a cloth dampened in an approved solvent.

b. Inspect threaded areas for crossed, stripped or peened threads.

c. Provide a means of controlling and measuring pressure and temperature of test water.

d. Inspect relief valve for dents, cracks or other damage.

i. Check relief valve setting; valve shall open at 15 psig.

f. Check temperature relief setting; valve shall start to open at 200°F and shall be fully open at 210°F.

g. Replace relief valve if damaged beyond simple repair or if inspection requirements are not met.

8-14. Safety Relief Valve

a. Clean safety relief valve using a cloth dampened in an approved solvent.

b. Inspect threaded areas for stripped, crossed or peened threads.

c. Inspect body of valve for dents, cracks or other damage.

d. Apply air pressure to inlet post of valve and gradually increase pressure to 100 psig. Valve shall relieve at 100 ± 5 psig.

e. Replace valve if damaged beyond simple repair or if test requirements are not met.

8-15. Installation of Components

Refer to TM 5-6115-586-12 for installation instructions.

CHAPTER 9

ENCLOSURE AND SHELL ASSEMBLY

9-1. General

The enclosure and shell assembly contains the operating components of the power units and systems and mounts lifting and leveling components.

9-2. Enclosure and Shell Assembly

a. Disassembly.

(1) Do not disassemble the enclosure unless inspection reveals damage. If required, disassemble the enclosure assembly by following the sequence of index numbers 1 through 271 assigned to figure 9-1 .

(2) Do not disassemble the shell assembly unless inspection reveals damage. If required, disassemble the shell assembly by following the sequence of index numbers 1 through 315 assigned to figure 9-1.

Note

Do not disassemble the enclosure or the shell assembly in their entirety. Remove and disassemble only those parts requiring repair or replacement and those parts necessary to gain access to the damaged parts.

b. Cleaning. Inspection an Repairs.

(1) Clean components of the enclosure with a clean cloth dampened in an approved solvent, dry thoroughly with compressed air.

(2) Inspect doors and panels for cracks, loose rivets, damaged fasteners and other defects.

(3) Inspect frame assembly and other welded components for cracks or breaks on welded joints. Reweld the frame which is aluminum alloy 6061. T4 and T6 QQ-A-200 / 8 and QQ-A-250 / 16 using filler 4043, examine and certify according to military specification MIL-T-5021.

(4) Repair damaged components using simple shop repair.

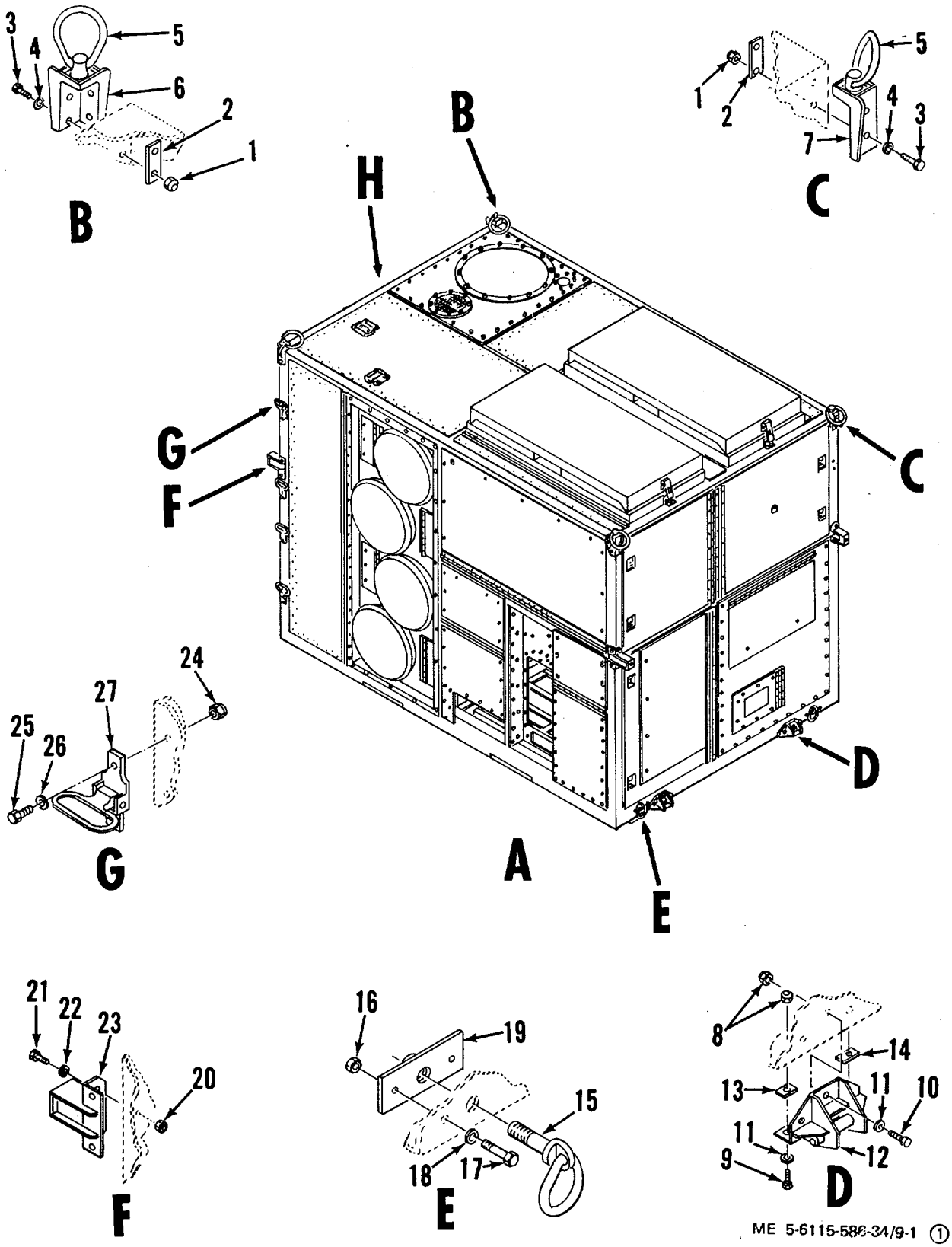


Figure 9-1. Enclosure assembly, exploded view. (sheet 1 of 10)

KEY to figure 9-1.

1. Nut
2. Plate
3. Bolt
4. Flat washer
5. Ring bolt
6. Bracket
7. Bracket
8. Nut
9. Bolt
10. Bolt
11. Flat washer
12. Bracket
13. Spacer
14. Spacer
15. Ring bolt
16. Nut
17. Bolt
18. Flat washer
19. Nut plate
20. Nut
21. Bolt
22. Flat washer
23. Bracket
24. Nut
25. Bolt
26. Flat washer
27. Folding step

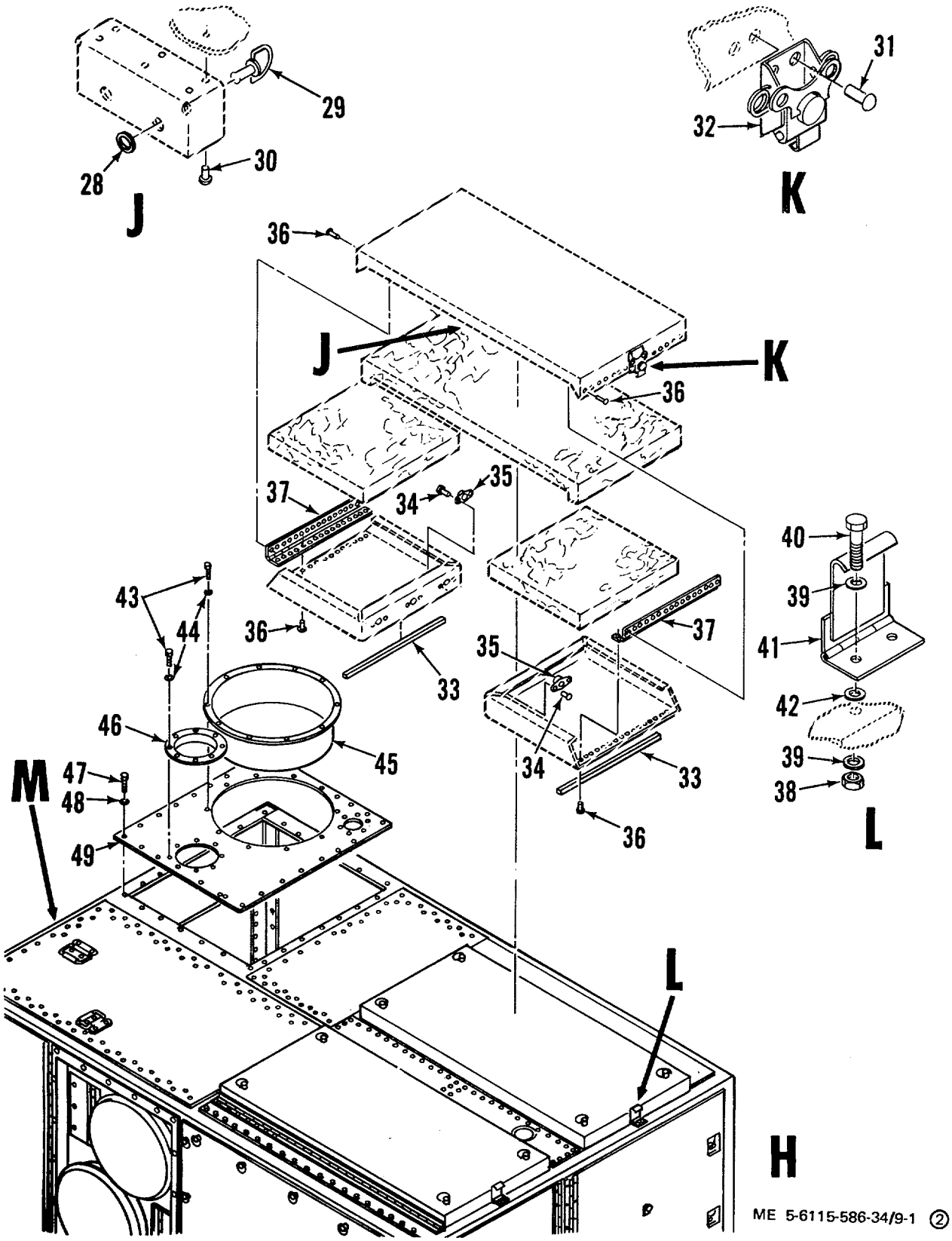
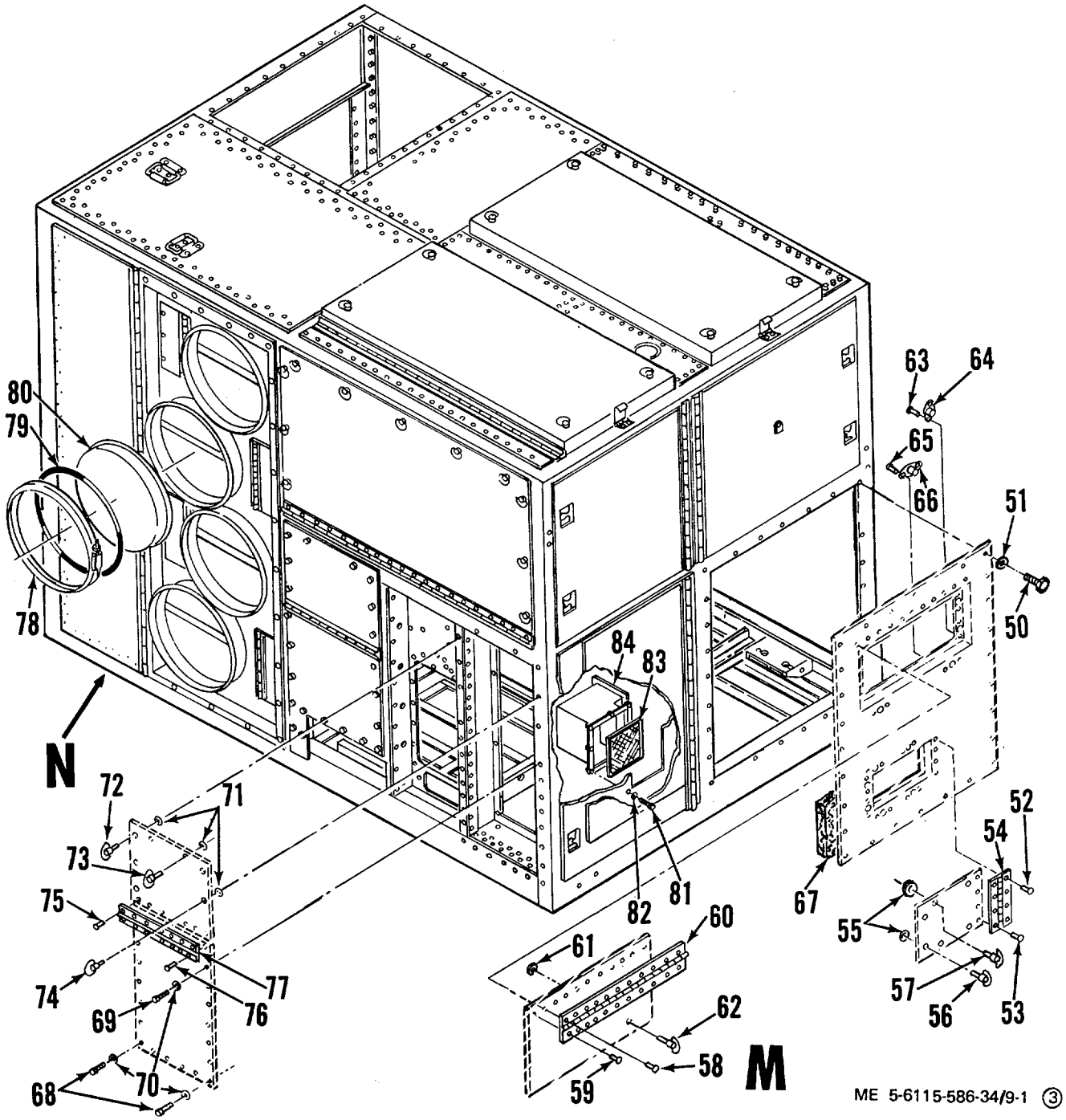


Figure 9-1. Enclosure assembly, exploded view. (sheet 2 of 10)

KEY to figure 9-1-Continued:

28. Retainer
29. Stud
30. Rivet
31. Rivet
32. Catch
33. Tape
34. Rivet
35. Receptacle
36. Rivet
37. Hinge
38. Nut
39. Flat washer
40. Bolt
41. Strike
42. Flat washer
43. Bolt
44. Flat washer
45. Seal ring
46. Ring
47. Bolt
48. Flat washer
49. Top plate



50. Bolt
51. Flat washer
52. Rivet
53, Rivet
54. Hinge
55. Retainer
56. Turnlock fastener stud
57. Turnlock fastener stud
58. Rivet
59. Rivet
60, Hinge
61. Retainer
62. Turnlock fastener stud
63. Rivet
64. Receptacle
65. Rivet
66. Nut plate
67. Insulation
68. Bolt
69. Bolt
70. Washer
71. Retainer
72. Turnlock fastener stud
73. Turnlock fastener stud
74. Turnlock fastener stud
75. Rivet
76. Rivet
77. Hinge
78. Coupling clamp
79. Packing
80. Dust cover
81. Bolt
82. Flat washer
83. Screen
84. Air duct

Figure 9-1. Enclosure assembly, exploded view. (sheet 3 of 10)

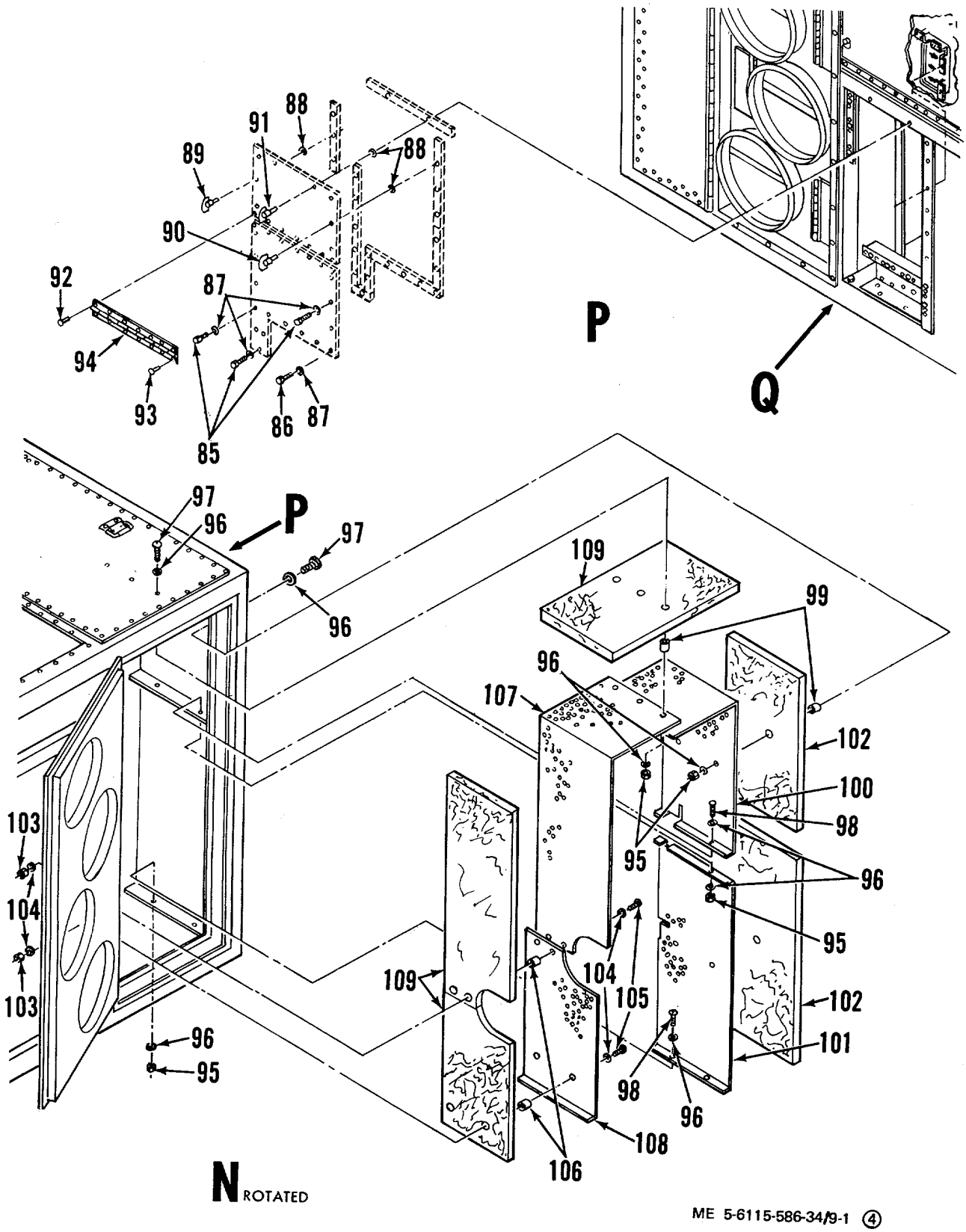


Figure 9-1. Enclosure assembly, exploded view. (sheet 4 of 10)

KEY to figure 9-1-Continued:

