TM 11-5507

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

ROTARY CONVERTERS

PU-134/U, PU-140/U
PU-140A/U, PU-141/U
PU-141A/U, PU-141B/U
PU-143/U, PU-143A/U
AND PU-143B/U



DEPARTMENT OF THE ARMY • *DECEMBER 1956*

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WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

Be sure that the equipment is disconnected from the input power source before attempting to make any repairs or adjustments.

TECHNICAL MANUAL
No. 11–5507

DEPARTMENT OF THE ARMY
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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

a. This technical manual contains information on the installation, operation, and maintenance of the rotary converters covered herein.

b. Forward comments on this publication directly to: Commanding Officer, The Signal Equipment Support Agency, Fort Monmouth, N. J., ATTN: SIGFM/ES–PMA.

2. Forms and Records

a. Unsatisfactory Equipment Reports. Fill out and forward DA Form 468 (Unsatisfactory Equipment Report) to Commanding Officer, Signal Corps Equipment Support Agency, Fort Monmouth, N. J., as prescribed in AR 700–38.

b. Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58 (Army); Navy Shipping Guide, Article 1850–4, (Navy); and AFR 71–4 (Air Force).

Section II. DESCRIPTION AND DATA

3. Description
(figs. 1–5)

The rotary converters, covered in this manual, are fan-ventilated, semi-inclosed units. Filter boxes are located either on the top or the side of all units, except PU–141A/U. Inspection covers are provided on both ends and mounting feet are provided to support the rotary converter on the floor or foundation.

4. Purpose and Use

The rotary converters, covered in this manual, are used to convert various dc voltages to 110-volt, 60-cycle per second (cps), ac, at a power factor of not lower than 80 percent. They are intended primarily to supply ac power for fixed station and shipborne radio receiving and transmitting equipment.

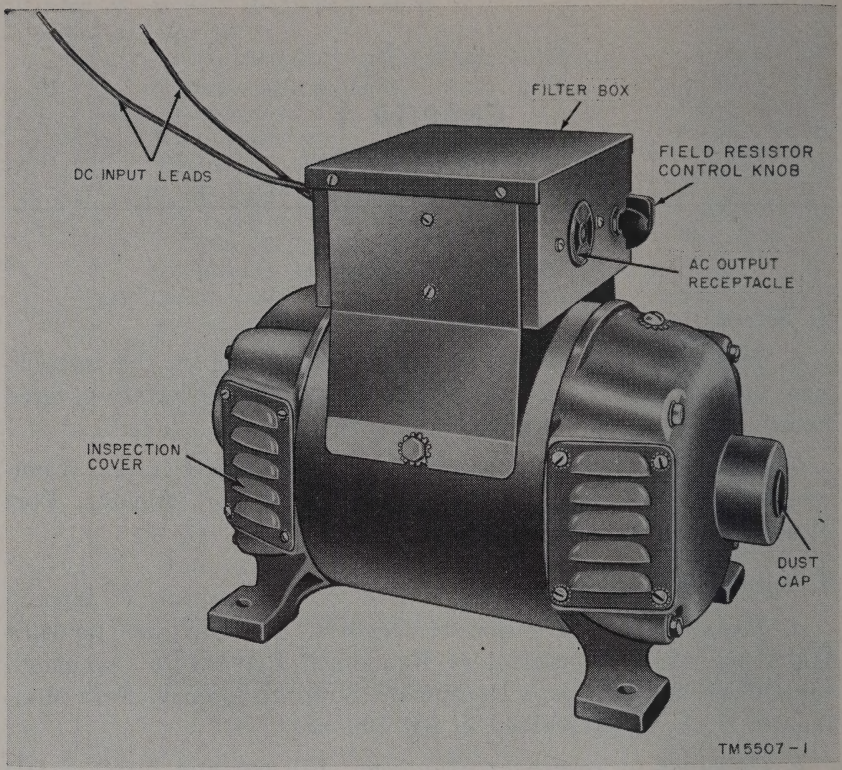


Figure 1. Rotary Converter PU–140/U, PU–140A/U, or PU–143B/U.

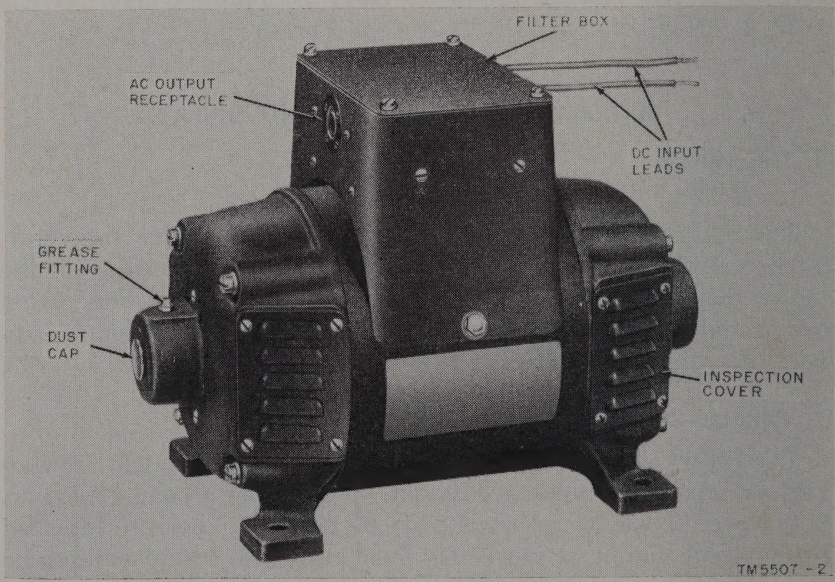


Figure 2. Rotary Converter PU–141/U, PU–143/U, or PU–143A/U.

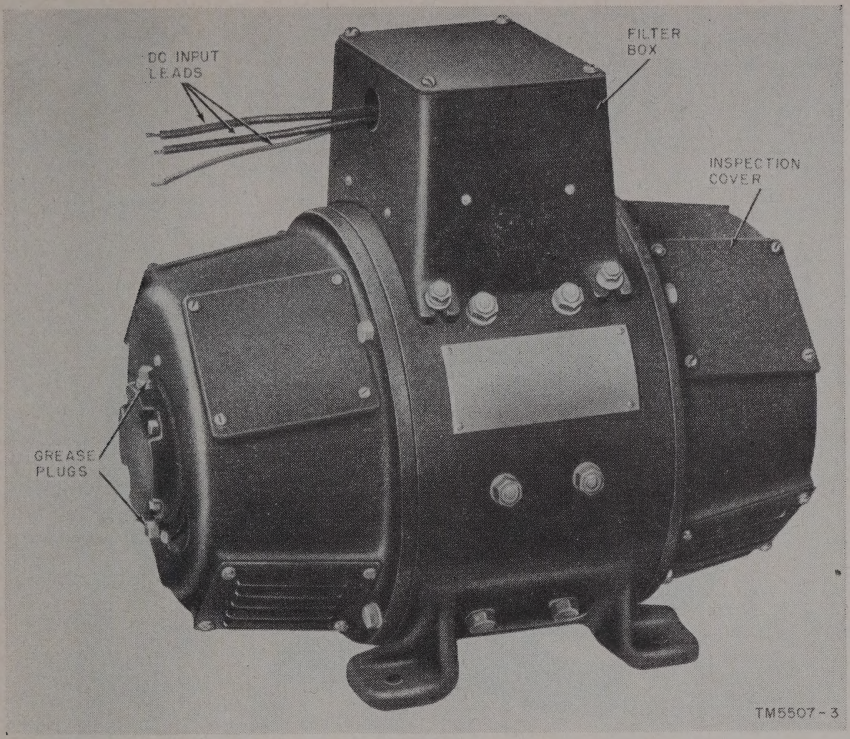


Figure 3. Rotary Converter PU–134/U.

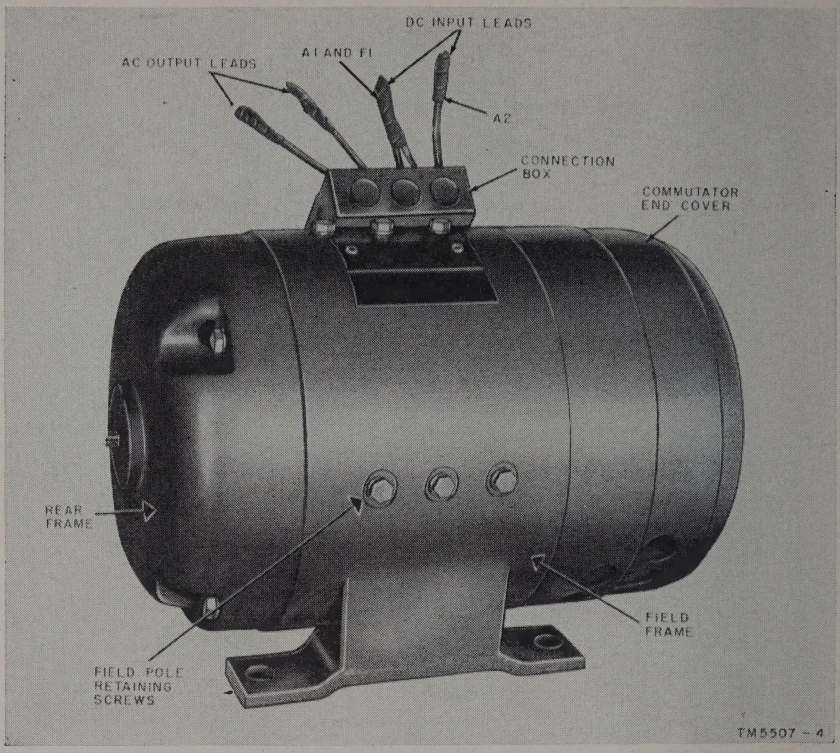


Figure 4. Rotary Converter PU–141A/U.

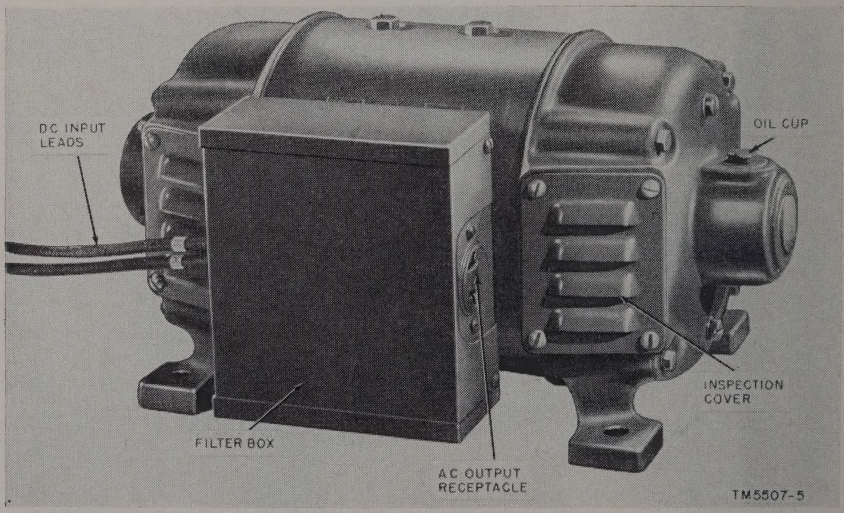


Figure 5. Rotary Converter PU–141B/U.

5. Performance Characteristics

a. Rotary Converter PU–134/U.

Dc input (230 volts)	Ac output									
	No load		Half load				Full load			
			Pf 100%		Pf 85%		Pf 100%		Pf 85%	
	Volts	Freq	Volts	Volts	Volts	Freq	Volts	Freq	Volts	Freq
10% low	117	57	111	57	109	68	106	56	103	58
Rated value	130	62	124	60	122	61	118	59	114	61
10% high	143	65	136	63	134	64	130	62	125	64

b. Rotary Converter PU–140/U.

Dc input (115 volts)	Ac output									
	No load		Half load				Full load			
			Pf 100%		Pf 85%		Pf 100%		Pf 85%	
	Volts	Freq	Volts	Freq	Freq	Freq	Volts	Freq	Volts	Freq
10% low	113	57	107	55.4	105	56.8	100	53.8	96	56.5
Rated value	126	62	119	60.4	117	61.8	112	58.8	108	61.5
10% high	139	67	132	65.4	130	66.8	125	63.8	120	66.6

c. Rotary Converter PU–140A/U.

Dc input (115 volts)	Ac output									
	No load		Half load				Full load			
			Pf 100%		Pf 85%		Pf 100%		Pf 85%	
	Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq
10% low	111	59	106	57	106	58	100	56	98	57
Rated value	124	62	118	60	117	61	112	59	110	60
10% high	136	65	130	63	129	64	123	62	121	63

d. Rotary Converter PU–141A/U.

Dc input (32 volts)	Ac output									
	No load		Half load				Full load			
			Pf 100%		Pf 85%		Pf 100%		Pf 85%	
	Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq
10% low	109	57	103	56	101	58	100	55	98	58
Rated value	122	62	118	61	116	62	114	60	113	62
10% high	134	65	127	66	126	66	125	65	123	67

e. Rotary Converter PU–141B/U.

Dc input (24 volts)	Ac output									
	No load		Half load				Full load			
			Pf 100%		Pf 85%		Pf 100%		Pf 85%	
	Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq
10% low	115	61	110	58	108	59	103	55	100	57
Rated value	128	64	122	61	120	62	114	58	111	60
10% high	141	68	135	64	132	65	125	61	122	63

f. Rotary Converter PU–143A/U.

Dc input (24 volts)	Ac output									
	No load		Half load				Full load			
			Pf 100%		Pf 85%		Pf 100%		Pf 85%	
	Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq
10% low	116	62	110	57	108	59	104	55	99	57
Rated value	129	65	123	60	120	62	116	58	111	60
10% high	142	68	135	64	132	65	128	61	122	63

g. Rotary Converter PU–143B/U.

Dc input (24 volts)	Ac output									
	No load		Half load				Full load			
			Pf 100%		Pf 85%		Pf 100%		Pf 85%	
	Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq
10% low	115	58	108	56	107	57	100	56	98	57
Rated value	128	61	120	60	119	61	112	58	110	60
10% high	141	67	132	65	130	67	123	63	121	66

h. Input, Output, and Speed.

Model	Input volts (dc)	Output volts (ac)	Output (amp)	Speed (rpm)
PU–134/U	230	110	5.45	1,800
PU–140/U	115	110	4.55	3,600
PU–140A/U	115	110	4.55	3,600
PU–141/U	32	110	4.55	3,600
PU–141A/U	32	110	4.55	1,800
PU–141B/U	32	110	4.55	3,600
PU–143/U	24	110	4.1	3,600
PU–143A/U	24	110	4.1	3,600
PU–143B/U	24	110	4.1	3,600

6. Differences Between Models

a. Physical Differences. Most of the external physical differences between the rotary converters covered in this manual will be apparent by referring to figures 1 through 5. The major physical differences involve the size and weight, the location of the filters, and the type and location of the inspection covers.

b. Differences in Weights and Dimensions. The weight and dimensions of the various rotary converters are given in the following table:

Model	Height (in.)	Depth (in.)	Width (in.)	Weight (lb)
PU–134/U	13	15¾	9¾	122
PU–140/U	9⅝	13⅞	7⅛	51
PU–140A/U	10½	13⅞	7 9/16	58
PU–141/U	9⅝	13⅞	7⅛	51
PU–141A/U	10½	14 5/16	10¼	125
PU–141B/U	7¼	12⅞	8⅞	46.5
PU–143/U	13⅛	14¾	9¾	76
PU–143A/U	9⅝	13⅝	7⅜	58
PU–143B/U	9⅝	13⅝	7⅜	58

c. Interchangeable Models. Some commercial models of rotary converters have been procured by the Signal Corps. These may be used interchangeably with some models that have been assigned Signal Corps nomenclature. Those rotary converters that may be used interchangeably are listed below.

Commercial models	Signal Corps models
Janette CS12F, 24-volt	PU–143/U, PU–143A/U, and PU–143B/U
2DL60	PU–134/U
3K50	PU–141/U, PU–141A/U, and PU–141B/U
1K50	PU–140/U and PU–140A/U

CHAPTER 2
INSTALLATION AND OPERATION

7. Unpacking and Checking

Unpack the rotary converter at the location where it will be installed. The location should be convenient to the load equipment and to the dc power source.

a. Withdraw the nails that secure the top of the wooden box, with a nail puller. Be careful not to damage the equipment when removing the packing material.

b. Lift off the top of the box and remove the technical literature.

c. Slit the barrier material along the seal and open the barrier. Slit the inner paper seal and remove the paper blocking.

d. Lift the rotary converter from the fiberboard box. Be sure that the fiberboard-wrapped spare parts are not thrown away with the packaging material.

e. Inspect the unpackaged equipment for any evidence of damage through rough handling or improper shipment.

f. If any damage is noted, forward DD Form 6 in accordance with instructions in paragraph 2*b*.

8. Installation

a. Provide a foundation that will keep the rotary converter about 6 inches above the floor or deck. Allow about 2 feet of space on all sides of the rotary converter to enable servicing and to permit a free circulation of air.

b. Fasten the rotary converter to the foundation with bolts or lag screws. If sensitive electronic equipment is installed close by, install vibration dampening material between the foundation and the base of the rotary converter.

