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COMPONENT MAINTENANCE MANUAL
WITH ILLUSTRATED PARTS LIST

DC GENERATOR
30086 SERIES II

List of Part Numbers

30086-010

30086-011

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HIGHLIGHTS

TO: Holders of Component Maintenance Manual with IPL for DC Generator Model 30086 Series II.

Attached to this transmittal letter is Revision No. 12 of the Component Maintenance Manual with IPL (basic issue dated November 30, 1998).

REVISION 12, DATED APRIL 1, 2022

Remove the complete existing manual and replace with this full revision of the manual. Retain the Highlights page(s) in the front of the manual for future reference.

This Component Maintenance Manual has been fully revised to include the latest engineering information and also to include Service Bulletin(s) and Service Information Letter(s) as listed in the Service Bulletin and Service Information List in the front of the manual.

The content has been fully converted to provide customers with electronic delivery and is distributed in a “pdf” format compatible with the Adobe Acrobat Reader® that can be obtained from Adobe.

The contents of this revision has technical changes individually identified with revision bars, because the new format of the Safran Power manuals was significantly changed to be more consistent with current standards set by the Air Transport Association of America Specifications ATA-100.

Key items included in this revision:

- Copyright date changed to 2022.
- Incorporated TR 24-43 through TR 24-46
- Incorporated SIL 30086-310-24-01.
- Incorporated SIL 23032-1910-24-01.
- Changes done in Testing and Fault Isolation section:
  - Updated the procedures with latest content.
- Changes done in Disassembly section:
  - Updated Table 3002 - Solder P/N added.
  - Updated the procedures with latest content.
- Changes done in Check section:
  - Updated the procedures with latest content.
- Changes done in Repair section:
  - Updated Table 6002 and 6003.

  - Updated the procedures with latest content.
- Changes done in Assembly section:
  - Updated Table 7001 and 7002.
  - Added Figure 7025.
  - Updated the procedures with latest content.
- Changes done in Special Tools, Fixtures, and Equipments section:
  - Updated Table 9001.
  - Added Figure 9027.
- Changes done in Storage section:
  - Updated Table 15001.
- Changes done in ILLUSTRATED PARTS LIST section:
  - Figure 10002 is updated to show the correct orientation of terminal post (35)
  - Updated part number of terminal post (35).
  - Figure 10004 updated to show terminal lugs.
  - Item 140 updated as illustrated.

The technical changes in this revision are individually identified with revision bar.

RECORD OF REVISIONS

Revision Number	Date Issued	Date Inserted into CMM	Initials
Original Issue	Nov 30/98	Nov 30/98	SP
Revision 1	April 20/00	April 20/00	SP
Revision 2	May 12/00	May 12/00	SP
Revision 3	July 14/00	July 14/00	SP
Revision 4	Sep 21/02	Sep 21/02	SP
Revision 5	Mar 15/04	Mar 15/04	SP
Revision 6	Sep 15/09	Sep 15/09	SP
Revision 7	Jan 16/14	Jan 16/14	SP
Revision 8	Nov 19/14	Nov 19/14	SP
Revision 9	Nov 23/15	Nov 23/15	SP
Revision 10	Jul 27/17	Jul 27/17	SP
Revision 11	Aug 22/20	Aug 22/20	SP
Revision 12	Apr 1/22	Apr 1/22	SP

Retain this record in the front of the CMM. On receipt of revisions, insert affected pages into the manual. Record revision number, date issued, date inserted into the CMM, and initials on this page.

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RECORD OF TEMPORARY REVISIONS