85. Bolt
86. Bolt
87. Flat washer
88. Retainer
89. Turnlock fastener stud
90. Turnlock fastener stud
91. Turnlock fastener stud
92. Rivet
93. Rivet
94. Hinge
95. Nut
96. Flat washer
97. Machine screw
98. Machine screw
99. Spacer
100. Shield
101. Outlet shield
102. Insulation
103. Nut
104. Flat washer
105. Machine screw
106. Spacer
107. Shield
108. Shield
109. Insulation

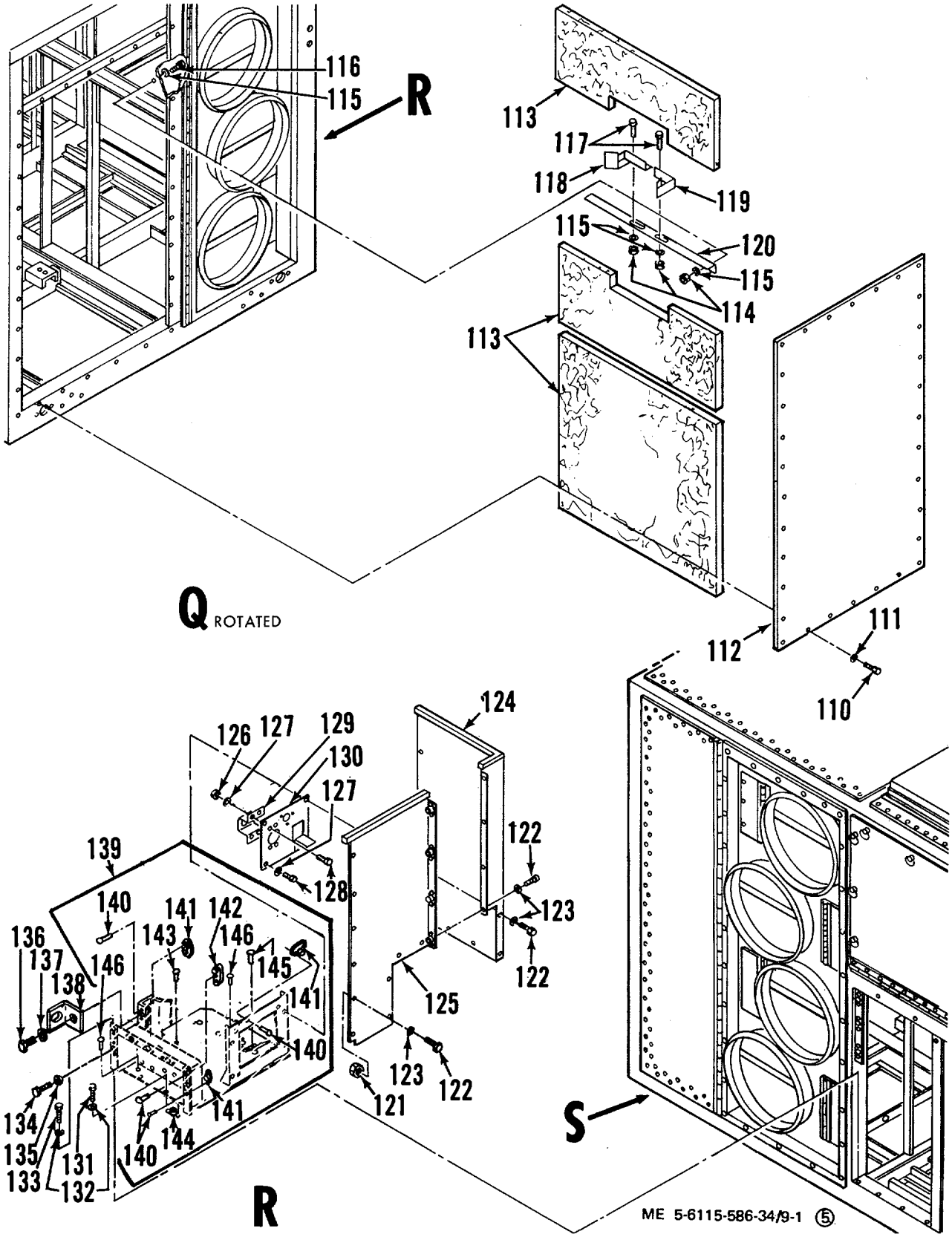
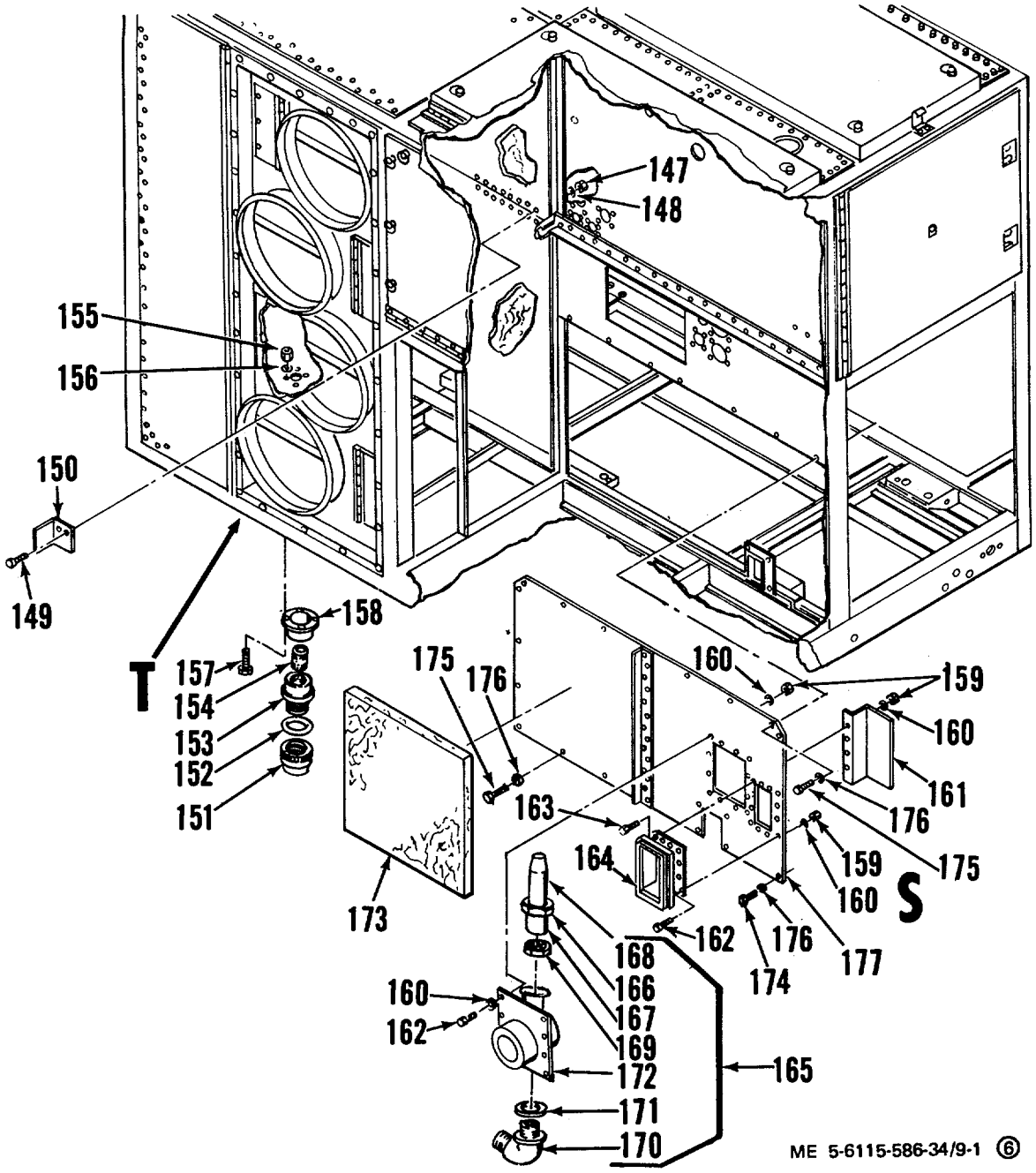


Figure 9-1. Enclosure assembly, exploded view. (sheet 5 of 10)

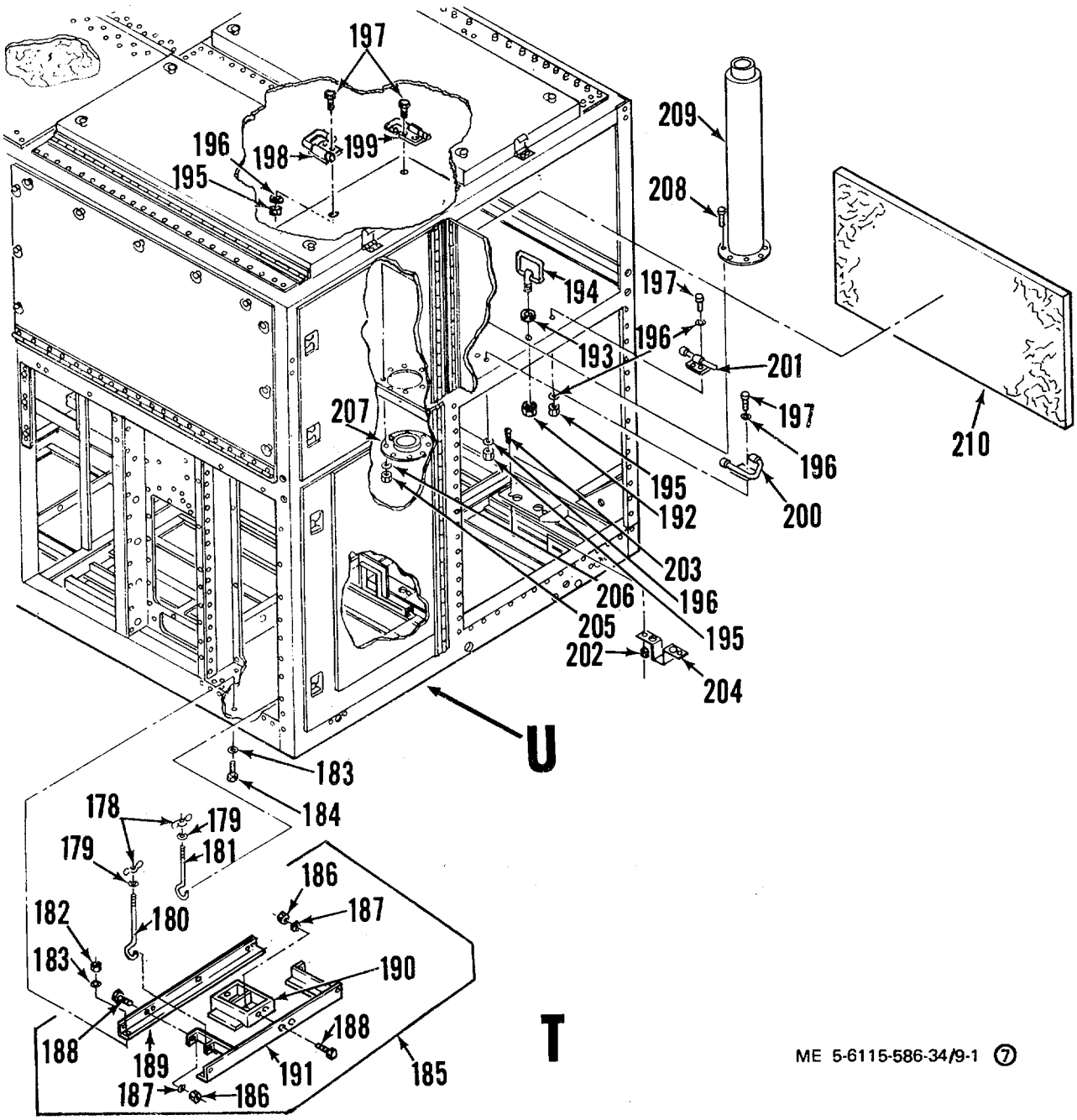
KEY to figure 9-1-Continued:

110. Bolt
111. Flat washer
112. Panel
113. Insulation
114. Nut'
115. Flat washer
116. Bolt
117. Bolt
118. Bracket
119. Bracket
120. Brace
121. Nut
122. Bolt
123. Flat washer
124. Partition
125. Panel
126. Nut
127. Flat washer
128. Bolt
129. Bracket
130. Pump mount bracket
131. Bolt
132. Flat washer
133. Bolt
134. Bolt
135. Flat washer
136. Bolt
137. Flat washer
138. Clip
139. Base plate
140. Rivet
141. Plate nut
142. Plate nut
143. Rivet
144. Plate nut
145. Rivet
146. Rivet



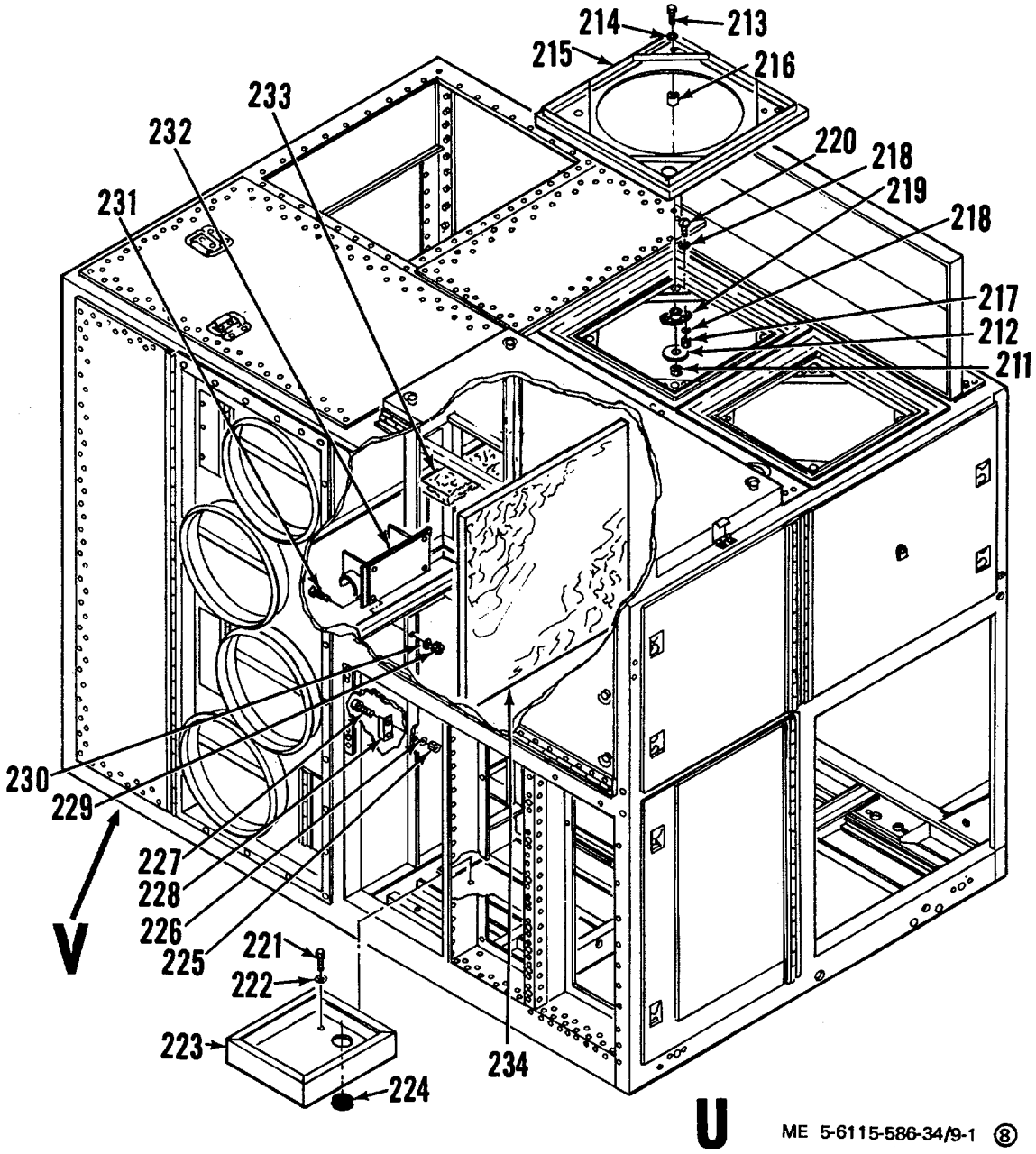
147. Nut
148. Flat washer
149. Bolt
150. Bracket
151. End cap, hose
152. Gasket
153. Adapter
154. Nipple, pipe
155. Nut
156. Flat washer
157. Screw
158. Companion flange
159. Nut
160. Flat washer
161. Baffle, inlet air
162. Bolt
163. Bolt
164. Duct
165. Inlet air housing assy
166. Coupling nut
167. Sleeve
168. Nozzle
169. Nut
170. Elbow
171. Washer
172. Housing
173. Insulation
174. Bolt
175. Bolt
176. Flat washer
177. Engine compartment bulkhead

Figure 9-1. Enclosure assembly, exploded view. (sheet 6 of 10)



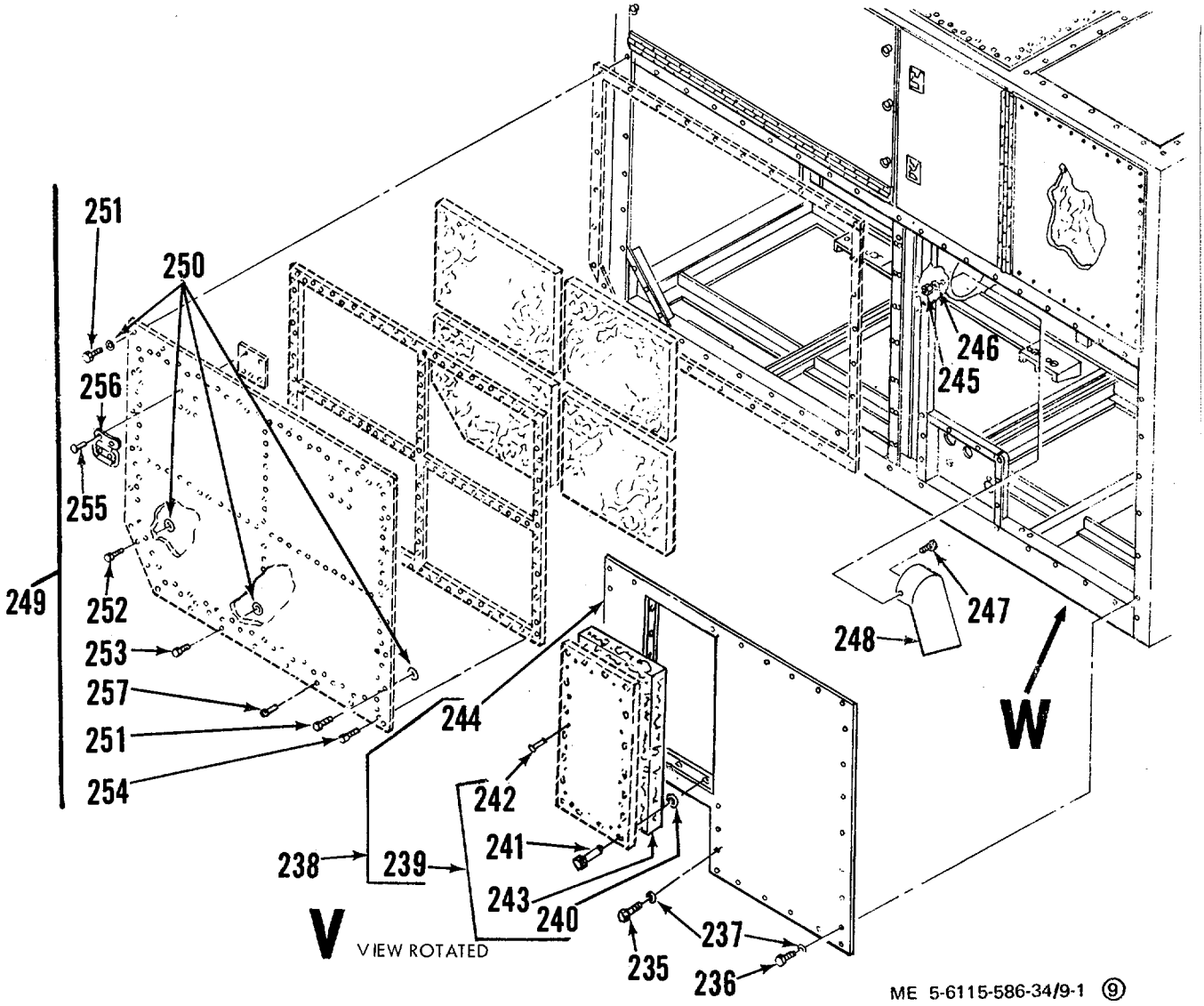
178. Wing nut
179. Flat washer
180. Eyebolt
181. Eyebolt
182. Nut
183. Flat washer
184. Bolt
185. Battery support assy
186. Nut
187. Flat washer
188. Bolt
189. Rail
190. Center support
191. Battery support
192. Nut
193. Flat washer
194. Tie-down fitting
195. Nut
196. Flat washer
197. Screw
198. Retainer
199. Retainer
200. Retainer
201. Retainer
202. Nut
203. Bolt
204. Bracket
205. Nut
206. Flat washer
207. Flange
208. Bolt
209. Air inlet tube
210. Polyurethane foam