9. Connections

a. General. All rotary converters, except Rotary Converter PU–141A/U, are provided with a female output receptacle for the ac output connection. The dc input is connected to the input leads that are provided on all models of the equipments.

b. Input Connections. Connect the dc power source to a fused safety switch and connect the input leads of the rotary converter

to the other side of the switch. Connect Rotary Converter PU–134/U and PU–141A/U as shown in B, figure 6: connect all other equipments as shown in A, figure 6. Install fuses in the input circuit. The recommended input fuses for the various models of the equipment are listed in the following table:

Rotary Converter	Fuse rating	
	Amperes	Volts
PU–134/U	5	230
PU–140/U	9	115
PU–140A/U	9	115
PU–141/U	20	32
PU–141A/U	20	32
PU–141B/U	20	32
PU–143/U	30	24
PU–143A/U	30	24
PU–143B/U	30	24

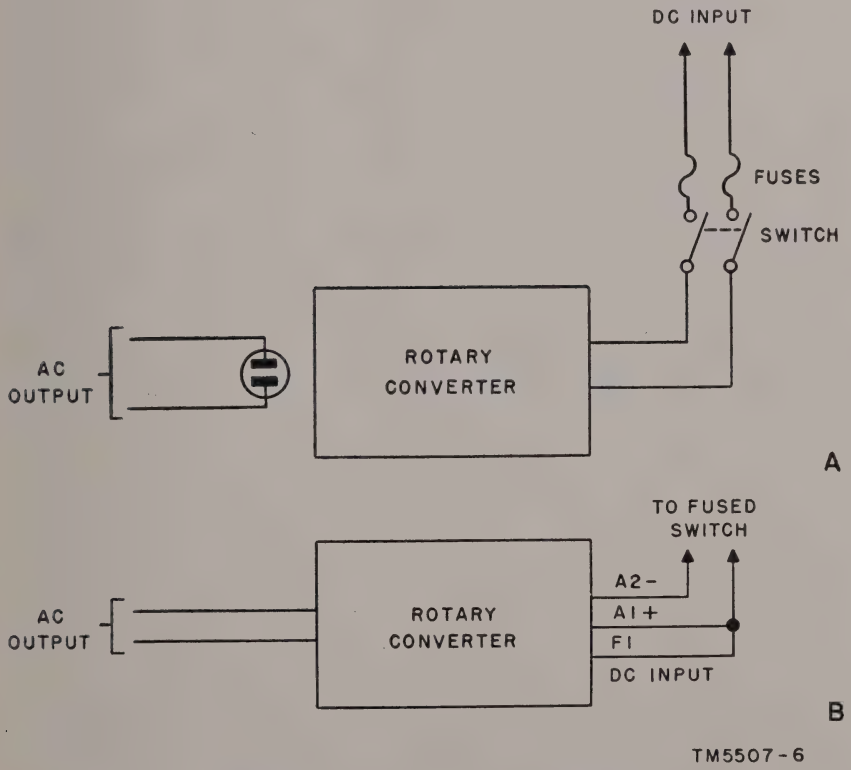


Figure 6. Typical connection diagrams.

c. Output Connections. On Rotary Converter PU–141A/U, connect the load leads to the ac output leads in the connection box, as shown in B, figure 6. Solder the connections and tape them securely. On all other models of the rotary converters, attach a two-pronged, male plug to the load leads and insert the plug into the output receptacle, as shown in A, figure 6.

10. Operation

a. Starting. Close the safety switch and use Electrical Power Test Set TS–914/U to test the output voltage and frequency. Compare the no-load voltage and frequency with the values in paragraph 5.

b. Frequency Adjustment. Adjust the output frequency, if necessary.

(1) *PU–140A/U and PU–143B/U* (fig. 18). These units are provided with a rheostat in the dc shunt-field circuit. If the frequency is not satisfactory, apply maximum load to the unit and adjust the rheostat either clockwise or counterclockwise until the correct output is obtained.

(2) *PU–143A/U, PU–140/U, and PU–141/U.* These units are supplied with an adjustable tap resistor inside of the filter box (fig. 19). If the frequency is not satisfactory, remove the top of the filter box and adjust the movable tap on the resistor until the output is satisfactory. Be sure to tighten the adjustable tap and replace the filter box cover.

(3) *PU–141A/U, PU–141B/U, and PU–134/U.* These units are not provided with any means for adjusting the output.

Note. Some early models of the rotary converters were supplied with a frequency control governor.

c. Stopping. Open the safety switch. Remove the ac output plug.

CHAPTER 3
ORGANIZATIONAL MAINTENANCE

Section I. FIRST AND SECOND ECHELON MAINTENANCE

11. Scope of Responsibility

a. First Echelon. First echelon personnel should keep the exterior of the equipment clean, inspect the general condition of the equipment, and see that it has not been damaged.

b. Second Echelon. Second echelon personnel should tighten any loose screws, nuts and bolts, replace worn brushes, and clean the commutator and slip rings. Second echelon personnel should test and adjust output voltage and frequency and should make such minor repairs as available tools and spare parts permit.

12. Technical Differences Between Models

Model	Notes					
PU–134/U	1	3	7		12	15
PU–140/U	1	3	9	11	12	14
PU–140A/U	1	3	8	10	12	14
PU–141/U	1	3	9	11	12	14
PU–141A/U	2	5	7		13	15
PU–141B/U	1	4	9		12	14
PU–143/U	1	3	9	11	12	14
PU–143A/U	1	3	6	11	12	14
PU–143B/U	1	3	8	10	12	14

Notes.

1. Commutator and slip rings on opposite ends.
2. Commutator and slip rings on same end.
3. Filter box on top of field yoke.
4. Filter box on side of field yoke.
5. No filter.
6. Ball bearings with grease fittings.
7. Ball bearings with grease plugs.
8. Ball bearings with no grease plugs or fittings.
9. Sleeve bearings with oil cups.
10. Field current controlled by rheostat.
11. Field current controlled by adjustable tap resistor.
12. Load connected through output receptacle.
13. Load permanently connected; no output receptacle.
14. Two-wire input connection.
15. Three-wire input connection.

13. Tools, Materials, and Test Equipment

a. Tools. The following common hand tools are required for organizational maintenance:

Adjustable, slip-joint pliers, 6-inch.
Open-end wrench, $\frac{1}{4}$-inch and $\frac{5}{16}$-inch openings.
Screw Driver TL–358/U.
Screw Driver TL–496/U.
Pressure lubricator (for units with grease fittings only).
Lubricating oil can (for units with oil cups only).

b. Materials. The following materials are required for organizational maintenance:

Sandpaper, No. 0000.
Clean cloth.
Dry, wooden stick.
Solvent, dry cleaning (SD).

c. Test Equipment. The following test equipment is available for the use of organizational maintenance personnel.

Multimeter ME–87/U.
Multimeter TS–352/U.
Electrical Power Test Set TS–914/U.

14. Organizational Maintenance Operations

a. Operator's Maintenance. Each day that the equipment is used, inspect it thoroughly to see that it is not damaged. Wipe the exterior with a clean cloth to remove all dust and dirt. Use cleaning solvent (SD) if necessary. While the equipment is operating, be alert for unusual noise, vibration, signs of overheating, and other indications of faulty operation.

b. Second Echelon Maintenance.

(1) *Weekly.* Once each week, inspect all exposed wiring for cuts, cracked insulation, loose terminals and connections, and other unsatisfactory conditions. Inspect all fastenings and tighten those in need of tightening. Remove the inspection covers and inspect the commutator, slip rings, and brushes. Operate the equipment and note if there is excessive sparking at the brushes. Perform any lubrication that may be scheduled.

(2) *Monthly.* Once each month, remove the inspection covers and inspect the brushes, brush holders, and brush springs. Remove the brushes from their holders and measure their length. Replace any brush that is worn to less than three-eighths-inch or that is cracked, chipped, or otherwise unsatisfactory. Make sure that the brush

holders are securely mounted and clean. See that the brushes move freely in their holders and that they make good contact with the commutator and slip rings. Inspect the surfaces of the commutator and the slip rings to see that they are clean and smooth. Remove any dirt, or grease with a clean cloth, moistened with cleaning solvent. If the surface is slightly pitted, clean it with fine sandpaper (No. 0000). Make sure all fastenings are tight and inspect all wires to see that the insulation is not damaged and that all soldering is secure.

15. Care of Commutator and Slip Rings

a. A slight discoloration of the commutator and slip rings is normal. Do not attempt to maintain a surface that appears newly machined. However, the surfaces of the slip rings and the commutator should be smooth and free from pitting and dirt. For normal cleaning, use a strip of heavy canvas and a dry stick of wood. Cut the canvas and the stick about the width of the surface to be cleaned and wrap the canvas over the end of the stick. With the unit operating, hold the canvas in contact with the surface of the commutator or slip ring. If the surface is slightly pitted, fold a piece of No. 0000 sandpaper over the end of the stick and hold the sandpaper lightly against the surface to be cleaned while the unit is running. After using the sandpaper, burnish the surface with the canvas and clean all sand and carbon dust from the unit.

Caution: When cleaning the commutator or slip rings avoid coming into contact with live parts of the equipment.

b. If the surface of the commutator or the slip rings is badly pitted or scratched or nicked, remove the armature and turn it in for repair to a higher echelon of maintenance. The armature will have to be turned down on a lathe.

16. Seating Brushes
(fig. 7)

Whenever new brushes are installed or it is necessary to reseat old ones, proceed as follows:

a. Cut a strip of No. 0000 sandpaper slightly wider than the width of the brush. Turn the sandpaper so that the sanded surface will be toward the brushes and slip it under the brushes. Allow the brush to rest on the sandpaper and draw the sandpaper under the brush in the direction of normal rotation. Lift the brush and return the sandpaper to its original position. Continue this procedure until the brush is properly seated. Perform the same operation for all brushes. When fitting commutator brushes,

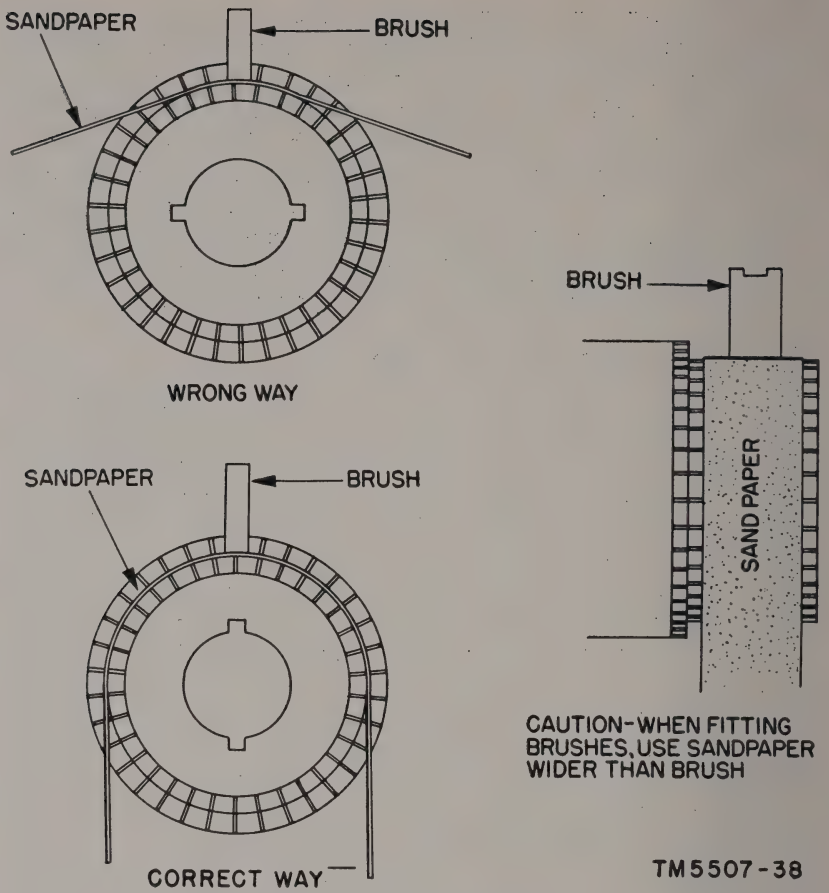


Figure 7. Seating brushes.

be sure that the sandpaper follows the curve of the commutator. Blow all sand and carbon dust from the unit.

b. When fitting brushes, be sure to check the brush spring tension and to see that the brushes move freely in the brush holders.

Section II. LUBRICATION

17. Lubricants

The following lubricants are authorized for lubrication of the equipment covered in this manual. Apply the lubricants in accordance with the applicable lubrication order and instructions in paragraph 18.

Symbol	Nomenclature	Equipment
OE	Oil, Engine, Heavy Duty	Rotary Converters PU–140/U, PU–141/U, PU–141B/U, PU–143/U, and commercial models that have oil cups.
GL	Grease, Aircraft and Instruments	Rotary Converters PU–134/U, PU–140A/U, PU–141A/U, PU–143A/U, PU–143B/U, and commercial models that have grease fittings or plugs.

18. Lubricating Procedures

The following lubrication operations will be performed by the second echelon personnel.

a. Rotary Converter PU–134/U (fig. 3). Once each quarter (3 months), wipe all dust and dirt from the area surrounding the grease plugs on both ends of the rotary converter. Remove both the upper and the lower plugs on each end. With a pressure gun, apply grease (GL) to the upper hole in each bearing housing until the grease forced out of the lower hole is the same color as fresh grease. Replace all plugs and wipe off any excess grease.

b. Rotary Converters PU–140A/U, PU–143A/U, and PU–143B/U. Once each quarter (3 months), wipe all dust and dirt from the grease fittings on PU–140A/U and PU–143A/U (fig. 2). With a pressure gun, apply grease (GL) until the bearing is full. Remove the grease fittings and operate the rotary converter, with the fittings removed, to expel excess grease. Operate the rotary converter for about 5 minutes and then replace the fittings. On PU–143B/U (fig. 1), pry the dust caps from both bearing housings and repack the bearings with grease (GL) until they are about two-thirds full. Replace the dust caps and wipe off any excess grease.

c. Rotary Converters PU–140/U, PU–141/U, PU–141B/U, and PU–143/U. Once each month, wipe all dust and dirt from the oil cups in the bearing housings. Fill the oil cups (fig. 5) with engine oil (OE), of the correct seasonal grade. Wipe off any excess oil that may have overflowed.

d. Rotary Converter PU–141A/U (fig. 4). Once each quarter (3 months), wipe all dust and dirt from the area surrounding the grease plugs on both ends of the rotary converter. Remove the grease plugs and apply grease (GL) with a pressure gun. Pack each bearing about one-half full and then, before replacing the grease plugs, operate the equipment for about 5 minutes to expel excess grease. Replace the plugs and wipe off any excess grease.

Section III. ORGANIZATIONAL TROUBLESHOOTING

19. General Procedure

Whenever difficulty with a rotary converter is experienced, inspect it visually. This will frequently disclose a blown fuse, loose connection, broken wire, or other obvious cause for faulty operation or failure.

20. Detailed Troubleshooting

The troubleshooting charts that follow list various troubles and trouble symptoms that may be readily detected. When the type of the trouble has been determined, check the various points listed under *possible causes* and then correct the difficulty in accordance with instructions listed under *remedy*. If checking the items listed in the following troubleshooting charts does not disclose the cause of the difficulty, refer the equipment to a higher repair echelon.

a. Unit Fails to Start.

Possible cause	What to check	Remedy
No dc input; open in dc circuit	Test dc power source. Inspect fuses. Inspect fuse holder. Inspect dc input switch.	Correct faulty dc power source. Replace blown fuse (par. 10*c*.). Clean fuse holder.
	Inspect dc wiring inside of filter box. Test dc components in filter box.	Correct faulty wiring inside of filter box. Replace faulty dc filter components.
Dc brush not making contact	Check for weak or broken brush holder spring.	Replace faulty brush spring.
	See that brushes move freely in their holders.	Clean brushes and brush holders.
	Measure brush length	Replace any brush worn to less than ⅜-inch.
Armature jammed	Remove inspection cover and try to turn it by hand.	If jammed, refer the trouble to a higher repair echelon.

b. Unit Runs but Does Not Deliver Current.

Possible cause	What to check	Remedy
Open ac circuit	Inspect ac wiring and connections. Test choke coils.	Repair or replace faulty part.
Ac brushes not making good contact	Inspect for weak or broken brush holder spring.	Replace broken spring.
	See that brushes move freely in holders	Clean brushes and brush holders.
	Measure brush length	Replace worn brushes.
Partial short in ac circuit	Test wiring to load	Repair or replace faulty wiring.
	Test filter capacitors	Replace capacitors.

c. Low Ac Output Voltage.

Possible cause	What to check	Remedy
Low dc input voltage	Test dc input voltage	Correct cause of low dc input voltage.
Partial short in ac circuit	Check wiring to load	Repair or replace faulty wiring.
	Test filter capacitors	Replace faulty capacitors.

d. Ac Output Excessively High.

Possible cause	What to check	Remedy
Dc input voltage high	Test dc input voltage	Reduce dc input voltage.

e. Speed or Frequency Above or Below Normal.

Possible cause	What to check	Remedy
Shunt field resistor or rheostat not correctly adjusted.	Inspect setting of resistor or rheostat	Adjust resistor or rheostat.

f. Excessive Sparking at Brushes.

Possible cause	What to check	Remedy
Brushes out of position	Check position of brush holder yoke assembly.	Adjust brush holder yoke.
	Check position of brush holder studs	Adjust brush holder.
	Check for broken brush holder spring	Replace broken spring.
Brush sticking in holder	Check for free brush movement	Clean brush and brush holder.
Overload on unit	Check load against name plate rating	Reduce load.

g. Unit Overheats.

Possible cause	What to check	Remedy
Unit overloaded	Check load against nameplate rating	Reduce load.
Poor ventilation	Inspect ventilating louvers and other air passages.	Clean air passages.
	Check area ventilation	Provide better area ventilation.

h. Bearings Overheated.

Possible cause	What to check	Remedy
Lack of lubrication	Check lubrication	Lubricate in accordance with lubrication order.
Excessive lubrication (ball bearing models only).	Check lubrication	Purge bearing of excess grease.
Bearings misalined	Check fit of end brackets	Adjust seating of end brackets.

i. Noisy Operation.

Possible cause	What to check	Remedy
Unit not firmly mounted	Inspect mounting bolts	Tighten mounting bolts. Install vibration dampers under unit.

j. Unit Causes Radio Interference.