Temporary Revision Number	Number Pages	Date Issued	Date Inserted	Initials	Date Removed	Initials
24-01	6	Feb 11/02	Feb 13/02	SP	Dec 27/02	SP
24-02	3	Feb 13/02	Feb 13/02	SP	Dec 27/02	SP
24-03	1	Mar 13/02	Mar 13/02	SP	Dec 27/02	SP
24-04	1	Mar 13/02	Mar 13/02	SP	Dec 27/02	SP
24-05	1	Mar 13/02	Mar 13/02	SP	Dec 27/02	SP
24-06	9	Mar 13/02	Mar 13/02	SP	Dec 27/02	SP
24-07	2	Mar 13/02	Mar 13/02	SP	Dec 27/02	SP
24-08	4	Nov 06/02	Nov 06/02	SP	Dec 27/02	SP
24-09	2	Jun 11/04	Jun 11/04	SP	Jan 16/14	SP
24-10	1	Jun 01/04	Jun 01/04	SP	Jan 16/14	SP
24-11	7	Apr 22/05	Apr 22/05	SP	Jan 16/14	SP
24-12	3	Apr 22/05	Apr 22/05	SP	Jan 16/14	SP
24-13	10	Sep 21/05	Sep 21/05	SP	Jan 16/14	SP
24-14	1	Sep 26/05	Sep 26/05	SP	Jan 16/14	SP
24-15	1	Mar 30/06	Mar 30/06	SP	Jan 16/14	SP
24-16	2	Jun 06/06	Jun 06/06	SP	Jan 16/14	SP
24-17	11	Aug 18/06	Aug 18/06	SP	Jan 16/14	SP
24-18	12	May 04/07	May 04/07	SP	Jan 16/14	SP
24-19	5	Nov 17/08	Nov 17/08	SP	Jan 16/14	SP
24-20	1	Oct 01/10	Oct 01/10	SP	Jan 16/14	SP
24-21	1	Oct 01/10	Oct 01/10	SP	Jan 16/14	SP
24-22	1	Oct 01/10	Oct 01/10	SP	Jan 16/14	SP
24-23	1	Oct 01/10	Oct 01/10	SP	Jan 16/14	SP

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24-27	1	Oct 01/10	Oct 01/10	SP	Jan 16/14	SP
24-28	1	Oct 01/10	Oct 01/10	SP	Jan 16/14	SP
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24-39	1	Jun 02/14	Jun 02/14	SP	Nov 19/14	SP
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24-41	1	Aug 14/14	Aug 14/14	SP	Nov 19/14	SP
24-42	1	Aug 14/14	Aug 14/14	SP	Nov 19/14	SP
24-43	1	Apr 05/16	Apr 05/16	SP	Apr 1/22	SP
24-44	1	Apr 05/16	Apr 05/16	SP	Apr 1/22	SP
24-45	1	Apr 05/16	Apr 05/16	SP	Apr 1/22	SP
24-46	2	Apr 05/16	Apr 05/16	SP	Apr 1/22	SP

Temporary Revision Number	Number Pages	Date Issued	Date Inserted	Initials	Date Removed	Initials

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SERVICE BULLETIN LIST

Service Bulletin Number	Status	Rev	Date Issued	Service Bulletin Number	Status	Rev	Date Issued
30086-010-24-01	Incorporated	-	Nov 30/98				
30086-010-24-02	Incorporated	1	Sep 20/99				
30086-010-24-03	Incorporated	3	Feb 07/00				
30086-011-24-01	Incorporated	-	Mar 15/02				
30086-011-24-02	Superseded	-	Mar 11/03				
30086-011-24-03	Incorporated	1	Dec 01/05				

Retain this record in the front of the CMM. On receipt of service bulletins, record the service bulletin number, status (valid or invalid), revision number (if applicable) and the date issued. Unless invalidated, all service bulletins affecting the 30086 Series II should be kept with the CMM.

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SERVICE INFORMATION LETTER LIST

Service Information Letter Number	Status	Rev	Date Issued	Service Information Letter Number	Status	Rev	Date Issued
30086-010-01	Incorporated	-	Mar 15/00				
30086-0XX-24-01	Incorporated	-	Aug 24/01				
30086-011-24-01	Incorporated	1	Feb 28/02				
30086-011-24-02	Incorporated	-	Jan 10/03				
30086-011-24-03	Valid	-	Nov 07/08				
GSIL 2006-01	Incorporated	-	Sep 26/06				
GSIL 2006-02	Incorporated	1	Feb 10/09				
GSIL 2006-03	Incorporated	-	Feb 15/06				
GSIL 2011-01	Incorporated	-	Dec 16/11				
30086-011-24-04	Incorporated	-	Apr 01/14				
30086-310-24-01	Valid	-	Feb 01/16				
23032-1910-24-01	Valid	-	Feb 26/16				

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INTRODUCTION

1. General

A. This Component Maintenance Manual (CMM) provides detailed instructions for restoration and service repair (continued time) of the 30086 Series II DC Generator.

B. This manual is divided into sections to agree with ATA100. Refer to the TABLE OF CONTENTS section for the page locations of the Sections in this manual.