Figure 9-1. Enclosure assembly. exploded view. (sheet 7 of 10)



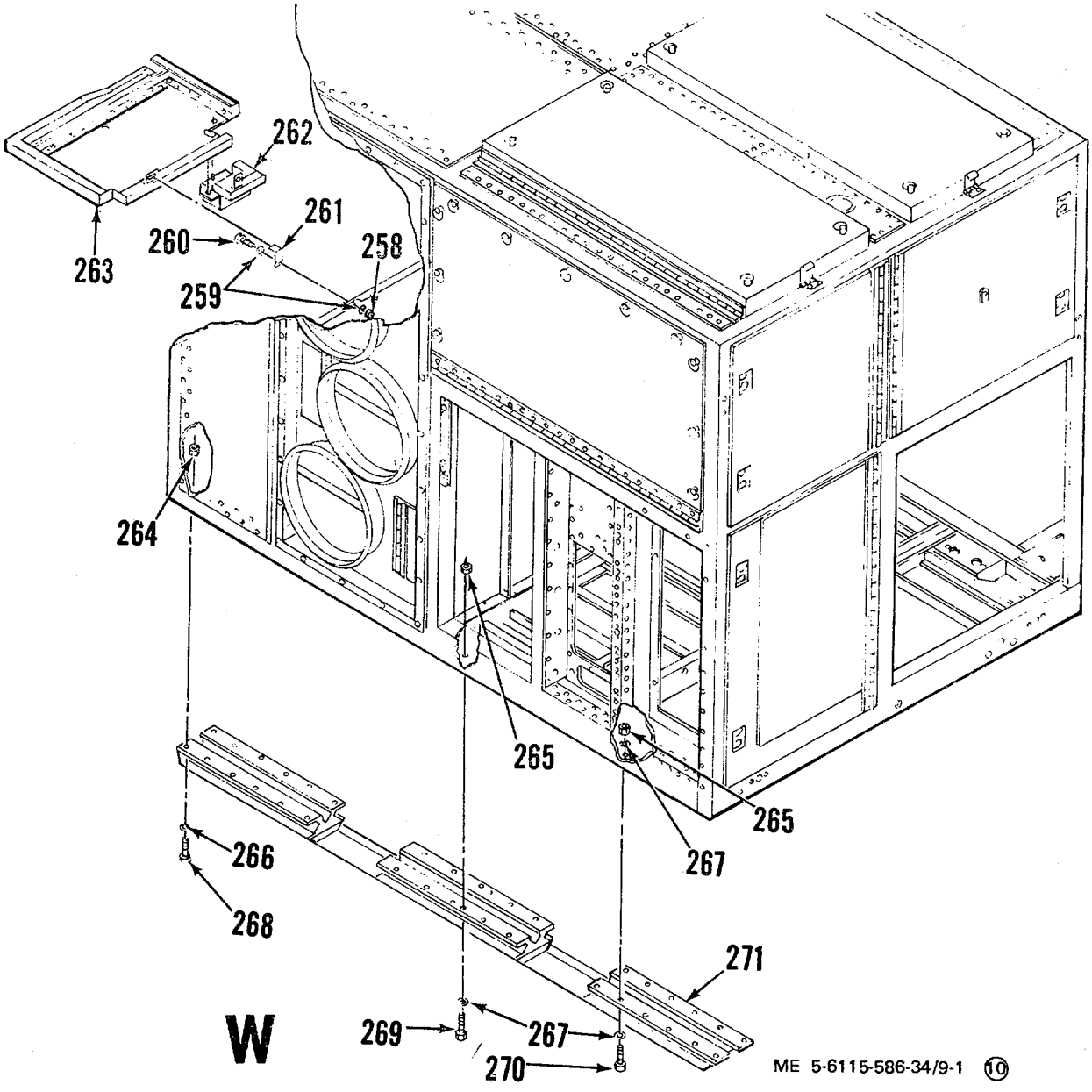
211. Nut
212. Flat Washer
213. Bolt
214. Flat washer
215. Mounting plate
216. Spacer
217. Nut
218. Flat washer. Nut
foam
219. Resilient mount
220. Screw
221. Bolt
222. Flat washer
223. Plenum case
224. Grommet
225. Nut
226. Flat washer
227. Bolt
228. Valve bracket
229. Nut
230. Flat washer
231. Bolt
232. Bracket
233. Insulation
234. Polyurethane

Figure 9-1. Enclosure assembly, exploded view. (sheet 8 of 10)



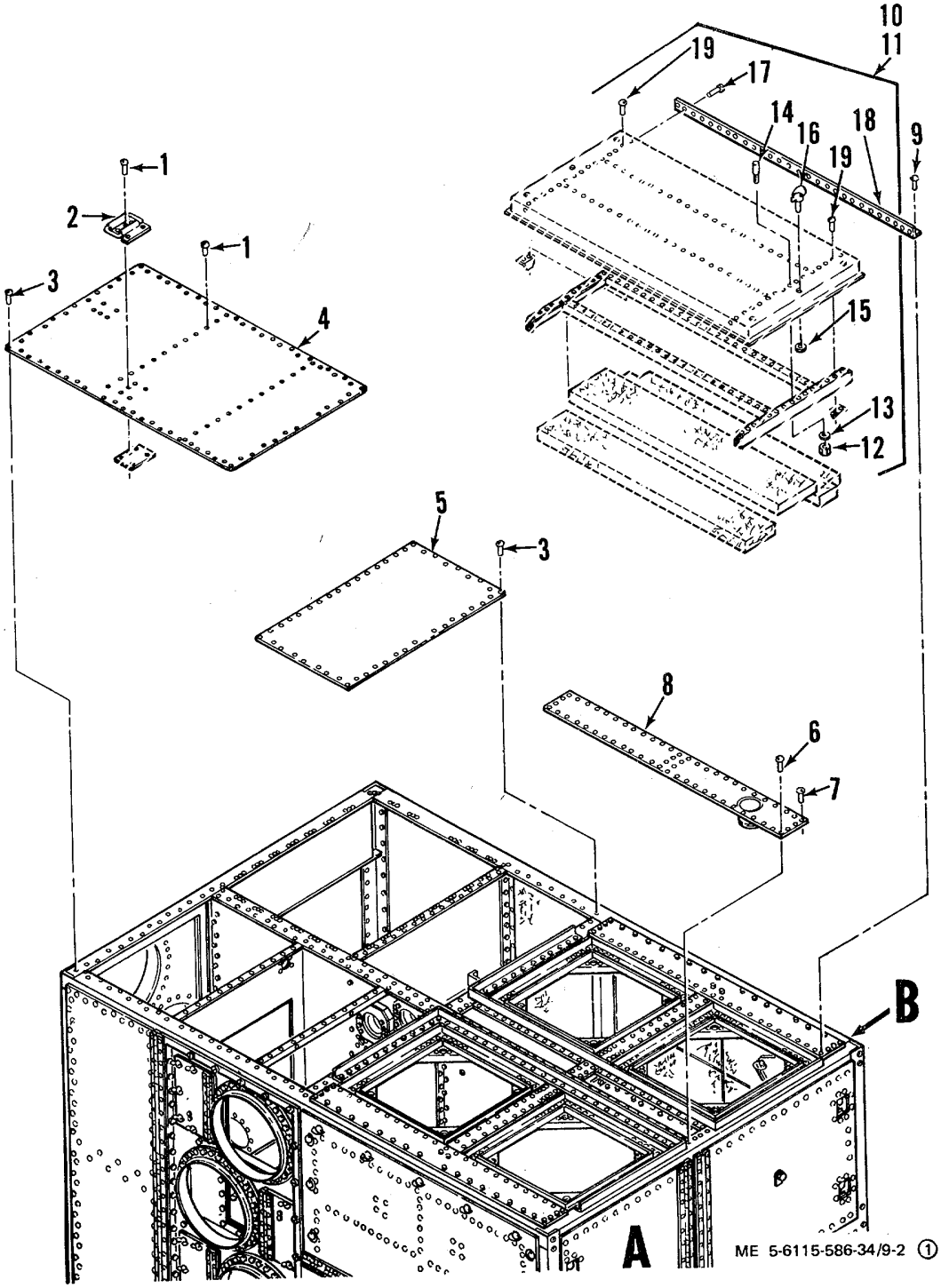
235. Bolt
236. Bolt
237. Flat washer
238. Exhaust panel assy
239. Exhaust panel door
240. Retainer
241. Turnlock fastener stud
242. Rivet
243. Insulation
244. Exhaust panel
245. Nut
246. Flat washer
247. Bolt
248. Elbow
249. Turbine access panel
250. Retainer
251. Stud fastener
252. Stud fastener
253. Stud fastener
254. Stud fastener
255. Rivet
256. Handle
257. Rivet

Figure 9-1. Enclosure assembly, exploded view. (sheet 9 of 10)



258. Nut
259. Flat washer
260. Bolt
261. Clip
262. Partition
263. Partition
264. Nut
265. Nut
266. Flat washer
267. Flat washer
268. Bolt
269. Bolt
270. Bolt
271. Resilient mount

Figure 9-1. Enclosure assembly, exploded view. (sheet 10 of 10)



1. Rivet
2. Bail handle
3. Rivet
4. Top plenum panel
5. Top compressor panel
6. Rivet
7. Rivet
8. Top panel
9. Rivet
10. Left condenser door
11. Right condenser door
12. Nut
13. Washer
14. Ball stud
15. Retainer
16. Turnlock fastener stud
17. Rivet
18. Hinge
19. Rivet

Figure 9-2. Shell assembly, exploded view. (sheet 1 of 9)

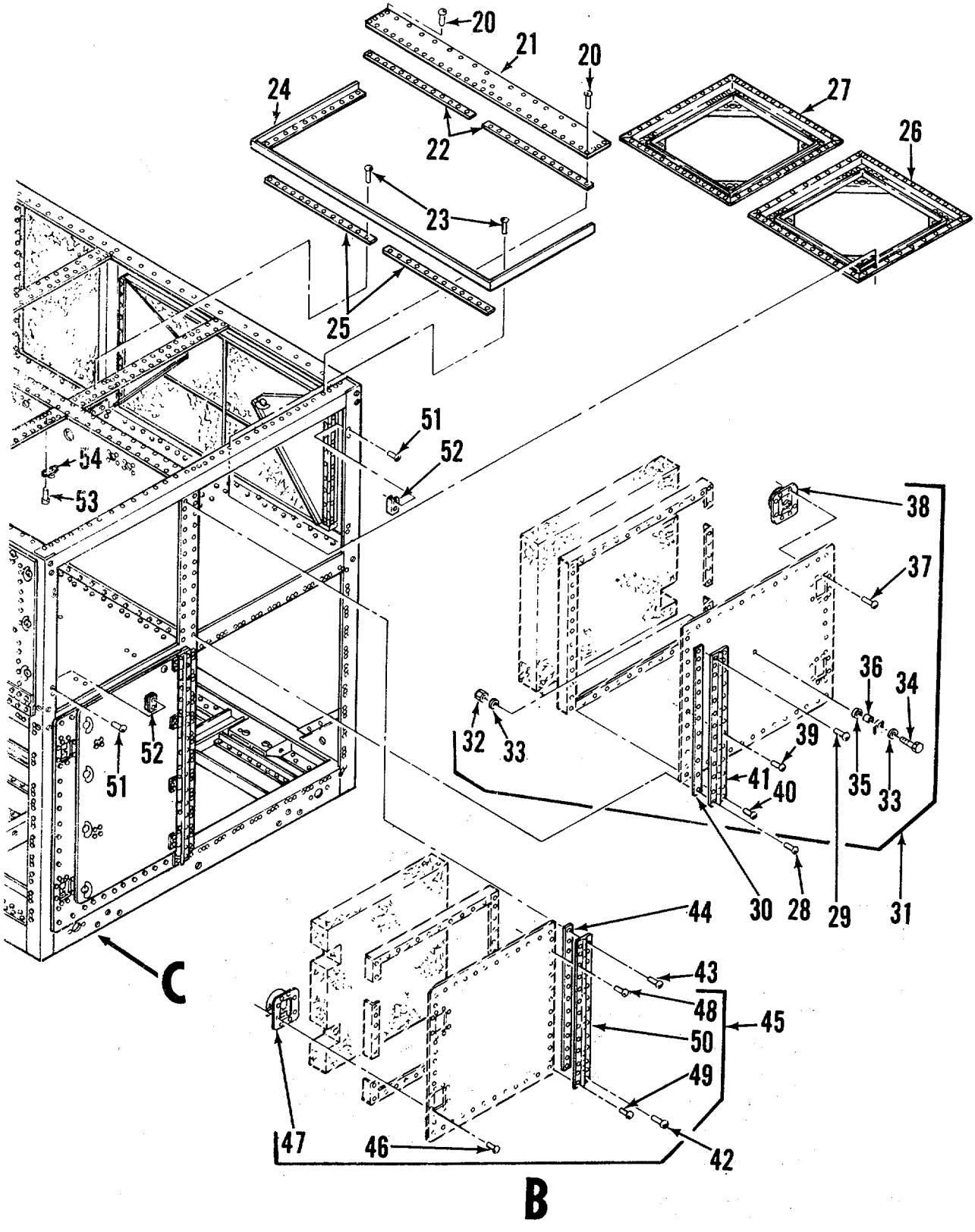


Figure 9-2. Shell assembly, exploded view. (sheet 2 of 9)

KEY to figure 9-2-Continued:

20. Rivet
21. Top panel, right
22. Plate spacer
23. Rivet
24. Panel frame
25. Plate spacer
26. Condenser fan support
27. Condenser fan support
28. Rivet
29. Rivet
30. Plate spacer
31. Condenser door, left front
32. Nut
33. Flat washer
34. Bolt
35. Flat washer
36. Tubing
37. Rivet
38. Lock
39. Rivet
40. Rivet
41. Hinge
42. Rivet
43. Rivet
44. Plate spacer
45. Condenser door, right front
46. Rivet
47. Lock
48. Rivet
49. Rivet
50. Hinge
51. Rivet
52. Latch retainer
53. Rivet
54. Receptacle

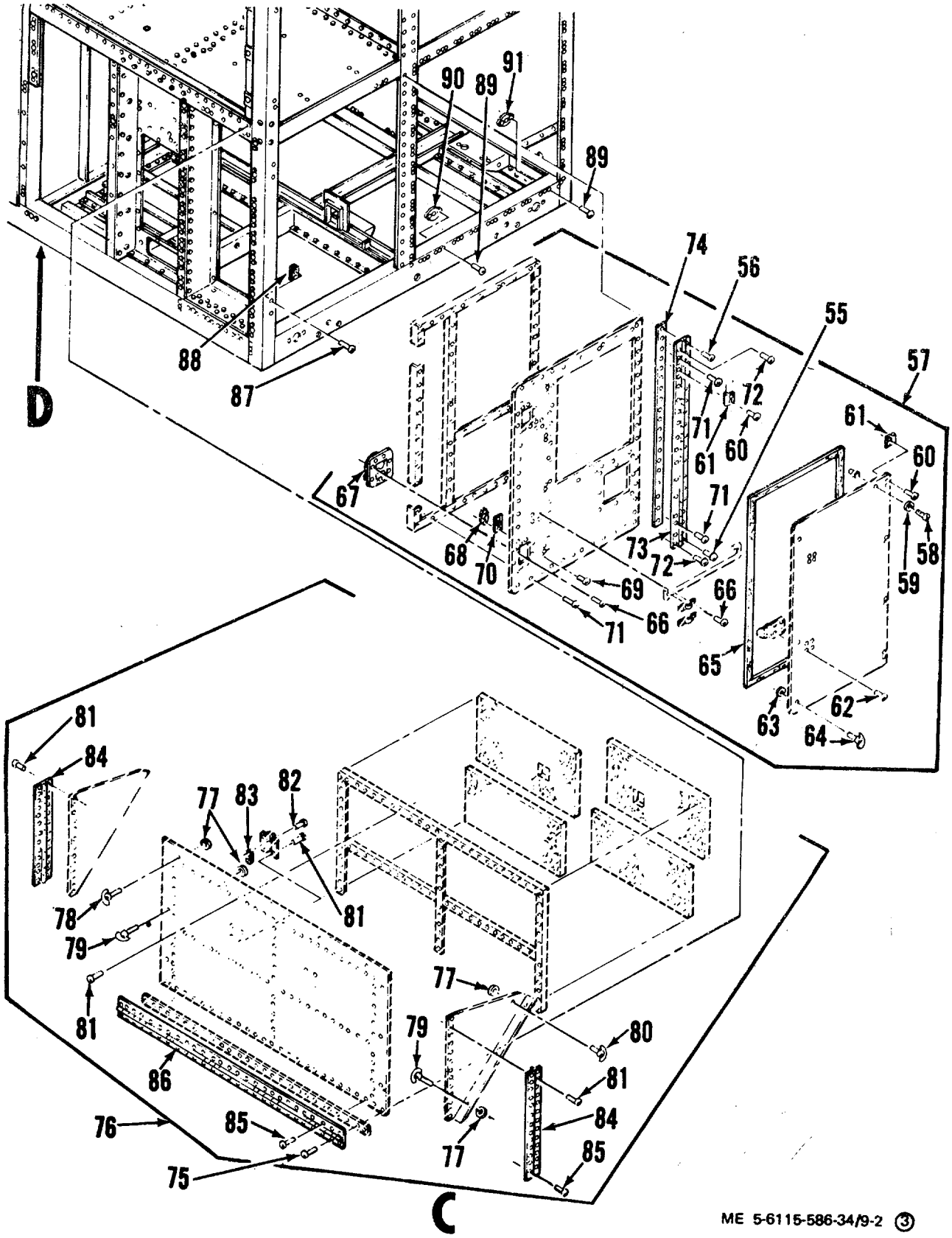


Figure 9-2. Shell assembly, exploded view. (sheet 3 of 9)