Possible cause	What to check	Remedy
Faulty filter capacitor	Test capacitors in filter	Replace faulty capacitor.
Defective reactor or choke coil	Test coils for short circuits and grounds	Repair or replace faulty part.
Sparking at commutator or slip rings	Inspect commutator, slip rings, and brushes.	Clean commutator or slip rings; replace brushes.

21. Test Procedures

a. General. Before making any tests on the rotary converter, except operational tests, open the dc input safety switch and remove the fuses. Multimeter TS–352/U may be used for making continuity tests, checking dc voltage, and current. Electrical Power Test Set TS–914/U should be used for measuring ac voltage and frequency. Multimeter ME–87/U should be used for testing the dc input circuit.

b. Fuse Test. If the fuses in the dc input circuit have no visible indication of being open, connect Multimeter ME–87/U across the dc input line; first on the line side and then on the load side of the fuse holder. If there is voltage on the line side and no voltage on the load side, one or both of the fuses are either open or not making contact in the fuse holders. Check fuses and fuseholders.

c. Armature Test.

(1) *Test for ground.* First lift the brushes from both the commutator and slip rings and block them in raised position. With Multimeter TS–352/U, test between the armature shaft and each slip ring. Test between the armature shaft and each segment of the commutator. A closed circuit reading indicates that the part under test is grounded.

(2) *Test for open circuit.* Place one of the test prods of the multimeter on one of the segments of the commutator. Place the other test prod on the adjoining segment. Keep the first prod in contact with the one segment and move the second prod, from segment to segment, completely around the commutator, until a check of all commutator segments has been made. No reading indicates an open circuit. If an open circuit is indicated, inspect the soldered connection on the end of the segment. To test the ac circuit, place one test prod on each of the slip rings. No reading indicates that the circuit is open.

d. Capacitor Tests. Before testing a capacitor, disconnect one end. Make a continuity test between the two terminals of the capacitor. If continuity is indicated, the capacitor is short-circuited and must be replaced. The best test for a small capacitor is to substitute a good capacitor for the one suspected of being faulty. To be safe, replace any capacitor suspected of causing trouble.

e. Frequency. Some models of the rotary converters are supplied with either a rheostat or an adjustable tap resistor in the shunt-field circuit to control the speed, and the frequency of the ac output. A few early models were equipped with an automatic frequency control governor. To test the output frequency of the rotary converters, use Electrical Power Test Set TS–914/U.

CHAPTER 4
THEORY

22. General

The general theory of the rotary converters is the same for all models. They are similar in construction to a dc, compound-wound motor, except that the armature has a second winding from which 110-volt, 60-cycle per second, ac may be obtained. All models of the equipments functions similarly, but minor differences do exist between certain models.

23. No-load Operation

a. Energizing the dc side of the rotary converter places line voltage across the commutator and the shunt field circuits, causing current to flow in the dc armature winding and in the field coils. The field coils are connected so that every other pole is a north pole and the remaining poles are south poles. The resulting magnetic field reacts to the magnetic field of the armature, causing the armature to rotate.

b. An ac voltage is induced in the ac armature winding. The value of the voltage is determined by the number of turns in the windings.

c. The output frequency depends solely on the speed of armature rotation, which is governed by the magnetic field strength and the armature voltage. Increasing the resistance in the shunt-field circuit weakens the magnetic field, causing the armature to speed up and bring the cemf back to normal. Since the cemf remains unchanged, the output voltage is unchanged. Decreasing the shunt-field resistance strengthens the magnetic field, reducing the speed and frequency, and again leaving the output unchanged. An increase in the applied voltage raises the armature voltage and hence tends to increase the speed. However, this also strengthens the magnetic field which tends to oppose the increased armature speed. Because the per cent of increase in field strength is less than the per cent of increase in applied voltage, the armature speed increases. A decrease in applied voltage causes a decrease in speed.

d. The series-field winding aids starting by adding its effect to that of the shunt winding. It strengthens the magnetic field and

thereby increases the starting torque. When the rotary converter is running without load, the series field has practically no effect.

e. In rotary converters that are provided with interpoles, the interpole coils are series-connected. These interpole coils reduce objectionable sparking at the dc brushes by reducing the voltage appearing between the commutator segments at that point.

24. Operation Under Load

a. When load is connected to the ac output of the rotary converter, the output voltage decreases, even though the input voltage may remain unchanged. This decrease, caused by the resistance and reactance of the unit, is greatest when the power factor of the load is low; then the reactance drop is most effective.

b. When the rotary converter is under load, current in the series field winding increases. This increase in current in the series field winding strengthens the magnetic field, causing a slight drop in frequency.

c. When the rotary converter is under load, current flows in the armature and the armature becomes a magnet. The result is a distortion of the magnetic field produced by the field windings. When the load is of unit power factor (1.0), the field is shifted so that the neutral point is no longer at the brushes, and sparking may occur. A load of low power factor produces still another effect. The lagging component of this load (magnetizing current for transformers and motors) has a magnetizing effect, weakens the field, and causes a rise in frequency.

d. To summarize the effects of load on the rotary converter; a load of unity power factor causes a drop in output voltage and a small drop in frequency and may cause sparking at the brushes. A load of low power factor produces a large drop in output voltage and a rise in frequency and may also cause sparking.

CHAPTER 5
FIELD MAINTENANCE

Section I. GENERAL

25. Field Maintenance Tools and Test Equipment

The following tools and test equipment are required for field maintenance of the rotary converters.

a. Test Equipment.
Multimeter ME–87/U
Multimeter TS–352/U
Ohmmeter ZM–21/U (4th and 5th echelons only)
Electrical Power Test Set TS–914/U
Thermometer MX–1570/G (4th and 5th echelons only)

b. Tools.
Hammer, 1 pound, ballpeen
Pliers, combination, with side cutters, 6 inch
Knife TL–29
Pliers TL–103
Pliers TL–126
Screwdriver TL–358/U
Screwdriver TL–496/U
Spring scale, 0–32 oz
Soldering Iron TL–120
Wrench, open end, ¼-inch and 5/16-inch openings
Wrench, open end, ⅜-inch and 7/16-inch openings
Wrench, open end, ½-inch and 9/16-inch openings

26. Preliminary Inspection

Before proceeding with dissassembly and repair of a rotary converter, inspect it for visual evidence of damage, missing parts, or other unsatisfactory condition. Carefully inspect the brushes, commutator, slip rings, and brush mountings to see if they are in need of repair or replacement.

Note. When repairing the rotary converters, disassemble only so much of the equipment as is necessary to accomplish the required inspection, cleaning, or repair. Mark assemblies with punch marks and tag all coils, wires, and leads to insure their reassembly in correct relation to other parts.

27. Disassembly of PU–141/U
(fig. 8)

a. Removal of End Cover, Rear Frame, and Armature. Remove the four roundhead machine screws and washers that secure the commutator end cover and pull off the end cover. Unscrew the four hexagonal-head screws that hold the rear frame to the field frame and pull the two apart. Lift the brush springs and remove all brushes. Pull the armature out of the field frame. Be careful not to damage the armature or the field coils.

b. Removal of Brush Holder Ring Assembly.

(1) Perform the operations in *a* above. Disconnect the dc leads from the dc brush holders; disconnect the capacitor leads from the brush holder terminals; and disconnect the ac leads from the ac brush holder terminals. Tag all leads as they are removed.

(2) Remove the four hexagonal-head screws that hold the commutator end frame to the field frame and remove the commutator end frame. Unscrew the four screws that secure the brush holder ring to the commutator end frame. Loosen the setscrews that hold the brush holder ring in position and remove the brush holder assembly.

c. Dismantling Field Frame Assembly. Perform the operations in *a* and *b* above. Remove the hexagonal-head screws that hold the field poles to the field frame. Remove the field coils and pole shoes. Mark the position of each of the coils, with relation to the

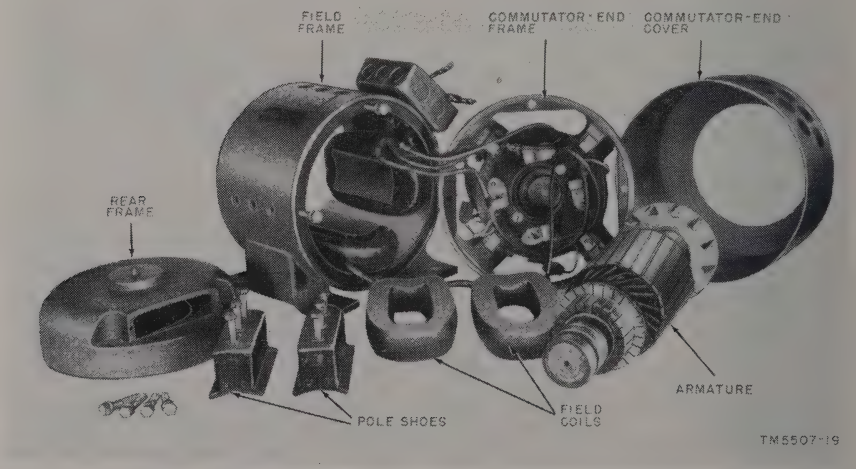


Figure 8. Rotary Converter PU–141A/U, disassembled.

field frame, before removing them. Push the pole shoes out of the field coils.

d. Removing Ball Bearings. The ball bearings will remain on the ends of the armature shaft when the armature is removed. To remove the bearings, support the inner bearing race and press the shaft from the bearing. Never apply pressure to the outer bearing race.

28. Disassembly of PU–140/U, PU–141/U, and PU–141B/U (fig. 9)

a. Removal of Brushes. Remove the four screws and lockwashers that secure each of the four inspection covers (louvers).

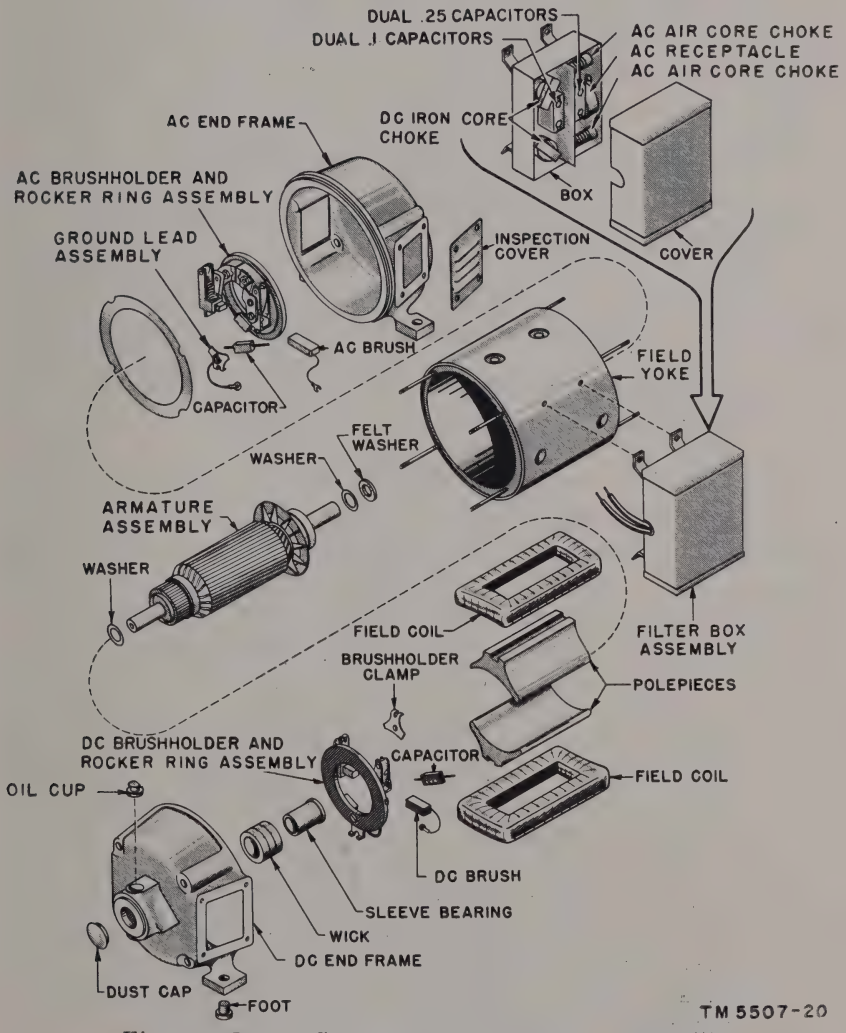


Figure 9. Rotary Converter PU–141B/U, disassembled.

Disconnect the field coil and filter leads from the ac and the dc brush holders and lift out the brushes.

b. Removal of End Brackets. Remove the stud nuts from the through-bolts that secure the end brackets. Tap the end brackets with a rubber hammer to loosen them and remove them from the field yoke.

c. Removal of Brush Holder Rings. Remove the screws that secure the brush holder clamps and remove the clamps and brush holder rings from the end brackets.

Caution: Do not disassemble the brush holder and rocker ring assemblies.

d. Armature Removal. As the end brackets are removed, check the number and location of the felt washers and the steel washers on both ends of the armature shaft. These must be replaced in the same order when the rotary converter is reassembled. With the end brackets removed, carefully remove the armature from the field yoke. Be careful not to damage the windings.

e. Pole Piece Removal. Open the connection between the field coils and the filter box. Remove the screws that hold the pole piece assemblies and lift out the pole pieces and field coils.

f. Filter Box Removal. With all connections to the filter box disconnected, remove the screws that secure the filter box to the field yoke and remove the filter box.

29. Disassembly of PU–140A/U, PU–143/U, PU–143A/U, and PU–143B/U

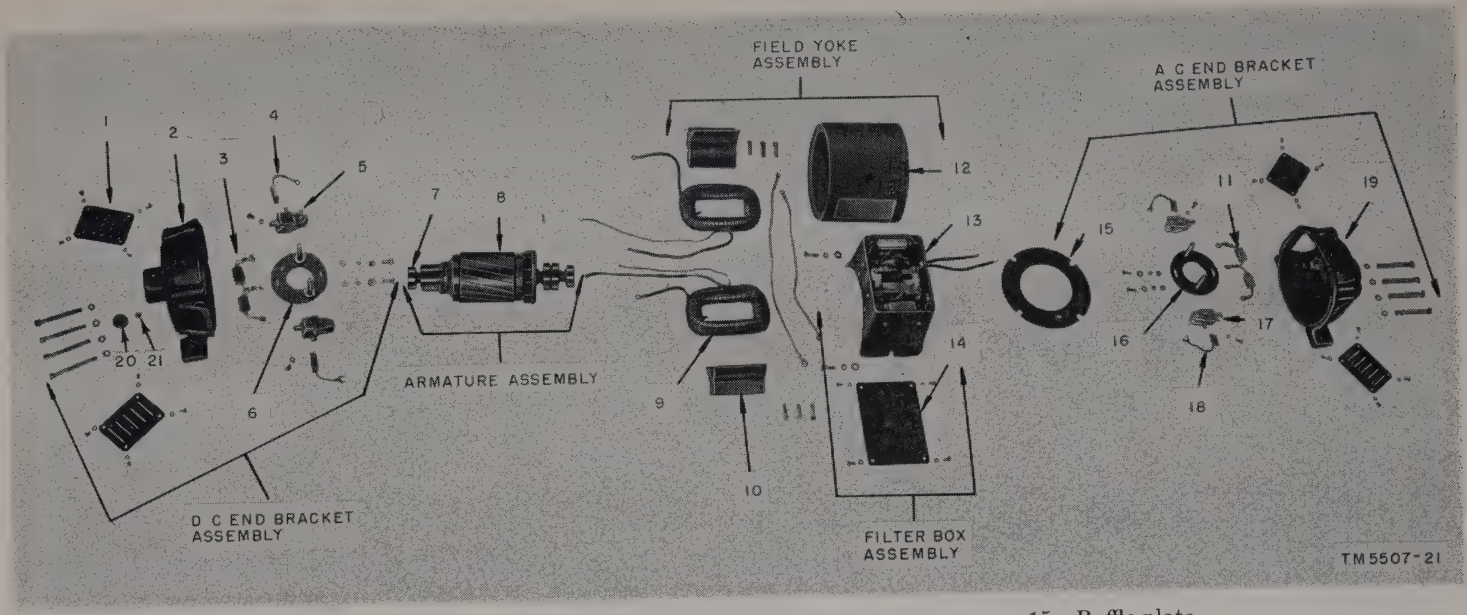
(figs. 10 and 11)

a. Removal of Filter Box. Remove the four screws that hold the filter box cover and remove the cover. Disconnect the ac leads from the radio-frequency (rf) coils and the dc leads from the reactors (figs. 18 and 19). Remove the two screws that hold the filter box to the field yoke and remove the filter assembly.

b. Removal of End Brackets (figs. 24, 25, and 26).

(1) Remove the screws that secure each of the four inspection covers (louvers) and remove the covers. Remove the screws that attach the brush leads and the capacitor leads to the brush holders. Pull back the brush spring arms and lift out the brushes. Perform the same operation on both the ac and dc ends.

(2) Stand the rotary converter on the dc end bracket. Use a small punch and mark the ac end bracket and the field yoke to insure correct alinement when these parts are reassembled. Set the rotary converter on its ac end and mark the dc end bracket and field yoke in the same manner.



1 Inspection cover
2 Dc end bracket
3 Capacitors (C3 and C4)
4 Commutator brush
5 Dc brush holder
6 Dc brush holder ring
7 Armature bearing
8 Armature
9 Field coil
10 Pole shoe
11 Capacitors (C5 and C6)
12 Field yoke
13 Filter assembly
14 Filter box cover
15 Baffle plate
16 Ac brush holder ring
17 Ac brush holder
18 Slip ring brush
19 Ac end bracket
20 Bearing housing seal cap
21 Grease fitting

Figure 10. Rotary Converter PU–143A/U, disassembled.

(3) Remove the screws that hold the ac end bracket to the field yoke and remove the ac end bracket. Remove the baffle plate; guide the two ac leads through the grommet in the plate. Pull the armature out of the field yoke and the dc end bracket.

(4) Turn the rotary converter onto its open end and remove the dc end bracket in the same manner as the ac end bracket.

c. Pole Piece Removal. Pull the field leads out through the grommet in the field yoke. Remove the screws that hold the field coils and the pole pieces and remove the coils and pole pieces.

d. Removal of Brush Holder Rings. Remove the screws that secure the brush holder rings and the capacitors and remove the brush holder rings. Do not disassemble the brush holder rings or the brush holders.

30. Disassembly of PU–134/U (fig. 12)

a. Removal of Filter Box. Remove the screws that secure the filter box cover and remove the cover. Disconnect the two small ac leads from the air-core choke. Remove the hexagonal-head screws that secure the filter box to the field yoke. Expose the two dc leads connected to the reactor coils and unsolder them. Lift the filter assembly from the unit.

b. Removal of End Bracket Assemblies (figs. 22 and 23).

(1) Remove the inspection covers. Remove the roundhead screws that secure the ac and dc brush leads and pigtails and disconnect the leads.

(2) Pull back the brush holder spring arms and remove the brushes.

(3) Set the unit on its dc end and mark the position of the ac end bracket, with relation to the field yoke. Turn the unit onto its ac end and mark the dc end in the same manner.

(4) Remove the ac end bracket mounting screws and carefully remove the ac end bracket. Remove the baffle plate and pull the armature out of the field yoke.

(5) Set the rotary converter on its open end and remove the dc end bracket.

c. Pole Piece Removal. Pull the two ac leads out of the hole in the field yoke. Remove the screws that secure the field coils and the interpole coils and remove the coils from the inside of the field yoke.

1 Dc end bracket
2 Inspection cover
3 Capacitor (C2, PU–140A/U; C3, PU–143B/U)
4 Commutator brush
5 Dc brush holder
6 Dc brush holder ring
7 Capacitor (C4, PU–143B/U; C8, PU–140A/U)
8 Armature shaft bearing
9 Field coil
10 Pole shoe
11 Armature
12 Filter box
13 Filter assembly
14 Field yoke
15 Baffle plate
16 Filter box cover
17 Capacitor (C3, PU–140A/U; C5, PU–143B/U)
18 Slip ring brush
19 Ac brush holder
20 Ac brush holder ring
21 Capacitor (C7, PU–140A/U; C6, PU–143B/U)
22 Ac end bracket

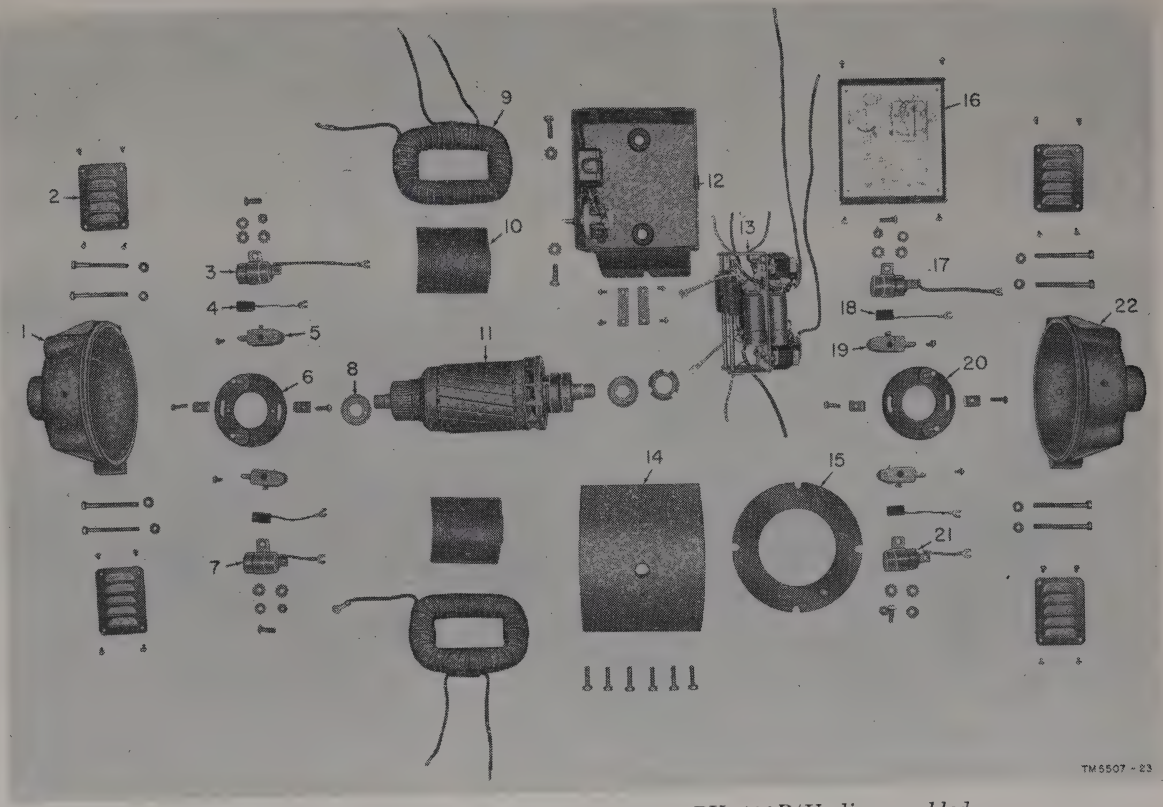
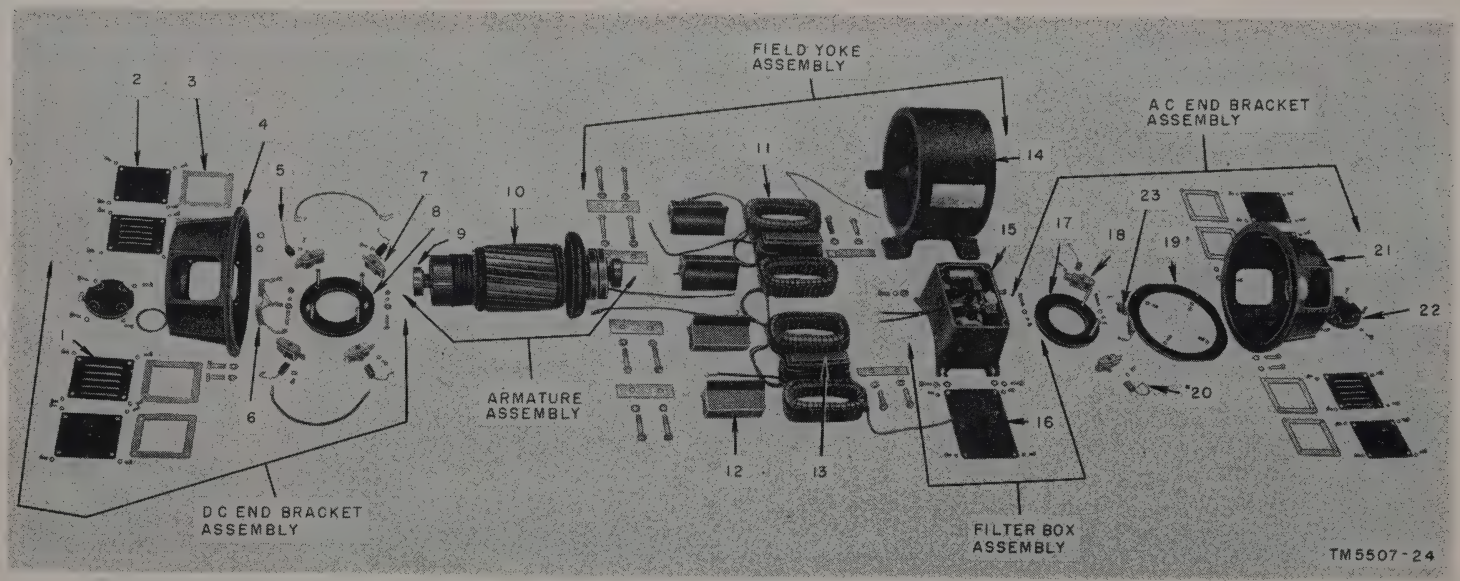


Figure 11. Rotary Converters PU–140A/U or PU–143B/U, disassembled.



1	Inspection cover (louvered)	9	Armature bearing	17	Ac brush holder ring
2	Inspection cover (plain)	10	Armature	18	Ac brush holder
3	Inspection cover gasket	11	Field coil	19	Baffle plate
4	Dc end bracket	12	Field pole	20	Ac brush
5	Commutator brush	13	Interpole	21	Ac end bracket
6	Suppression capacitors	14	Field yoke	22	Bearing housing cap
7	Dc brush holder	15	Filter assembly	23	Suppression capacitors
8	Dc brush holder ring	16	Filter box cover		

Figure 12. Rotary Converter PU-134/U, disassembled.

d. Removal of Brush Holder Rings. Remove the screws that secure the brush holder ring and lift out the brush holder ring assembly. On the dc end, mark the position of the brush holder ring screws before removing them.

Section III. REASSEMBLY

31. Replacement of Bearings

a. Sleeve Bearing Removal. To remove the armature bearings from rotary converters equipped with sleeve bearings, place the end bracket on the flat plate of an arbor press, with the hub of the end bracket facing up. Use a piece of rod or tubing that is slightly smaller than the outside diameter of the bearing and place it between the bearing and the shaft of the press. Be sure that the ends of the rod or tubing are square and press the bearing from the end bracket. If the bearing is to be reused, wash it in cleaning solvent (SD) and wrap it in a clean cloth to protect it from dust and dirt.

b. Ball Bearing Removal. To remove the armature bearings from rotary converters equipped with ball bearings, place the armature in an arbor press so that it is supported only by the inner race of the bearing. Press the armature shaft out of the bearing. *Be careful not to drop the armature.* Wash the bearing in cleaning solvent (SD) and wrap it in a clean cloth to protect it from dust and dirt.

Caution: Be sure that the hands are free from dirt and grit when handling bearings.

c. Sleeve Bearing Installation. Before reinstalling an old bearing or installing a new one, thoroughly clean the bearing housing and the armature shaft. Use a fine file to remove any burrs or raised surfaces. Place the end bracket on the flat plate of an arbor press with the hub of the end bracket resting on the plate. Set the bearing in place and apply pressure to the bearing, with the press. Be sure to keep the bearing alined and to keep it from cocking while pressing it into the housing. Be sure to install any wicks, felt washers, and plain washers in their correct positions. After the bearings have been pressed into the bearing housings, install the end brackets temporarily and line ream the bearings to the correct size.

d. Ball Bearing Installation. Before reinstalling an old bearing or installing a new one, thoroughly clean the shaft. Use a fine file to remove any burrs or raised surfaces. Set the armature in position with the lower end of the shaft resting on the bottom plate of the press. Place the bearing in position on the upper end of the shaft and press it into place. Use a piece of heavy tubing,

slightly larger than the inside diameter of the bearing to keep the pressure applied to the inner bearing race. Be sure to keep the bearing in correct alinement while pressing it into place. After pressing the bearings into place, cover them with a piece of clean cloth to protect them from dust, grit, and dirt. Be sure to install all felt seals and washers.

Caution: Be sure to apply pressure to the inner race of the bearings only.

32. General Reassembly

After installing the bearings as instructed in paragraph 31, reassemble the rest of the rotary converter by reversing the operations for disassembly. Be sure to replace all washers, spacers, felt wicks, and grease and oil retainers in the same positions from which they were removed. Be sure to line up the guide marks that were made when disassembling. On rotary converters that have ball bearings, make sure that the bearing housings are thoroughly clean before reassembling the units. Remake all electrical connections in accordance with the appropriate diagram (figs. 13 through 17) for the rotary converter that is being assembled and observe the tags that were attached to the wires and leads when disassembling. Always assemble the dc end of the rotary converter first and install the armature in the field yoke with the commutator (dc) end first. Reference to appropriate illustrations in this manual will aid in assembly.

33. Suppression Component Replacement

a. General. The rotary converters are suppressed to prevent interference with nearby radio equipment. Capacitors are installed in the end brackets; filter assemblies are provided on some units in which chokes, reactors, and capacitors are installed. Replace all suppression components in exactly the same positions from which they were removed. Be sure that all connections are tight.

b. Differences in Filters (figs. 18–21). With the exception of Rotary Converter PU–141A/U, all models are provided with filters. The components of the filters and the values of some of the components differ from one equipment to another. In some models an adjustable resistor is used in the filter assembly. The earlier models were equipped with a resistor with a sliding band adjustment and later models were equipped with a rheostat. Reference to figures 18 through 21 will show the physical differences and references to the appropriate schematic diagrams (figs. 13–17) will show the electrical differences.

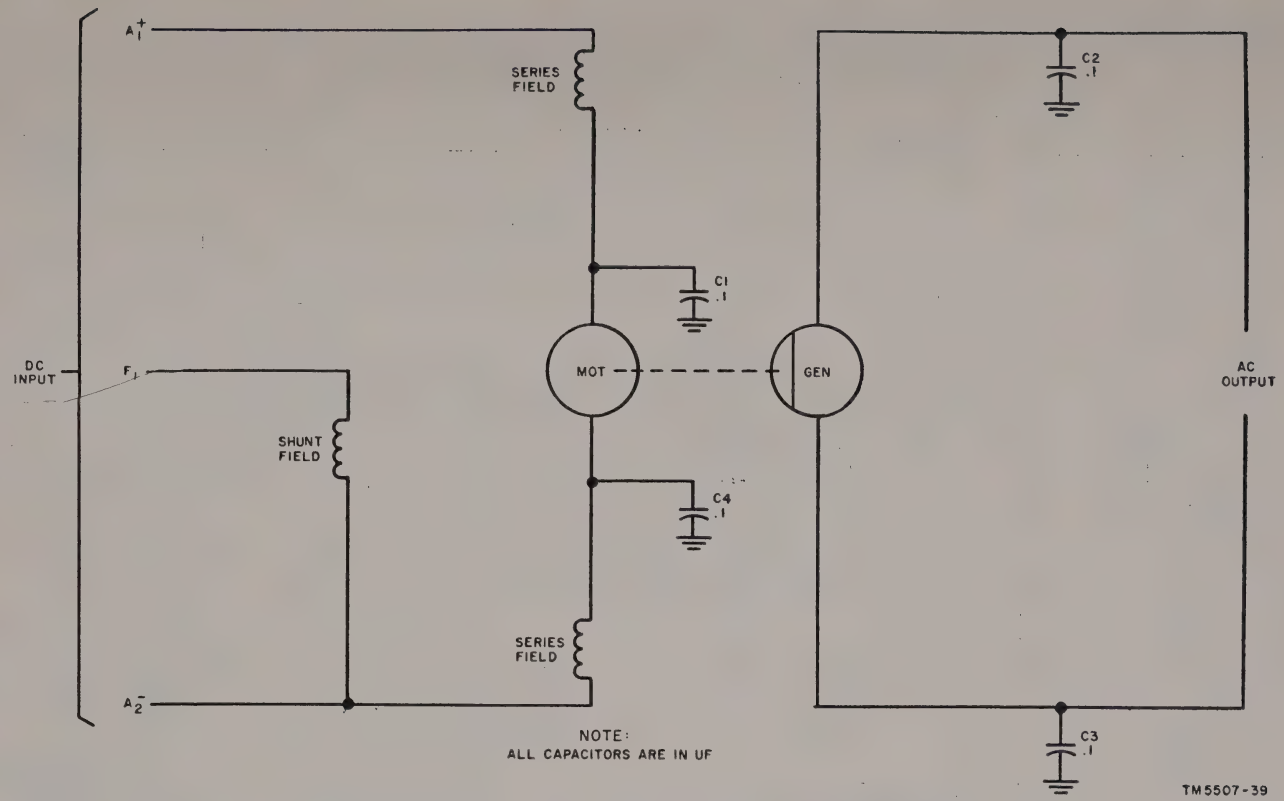


Figure 13. Rotary Converter PU–141A/U, schematic diagram.

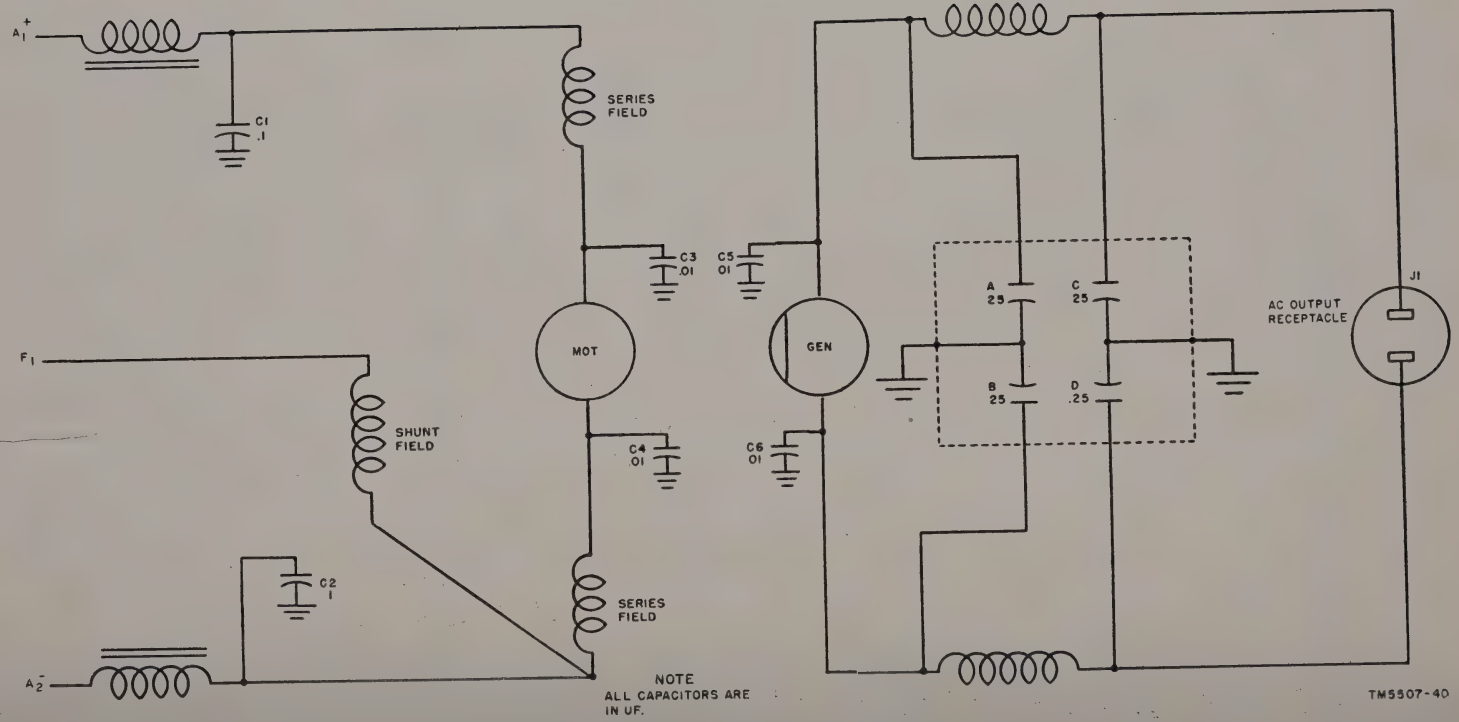


Figure 14. Rotary Converter PU–141B/U, schematic diagram.