KEY to figure 9-2-Continued:

55. Rivet
56. Rivet
57. Turbine air inlet door
58. Screw
59. Tooth lockwasher
60. Rivet
61. Butt hinge
62. Rivet
63. Retainer
64. Turnlock fastener stud
65. Foam tape
66. Rivet
67. Lock
68. Protective cap
69. Rivet
70. Receptacle
71. Rivet
72. Rivet
73. Hinge
74. Plate spacer
75. Rivet
76. Condenser door, right
77. Retainer
78. Turnlock fastener stud
79. Turnlock fastener stud
80. Turnlock fastener stud
81. Rivet
82. Rivet
83. Receptacle
84. Hinge
85. Rivet
86. Hinge
87. Rivet
88. Latch retainer
89. Rivet
90. Plate nut
91. Plate nut

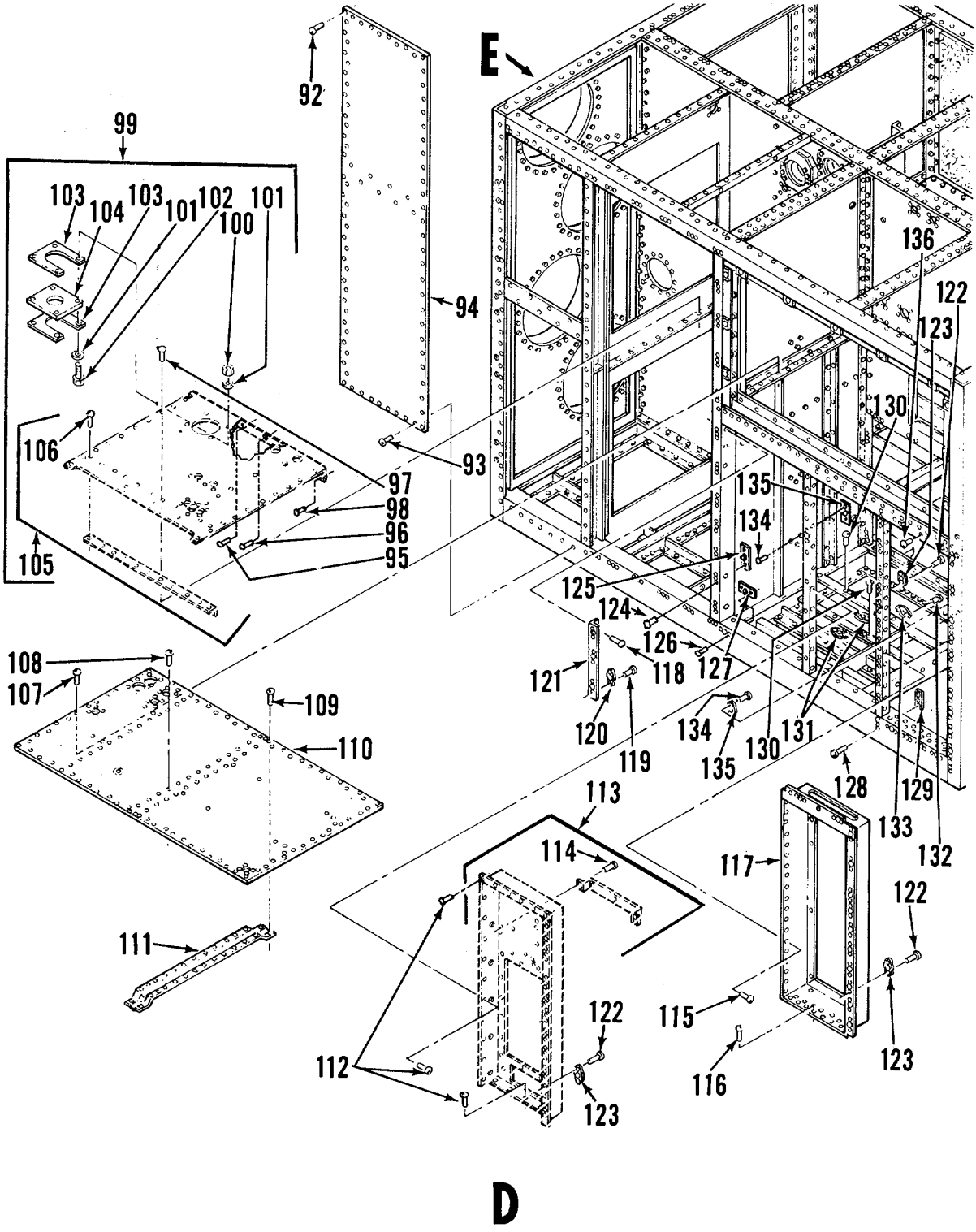


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Figure 9-2. Shell assembly, exploded view. (sheet 4 of 9)

KEY to figure 9-2-Continued:

92. Rivet
93. Rivet
94. Outer evaporator panel
95. Rivet
96. Rivet
97. Rivet
98. Rivet
99. Partition assembly
100. Nut
101. Flat washer
102. Bolt
103. Insulation retainer
104. Insulation
105. Plenum partition
106. Rivet
107. Rivet
108. Rivet
109. Rivet
110. Condenser floor, right
111. Floor stiffener
112. Rivet
113. Power panel frame
114. Rivet
115. Rivet
116. Rivet
117. Panel housing
118. Rivet
119. Rivet
120. Receptacle
121. Bracket
122. Rivet
123. Plate nut
124. Rivet
125. Plate nut
126. Rivet
127. Plate nut
128. Rivet
129. Plate nut
130. Rivet
131. Plate nut
132. Rivet
133. Plate nut
134. Rivet
135. Receptacle
136. Rivet

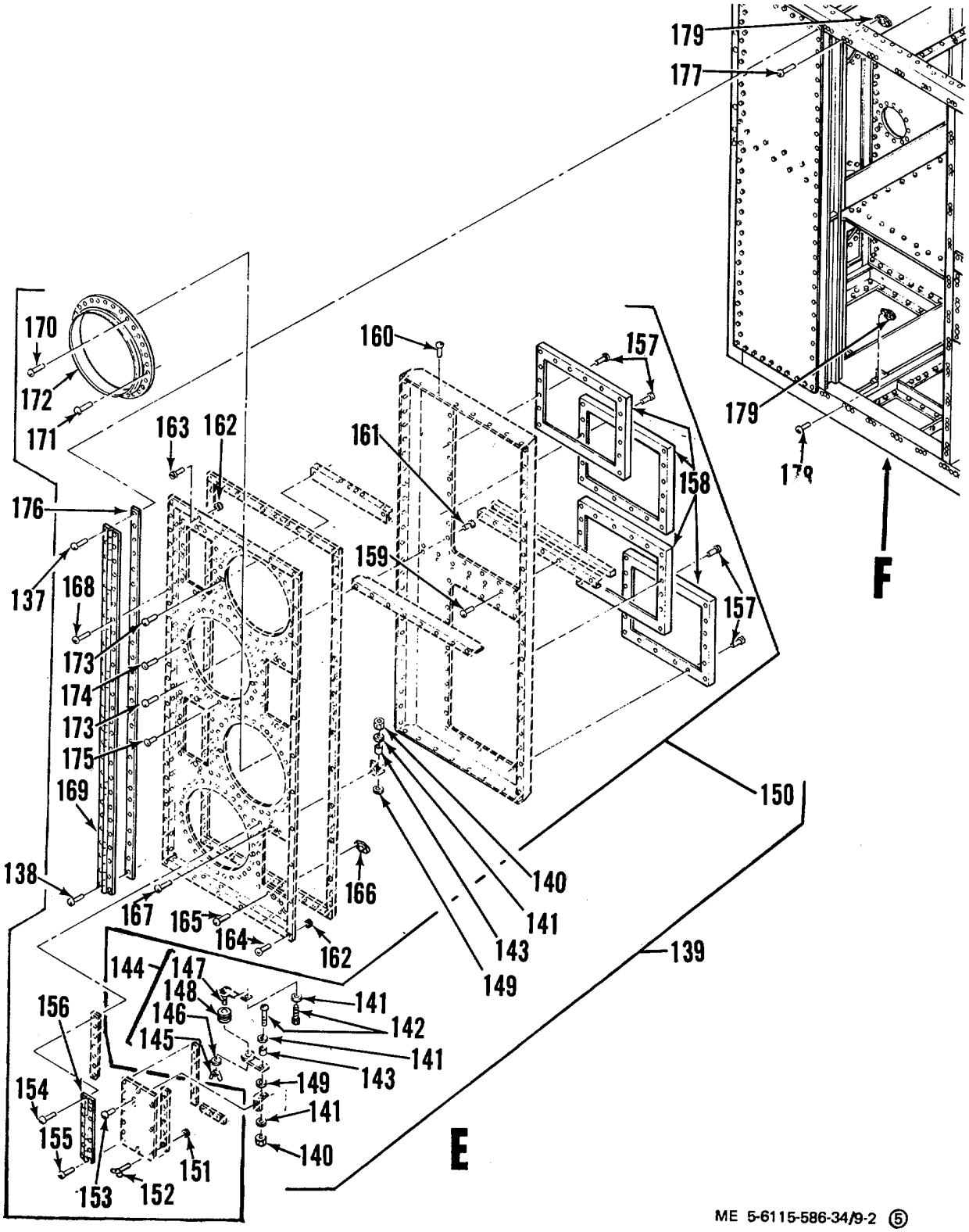


Figure 9-2. Shell assembly, exploded view. (sheet 5 of 9)

KEY to figure 9-2-Continued:

137. Rivet
138. Rivet
139. Inlet air door assy
140. Nut
141. Flat washer
142. Screw
143. Spacer
144. Door positioning arm
145. Wing nut
146. Flat washer
147. Rod
148. Grommet
149. Flat washer
150. Door
151. Retainer
152. Turnlock fastener stud
153. Rivet
154. Rivet
155. Rivet
156. Hinge
157. Rivet
158. Filter holding frame
159. Rivet
160. Rivet
161. Rivet
162. Retainer
163. Stud fastener
164. Rivet
165. Rivet
166. Receptacle
167. Rivet
168. Rivet
169. Hinge
170. Rivet
171. Rivet
172. Flange
173. Rivet
174. Rivet
175. Rivet
176. Plate spacer
177. Rivet
178. Rivet
179. Receptacle

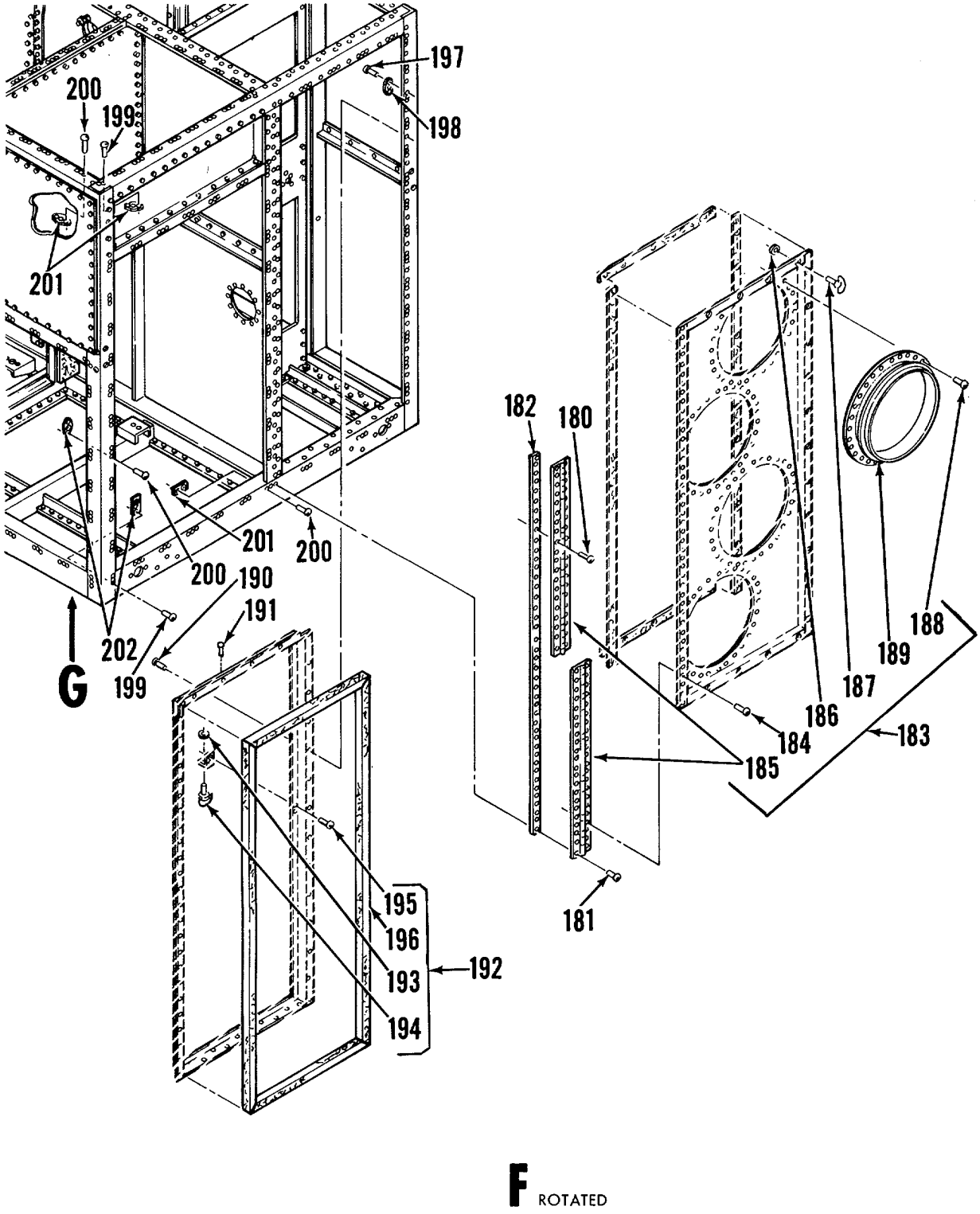


Figure 9-2. Shell assembly, exploded view. (sheet 6 of 9)

KEY to figure 9-2-Continued:

180. Rivet
181. Rivet
182. Plate spacer
183. Air outlet door
184. Rivet
185. Hinge
186. Retainer
187. Turnlock fastener stud
188. Rivet
189. Flange
190. Rivet
191. Rivet
192. Outlet panel frame
193. Retainer
194. Stud fastener
195. Rivet
196. Foam tape
197. Rivet
198. Receptacle
199. Rivet
200. Rivet
201. Plate nut
202. Plate nut

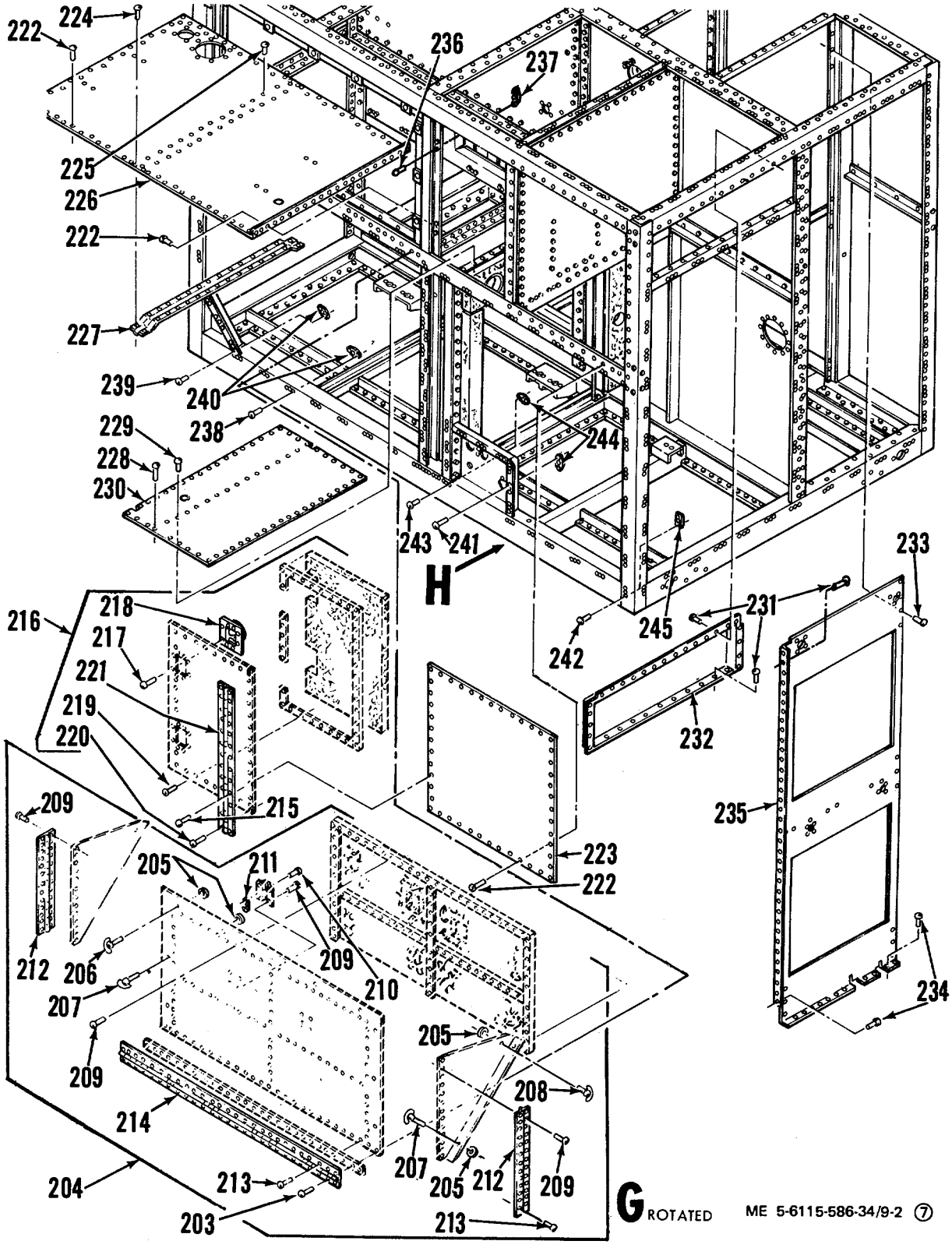


Figure 9-2. Shell assembly, exploded view. (sheet 7 of 9)

KEY to figure 9-2

--Continued: --

203. Rivet
204. Left condenser door
205. Retainer
206. Turnlock fastener stud
207. Turnlock fastener stud
208. Turnlock fastener stud
209. Rivet
210. Rivet
211. Receptacle
212. Hinge
213. Rivet
214. Hinge
215. Rivet
216. Compressor door
217. Rivet
218. Lock
219. Rivet
220. Rivet
221. Hinge
222. Rivet
223. Exhaust compartment panel
224. Rivet
225. Rivet
226. Condenser compartment floor
227. Floor stiffener
228. Rivet
229. Rivet
230. Compressor floor panel
231. Rivet
232. Recessed panel
233. Rivet
234. Rivet
235. Evaporator panel
236. Rivet
237. Latch retainer
238. Rivet
239. Rivet
240. Receptacle
241. Rivet
242. Rivet
243. Rivet
244. Plate nut
245. Plate nut