TECHNICAL MANUAL

ROTARY CONVERTERS PU–134/U, PU–140/U, PU–140A/U, PU–141/U, PU–141A/U, PU–141B/U, PU–143/U, PU–143A/U, AND PU–143B/U, AND MOTOR-GENERATOR PU–143E/U

TM 11–5507
CHANGES No. 1

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *27 December 1960*

TM 11–5507, 31 December 1956, is changed as indicated so that the manual also applied to the following equipment:

Nomenclature	*Order No.*	*Serial No.*
Motor-Generator PU–143E/U	10249–PP–60–C2–51	1 through 83

Change the title of the manual to: ROTARY CONVERTERS PU–134/U, PU–140/U, PU–140A/U, PU–141/U, PU–141A/U, PU–141B/U, PU–143/U, PU–143A/U, AND PU–143B/U, AND MOTOR-GENERATOR PU–143E/U.

Page 3, chapter 1. Add the following "Note" below the title of chapter 1:

Note. Motor-Generator PU–143E/U is similar to Rotary Converter PU–143B/U. Information in this manual applies to both sets unless otherwise specified.

Section 1. Delete paragraphs 1 and 2 and substitute:

1. Scope

This technical manual describes Rotary Converters PU–134/U, PU–140/U, PU–140A/U, PU–141/U, PU–141A/U, PU–141B/U, PU–143/U, PU–143A/U, and PU–143B/U, and Motor Generator PU–143E/U, and covers their installation, operation, maintenance, troubleshooting, testing, and repair. It also lists tools, materials, and test equipment for all echelons of maintenance. Detailed functions of the equipments are covered in the theory chapter.

2. Forms and Records

a. Unsatisfactory Equipment Report. Fill out and forward DA Form 468 (Unsatisfactory Equipment Report) to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS–ML, Fort Monmouth, N.J., as prescribed in AR 700–38.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58 (Army).

c. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manuals 7, 8, and 9) directly to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS–ML, Fort Monmouth, N.J., with comments on parts listings.

d. Comments on Manual. Forward all other comments on this publication directly to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS–PA2d, Fort Monmouth, N.J.

Page 10, paragraph 5. Make the following changes:

Subparagraph *g*. Change the heading to: Rotary Converter PU–143B/U Only.

After subparagraph *g*, add:

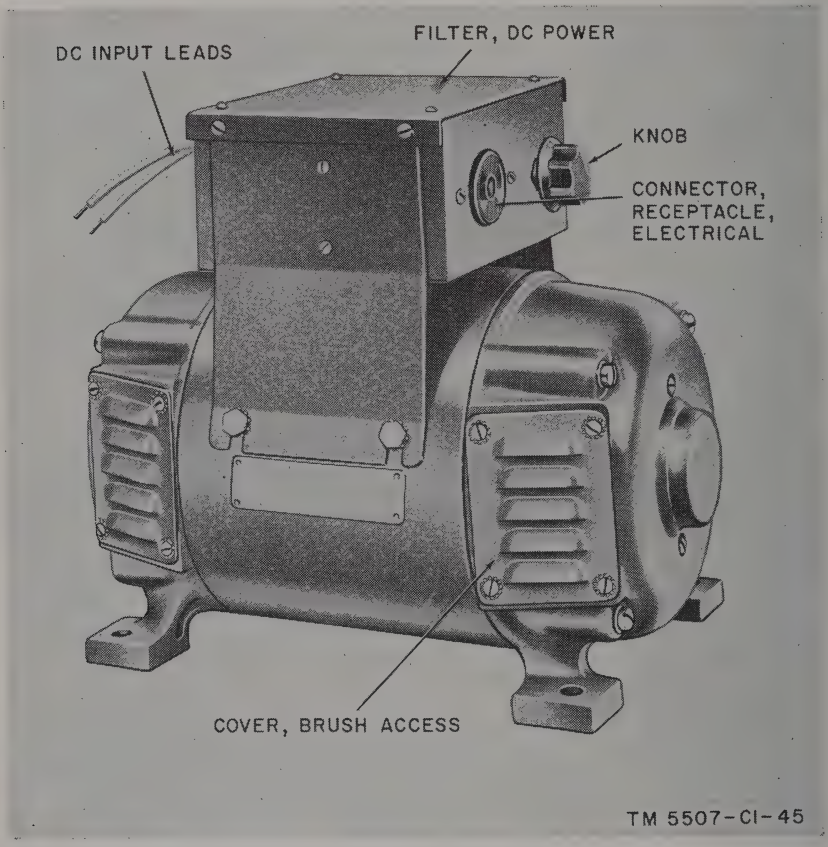


Figure 5.1. (Added) *Motor-Generator PU–143E/U.*

g.1. Motor-Generator PU–143E/U.

Dc input (24 volts)	Ac output									
	No load		Half load				Full load			
	Volts	Freq	Pf 100%		Pf 85%		Pf 100%		Pf 85%	
			Volts	Freq	Volts	Freq	Volts	Freq	Volts	Freq
10% low	115	62	108	59	106	60	105	57	98	58
Rated value	125	66	120	64	116	63	115	60	107	61
10% high	139	69	132	68	127	69	125	66	118	67

Page 11. Make the following changes:

Paragraph 5*h*, chart. After the last item, add:

Model	Input volts (dc)	Output volts (ac)	Output (amp)	Speed (rpm)
PU–143E/U	24	107	4. 66	3, 600

Paragraph 6*b*, chart. After the last item, add:

Model	Height (in.)	Depth (in.)	Width (in.)	Weight (lb)
PU–143E/U	11¼	12½	7⅜	60

Paragraph 6*c*, chart. "Signal Corps models" column, line 1. Add "only" after "PU–143B/U."

Page 12, paragraph 7. Add the following after subparagraph *c*:

c.1. For the PU–143E/U, slit the tape along the top and end seams of the fiberboard carton. Remove the top padding.

Page 14, paragraph 10*b*(1), heading. Change "PU–140A/U and PU–143B/U (fig. 18)" to: PU–140A/U, PU–143B/U, and PU–143E/U (fig. 18 and 18.1).

Page 19, paragraph 18*b*. Add the following note below the heading:

Note. Motor-Generator PU–143E/U does not require periodic lubrication; the bearings used are the sealed, permanently lubricated type.

Page 32, paragraph 29, heading. Add "Only" after "PU–143B/U."

Page 34. Add paragraph 29.1 after paragraph 29.

29.1. Disassembly of PU–143E/U

a. Removal of Filter Box.

(1) Stand the motor-generator in its normal upright position (fig. 5.1).

(2) Remove the screws and washers (1, fig. 11.1) that hold the filter box cover (2) to the filter box assembly (9).

(3) Remove the filter box cover (2).

(4) Disconnect the positive dc electrical lead (3, fig. 11.1; W5, fig. 18.1) from the top terminal of reactor L1.

(5) Disconnect the negative dc electrical lead (4, fig. 11.1; W7, fig. 18.1) from the top terminal of reactor L2.

(6) Disconnect the ground electrical lead (12, fig. 11.1; W10, fig. 18.1) from the mounting terminal of reactor L1.

(7) Disconnect the dc electrical leads (4 and 5, fig. 11.1; W6 and W4, fig. 18.1) from the terminals of variable resistor R1.

(8) Disconnect the ac electrical leads (21 and 23, fig. 11.1; E8 and E9, fig. 18.1) from rf coils L3 and L4.

(9) Carefully pull the electrical leads ((4) through (8) above) down through the grommets (MP13, fig. 18.1) and out of the filter box assembly (9, fig. 11.1).

(10) Remove the capscrews (7) and lockwashers (8) that secure the filter box assembly (9) to the field housing (29).

(11) Remove the filter box assembly (9).

(12) Remove the capscrew (11), lockwasher (13), and ground electrical lead (12) from the field housing (29).

b. Removal of End Bells.

(1) Before removing the ac and dc end bells (26 and 35, fig. 11.1), mark (scribe line or punch mark) the position of each end bell in relation to the field housing (29). These markings will facilitate proper alinement of the parts during reassembly.

(2) Remove the screws and washers (14) that secure the brush access covers (15) to the end bells.

(3) Remove the brush access covers (15).

(4) Remove the machine screws (16) that attach the capacitor leads (17), the field coil electrical leads (18 and 20), and the commutator brush leads (19) to the dc brush holders (64).

(5) Pull back the brush spring arms (not shown) and lift out the commutator brushes (19).

(6) Remove the machine screws (16) that attach the capacitor leads (17), the rf coil (L3 and L4, fig. 18.1) electrical leads (21 and 23, fig. 11.1), and the slip ring brush leads (22) to the ac brush holders (52).

(7) Pull back the brush spring arms (not shown) and remove the slip ring brushes (22).

(8) Remove the machine screws (24) and lockwashers (25) that hold the ac end bell (26) to the field housing (29).

(9) Carefully remove the ac end bell (26).

Caution: **Equipment damage may result if the rotor armature (28, fig. 11.1) is allowed to drop onto the bottom field winding (41) and pole shoe assembly (39).**

(10) Carefully remove the stator motor plate (27); guide the electrical leads ((6) above) through the opening in the stator motor plate (27).

(11) Carefully pull the rotor armature (28) out of the field housing (29) and dc end bell (35).

(12) Remove the ball bearings (30 and 31) from each end of the rotor armature (28) (para 31*b*).

(13) Remove the end play shim (32) from the ac end bell (26).

(14) Remove the machine screws (33) and lockwashers (34) that hold the dc end bell (35) to the field housing (29).

(15) Carefully remove the dc end bell (35).

(16) Remove the end play shim (36) from the dc end bell (35).

c. Removal of Pole Shoes and Field Windings.

Caution: **Damage to the field windings (40 and 41, fig. 11.1) may result if the pole shoe assemblies (39) are allowed to fall when being removed.**

(1) Pull the electrical leads (3, 4, 5, 6, 21, and 23, fig. 11.1) down through the rubber grommet (65) into the field housing (29).

(2) Remove the capscrews (37) and lockwashers (38) that secure the pole shoe assemblies (39) and field windings (40 and 41) to the field housing (29).

(3) Remove the field windings (40 and 41) from the pole shoe assemblies (39).

d. Removal of Ac Brush Holder Ring and Ac Brush Holders.

(1) Loosen the machine screws (42, fig. 11.1) that secure the ac brush holder ring (47) and capacitors (17) to the ac end bell (26).

(2) Remove the capacitor mounting assemblies; hexagonal nut (43), lockwasher (44), capacitor retainer (45), and flat washer (46).

(3) Remove the capacitors (17).

(4) Remove the ac brush holder ring (47) from the ac end bell (26).

(5) Remove the machine screws (42) and lockwashers (48) from the ac end bell (26).

(6) Remove the machine screws (49), lockwashers (50), and flat washers (51) that secure the ac brush holders (52) to the ac brush holder ring (47).

(7) Remove the ac brush holders (52).

TM5507-CI-46

1 Screw with washer (H18)
2 Filter box cover (MP8) with diagram
3 Electrical lead (W5)
4 Electrical lead (W6)
5 Electrical lead (W7)
6 Electrical lead (W4)
7 Capscrew, ¼–20 by ⅝
8 Lockwasher, $^{15}/_{32}$ inch diameter
9 Filter box assembly (MP7)
10 Knob (MP9)
11 Capscrew (H5)
12 Electrical lead (W10)
13 Lockwasher, $^{15}/_{32}$ inch diameter
14 Screw with washer (H18)
15 Brush access cover (MP1)
16 Machine screw, 10–24 by ⅜
17 Capacitor (C3, C4, C5, C6) with lead
18 Electrical lead (W8)
19 Commutator brush (E4, E5) with lead
20 Electrical lead (W9)
21 Electrical lead (E8)
22 Slip ring brush (E2, E3) with lead
23 Electrical lead (E9)
24 Machine screw, ¼–20 by 2¾
25 Lockwasher, ½ inch diameter
26 Ac end bell (MP2)
27 Stator motor plate (MP6)
28 Rotor armature (E1)
29 Field housing (MP4)
30 Ball bearing (01)
31 Ball bearing (02)
32 End play shim, 1⅜ inch diameter
33 Machine screw, ¼–20 by 2¾
34 Lockwasher, ½ inch diameter
35 Dc end bell (MP3)
36 End play shim, 1⅜ inch diameter
37 Capscrew (H5)
38 Lockwasher, $^{15}/_{32}$ inch diameter
39 Pole shoe assembly (MP5)
40 Top field winding (L5, L6)
41 Bottom field winding (L7, L8)
42 Machine screw, 10–24 by 1
43 Plain hexagonal nut (H12)
44 Lockwasher, $^{13}/_{32}$ inch diameter
45 Capacitor retainer (holds C5, C6)
46 Flat washer, ⅝ inch diameter
47 Ac brush holder ring (A1)
48 Lockwasher, $^{13}/_{32}$ inch diameter
49 Machine screw, 10–24 by ⅝
50 Lockwasher, ⅜ inch diameter
51 Flat washer, $^{7}/_{16}$ inch diameter
52 Ac brush holder (04)
53 Ac brush holder (03)
54 Machine screw, 10–24 by 1
55 Plain hexagonal nut (H12)
56 Lockwasher, $^{13}/_{32}$ inch diameter
57 Capacitor retainer (holds C3, C4)
58 Flat washer, ⅝ inch diameter
59 Dc brush holder ring (A2)
60 Lockwasher, $^{13}/_{32}$ inch diameter
61 Machine screw, 10–24 by ⅝
62 Lockwasher, ⅜ inch diameter
63 Flat washer, $^{7}/_{16}$ inch diameter
64 Dc brush holder (05, 06)
65 Rubber grommet

Figure 11.1. (Added) *Motor-Generator PU–143E/U, disassembled.*

e. Removal of Dc Brush Holder Ring and Dc Brush Holder.

(1) Loosen the machine screws (54) that secure the dc brush holder ring (59) and capacitors (17) to the dc end bell (35).

(2) Remove the capacitor mounting assemblies, hexagonal nut (55), lockwasher (56), capacitor retainer (57), and flat washer (58).

(3) Remove the capacitors (17).

(4) Remove the dc brush holder ring (59) from the dc end bell (35).

(5) Remove the machine screws (54) and lockwashers (60) from the dc end bell (35).

(6) Remove the machine screws (61), lockwashers (62), and flat washers (63) that secure the dc brush holders (64) to the dc brush holder ring (59).

(7) Remove the dc brush holders (64).

Page 42, figure 16. Make the following changes:

In the generator circuit at the right-hand section of the illustration, change "(C8) C9" to: C8 (C9).

Delete all capacitance values.

Delete notes 1 and 2 and substitute:

1. PU–143B/U AND PU–143E/U INPUTS ARE 24 VDC.

2. THE FOLLOWING CHART INDICATES COMPARABLE ELECTRICAL RATINGS FOR COMPONENTS OF PU–140A/U, PU–143B/U, AND PU–143E/U

Component	Electrical rating		
	PU–140A/U	PU–143B/U	PU–143E/U
C1	0.25 UF	0.25 UF	0.22 UF.
C2	0.1 UF	0.25 UF	0.22 UF.
C3	0.1 UF	0.1 UF	0.1 UF.
C4	0.25 UF	0.1 UF	0.1 UF.
C5	0.25 UF	0.1 UF	0.1 UF.
C6	0.1 UF	0.1 UF	0.1 UF.
C7	0.1 UF	NOT USED	0.22 UF.
C8	0.25 UF	0.25 UF	0.22 UF.
C9	NOT USED	0.25 UF	NOT USED.
L1[a]	0.01 OHM	0.001 OHM	0.001 OHM.
L2[a]	0.01 OHM	0.001 OHM	0.001 OHM.
L3[a]	0.14 OHM	0.14 OHM	0.14 OHM.
L4[a]	0.14 OHM	0.14 OHM	0.14 OHM.
L5[a]	0.01 OHM	0.003 OHM	0.003 OHM.
L6[a]	3.0 OHMS	3.0 OHMS	3.0 OHMS.
L7[a]	0.14 OHM	3.0 OHMS	3.0 OHMS.
L8[a]	0.14 OHM	0.003 OHM	0.003 OHM.
R1	125 OHMS	6 OHMS	6 OHMS.

[a] Electrical rating for each coil is the DC resistance.

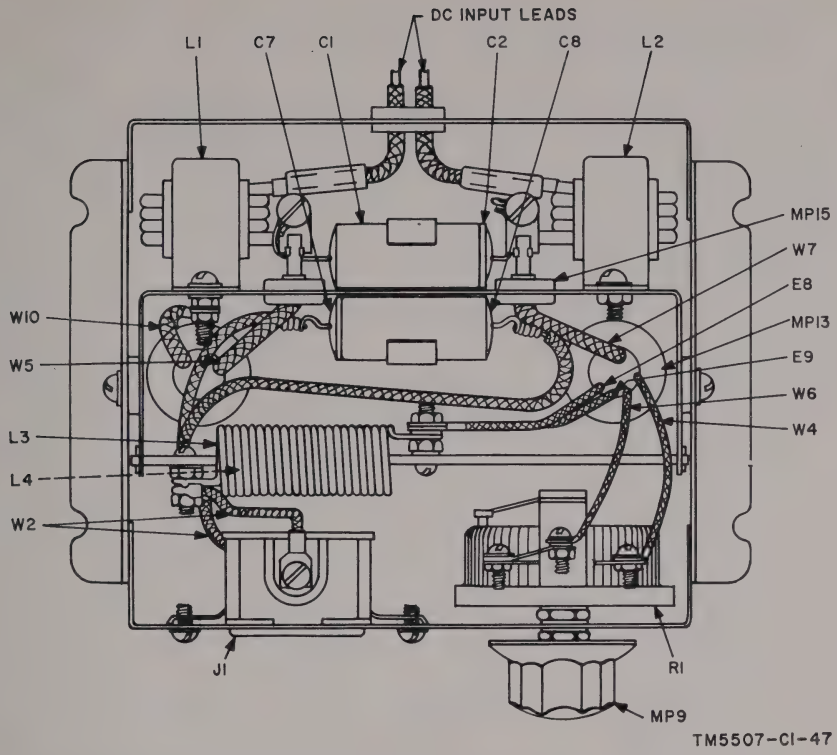


Figure 18.1. (Added) *Filter interior, Motor-Generator PU–143E/U.*

Page 48, paragraph 35:

Heading. Change "Reassembly of PU–140A/U, PU–143/U, PU–143A/U, and PU–143B/U (figs. 10 and 11)" to: Reassembly of PU–140A/U, PU–143/U, PU–143A/U, PU–143B/U, and PU–143E/U (figs. 10, 11, and 11.1).

By Order of *Wilber M. Brucker*, Secretary of the Army:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

To be distributed in accordance with DA Form 12–7 requirements for TM 11 Series (unclas) plus the following formula:

USASA (2)	11–16 (2)
Def Atomic Spt Agcy (5)	11–57 (2)
CNGB (1)	11–97 (2)
Tech Stf, DA (1) except	11–117 (2)
CSigO (18)	11–155 (2)
US ARADCOM (2)	11–500 (AA–AE) (4)
US ARADCOM Rgn (2)	11–557 (2)
MDW (1)	11–587 (2)
Seventh USA (2)	11–592 (2)
EUSA (2)	11–597 (2)
Units organized under following TOE's:	
11–7 (2)	

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE: 1961

TECHNICAL MANUAL

ROTARY CONVERTERS PU-134/U, PU-140/U, PU-140A/U, PU-141/U, PU-141A/U, PU-141B/U, PU-143/U, PU-143A/U, AND PU-143B/U, AND MOTOR-GENERATOR PU-143E/U

TM 11-5507
CHANGES No. 2

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *25 July 1961*

TM 11-5507, 31 December 1956, is changed as follows:

Page 3. Paragraph 2. Delete subparagraph *c* (page 2 of C 1) and substitute the following:

c. Comments or Suggestions. Any comments concerning omissions and discrepancies in this manual will be prepared on DA Form 2028 and forwarded direct to Commanding Officer, U.S. Army Signal Material Support Agency, ATTN: SIGMS-ML, Fort Monmouth, N.J.

Page 54. Add the following:

APPENDIX I

MAINTENANCE ALLOCATION

MOTOR GENERATORS PU-143/U, PU-143A/U, PU-143B/U, PU-143D/U, PU-143E/U ROTARY CONVERTER PU-141/U, PU-141A/U, PU-141B/U, PU-134/U, PU-140A/U, PIONEER MODEL 3K50

1. General

a. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Columns in the maintenance allocation chart are as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item name. Additional descriptive data is included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

* These changes supersede so much of DA Supply Manual SIG 7 & 8 PU-134/U, 7 August 1951, as pertains to the first echelon items.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(*a*) *Service.* To clean, to preserve, and to replenish fuel and lubricants.

(*b*) *Adjust.* To regulate periodically to prevent malfunction.

(*c*) *Inspect.* To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(*d*) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(*e*) *Replace.* To substitute service assemblies, subassemblies, and parts for unserviceable components.

(*f*) *Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to, inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.

(*g*) *Align.* To adjust two or more components of an electrical system so that their functions are properly synchronized.

(*h*) *Calibrate.* To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(*i*) *Rebuild.* To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(*j*) *Overhaul.* To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and test equipment is combined with minimum disassembly of the item during the overhaul process.

(3) *1st, 2d, 3d, 4th, 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, 5th echelon.* The dagger (†) symbol indicates the echelons allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by signal services organizations organic to theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

3. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, clamps, etc.

Maintenance Allocation Chart

(1) Part or component	(2) Maintenance function	(3) 1st ech.	(4) 2d ech.	(5) 3d ech.	(6) 4th ech.	(7) 5th ech.	(8) Tools required	(9) Remarks
MOTOR GENERATOR PU–143/U; PU–143A, B, D, E/U, ROTARY CONVERTER PU–141/U; PU–141A, B/U, PU–134/U, PU–140A/U PIONEER MODEL 3K50.	service	X						Cleans cables, connectors and exterior of equipment.
	adjust		X				1, 2	Frequency; output voltage; brush spring tension.
	inspect		X					Connections, brushes, brush spring tension, commutator and slip rings.
	test		X				1, 2, 7, 8, 9	Continuity of circuits, output voltage, frequency and brush spring tension.
	service		X				1, 2, 3	Cleans commutator, slip rings and brush holders, tightens loose, connections, controls, screws, lubricates equipment.
	test				X		1, 2, 6, 7, 8, 10, 11, 12, 13, 14	Performs all test requirements.
	rebuild					X	1, 4, 5	Plus shop support.
CONTROL BOX:								
CAPACITOR FIXED PAPER DIELECTRIC.	replace			X			1	
COIL, RF	replace			X			1, 5	

COLLAR, SPACING	replace			X			1
CONNECTOR, RECEPTACLE, ELECTRICAL.	replace		X				1
KNOB	replace		X				1
REACTOR	replace			X			1, 5
RESISTOR, ADJUSTABLE	replace			X			1, 5
RESISTOR, VARIABLE	replace			X			1, 5
SUPPRESSOR, ELECTRICAL NOISE.	replace			X			1, 5
MOTOR GENERATOR:							
ARMATURE-ROTOR	replace			X			1
BEARING, BALL ANNULAR	replace			X			1
BEARING SLEEVE	replace			X			1
BRUSH, ELECTRICAL CONTACT	replace		X				1
CAPACITORS	replace			X			1, 5
HOLDER BRUSH ELECTRICAL CONTACT.	replace			X			1
MOUNTING	replace			X			1
MOUNT, VIBRATION	replace		X				1
PACKING, PERFORMED	replace			X			1
PLATE, LOCK	replace			X			1
RING, HOLDER ELECTRICAL BRUSH.	replace			X			1
SEAL, DUST	replace			X			1
SHIM	replace			X			1
SPRINGS	replace		X				1
WINDING, MOTOR-GENERATOR	replace			X			1, 5

Allocation of Tools for Maintenance Functions

(1) Tools required for maintenance functions	(2) 1st Ech	(3) 2d Ech	(4) 3d Ech	(5) 4th Ech	(6) 5th Ech	(7) Tool code	(8) Remarks
PU–143A, B, D, E/U, PU–141A, B/U, PU–134/U, PU–140A/U, PIONEER MODEL 3K50—(Continued).							
TOOL SET GENERAL MECHANICS	------	†	†	†	†	1	FSN 5180–754–0641
SPRING SCALE	------	†	†	†	†	2	FSN 6670–246–8465
GREASE GUN, HAND	------	†	†	†	†	3	FSN 4930–356–3924
HAMMER SOFT FACE	------	------	------	†	†	4	FSN 5120–357–6074
SOLDERING IRON TL–120	------	------	†	†	†	5	
THERMOMETER MX–1570/G	------	------	------	†	†	6	
MULTIMETER TS–352/U	------	†	†	†	†	7	
MULTIMETER ME–87/U	------	†	†	†	†	8	
TEST SET, ELECTRICAL POWER AN/UPM–100	------	†	†	†	†	9	
TEST SET INSULATION BREAKDOWN AN/GSM–6	------	------	------	†	†	10	
OHMMETER ZM–21/U	------	------	------	†	†	11	
AMMETER ME–65/U	------	------	------	†	†	12	
VOLTMETER TS–340/U	------	------	------	†	†	13	
FREQUENCY METER FR–40/GSM–1	------	------	------	†	†	14	

APPENDIX II

BASIS ISSUE ITEMS LIST FOR MOTOR GENERATOR PU-143/U, PU-143A,B,D,E/U, ROTARY CONVERTER PU-141/U, PU-141A,B/U, PU-134/U, PU-140A/U PIONEER MODEL 3K50

Section I. INTRODUCTION

1. Scope

a. This appendix lists items supplied for initial operation. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

b. Columns are as follows:

(1) *Federal stock number.* This column lists the 11-digit Federal stock number.

(2) *Description.* Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

(3) *Unit of issue.* The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

(4) *Expendability.* Expendable items are indicated by the letter X; nonexpendable items are indicated by NX.

(5) *Quantity authorized.* Under "Items Comprising an Operable Equipment", the column lists the quantity of items supplied for the initial operation of the equipment.

Section II. FUNCTIONAL PARTS LIST

Federal stock number	Description	Unit of issue	Expendability	Quantity authorized
	ITEMS COMPRISING AN OPERABLE EQUIPMENT			
	MOTOR GENERATOR PU–143/U, PU–143A,B,D,E/U; ROTARY CONVERTER PU–141/U, PU–141A,B/U, PU–134/U, PU–140A/U; PIONEER MODEL 3K50			
6125–229–0347	MOTOR GENERATOR PU–143/U, PU–143A,B,D,E/U: input 24 vdc, 27 amp, 648 w; output 110 vac; 4.55 amp, 60 cyc, single phase, 425 w, 2 wire; 3600 RPM.	ea	NX	
Ord thru AGC	TECHNICAL MANUAL TM 11–5507	ea	X	2
6125–241–2675	ROTARY CONVERTER PU–141/U, PU–141A,B/U; AND PIONEER MODEL 3K50: input 32 vdc, 25 amp, 800 w; output 110 vac, 60 cyc, 4.55 amp, 425 w, single phase; 3600 RPM.	ea	NX	
6125–229–0350	ROTARY CONVERTER PU–134/U: input 230 vdc, 4.1 amp; output 110 vac, 60 cyc, single phase, 2 wire; 1800 RPM.	ea	NX	
6125–185–1086	ROTARY CONVERTER PU–140A/U: input 115 vdc, 6.1 amp, 597 w; output 110 vac, 4.55 amp, 60 cyc, single phase, 500 va, 2 wire; 3600 RPM.	ea	NX	
	RUNNING SPARES AND ACCESSORY ITEMS			
	MOTOR GENERATOR PU–143/U, PU–143A,B,D,E/U; ROTARY CONVERTER PU–141/U, PU–141A,B/U, PU–134/U, PU–140A/U; PIONEER MODEL 3K50			
	No parts authorized for stockage at first echelon.			

By Order of the Secretary of the Army:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army: To be distributed in accordance with DA Form 12–7 requirements for TM 11–series (unclas) plus the following:

DASA (6)	11–16 (2)
USASA (2)	11–57 (2)
CNGB (1)	11–97 (2)
Tech Stf, DA (1) except CSigO (18)	11–117 (2)
	11–155 (2)
ARADCOM (2)	11–500 (AA–AE) (4)
ARADCOM Rgn (2)	11–557 (2)
MDW (1)	11–587 (2)
Seventh USA (2)	11–592 (2)
EUSA (2)	11–597 (2)
Units organized under following TOE's: 11–7 (2)	

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320–50.

U.S. GOVERNMENT PRINTING OFFICE: 1961

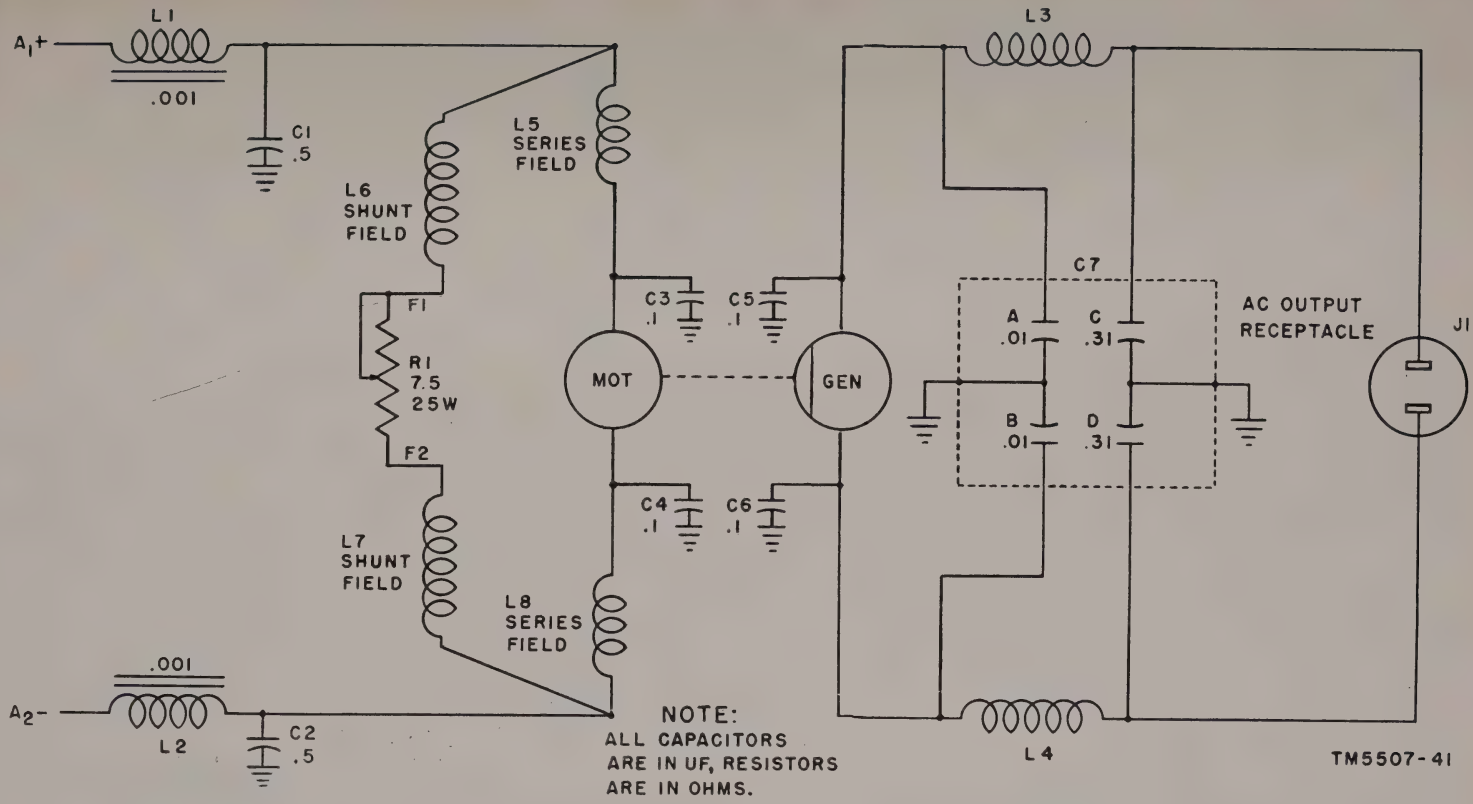
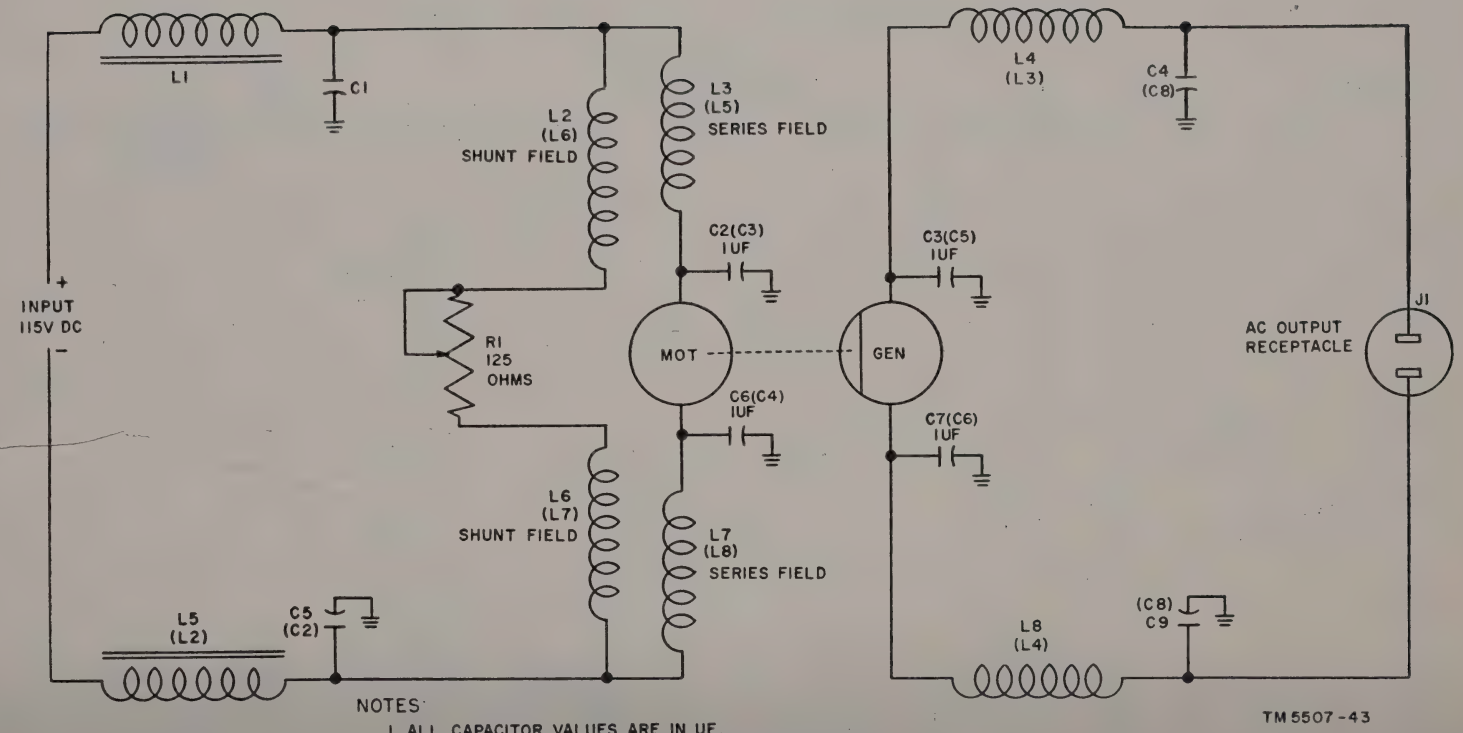


Figure 15. Rotary Converter PU–143A/U, schematic diagram.