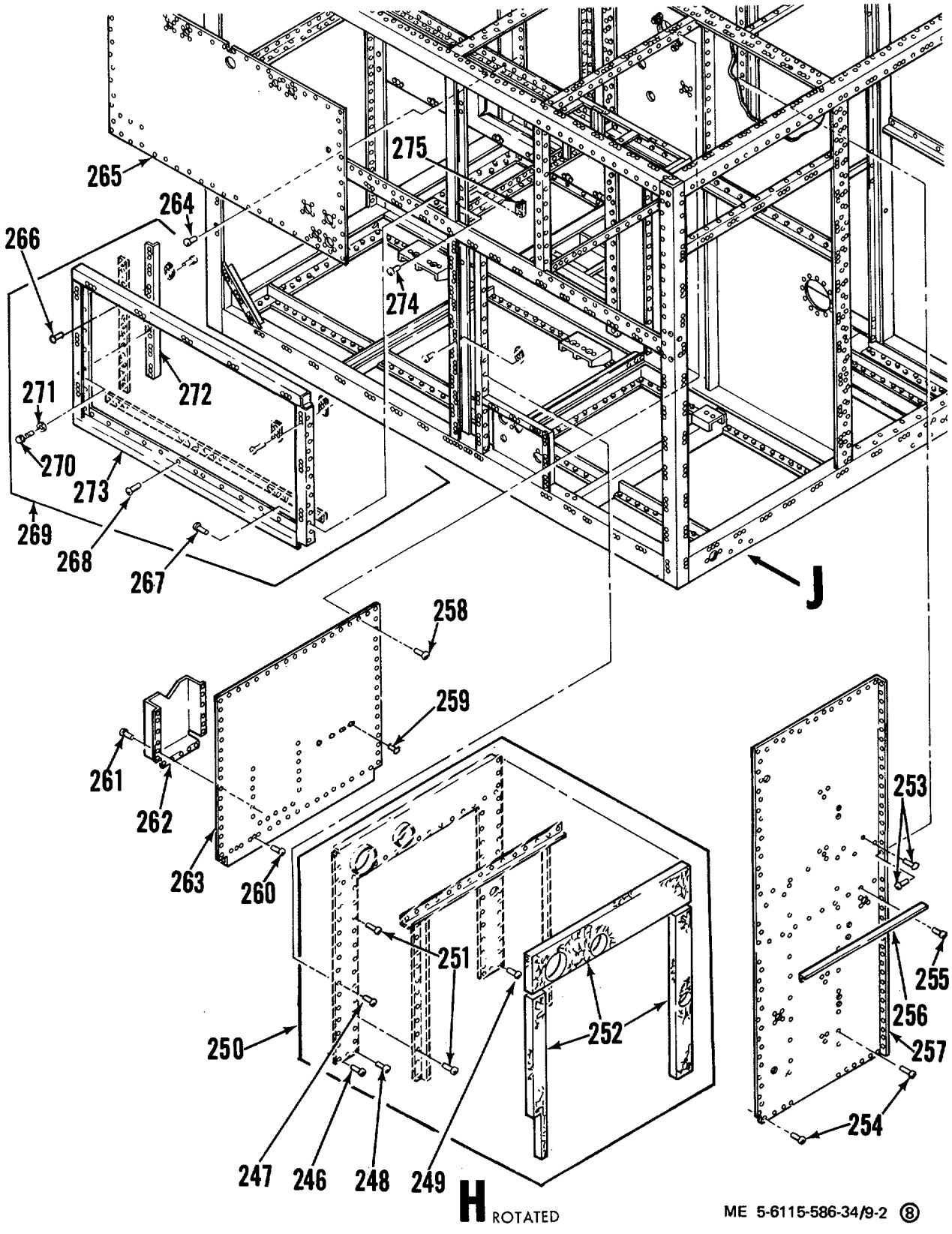


Figure 9-2. Shell assembly, exploded view. (sheet 8 of 9)

KEY to figure 9-2-Continued:

246. Rivet
247. Rivet
248. Rivet
249. Rivet
250. Combustor compartment panel
251. Rivet
252. Insulation
253. Rivet
254. Rivet
255. Rivet
256. Plenum separator support
257. Air inlet panel
258. Rivet
259. Rivet
260. Rivet
261. Rivet
262. Handbook storage rack
263. Rear compressor panel
264. Rivet
265. Condenser panel
266. Rivet
267. Rivet
268. Rivet
269. Condenser support assy
270. Bolt
271. Flat washer
272. Condenser support angle
273. Left condenser support
274. Rivet
275. Latch retainer

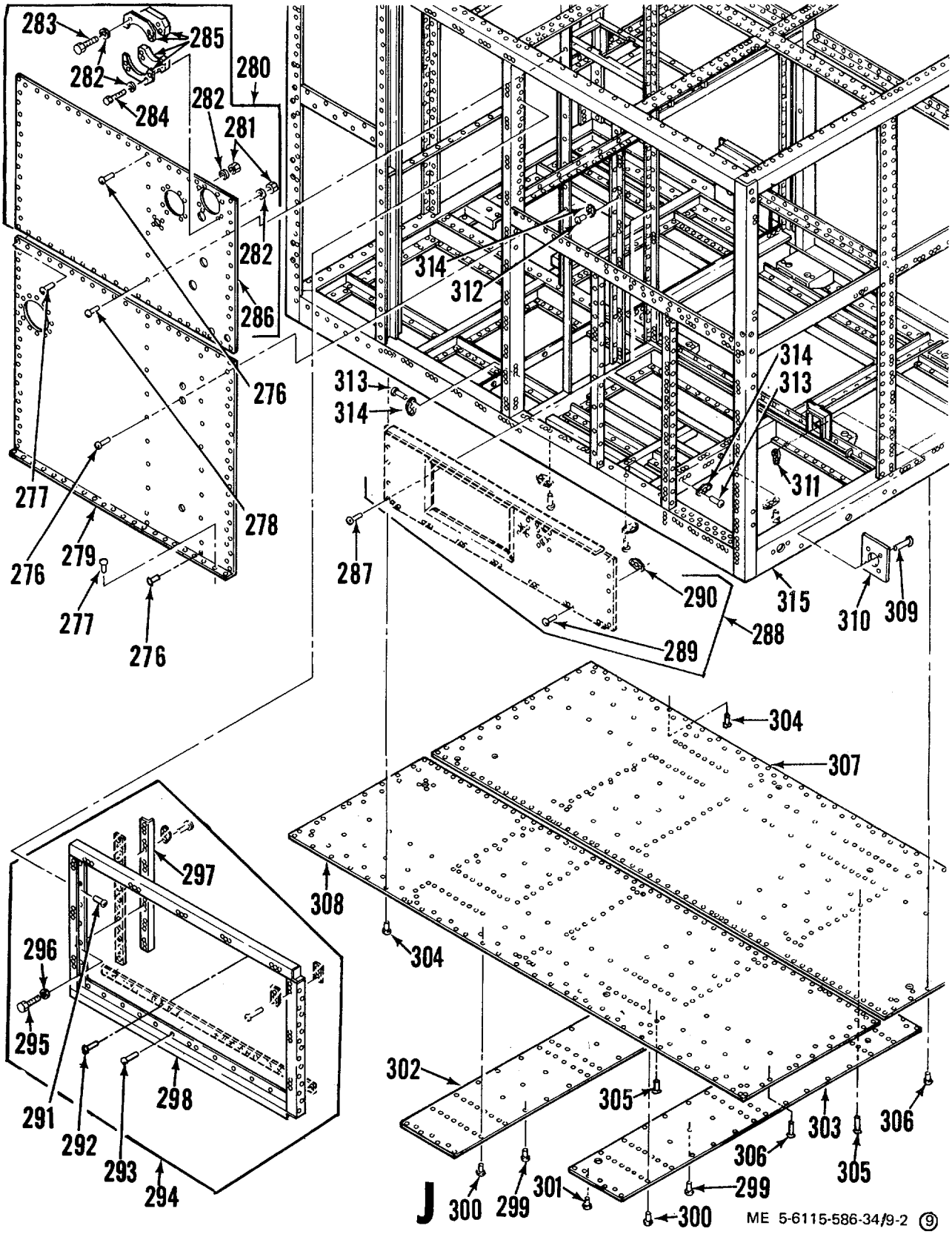


Figure 9-2. Shell assembly, exploded view. (sheet 9 of 9)

KEY to figure 9-2-Continued:

276. Rivet
277. Rivet
278. Rivet
279. Lower plenum panel
280. Plenum panel assy
281. Nut
282. Flat washer
283. Bolt
284. Bolt
285. Cover
286. Panel
287. Rivet
288. Engine bulkhead
289. Rivet
290. Nut plate
291. Rivet
292. Rivet
293. Rivet
294. Right condenser support assy
295. Bolt
296. Flat washer
297. Condenser support angle
298. Right condenser support
299. Rivet
300. Rivet
301. Rivet
302. Rear reinforcement plate
303. Front reinforcement plate
304. Rivet
305. Rivet
306. Rivet
307. Bottom left panel
308. Bottom right panel
309. Rivet
310. Receptacle plate
311. Plate nut
312. Rivet
313. Rivet
314. Plate nut
315. Enclosure frame

(5) If the components of a subassembly are damaged beyond simple shop repair, replace the entire subassembly.

(6) Repaint frame assembly with primer (Cati-coat 42GP22 and thinner VK66KP46, Sherwin-Williams Co., Cleveland, Ohio, or equivalent, no known government specifications) air dry thirty minutes and bake at 150° to 175° F. for one hour. Apply a finish coat of enamel (Federal specification TT-E-527, Color 3412 (Federal Specification TT-595).

c. Assembly.

(1} Assemble the shell assembly in reverse order of disassembly procedures (para 9-2 a above).

(2) Assemble the enclosure in reverse order of disassembly procedures (para 9-2 a. above).

CHAPTER 10

REPAIR OF ACCESSORY COMPONENTS

Section I. GENERAL INFORMATION

10-1. General Information

This chapter contains repair instructions for the accessory components used with the power plant. No removal or installation instructions are given as these items are normally installed during setting up of the power plant and removed for movement to a new worksite according to instructions provided in TM 5-6115-586-12. A list of the accessory components and an illustration of each is also included in TM 5-6115-586-12; therefore, illustrations are provided in this chapter only when required as an aid to repair of specific components.

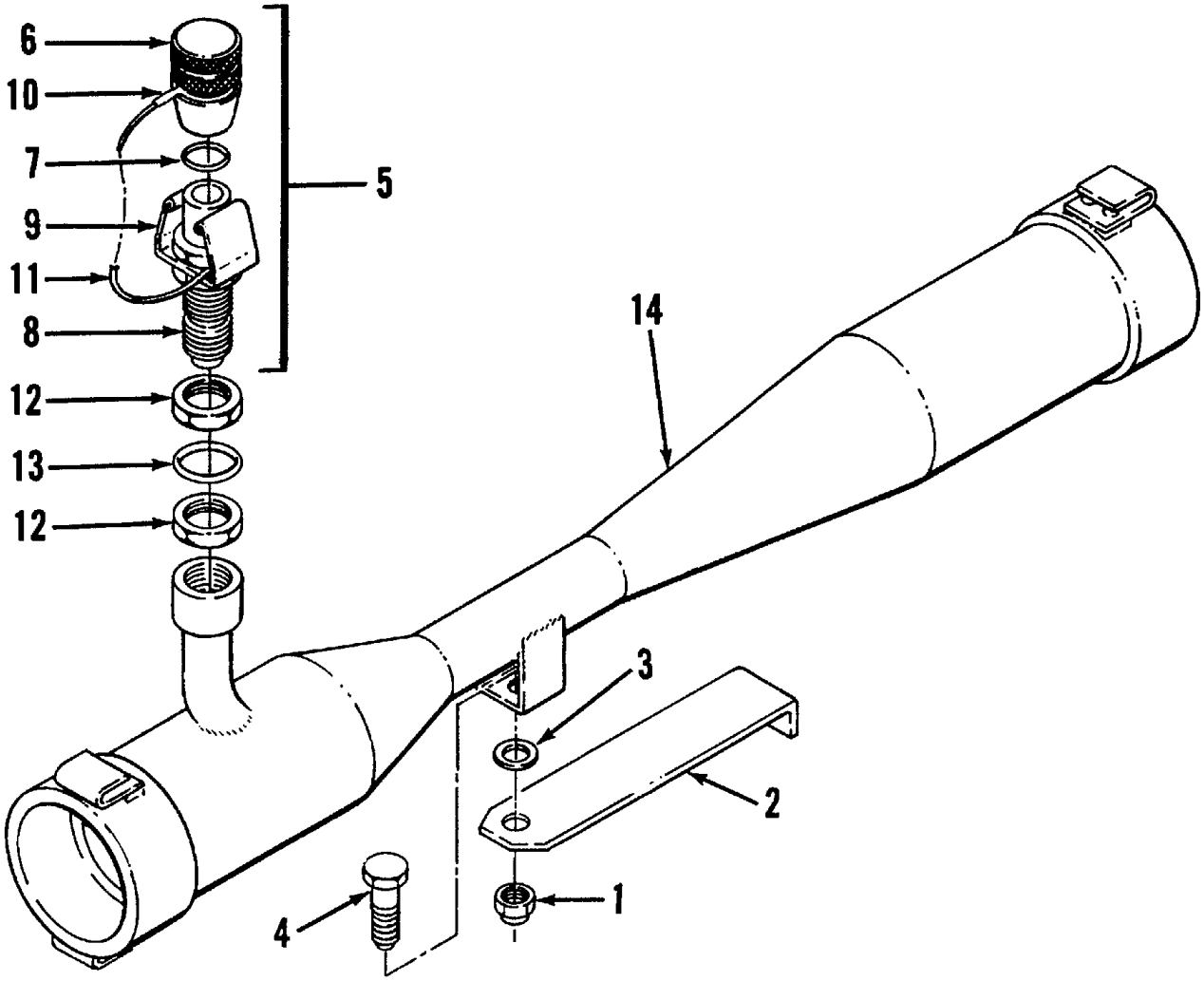
Section II. COMPRESSED AIR AND VACUUM SYSTEM ACCESSORY COMPONENTS

10-2. Inflation and Deflation Ejector Assembly

a. General. The inflation and deflation ejector assembly is used in conjunction with the compressed air hose assembly to apply inflation air from the power plant compressed air outlet for the MUST hospital inflatable elements. Its main components are an ejector tube, a quick disconnect coupling half, and a support.

b. Disassembly. Refer to figure 10-1 and disassemble the inflation and deflation ejector assembly as follows.

(1) Remove nut (1) , ejector assembly support (2), flat washer (3) and bolt (4) from the ejector tube (14).



ME 5-6115-586-34/10-1

Figure 10-1. Inflation and deflation ejector assembly.

KEY to figure 10-1.

1. Nut
2. Ejector assembly support
3. Flat washer
4. Bolt
5. Quick disconnect coupling half
6. Cap
7. Seal
8. Nose piece
9. Clip
10. Sleeve
11. Cable assembly
12. Nut
13. Packing
14. Ejector tube

(2) Loosen nuts (12) and remove the quick disconnect coupling half (5), nuts (12), and packing (13).

(3) Disassemble the quick disconnect coupling half by removing the cap (6) and seal (7) from the nose piece (8). Leave cable assembly (1) and sleeve (10) attached unless repair is necessary. Remove clip (9) by sliding it off opposite end of nose piece from the cap.

c. Cleaning and Inspection

(1) Clean metal components of the assembly with solvent and dry thoroughly with compressed air.

(2) Inspect threaded parts for damaged, stripped or crossed threads.

(3) Inspect ejector tube for cracks, bends, and broken welds. Check that wire mesh in the tube is not torn or clogged. Check for loose rivets.

(4) Inspect quick disconnect coupling half for damaged cap, nose piece, or clip. Check that cable assembly is not damaged, broken or missing.

d. Repair and Replacement.

(1) Replace parts if threads are damaged beyond simple repair.

(2) Repair tube by welding; replace loose rivets. If ejector tube is damaged beyond simple repair, replace the tube.

(3) Replace damaged or missing quick disconnect coupling half components and replace seal.

(4) Replace packing (13).

e. Reassembly. Refer to figure 10-1 and reassemble the inflation and deflation ejector assembly by reversing the disassembly sequence.

10-3. Box and Valve Manifold Assembly

a. General. The box and valve manifold assembly connects the inflation and deflation ejector assembly to the MUST hospital inflatable element. Its main components are the junction box, the two regulating valves, and the manifold cap.

b. Disassembly. Remove screws (1, fig. 10-2) and washers (2, 3) to remove regulating valve (4). Remove manifold cap (5) from junction box (6).

c. Cleaning, Inspection, and Testing.

(1) Clean the metal parts with solvent and dry thoroughly.

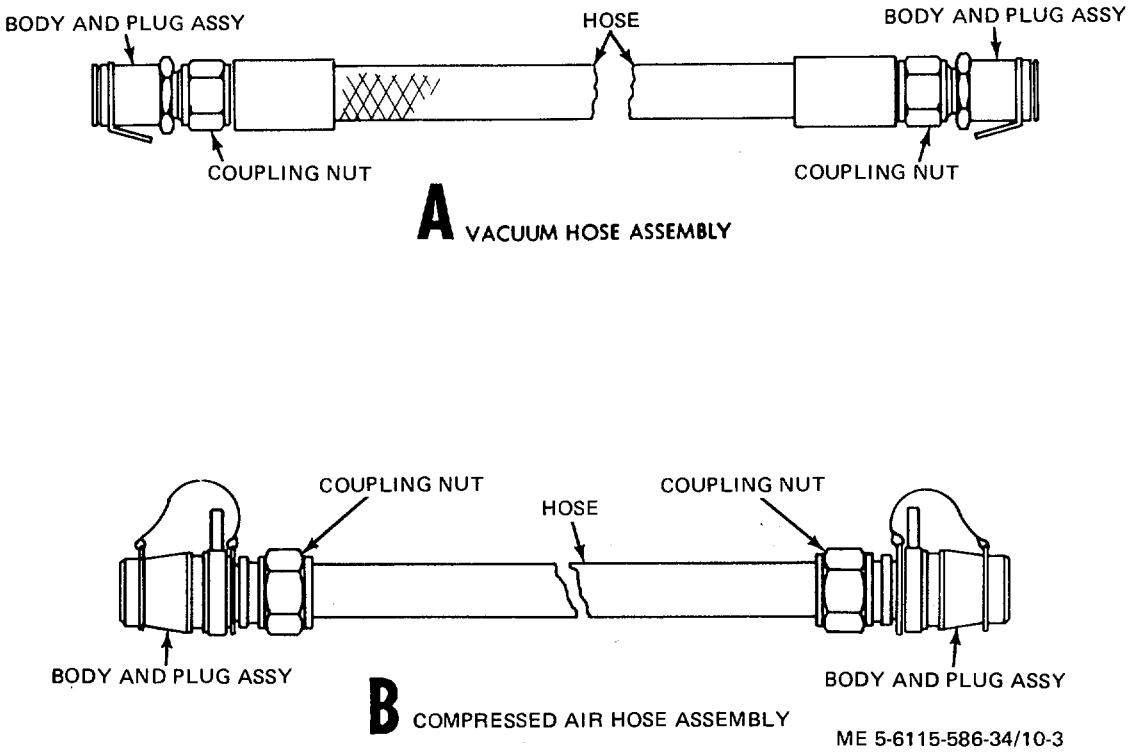


Figure 10-2. Box and valve manifold assembly.