NOTES:

1. ALL CAPACITOR VALUES ARE IN UF.
2. PU-143B/U INPUT IS 24 V DC, RESISTOR R1 IS 6 OHMS.
3. SYMBOLS IN PARENTHESES INDICATE COMPONENTS FOR PU-143B/U.

Figure 16. Rotary Converters PU–140A/U and PU–143B/U, schematic diagram.

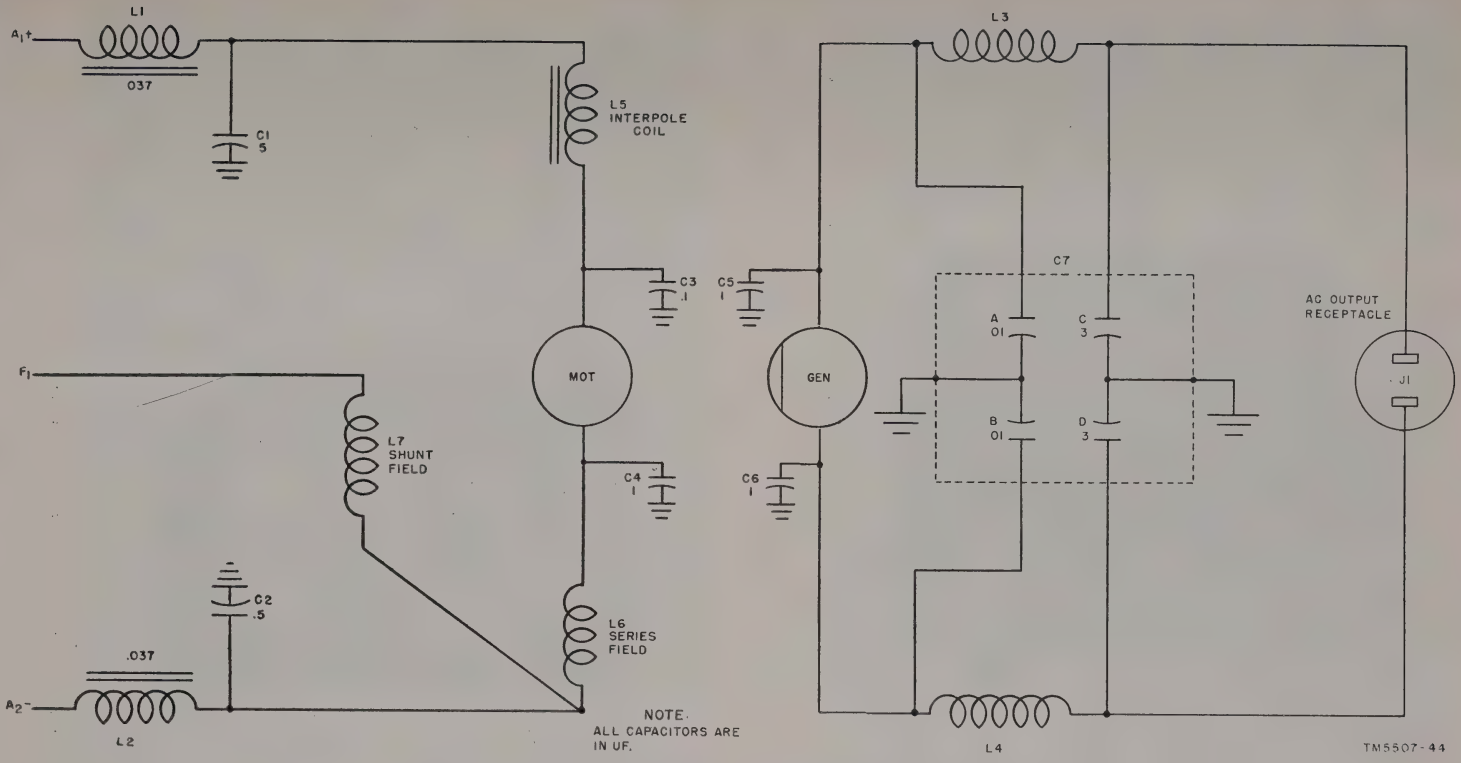


Figure 17. Rotary Converter PU–134/U, schematic diagram.

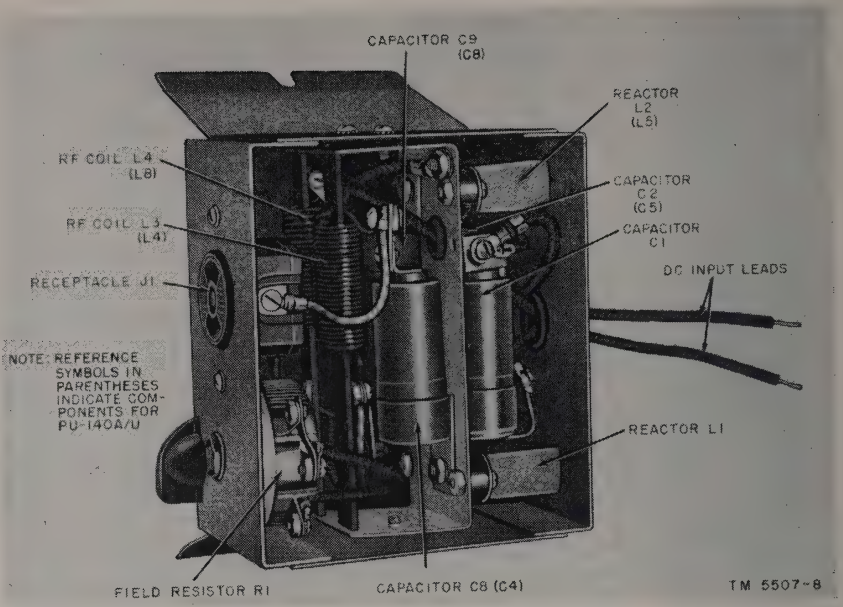


Figure 18. Filter interior, Rotary Converter PU–140A/U or PU–143B/U.

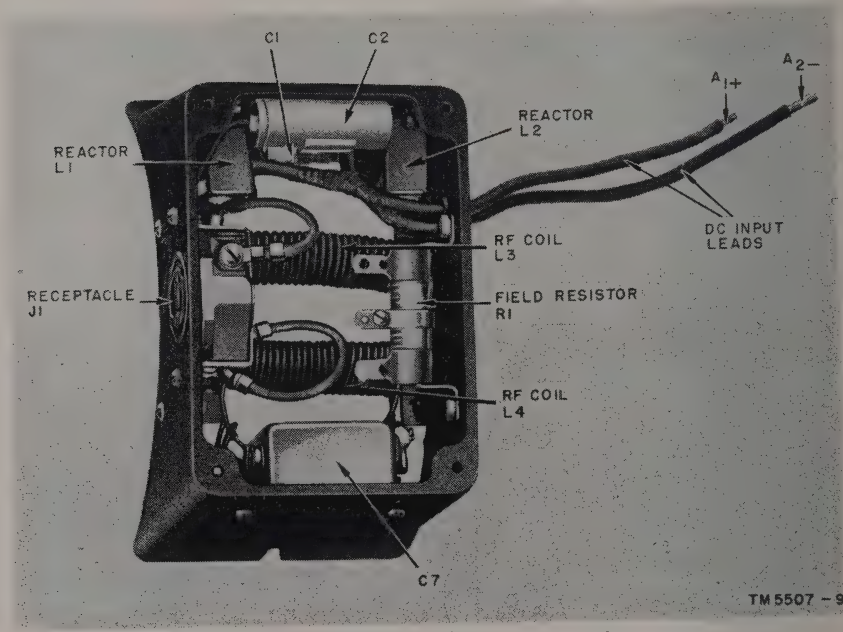


Figure 19. Filter interior, Rotary Converter PU–143A/U, PU–140/U, or PU–141/U.

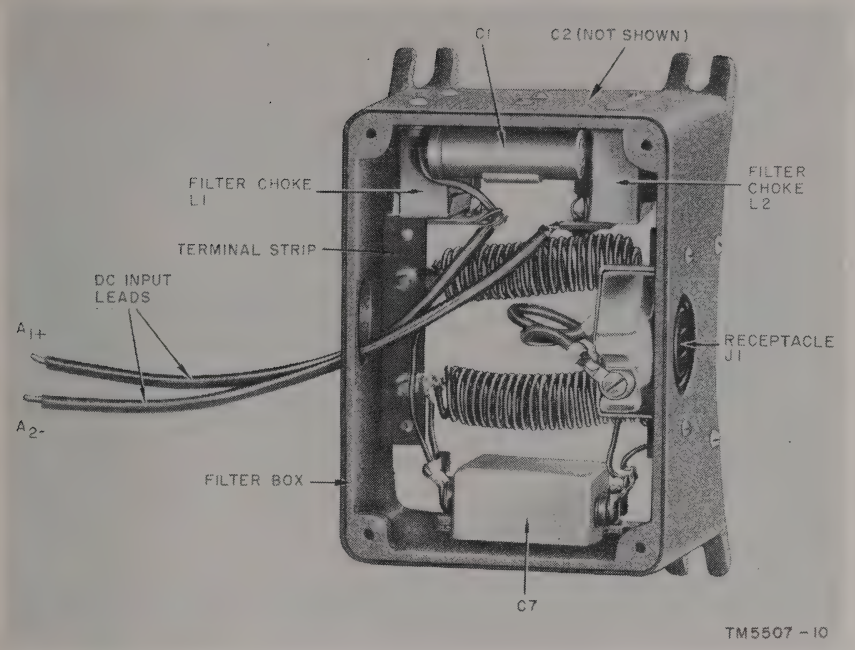


Figure 20. Filter interior, Rotary Converter PU–134/U.

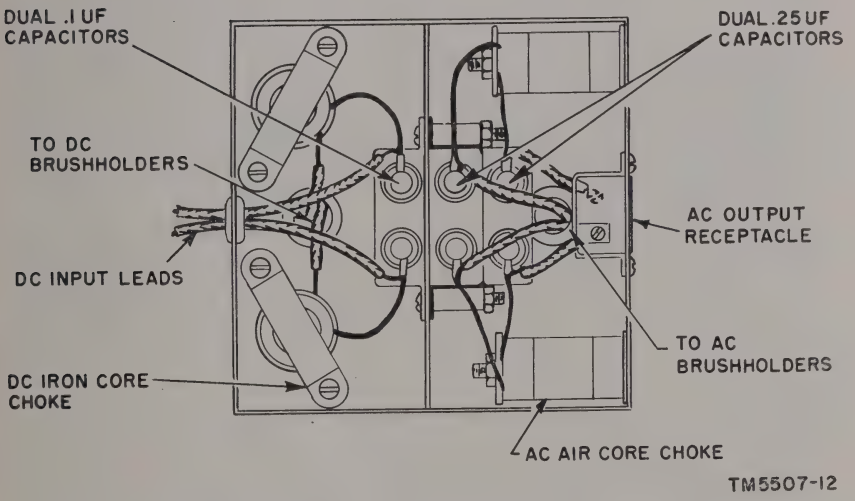


Figure 21. Filter interior, Rotary Converter PU–141B/U.

34. Reassembly of PU–134/U
(figs. 12, 17, 20, 22, and 23)

a. Press the field coils on to their respective pole pieces and install the assemblies in the field yoke. Be sure to install the narrow shims under the interpoles and the wider shims under the main poles. Make sure that the leads are positioned properly for reconnection and fasten the field coils and pole pieces with the screws that were removed when disassembling.

b. Pass both the ac and the dc leads through the hole in the top of the field yoke. Bring the ac leads out toward the ac end of the unit.

c. Install the end plates on each of the end brackets and screw both the upper and lower grease plugs into the bearing housings. Install the dc brush holders on the brush holder ring studs. Be sure that the brush holders are alined with the markings that were made when disassembling and that the brush slots are radial. Tighten the squarehead setscrews. Install the brush holder ring and the capacitors in the dc end bracket. Mount the capacitors to the top screws. Be sure to aline the brush holder ring with the marks that were made when disassembling and then tighten the mounting screws.

d. Install the ac brush holder ring in the ac end bracket with the brush holders at the top. See that the capacitors are correctly installed and then install the baffle plate with the grommet hole at the top.

e. Mount the dc end bracket on the dc end of the field yoke. Be sure to aline the marks that were made when disassembling. Through the inspection holes, connect the dc field leads, brush pigtails, and capacitor lugs to the appropriate brush holder terminals. Be sure that all terminal screws are tight.

f. Remove the protective wrapping from the bearing. See that the felt seal is on the inner side of the bearing and that the bearing is pressed all of the way onto the armature shaft. Insert the armature through the field yoke, commutator (dc) end first, and carefully guide the bearing into the bearing housing in the end bracket.

Note. Make sure that the bearing housing is thoroughly clean before inserting the bearing.

g. Mount the ac end bracket assembly on the ac end of the field yoke. Be sure to aline the marks that were made when disassembling. Pass the ac leads through the grommet hole in the baffle plate. Connect the ac leads, brush pigtails, and capacitor lugs to the appropriate brush holder terminals.

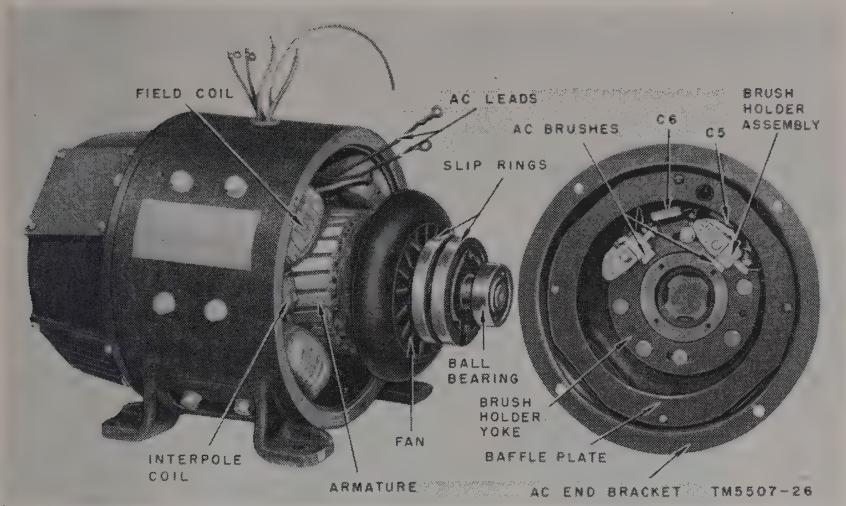


Figure 22. Rotary Converter PU–134/U, ac end bracket removed.

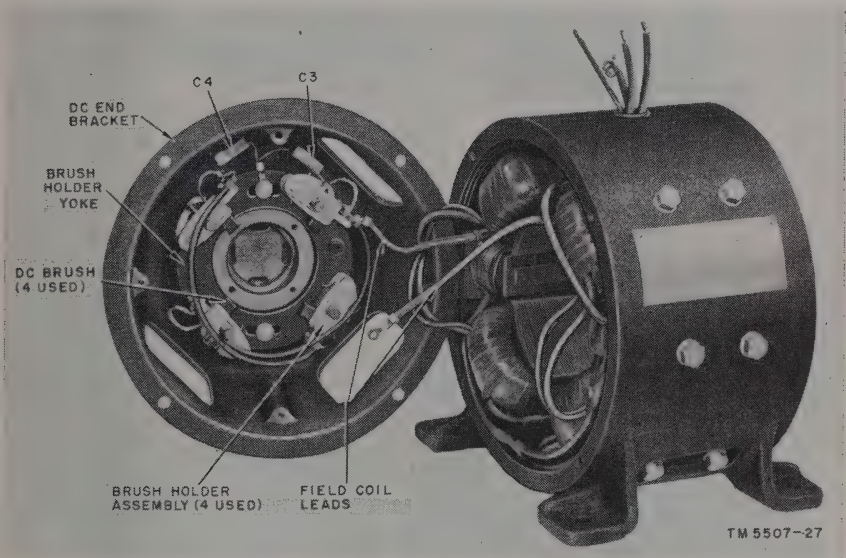


Figure 23. Rotary Converter PU–134/U, dc end bracket removed.

h. Install both the ac and the dc brushes in their brush holders. See that the brushes move freely in their holders and that they make good contact with the commutator and the slip rings.

i. Set the filter box in place on the field yoke and solder the dc leads to the reactor coils. Connect the ac leads to the air-core choke coil terminals on the terminal strip and secure the filter box to the field yoke with the mounting screws. Install the filter box cover.