KEY to figure 10-2.

1.	Screw	4.	Regulating valve
2.	Lockwasher	5.	Manifold cap
3.	Flat washer	6.	Junction box

(2) Inspect the junction box (6. fig. 10-2) for bends and breaks. loose or missing latches or rivet nuts.

(3) Visually inspect the two regulating valves for damage.

(4) Test that regulating valves relieve at 1.5 -0.25 PSIG.

d. Repair and Replacement. Replace all parts damaged beyond simple repair.

e. Reassembly. Reassemble the box and valve manifold assembly by reversing the disassembly sequence.

10-4. Compressed Air Hose Assembly and Vacuum Hose Assembly

a. General.' The compressed air hose assembly connects the inflation and deflation ejector assembly to the power plant compressed air outlet. The vacuum hose assembly connects the power plant vacuum outlet to elements of the MUST system that require vacuum service.

b. Disassembly.

(1) Remove the two body and plug assemblies (fig. 10-3) from the compressed air hose ends by unscrewing them from the hose coupling nuts.

(2) Remove the body and plug assemblies from the vacuum hose ends by unscrewing them from the hose coupling nuts.

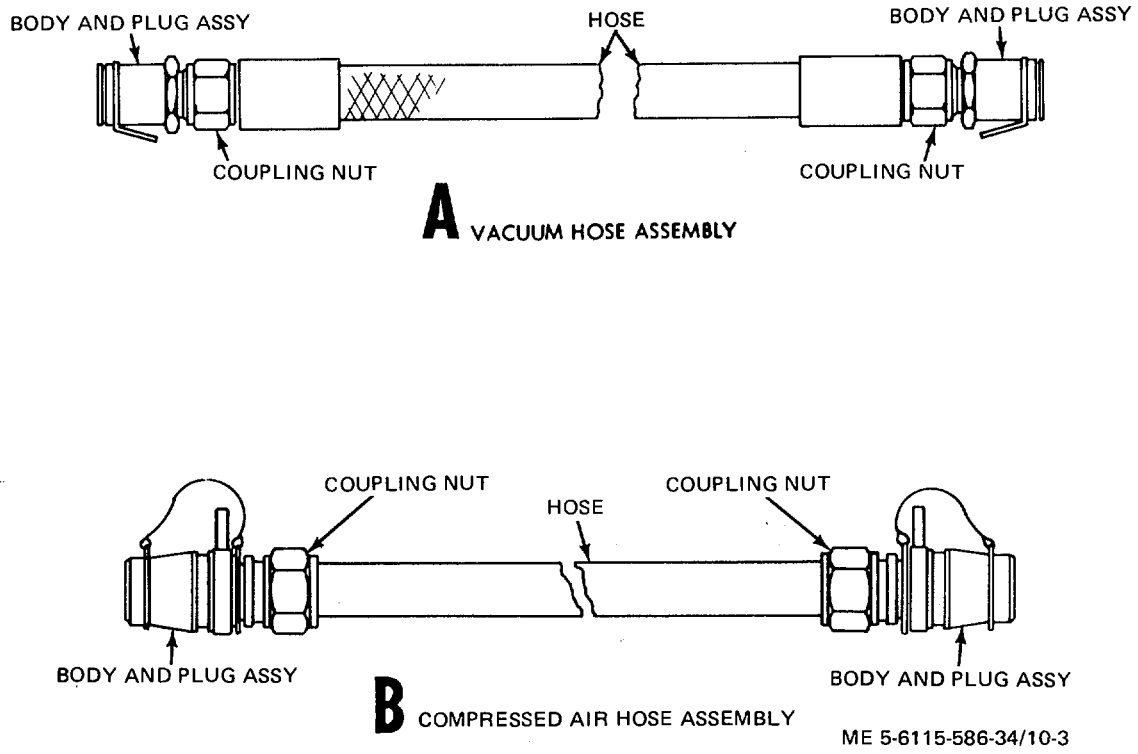


Figure 10-3. Compressed air hose assembly and vacuum hose assembly.

c. Inspection. Inspect both hose assemblies for any damage that could cause leakage, incorrect or difficult connection of hose assemblies to fittings.

d. Repair and Replacement. Replace all defective parts.

e. Reassembly. Reassemble hose assemblies by reversing disassembly procedure.

Section III. WATER SYSTEM ACCESSORY COMPONENTS

10-5. Dual Water Hose Assembly

a. General. The dual water hose assembly connects the hot and cold water outlets of the power plant water system to other elements of the MUST system. The two hoses are heated by a thermostatically-controlled electric heater that is powered from the power plant 400 Hz electrical system.

b. Disassembly. The dual water hose assembly (fig. 10-4) shall be disassembled only as required for repair as determined after inspection and testing.

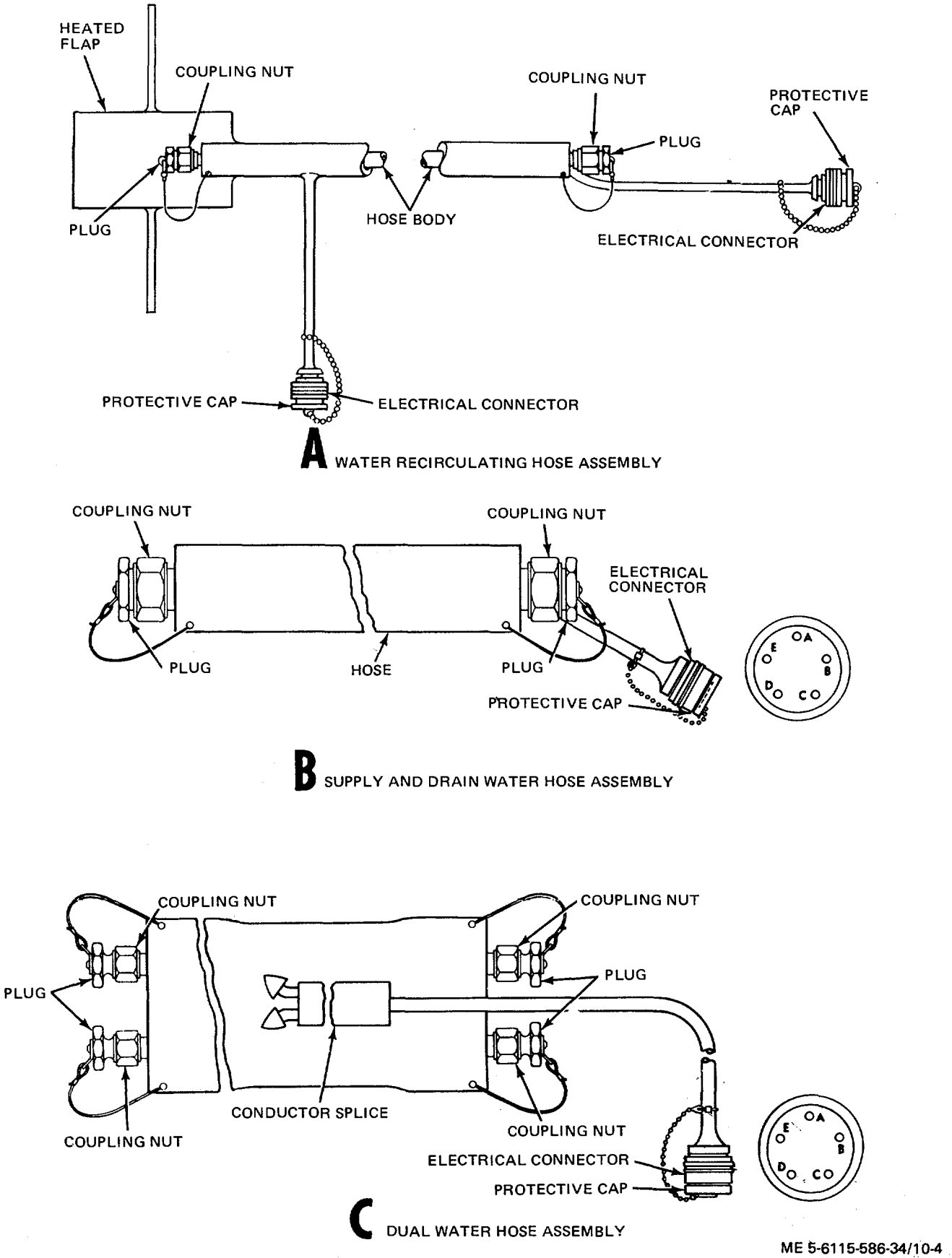


Figure 10-4. Water system accessory components.

c. Inspection and Testing.

(1) Visually inspect the dual water hose assembly for damage, signs of leakage, stripped or crossed threads on coupling nuts and electrical connectors, missing or damage protective cap or plugs.

(2) Test the heater with 400 Hz, 120 VAC. Connector pin arrangement is as follows: pin A: spare, pin B: spare, pin C: 400 Hz, 120 VAC (phase), pin D: 400 Hz, 120 VAC (neutral), pin E: ground.

(3) Test for leaks at 100 PSI water pressure.

d. Repair and Replacement.

(1) Replace. damaged or missing plugs, connector or protective cap.

(2) If wires are defective in the electrical cable, one of the spare wires (pin A, pin B) may be utilized if the remainder of the cable is in good condition. The connector pin must be jumped to the new pin connection to obtain power through the mating connector on the power plant, and the new wire must be connected to the heating element at the cable splice.

(3) If hose assembly is damaged beyond simple repair and replacement, replace the entire assembly.

10-6. Water Recirculating Hose and Water Supply and Drain Hose Assemblies

a. General. The water recirculating hose assembly is utilized to recirculating cold water back to source to prevent freezing in cold weather operation and for recirculation of hot water back through the power plant water system. The water supply and drain hose assembly delivers water from the source to the power plant water system inlet.
Both hose assemblies are heated by thermostatically-controlled electric heating elements powered from the power plant 400 Hz electrical system.

b. Disassembly. The water recirculating hose and' water supply and drain hose assemblies (fig. 10-4) shall be disassembled only as necessary for repairs indicated after inspection and testing.

c. Inspection and Testing.

(1) Visually inspect the hose assemblies for damage, signs of leakage, stripped or crossed threads, missing or damaged plugs or protective caps. Inspect heated flap of water recirculating hose assembly for visible damage.

(2) Test the heaters with 400 Hz 120 VAC.
Connector pin arrangement is: pin A: spare, pin B: spare, pin C: 400 Hz, 120 VAC (phase, pin D: 400 Hz, 120 VAC (neutral), pin E: ground.

(3) Test for leaks in hoses at 75 PSI water pressure.

d. Repair and Replacement.

(1) Replace damaged or missing plugs, connector, or protective cap.

(2) If wires are defective in the electrical cable, spare pins A and B may be utilized if remainder of cable is serviceable. Pins must be jumped for proper connection to obtain power through mating connection power plant.

Section IV. EXTERNAL FUEL FILTER ASSEMBLY

10-7. General

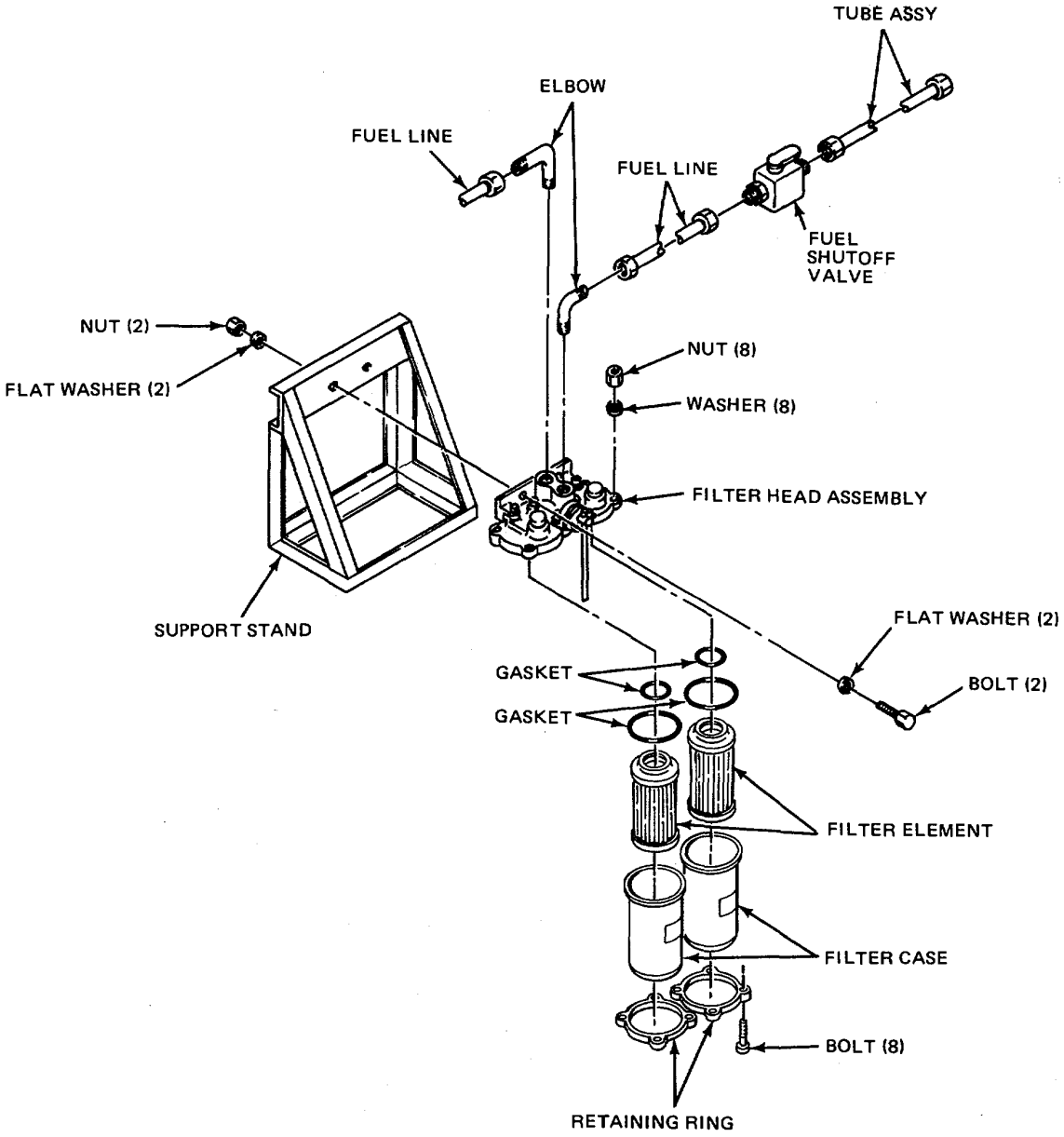
The fuel filter assembly delivers and filters fuel from the external fuel fitting. It consists of a dual element filter with a selector valve, three hose assemblies for connection to fuel source and one hose assembly with fuel shutoff valve for connection of filters to power plant fuel inlet.

10-8. Disassembly

a. Refer to TM 5-6115-586-12 and remove the two filter elements, gaskets, cases, and retainer rings according to instructions provided.

b. Unscrew hoses (fig. 10-5) and fittings and shutoff valve.

c. Remove two nuts, four flat washers, and two bolts to remove filter head assembly from fuel filter bracket.



ME 5-6115-586-34/10-5

Figure 10-5. External fuel filter assembly.

10-9. Cleaning and Inspection

a. Clean metal parts in an approved cleaning solvent and dry thoroughly with filtered compressed air.

b. Inspect all threaded parts for stripped, crossed, or peened threads.

c. Inspect filter cases, valve, retainers, and filter 10-8 head assembly for cracks, corrosion or other obvious damage.

d. Inspect hoses for cuts, deterioration, splits or other damage that could cause leakage.

10-10. Repair and Replacement

a. Replace filters and gaskets.

b. Replace all other damaged parts. Replace entire hose if damaged.

10-11. Reassembly

Reassemble the external fuel filter assembly by reversing disassembly procedure. Refer to TM 56115-586-12 for instructions regarding installation of filters and gaskets.

Section V. ELECTRICAL CABLE ACCESSORY COMPONENTS

10-12. General

a. The electrical cable accessory components are the 400 Hz electrical power output cable assembly, the 60 Hz electrical power output cable assembly, the 400 Hz remote power cable assembly, DC electrical power standby cable assembly, external DC electrical power input cable assembly, external battery DC power cable assembly.

b. Refer to TM 5-6115-586-12 for a description of use of the cable assemblies, illustrations, and wire run charts.

c. This section contains inspection, testing, and replacement instructions for the cable assemblies.

10-13. 400 Hz Electrical Power Output Cable Assembly

a. Visually inspect the cable assembly for damaged connectors or connector covers, sleeves, or cables.

b. Refer to TM 5-6115-586-12 and test individual wires for continuity.

c. Replace the cable assembly if inspection and/ or testing reveals damage or lack of continuity in individual wires.

10-14. 60 Hz Electrical Power Output Cable Assembly

a. Visually inspect the cable assembly for damaged connectors or connector covers, sleeves, or cables.

b. Refer to TM 5-6115-586-12 and test individual wires for continuity.

c. Replace the cable assembly if inspection and / or testing reveals damage or lack of continuity in individual wires.

10-15. 400 Hz Remote Power. Cable Assembly

a. Visually inspect the cable assembly for dam aged connectors or connector covers, sleeves, or cables.

b. Refer to TM 5-6115-586-12 and test individual wires for continuity.

c. Replace the cable assembly if inspection and / or testing reveals damage or lack of continuity in individual wires.

10-16. DC Electrical Power Standby Cable Assembly

a. Visually inspect the cable assembly for damaged connectors or connector covers, sleeves, or cables.

b. Refer to TM 5-6115-586-12 and test individual wires for continuity.

c. Replace the cable assembly if inspection and /or testing reveals damage or lack of continuity in individual wires.

10-17. External DC Electrical Power Input Cable Assembly

a. Visually inspect the cable assembly for damaged connectors or connector covers, sleeves, or cables.

b. Refer to TM 5-6115-586-12 and test individual wires for continuity.

c. Replace the cable assembly if inspection and /or testing reveals damage or lack of continuity in individual wires.

10-18. External Battery DC Power Cable Assembly

a. Visually inspect cable assembly for damaged connector, lugs, adapters, or cable.

b. Test continuity of the two wires.

c. Replace the cable assembly if inspection and / or testing reveals damage or lack of continuity in individual wires.

Section VI. CONDITIONED AIR SYSTEM ACCESSORY COMPONENTS

10-19. Coupling Assembly

a. Inspection.

Visually inspect the two clamps (fig. 10-6) and the flanged coupling for damage and check that the clamps operate satisfactorily.

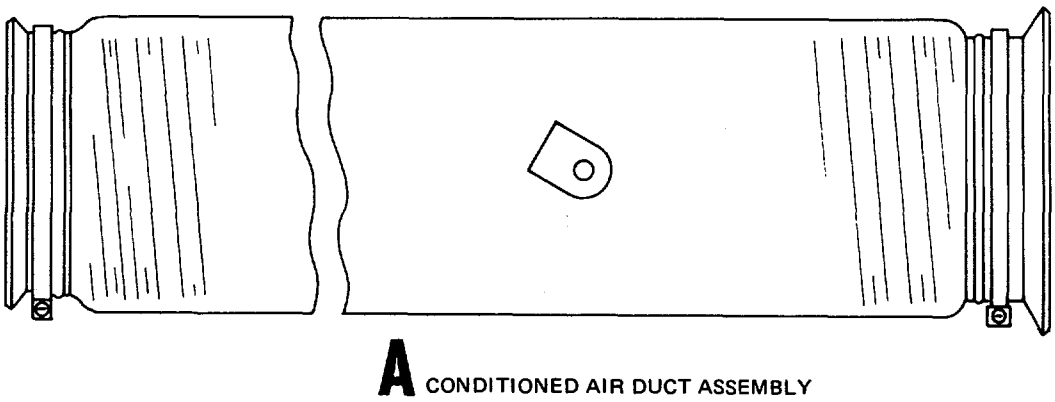


Figure 10-6. Conditioned air system accessory components.

b. Replacement. Replace defective clamps or flanged coupling.

10-20. Conditioned Air Duct Assembly

Visually inspect air duct assembly (fig. 10-6) for obvious damage. Replace assembly if damaged beyond simple repair.

APPENDIX A

REFERENCES

A1. Fire Protection

TM 5420020010	Hand Portable Fire Extinguishers Approved for Army Users

A2. Lubrication

C9100IL	Identification List for Fuels, Lubricants, Oils and Waxes
LO 5611558612	Lubrication Order

A3. Radio Suppression

TM 11483	Radio Interference Suppression

A4. Maintenance

TM 38750	The Army Maintenance Management Systems
TM 5611558612	Operator and Organizational Maintenance Manual
TM 5611558634P	Direct Support and General Support Maintenance Repair Parts and Special Tools List
TM 9614020015	Operation and Organizational, Field and Depot Maintenance Storage Batteries, Lead-Acid Type
TM 5492020015	Operator, Organizational, Field and Depot Maintenance Manual, Engine Analyzer, Gas Turbine

A5. Shipment and Storage

TB 740972	Preservation of USAMEC Mechanical Equipment for Shipment and Storage
TM 740901	Administrative Storage of Equipment

A6. Radioactive Material

TB 750248 Instructions	for Safe Handling, Maintenance, Storage, and Disposal of Radioactive Commodities Managed by U.S. Army Mobility Equipment Command

A7. Destruction to Prevent Enemy Use

TM 7502443	Procedures for Destruction of Equipment to Prevent Enemy Use

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Chief of Staff.

Official:

VERNE L. BOWERS,
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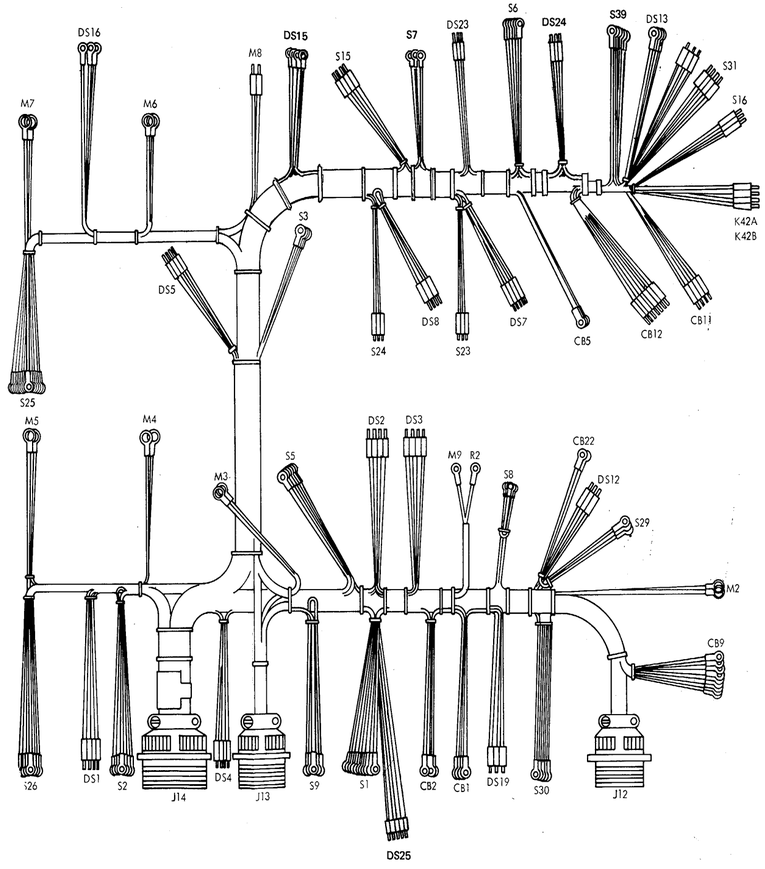


WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
AL-GREEN	P13-L	P88-q	AWG16	46.00
CR-WHITE	P13-M	P88-r	AWG16	46.00
D200N16N	P14-g	T86-4	AN16	36.50
D233A16	P13-D	P28-M	AN16	32.50
D234A16	P13-E	P28-N	AN16	32.50
D68A16	P14-F	R1+	AN16	19.00
D69A16	P14-Q	R1-	AN16	19.00
H2DT12N	P87-C	T86-2	AN12	34.00
H2DV16N	P88-f	T86-3	AN16	29.50
H300J16	P38-X	T85-7	AN16	38.50
H350D16	P12-T	CR13+	AN16	38.50
H350E16	P38-U	CR13+	AN16	35.50
H351D16	P12-U	CR14+	AN16	38.00
H351E16	P38-V	CR14+	AN16	35.00
H355B16	P12-X	P38-W	AN16	40.50
H356C16	P38-N	P88-f	AN16	78.00
H60E16	P38-M	K15-X1	AN16	79.50
H61D16	P38-A	P88-R	AN16	78.00
H76B16	P13-A	P88-b	AN16	46.00
H76E16	P88-C	CR10-	AN16	51.00
H77B16	P13-B	T85-13	AN16	
H77C16	P88-Z	T85-13	AN16	52.50
H77G16	T85-13	CR10+	AN16	11.50
H81C10	P52-V	P87-D	AN10	78.00
J2ED18N	T85-5	P107-B	AN18	45.00
J2EF18N	J107-B	J104-B	AN18	11.75
J31A16	P4-E	CR8-	AN16	26.50
J32A16	P4-C	P88-p	AN16	45.00
J74A16	P4-B	P88-m	AN16	45.00
J99A20	J104-A	P105-B	AN20	11.00
K14A16	P3-B	CR3-	AN16	26.50
K15D16	P14-V	T85-2	AN16	19.25
K15E16	P88-u	T85-2	AN16	45.00
K15G16	P3-L	T85-3	AN16	21.00
K15H16	P4-g	T85-3	AN16	25.00
K15J16	P88-v	T85-2	AN16	45.00
K16A16	P3-S	P88-h	AN16	42.00
K17B16	P14-K	P88-V	AN16	47.00
K17F16	P3-K	P88-W	AN16	42.00
K18B16	P3-P	P88-X	AN16	42.00
K18D16	P14-L	P88-Y	AN16	47.00
K19A16	P3-R	P88-j	AN16	42.00
K2AD16N	P3-H	T86-1	AN16	33.00
K20A16	P3-J	P4-N	AN16	22.00
K24A16	P4-h	T85-4	AN16	25.75
K24B16	P88-g	T85-4	AN16	45.75
K24D16	P14-X	T85-4	AN16	20.75
K26A16	P3-C	CR6-	AN16	22.50
K26B16	P4-G	CR6-	AN16	25.50
K275D16	P106-B	P12-P	AN16	43.50
K276B16	P106-E	P12-S	AN16	43.50
K277D16	P106-A	P12-M	AN16	43.50
K278B16	P106-D	P12-L	AN16	43.50
K28B16	P14-Y	P88-k	AN16	47.00
K280A16	P106-F	CR19+	AN16	
K281A16	P106-G	CR20-	AN16	
K30A16	P88-n	T85-1	AN16	43.50
K30C16	T85-1	CR8+	AN16	13.50
K65C16	P12-B	CR20-	AN16	
K65D16	CR19+	CR20+	AN16	
K9C16	P14-H	T85-8	AN16	23.75

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
K9E16	P3-M	T85-8	AN16	25.75
K9F16	CR3+	T85-8	AN16	13.75
K94A16	P4-t	K10-ND	AN16	35.00
L13T18	P52-C	T85-9	AN20	38.50
L2L16N	P13-K	T85-5	AN16	20.00
L279C16	P106-C	P12-K	AN16	43.50
L295C16	P12-r	P106-J	AN16	11.50
L30D16	P14-C	T85-1	AN16	18.50
L347C16	P12-D	P52-H	AN16	43.50
L389C16	P12-Z	P52-r	AN16	43.50
L4A16	P52-B	CR1+	AN18	44.25
L45B16	P14-B	K10-NC	AN16	31.00
L50A16	P14-D	S10C-S3	AN16	31.50
L53D16	P14-E	P88-D	AN16	47.00
L79B16	P14-z	P88-a	AN16	47.00
L8F16	P12-A	T85-16	AN16	18.75
L8G16	P52-A	T85-16	AN16	33.25
L8M16	P38-h	T85-16	AN16	30.25
L98A18	P12s	P107-E	AN18	66.50
L98C20	J107-E	P105-C	AN20	11.00
M2AP16N	T86-3	K15-X2	AN16	28.50
M214B20	P13-S	K15-A1	AN20	47.50
M215A20	P38-H	K15-A2	AN20	80.00
M216B20	P13-T	K15-B1	AN20	45.50
M217A20	P38-J	K15-B2	AN20	79.50
M218B20	P13-U	K15-C1	AN20	48.50
M219A20	P38-K	K15-C2	AN20	80.00
M220B20	P13-V	P38-G	AN20	70.00
M222B20	P13-W	P38-F	AN20	70.00
M224B20	P13-X	P38-E	AN20	70.00
M95A16	P38-D	P4-s	AN16	60.00
P1D12	P87-A	R1-	AN12	45.50
P13L16	P14-J	T85-9	AN16	24.50
P2AC12N	T86-2	TR1-	AN12	42.50
P2AE16N	T86-1	P35 (Shell)	AN12	34.00
P2G12N	P52-t	T86-1	AN12	69.00
P2J12N	P52-u	T86-3	AN12	68.00
P21A16	P3-G	P4-0	AN12	22.00
P3D16	P88-d	CR1-	AN16	43.00
P3E16	CR1-	CR2+	AN16	13.50
P35B16	P12-d	P52-D	AN16	43.50
P37A16	P14-N	CR5-	AN16	24.50
P38B16	P52-Y	CR4+	AN16	42.50
P41D16	P52-m	S10A-S3	AN16	36.50
P42B16	P14-O	P4-H	AN16	27.00
P44B16	P14-Q	K10-COMM	AN16	27.00
P44C16	P4-n	K10-COMM	AN16	27.00
P46A16	P4-u	P4-p	AN16	27.00
P47D16	P14-s	P4-r	AN16	27.00
P5B16	P88-e	CR2-	AN16	
P51B16	P14-R	P88-A	AN16	47.00
P51E16	P4-M	P88-B	AN16	45.00
P51G16	P3-D	P88-C	AN16	42.00
P54B16	P14-S	P4-K	AN16	27.00
P55B16	P14-T	P29-M	AN16	28.00
P62A12	R1+	TR1+	AN12	53.00
P62B12	P13-J	R1+	AN12	14.50
P84G16	P12-C	P52-E	AN16	43.50
Q10A16	P3-N	CR7-	AN16	23.00
Q10B16	P35-A	CR7-	AN16	50.00
Q12C16	P14-d	CR7+	AN16	25.50

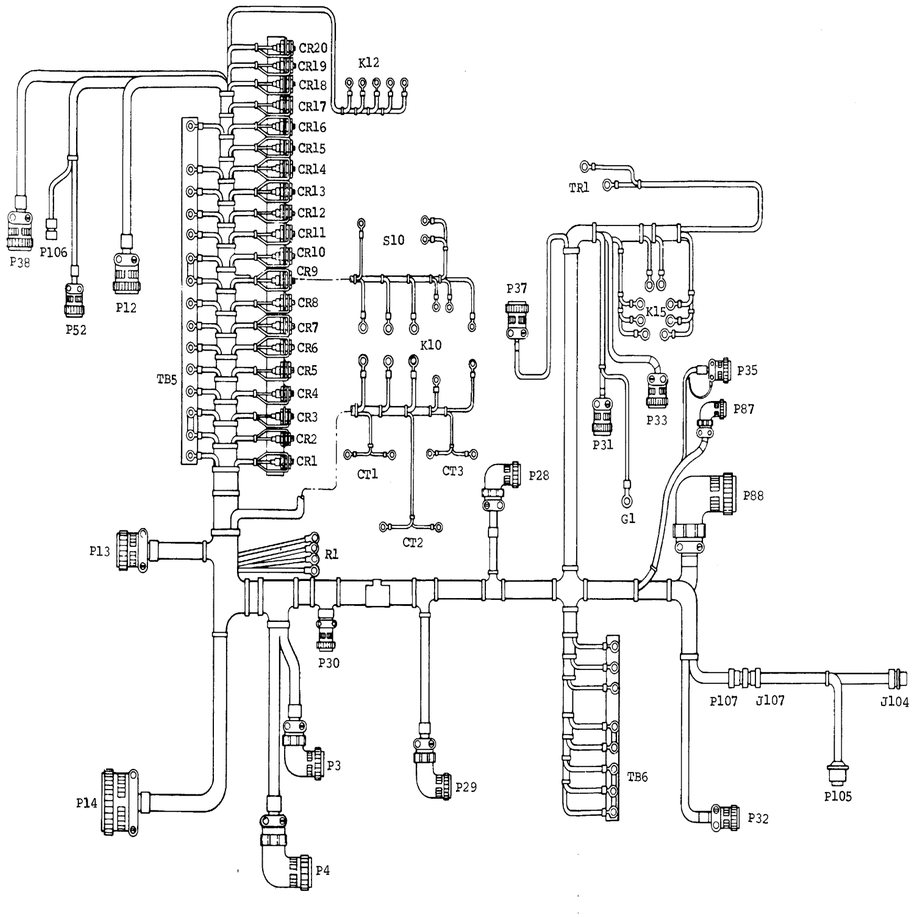
WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
V13M16	P29-K	T85-9	AN16	26.50
V13N16	P28-R	T85-10	AN16	33.00
V13Q16	P4-D	T85-10	AN16	30.50
V13R16	P3-E	T85-10	AN16	27.50
V13S16	P107-C	T85-10	AN16	27.50
V13W18	T85-9	P107-D	AN18	46.00
V13X16	J107-C	J104-D	AN16	11.75
V13Y20	J107-D	P105-A	AN20	11.00
V2AA16N	P29-H	T86-2	AN16	26.00
V2AB16N	P28-P	T86-2	AN16	25.00
V2AG16N	P88-P	T86-1	AN16	30.00
V2AR16N	P4-F	T85-5	AN16	26.50
V2AS16N	T85-5	K12-NEG	AN16	12.75
V2AT16N	S10-C	K12-NEG	AN16	31.50
V2AV16N	P52-b	P38-Y	AN16	55.00
V2K16N	T86-3	T85-5	AN16	36.75
V247A16	P30-J	T86-7	AN16	24.00
V247B16	P31-D	T86-7	AN16	33.00
V247C16	P30-K	T86-7	AN16	24.00
V248A16	P31-E	P30-E+	AN16	41.00
V25A16	P13-C	T85-6	AN16	18.25
V25C16	P4-P	T85-6	AN16	27.50
V25D16	T85-6	CR6+	AN16	10.00
V264C16	P4-V	T86-e	AN16	32.00
V265A16	P32-J	P4-T	AN16	42.00
V266A16	P4-U	T86-9	AN16	31.50
V266B16	P33-D	T86-9	AN16	30.00
V266C16	P32-K	T86-9	AN16	44.00
V300G16	P14-W	T85-7	AN16	23.00
V300H16	T85-7	CR11	AN16	12.00
V302C16	P12-N	CR13-	AN16	17.00
V302D16	CR15-	CR13-	AN16	14.00
V303B16	P52-P	P38-d	AN16	55.00
V302E16	P52-N	CR15-	AN16	37.00
V304C16	P12-R	CR14-	AN16	23.00
V304D16	CR16-	CR14-	AN16	14.00
V304E16	P52-R	CR16-	AN16	36.50
V336E16	P52-T	P38-P	AN16	55.00
V339C16	P52-S	P38-e	AN16	55.00
V34A16	P4-d	K10-X1	AN16	28.50
V348B16	P12-E	P38-S	AN16	40.50
V349B16	P12-F	P52-K	AN16	43.50
V357E16	P52-U	P38-R	AN16	55.00
V367B16	P12-H	P52-a	AN16	43.50
V368C16	P12-G	P52-L	AN16	43.50
V369B16	P12-J	P52-M	AN16	43.50
V372B16	P52-J	P38-T	AN16	55.00
V376A16	P12-k	CR11-	AN16	24.50
V377A16	P12-a	CR12-	AN16	24.00
V378B16	P12-j	T85-14	AN16	19.50
V378C16	T85-14	CR12+	AN16	11.00
V378D16	P52-b	T85-14	AN16	34.00
V379C16	P12-h	P52-n	AN16	43.50
V386C16	P12-e	P52-p	AN16	43.50
V387B16	P12-c	P52-F	AN16	43.50
V39A16	P4-A	CR-4	AN16	27.50
V391C16	P4-q	CR15+	AN16	33.00
V391D16	CR7+	CR15+	AN16	17.00
V391E18	P38-f	CR17-	AN18	36.00
V392A16	P38-b	CR17-	AN16	36.00
V394B16	P12-m	P38-z	AN16	40.50