35. Reassembly of PU–140A/U, PU–143/U, PU–143A/U, and PU–143B/U
(figs. 10 and 11)

a. Press the field coils onto the pole pieces and fasten the pole piece and field coil assemblies in the field yoke. Be sure that all coil leads are correctly positioned for reconnection.

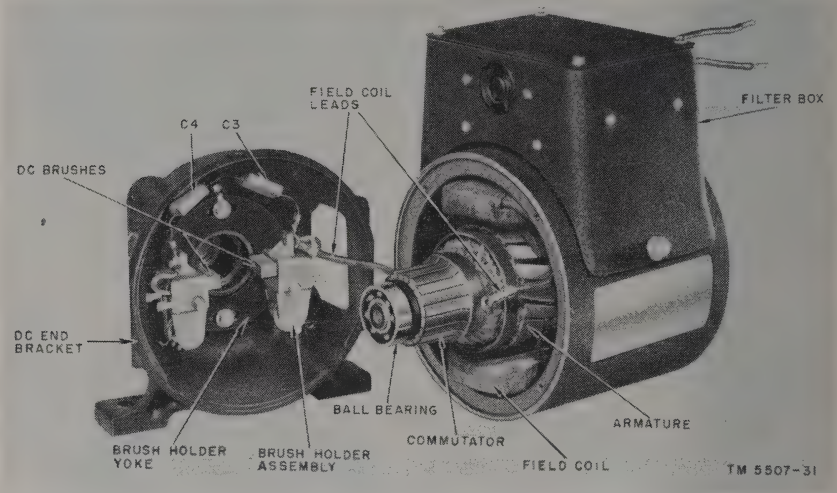


Figure 24. Rotary Converter PU–143A/U, dc end bracket removed.

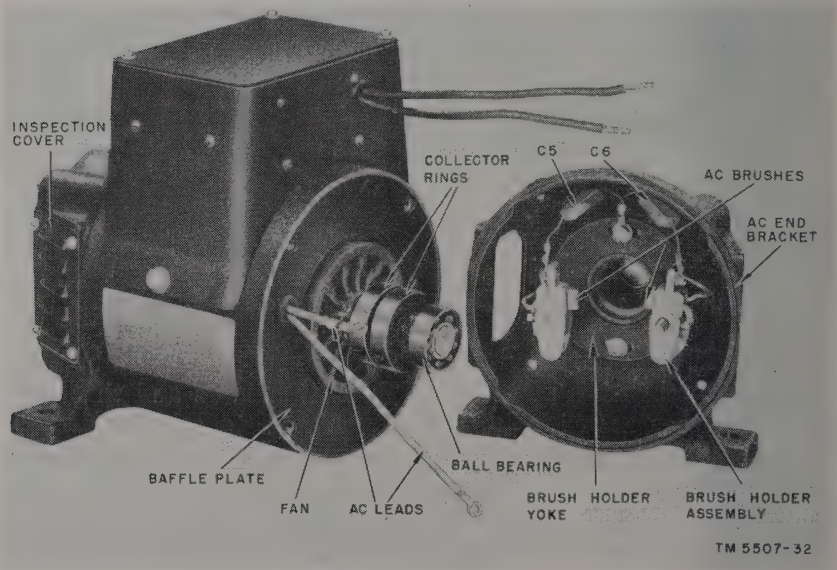


Figure 25. Rotary Converter PU–143A/U, ac end bracket removed.

b. Pass the ac leads through the hole in the top of the field yoke. Bring the other ends of the leads out through the ac end of the field yoke.

c. Press the seal caps into the bearing housings and, on units provided with lubricating fittings, screw the lubricating fittings into the bearing housings. Install the brush holders on the brush holder ring studs. Be sure that the brush holders are alined with the markings that were made when disassembling and that the brush slots are radial. Tighten the square-head set screws. Install the brush holder assemblies and capacitors in the end brackets. Mount the capacitors on the top screws. Mount the dc end bracket on the dc end of the field yoke and be sure that the alining marks, made when disassembling, match up.

d. Connect the dc field leads, brush pigtails, and capacitor lugs to their brush holder terminals. Be sure that the terminal screws are tight. Remove any protective covering from the bearings. See that the felt seal is on the inner side of the bearing and that the bearing is pressed all of the way onto the armature shaft. Insert the armature, commutator end first, through the field yoke and carefully guide the bearing into the bearing housing in the dc end bracket.

e. Install the baffle plate in the ac end of the field yoke and pass the ac leads through the grommeted hole in the baffle plate. Connect the ac leads, brush pigtails, and capacitor lugs to their brush holder terminals.

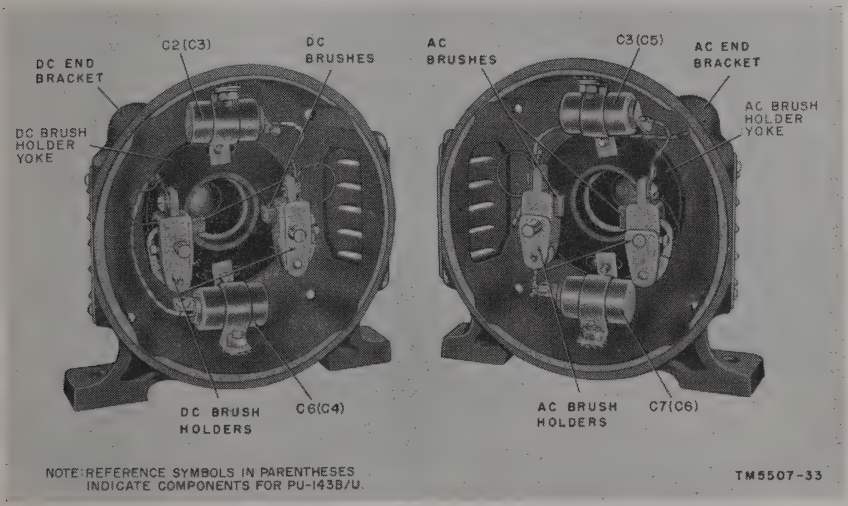


Figure 26. Rotary Converter PU–140A/U, and Rotary Converter PU–143B/U, end bracket assemblies.

f. Install both the ac and the dc brushes in their brush holders. See that they move freely in their holders and that they make good contact with the commutator and the slip rings.

g. Set the filter box in place on the field yoke and solder the dc leads to the reactor coils. Connect the ac output leads to the rf coil terminals on the terminal strip. Fasten the filter box in place and see that the field resistor is securely mounted to the inside of the filter box. Install the filter box cover.

36. Reassembly of PU–141A/U

a. Press the field coils onto the pole pieces. Fasten the pole piece and field coil assemblies in the field yoke. Be sure that all coil leads are correctly positioned for reconnection.

b. Connect the dc leads to the dc brush holders and then connect the ac leads to the ac brush holders.

c. Install the capacitors and then install the brush holder ring in the commutator end bracket. Install the commutator end bracket onto the field yoke. Be sure to line up the marks that were made when disassembling.

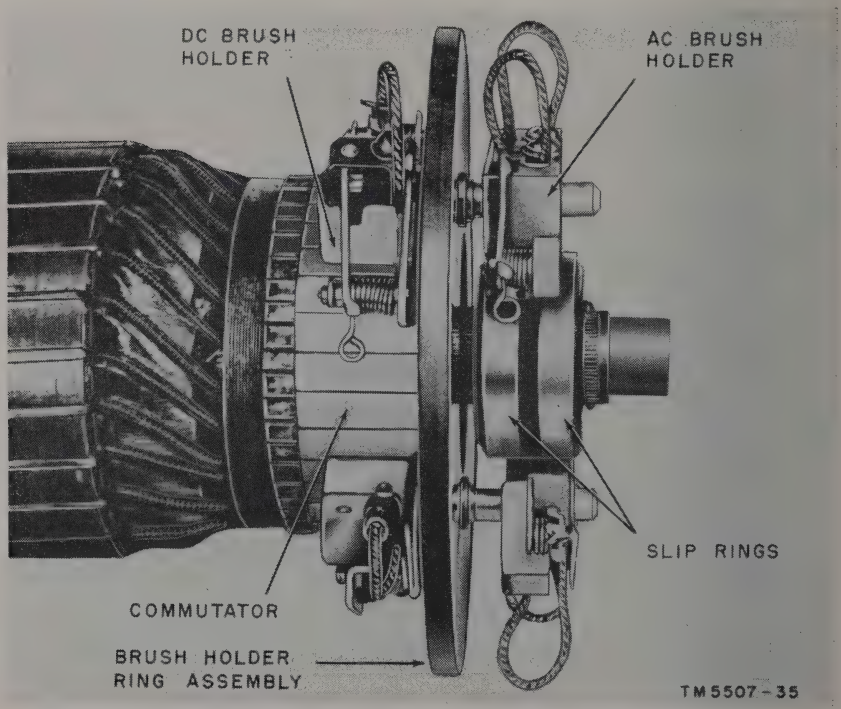


Figure 27. Rotary Converter PU–141A/U, commutator and slip rings.

d. Insert the armature through the field yoke. Be sure to insert the commutator and slip ring end first. Guide the commutator end bearing into the bearing recess in the end bracket.

e. Install the rear frame onto the field frame and carefully guide the bearing into the bearing housing. See that the air intake is positioned at the bottom of the rear bracket. Secure the bracket with the four cap screws.

f. Install the ac brushes in the ac brush holders and the dc brushes in the dc brush holders (fig. 27). See that the brushes move freely in the holders and that they make satisfactory contact with the commutator and slip rings. Replace the commutator end cover.

37. Reassembly of PU–140/U, PU–141/U, and PU–141B/U (fig. 9)

a. If the sleeve bearings were removed, reinstall them or install new bearings in accordance with instructions in paragraph 31.

b. Assemble the field coils on the pole pieces and install the field coil and pole piece assemblies in the field yoke.

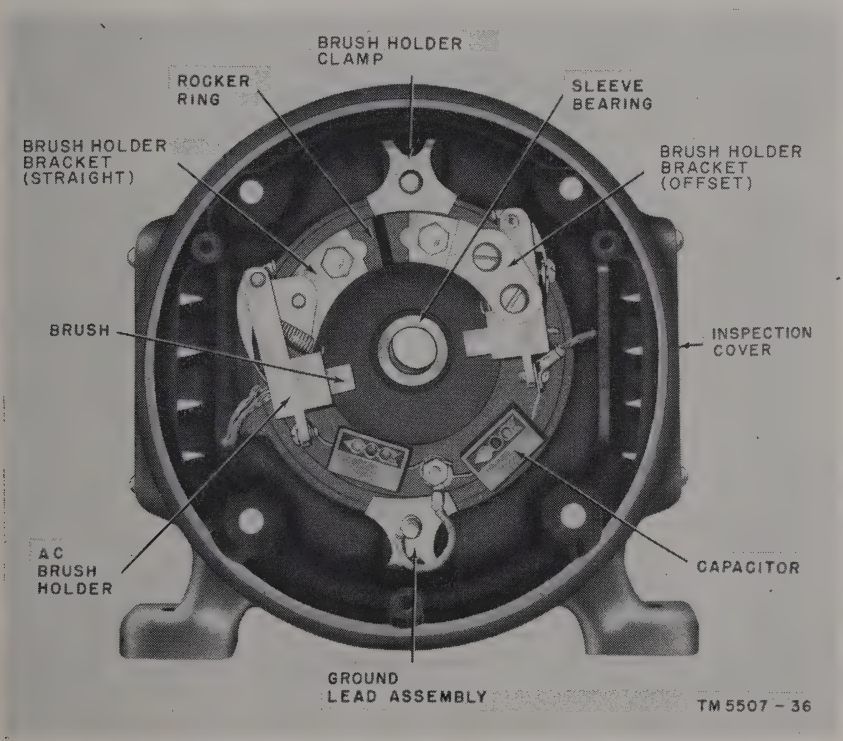


Figure 28. Rotary Converter PU–141B/U, ac end bracket.

c. Assemble the ac brush holder ring assembly and the dc brush holder ring assembly. Install the dc assembly in the dc end bracket (fig. 29) and install the ac assembly in the ac end bracket (fig. 28).

d. Mount the dc end bracket on the field yoke. Be sure to line up the assembly marks that were made when disassembling. Insert the armature, commutator end first. Before installing the commutator end of the armature shaft into the sleeve bearing, install the fiber and felt washers on the armature shaft. Place a wide fiber washer next to the armature; next, install a narrow fiber washer; install the felt washer and then the second wide fiber washer. Press the end of the armature shaft into the bearing.

e. Place the remaining fiber and felt washers on the other end of the armature shaft, in the order given in *d* above. Install the air shield in the ac end frame and mount the end frame onto the field yoke. Be sure to observe the assembly marks that were made when disassembling.

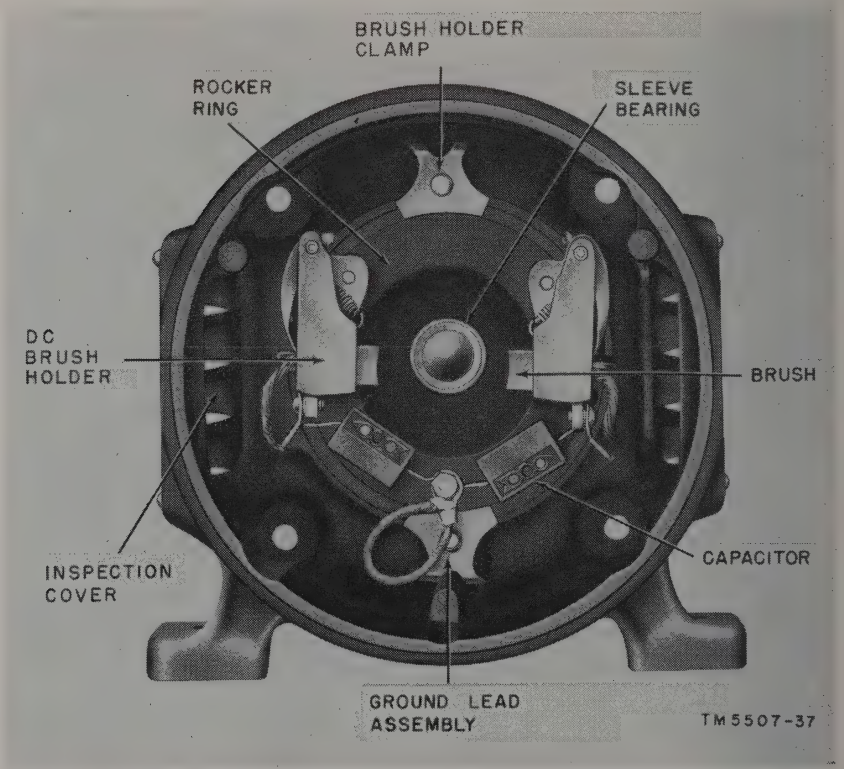


Figure 29. Rotary Converter PU–141B/U, dc end bracket.

f. Through the inspection holes, connect the ac and the dc leads to the ac and the dc brushes. Install the brushes in their respective brush holders. See that they move freely in their holders and that they make good contact with the commutator and slip rings.

g. Mount the filter box on the unit and make necessary electrical connections in the filter assembly before installing the filter box cover.

h. Install the dust caps in the ends of the bearing housings and replace the inspection covers.

38. Final Inspection

After the equipment has been overhauled, proceed as follows:

a. Remove the inspection covers and turn the armature by hand to check freedom of rotation. See that all brush leads and capacitor leads and connections are secure. Replace the inspection covers.

b. Remove the filter box cover and inspect all electrical connections within the box to see that they are clean and secure. On rotary converters that are supplied with shunt field resistors or rheostats, inspect the contacts to see that they are clean and not damaged. See that all fastenings are secure and replace the cover.

c. Connect the rotary converter to the correct dc input voltage and operate it for about 1 hour, without load. Feel the bearing housings to see that they do not run hot. Listen for unusual noise that might indicate trouble.

d. Place an appropriate load on rotary converter and operate it for 2 to 3 hours. Watch for signs of overheating, sparking at the brushes, or other unsatisfactory condition.

e. Inspect all capacitors, bonding washers, and other suppression components to see that they are properly installed and making good contact.

f. Inspect the exterior finish of the rotary converter to see that there are no bare metal surfaces. Touch up any painted surface that is scratched or otherwise damaged.

g. Operate the rotary converter and compare its performance with the tables in paragraph 5.

CHAPTER 6

SHIPMENT AND STORAGE AND DEMOLITION TO PREVENT ENEMY USE

39. Storage and Shipment

a. Limited Storage. If the equipment is to be out of use for less than 30 days, clean it thoroughly, lubricate it, and wrap it in canvas or other suitable covering. Take every precaution possible to protect it from moisture.

b. Extended Storage or Shipment. If the equipment is to be out of service for 30 days or more, or if it is to be transported a considerable distance, process it as follows:

(1) Remove the protective covers and clean the interior of the equipment. Replace the covers.

(2) Lubricate the equipment in accordance with the applicable lubrication order and instructions in paragraph 21 of this manual.

(3) Clean the exterior of the equipment and touch up any painted surfaces that may have become scratched or otherwise damaged. Seal all openings with nonhygroscopic tape.

(4) If the original packing materials are available, use them to repack the equipment. General repacking information is usually available at depots. The prime requirement is to pack the equipment securely to prevent damage. Use sufficient wadding to minimize the effects of severe jolting. Be sure that the equipment is protected against rain and dampness.

40. Demolition of Materiel to Prevent Enemy Use

a. General. The following demolition procedures will be accomplished, upon order of the commanding officer, to prevent the enemy from using or salvaging the equipment.

b. Methods of Destruction. Smash the entire equipment with sledges, axes, crowbars, and other heavy tools. If on shipboard, throw the equipment overboard; if on land, bury the equipment or throw it into a stream or other body of water.

[AG 413.44 (7 Nov 56)]

By Order of *Wilber M. Brucker,* Secretary of the Army:

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NG: State AG (6); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see SR 320–50–1.

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