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
V395C16	P14-r	CR16+	AN16	30.00
V395D16	CR16+	CR18+	AN16	14.00
V395E18	P38-g	CR18+	AN18	37.50
V396A16	P38-c	CR18-	AN16	37.50
V398B16	P12-n	P38-a	AN16	40.50
V40A16	P4-S	CR9-	AN16	30.50
V40B16	CR9-	CR5-	AN16	15.00
V41A16	P4-c	K12-13	AN16	39.00
V41B16	K12-B	CR9+	AN16	18.00
V41C16	K12-B	S10A-S3	AN16	27.00
V43B16	P14-P	P28-S	AN16	33.00
V44D16	P3-F	K10-COMM	AN16	30.00
V45A16	P4-b	K10-NC	AN16	33.00
V49B16	P14-a	K12-11	AN16	33.00
V49C16	S10A-S1	K12-11	AN16	27.00
V49D16	P3-W	S10A-S1	AN16	30.00
V52B16	P4-Q	P88-Q	AN16	45.00
V53B16	P4-R	P88-E	AN16	45.00
V56A16	P4-L	T85-11	AN16	33.00
V56B16	P29-J	T85-11	AN16	28.00
V56C16	P14-Z	T85-11	AN16	26.00
V57B16	P14-a	D4-W	AN16	27.00
V58A16	P29-L	P4-X	AN16	26.00
V63A16	P28-L	P4-F	AN16	31.00
V64A16	P4-J	T85-12	AN16	32.00
V64B16	P28-T	T85-12	AN16	34.50
V64C16	P14-b	T85-12	AN16	26.75
V66B16	P14-c	P4-c	AN16	27.00
V67A16	S10-S2	K12-X1	AN16	27.00
V67B16	P14-M	K12-X1	AN16	32.00
V70B16	P14-f	K12-12	AN16	33.50
V80B16	P14-A	P3-V	AN16	23.00
V97A16	P3-A	107-A	AN16	42.00
V97B16	J107-A	J104-E	AN16	11.75
W36B16	P12-b	P52-z	AN16	43.50
W6D16	P12-a	P52-W	AN16	43.50
W9B16	P52-X	T85-8	AN16	38.50
X200AA20N	P37-D	T86-4	AN20	31.00
X200M12N	T86-4	G1-T4	AN12	33.50
X200Q16N	P28-D	T86-5	AN16	23.50
X200R16N	P30-D	T86-5	AN16	25.00
X200S16N	P38-B	T86-5	AN16	71.00
X201B16	P30-F	K10-A1	AN16	23.00
X201C16	P28-A	K10-A1	AN16	35.00
X201D16	P14-h	K10-A1	AN16	24.00
X202B16	P30-G	K10-B1	AN16	23.00
X202C16	P28-B	K10-B1	AN16	35.00
X202D16	P14-j	K10-B1	AN16	25.00
X203B16	P30-H	K10-C1	AN16	23.00
X203C16	P28-C	K10-C1	AN16	35.00
X203D16	P14-k	K10-C1	AN16	26.00
X204H16	P13-N	K10-A2	AN16	24.50
X205H16	P13-P	K10-B2	AN16	24.50
X206H16	P13-R	K10-C2	AN16	24.50
X228B20	P14-n	P37-A	AN20	49.00
X229B20	P14-n	P37-B	AN20	49.00
X230B20	P14-p	P37-C	AN20	49.00
X232A16	P13-T	P28-F	AN16	31.50
X235A16	P28-E	CT1-X1	AN16	44.00
X236A16	P28-G	CT2-X1	AN16	46.00

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X237A16	P28-J	CT3-X1	AN16	44.00
X238A16	P13a-	CT1-X2	AN16	28.00
X239A16	P13-G	CT2-X2	AN16	29.50
X240A16	P13-H	CT3-X2	AN16	28.00
X243A16	P4-Z	P31-A	AN16	49.50
X244A16	P4-y	P31-B	AN16	49.50
X245A16	P30-C	P31-C	AN16	41.00
X246A16	P30-A	P4-Y	AN16	19.00
X249B16	P29-D	P88-R	AN16	35.00
X250B16	P29-F	P88-T	AN16	35.00
X251C16	P32-F	P88-F	AN16	30.50
X251E16	P29-A	P88-G	AN16	35.00
X251G16	P14-H	P88-H	AN16	47.00
X252C16	P32-H	P88-J	AN16	30.50
X252E16	P29-B	P88-K	AN16	35.00
X252G16	P14-u	P88-L	AN16	47.00
X253C16	P32-G	P88-M	AN16	30.50
X253E16	P29-C	P88-N	AN16	35.00
X253G16	P14-v	P88-O	AN16	47.00
X259B16	P14-w	P88-S	AN16	47.00
X260B16	P14-X	P88-U	AN16	47.00
X264A16	P35-E	T86-8	AN16	31.50
X264B16	P32-E	T86-8	AN16	44.50
X267A16	P32-A	P33-A	AN16	39.00
X268A16	P32-B	P33-B	AN16	39.00
X269A16	P32-C	P33-C	AN16	39.00
X273A16	P14-y	P29-E	AN16	28.00
X274A16	P30-B	P4-x	AN16	19.00

ME 5-6115-586-34/FO-2

Figure FO-1. Control panel wire harness assembly.



WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
AL-GREEN	P13-L	P88-q	AWG16	46.00
CR-WHITE	P13-M	P88-r	AWG16	46.00
D200N16N	P14-g	T86-4	AN16	36.50
D233A16	P13-D	P28-M	AN16	32.50
D234A16	P13-E	P28-N	AN16	32.50
D68A16	P14-F	R1+	AN16	19.00
D69A16	P14-Q	R1-	AN16	19.00
H2DT12N	P87-C	T86-2	AN12	34.00
H2DV16N	P88-f	T86-3	AN16	29.50
H300J16	P38-X	T85-7	AN16	38.50
H350D16	P12-T	CR13+	AN16	38.50
H350E16	P38-U	CR13+	AN16	35.50
H351D16	P12-U	CR14+	AN16	38.00
H351E16	P38-V	CR14+	AN16	35.00
H355B16	P12-X	P38-W	AN16	40.50
H356C16	P38-N	P88-f	AN16	78.00
H60E16	P38-M	K15-X1	AN16	79.50
H61D16	P38-A	P88-R	AN16	78.00
H76B16	P13-A	P88-b	AN16	46.00
H76E16	P88-C	CR10-	AN16	51.00
H77B16	P13-B	T85-13	AN16	
H77C16	P88-Z	T85-13	AN16	52.50
H77G16	T85-13	CR10+	AN16	11.50
H81C10	P52-V	P87-D	AN10	78.00
J2ED18N	T85-5	P107-B	AN18	45.00
J2EF18N	J107-B	J104-B	AN18	11.75
J31A16	P4-E	CR8-	AN16	26.50
J32A16	P4-C	P88-p	AN16	45.00
J74A16	P4-B	P88-m	AN16	45.00
J99A20	J104-A	P105-B	AN20	11.00
K14A16	P3-B	CR3-	AN16	26.50
K15D16	P14-V	T85-2	AN16	19.25
K15E16	P88-u	T85-2	AN16	45.00
K15G16	P3-L	T85-3	AN16	21.00
K15H16	P4-g	T85-3	AN16	25.00
K15J16	P88-v	T85-2	AN16	45.00
K16A16	P3-S	P88-h	AN16	42.00
K17B16	P14-K	P88-V	AN16	47.00
K17F16	P3-K	P88-W	AN16	42.00
K18B16	P3-P	P88-X	AN16	42.00
K18D16	P14-L	P88-Y	AN16	47.00
K19A16	P3-R	P88-j	AN16	42.00
K2AD16N	P3-H	T86-1	AN16	33.00
K20A16	P3-J	P4-N	AN16	22.00
K24A16	P4-h	T85-4	AN16	25.75
K24B16	P88-g	T85-4	AN16	45.75
K24D16	P14-X	T85-4	AN16	20.75
K26A16	P3-C	CR6-	AN16	22.50
K26B16	P4-G	CR6-	AN16	25.50
K275D16	P106-B	P12-P	AN16	43.50
K276B16	P106-E	P12-S	AN16	43.50
K277D16	P106-A	P12-M	AN16	43.50
K278B16	P106-D	P12-L	AN16	43.50
K28B16	P14-Y	P88-k	AN16	47.00
K280A16	P106-F	CR19+	AN16	
K281A16	P106-G	CR20-	AN16	
K30A16	P88-n	T85-1	AN16	43.50
K30C16	T85-1	CR8+	AN16	13.50
K65C16	P12-B	CR20+	AN16	
K65D16	CR19+	CR20+	AN16	
K9C16	P14-H	T85-8	AN16	23.75

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
K9E16	P3-M	T85-8	AN16	25.75
K9F16	CR3+	T85-8	AN16	13.75
K94A16	P4-t	K10-ND	AN16	35.00
L13T18	P52-C	T85-9	AN20	38.50
L2L16N	P13-K	T85-5	AN16	20.00
L279C16	P106-C	P12-K	AN16	43.50
L295C16	P12-r	P106-J	AN16	11.50
L30D16	P14-C	T85-1	AN16	18.50
L347C16	P12-D	P52-H	AN16	43.50
L389C16	P12-Z	P52-r	AN16	43.50
L4A16	P52-B	CR1+	AN18	44.25
L45B16	P14-B	K10-NC	AN16	31.00
L50A16	P14-D	S10C-S3	AN16	31.50
L53D16	P14-E	P88-0	AN16	47.00
L79B16	P14-z	P88-a	AN16	47.00
L8F16	P12-A	T85-16	AN16	18.75
L8G16	P52-A	T85-16	AN16	33.25
L8M16	P38-h	T85-16	AN16	30.25
L98A18	P12-s	P107-E	AN18	66.50
L98C20	J107-E	P105-C	AN20	11.00
M2AP16N	T86-3	K15-X2	AN16	28.50
M2148Z0	P13-S	K15-A1	AN20	47.50
M215A20	P38-H	K15-A2	AN20	80.00
M216B20	P13-T	K15-B1	AN20	45.50
M217A20	P38-J	K15-B2	AN20	79.50
M218B20	P13-U	K15-C1	AN20	48.50
M219A20	P38-K	K15-C2	AN20	80.00
M220B20	P13-V	P38-G	AN20	70.00
M222B20	P13-W	P38-F	AN20	70.00
M224B20	P13-X	P38-E	AN20	70.00
M95A16	P38-D	P4-s	AN16	60.00
P1D12	P87-A	R1-	AN12	45.50
P13L16	P14-J	T85-9	AN16	24.50
P2AC12N	T86-2	TR1-	AN12	42.50
P2AE16N	T86-1	P35 (Shell)	AN12	34.00
P2G12N	P52-t	T86-1	AN12	69.00
P2J12N	P52-u	T86-3	AN12	68.00
P21A16	P3-G	P4-0	AN12	22.00
P3D16	P88-c	CR1-	AN16	43.00
P3E16	CR1-	CR2+	AN16	13.50
P3S816	P12-s	P52-D	AN16	43.50
P37A16	P14-N	CR5-	AN16	24.50
P38B16	P52-Y	CR4+	AN16	42.50
P41D16	P52-m	S10A-S3	AN16	36.50
P428D16	P14-O	P4-H	AN16	27.00
P44B16	P14-Q	K10-COMM	AN16	27.00
P44C16	P4-n	K10-COMM	AN16	27.00
P46A16	P4-u	P4-p	AN16	27.00
P47D16	P14-s	P4-t	AN16	27.00
P5816	P88-e	CR2-	AN16	
P5B16	P14-R	P88-A	AN16	47.00
P5E16	P4-M	P88-B	AN16	45.00
P5G16	P3-D	P88-C	AN16	42.00
P54B16	P14-S	P4-K	AN16	27.00
P55B16	P14-T	P29-M	AN16	28.00
P62A12	R1+	TR1+	AN12	53.00
P62B12	P13-J	R1-	AN12	14.50
P84G16	P12-C	P52-E	AN16	43.50
Q10A16	P3-N	CR7-	AN16	23.00
Q10B16	P35-A	CR7-	AN16	50.00
Q12C16	P14-d	CR7+	AN16	25.50

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
V13M16	P29-K	TB5-9	AN16	26.50
V13N16	P28-R	TB5-10	AN16	33.00
V13Q16	P4-D	TB5-10	AN16	30.50
V13R16	P3-E	TB5-10	AN16	27.50
V13S16	P107-C	TB5-10	AN16	27.50
V13W18	TB5-9	P107-D	AN18	46.00
V13X16	J107-C	J104-D	AN16	11.75
V13Y20	J107-D	P105-A	AN20	11.00
V2AA16N	P29-H	TB6-2	AN16	26.00
V2AB16N	P28-P	TB6-2	AN16	25.00
V2AG16N	P88-P	TB6-1	AN16	30.00
V2AR16N	P4-F	TB5-5	AN16	26.50
V2AS16N	TB5-5	K12-NEG	AN16	12.75
V2AT16N	S10-C	K12-NEG	AN16	31.50
V2AV16N	P52-b	P38-Y	AN16	55.00
V2K16N	TB6-3	TB5-5	AN16	36.75
V247A16	P30-J	TB6-7	AN16	24.00
V247B16	P31-D	TB6-7	AN16	33.00
V247C16	P30-K	TB6-7	AN16	24.00
V248A16	P31-E	P30-E+	AN16	41.00
V25A16	P13-C	TB5-6	AN16	18.25
V25C16	P4-P	TB5-6	AN16	27.50
V25D16	TB5-6	CR6+	AN16	10.00
V264C16	P4-V	TB6-2	AN16	32.00
V265A16	P32-J	P4-T	AN16	42.00
V266A16	P4-U	TB6-9	AN16	31.50
V266B16	P33-D	TB6-9	AN16	30.00
V266C16	P32-K	TB6-9	AN16	44.00
V300G16	P14-W	TB5-7	AN16	23.00
V300H16	TB5-7	CR11	AN16	12.00
V302C16	P12-N	CR13-	AN16	17.00
V302D16	CR15-	CR13-	AN16	14.00
V303B16	P52-P	P38-d	AN16	55.00
V302E16	P52-N	CR15-	AN16	37.00
V304C16	P12-R	CR14-	AN16	23.00
V304D16	CR16-	CR14-	AN16	14.00
V304E16	P52-R	CR16-	AN16	36.50
V336E16	P52-T	P38-P	AN16	55.00
V339C16	P52-S	P38-e	AN16	55.00
V34A16	P4-d	K10-X1	AN16	28.50
V368B16	P12-E	P38-S	AN16	40.50
V349B16	P12-F	P52-K	AN16	43.50
V357E16	P52-U	P38-R	AN16	55.00
V367B16	P12-H	P52-a	AN16	43.50
V368C16	P12-G	P52-L	AN16	43.50
V369B16	P12-J	P52-M	AN16	43.50
V372B16	P52-J	P38-T	AN16	55.00
V376A16	P12-k	CR11-	AN16	24.50
V377A16	P12-a	CR12-	AN16	24.00
V378B16	P12-j	TB5-14	AN16	19.50
V378C16	TB5-14	CR12+	AN16	11.00
V378D16	P52-b	TB5-14	AN16	34.00
V379C16	P12-h	P52-n	AN16	43.50
V386C16	P12-e	P52-p	AN16	43.50
V387B16	P12-c	P52-F	AN16	43.50
V39A16	P4-A	CR-4	AN16	27.50
V391C16	P4-q	CR15+	AN16	33.00
V391D16	CR7+	CR15+	AN16	17.00
V391E18	P38-f	CR17-	AN18	36.00
V392A16	P38-b	CR17-	AN16	36.00
V394B16	P12-m	P38-z	AN16	40.50

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
V395C16	P14-r	CR16+	AN16	30.00
V395D16	CR16+	CR18+	AN16	14.00
V395E18	P38-g	CR18+	AN18	37.50
V396A16	P38-c	CR18-	AN16	37.50
V398B16	P12-n	P38-a	AN16	40.50
V40A16	P4-S	CR9-	AN16	30.50
V408I6	CR9-	CR5+	AN16	15.00
V41A16	P4-c	K12-13	AN16	39.00
V41B16	K12-B	CR9+	AN16	18.00
V41C16	K12-B	S10A-S3	AN16	27.00
V43B16	P14-P	P28-S	AN16	33.00
V44D16	P3-F	K10-COMM	AN16	30.00
V45A16	P4-b	K10-NC	AN16	33.00
V49B16	P14-q	K12-11	AN16	33.00
V49C16	S10A-S1	K12-11	AN16	27.00
V49D16	P3-W	S10A-S1	AN16	30.00
V52B16	P4-Q	P88-Q	AN16	45.00
V53B16	P4-R	P88-E	AN16	45.00
V56A16	P4-L	TB5-11	AN16	33.00
V56B16	P29-J	TB5-11	AN16	28.00
V56C16	P14-Z	TB5-11	AN16	26.00
V57B16	P14-a	D4-W	AN16	27.00
V58A16	P29-L	P4-X	AN16	26.00
V63A16	P28-L	P4-F	AN16	31.00
V64A16	P4-J	TB5-12	AN16	32.00
V64B16	P28 T	TB5-12	AN16	34.50
V64C16	P14-b	TB5-12	AN16	26.75
V66B16	P14-c	P4-c	AN16	27.00
V67A16	S10-S2	K12-X1	AN16	27.00
V67B16	P14-M	K12-X1	AN16	32.00
V70B16	P14-f	K12-12	AN16	33.50
V80B16	P14-A	P3-V	AN16	23.00
V97A16	P3-A	107-A	AN16	42.00
V97B16	J107-A	J104-E	AN16	11.75
W36B16	P12-b	P52-z	AN16	43.50
W6D16	P12-a	P52-W	AN16	43.50
W9B16	P52-X	TB5-8	AN16	38.50
X200AA20N	P37-D	TB6-4	AN20	31.00
X200M12N	TB6-4	G1-T4	AN12	33.50
X200Q16N	P28-D	TB6-5	AN16	23.50
X200R16N	P30-D	TB6-5	AN16	25.00
X200S16N	P38-B	TB6-5	AN16	71.00
X201B16	P30-F	K10-A1	AN16	23.00
X201C16	P28-A	K10-A1	AN16	35.00
X201D16	P14-h	K10-A1	AN16	24.00
X202B16	P30-G	K10-B1	AN16	23.00
X202C16	P28-B	K10-B1	AN16	35.00
X202D16	P14-j	K10-B1	AN16	25.00
X203B16	P30-H	K10-C1	AN16	23.00
X203C16	P28-C	K10-C1	AN16	35.00
X203D16	P14-k	K10-C1	AN16	26.00
X204H16	P13-N	K10-A2	AN16	24.50
X205H16	P13-P	K10-B2	AN16	24.50
X206H16	P13-R	K10-C2	AN16	24.50
X228B20	P14-n	P37-A	AN20	49.00
X229B20	P14-n	P37-B	AN20	49.00
X230B20	P14-p	P37-C	AN20	49.00
X232A16	P13-l	P28-F	AN16	31.50
X235A16	P28-E	CT1-X1	AN16	44.00
X236A16	P28-G	CT2-X1	AN16	46.00

WIRE NO.	FROM	TO	WIRE SIZE	LENGTH (INCHES)
X237A16	P28-J	CT3-X1	AN16	44.00
X238A16	P13g-	CT-X2	AN16	28.00
X239A16	P13-G	CT2-X2	AN16	29.50
X240A16	P13-H	CT3-X2	AN16	28.00
X243A16	P4-Z	P31-A	AN16	49.50
X244A16	P4-y	P31-B	AN16	49.50
X245A16	P30-C	P31-C	AN16	41.00
X246A16	P30-A	P4-Y	AN16	19.00
X249B16	P29-D	P88-R	AN16	35.00
X250B16	P29-F	P88-T	AN16	35.00
X251C16	P32-F	P88-F	AN16	30.50
X251E16	P29-A	P88-G	AN16	35.00
X251G16	P14-t	P88-H	AN16	47.00
X252C16	P32-H	P88-J	AN16	30.50
X252E16	P29-B	P88-K	AN16	35.00
X252G16	P44-u	P88-L	AN16	47.00
X253C16	P32-G	P88-M	AN16	30.50
X253E16	P29-C	P88-N	AN16	35.00
X253G16	P14-v	P88-O	AN16	47.00
X259B16	P14-w	P88-S	AN16	47.00
X260B16	P14-X	P88-U	AN16	47.00
X264A16	P35-E	TB6-8	AN16	31.50
X264B16	P32-E	TB6-8	AN16	44.50
X267A16	P32-A	P33-A	AN16	39.00
X268A16	P32-B	P33-B	AN16	39.00
X269A16	P32-C	P33-C	AN16	39.00
X273A16	P14-y	P29-E	AN16	28.00
X274A16	P30-B	P4-x	AN16	19.00

Figure FO-2. Engine skid wire harness assembly.

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