C. This manual gives procedures for maintenance of the unit in a workshop. This manual does not give procedures for maintenance of the unit when it is installed in the aircraft.

D. Only approved persons with the necessary skills must be used for the maintenance procedures given in this manual.

E. This manual contains:

- Technical data for the unit.
- Maintenance and repair procedures for the unit.
- An Illustrated Parts List (IPL) with data for the component parts of the unit.

F. If errors, omissions, or other technical discrepancies exist in CMM, fill out a Technical Publication Comment Form. Send a copy of form to: lps.twn.techpubs@safrangroup.com.

G. Publications can be obtained by subscribing to the publications web portal at https://techpubsdistribution.labinal-power.com.

2. Maintenance and Service Description

A. DC Generator “restoration” includes the following items:

NOTE: Refer to the Aircraft Maintenance Manual (AMM) for the DC generator restoration schedule.

- Replacement of non-reusable parts such as bearings and miscellaneous attaching hardware.
- Cleaning of sub assemblies.
- Detailed inspection of parts, electrical check of all electromagnetic parts (including; insulation integrity check), Non-Destructive Test (NDT) inspections, and complete acceptance testing.

  NOTE: Magnetic particle inspection of the parts as specified in the CHECK section is only required when a restoration of the generator assembly is being done.

- Reconditioning of housing finishes as required.
- Clean the old heat sink compound from the stator diodes/heat sink with alcohol, removed during overhaul and re-install the diodes with fresh heat sink compound.
- Repair/rework of parts as given in the REPAIR section.
- Recertification including final assembly, records, and release tags.
- A full acceptance test according to the Testing and Fault Isolation section.
- Test the stator diodes per Paragraph 8.Z. of CHECK section.

B. DC Generator "continued time":

Servicing or selected equipment repairs do not affect the Time Since Restoration (TSR) and the equipment is released on a "continued time" basis.

NOTE: Only after a restoration and a full acceptance test can zero operating hours "TSR" be given to a DC generator. "TSR" was previously known as Time Since Overhaul (TSO).

3. Manual Use

A. The operator can use the instructions given in this manual to make an analysis of the unit that was removed from service and use the recommended procedures to make the unit serviceable.

B. Make sure that the manual contains the data applicable to your unit. The part number of the unit can be found on the Title Page and in the IPL.

WARNING: YOU MUST OBEY THE INSTRUCTIONS GIVEN IN THIS MANUAL AND OTHER MANUALS OR INSTRUCTION DOCUMENTS THAT ARE REFERRED TO IN THIS MANUAL. IF YOU DO NOT OBEY THESE INSTRUCTIONS, YOU CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT OR PROPERTY.

CAUTION: DO NOT DO MAINTENANCE AND/OR REPAIR PROCEDURES THAT ARE NOT CONTAINED OR REFERRED TO IN THIS MANUAL OR WHICH ARE NOT APPROVED BY SAFRAN POWER.

CAUTION: DO NOT USE COMPONENTS THAT ARE NOT CONTAINED OR REFERRED TO IN THE ILLUSTRATED PARTS LIST SECTION OF THIS MANUAL AND THUS ARE NOT APPROVED BY SAFRAN POWER.

CAUTION: DO NOT USE COMPONENTS THAT WERE REPAIRED WITH PROCEDURES THAT ARE NOT CONTAINED OR REFERRED TO IN THIS MANUAL OR WHICH ARE NOT APPROVED BY SAFRAN POWER.

C. The instructions given in this manual must be used for all of the maintenance on the unit. Make sure that you read all applicable WARNINGS and CAUTIONS before you do a maintenance procedure on the unit.

D. All weights and measurements given in this manual are in imperial units with the equivalent SI units in parenthesis.

4. User Qualification and Certification Requirements

The information contained in this manual is intended for use by persons properly trained and certified in the repair and service of aircraft electrical accessories. Eligibility and certification of service technicians must be in accordance with guidelines established by the U.S. Federal Aviation Administration or an equivalent regulatory authority. Refer to U.S. Code of Federal Regulations 14 CFR, parts 65.101 through 65.103 and part 145.33.

Where special processes are included by reference to military or commercial standards, the qualifications and certification of personnel performing the process must be as indicated in the cited standard. Strictly follow the detailed requirements of all cited military or commercial standards used in the repair of this equipment.

5. Quality Assurance Requirements

The repair station's quality assurance activity is responsible for the correct performance of all tests and inspections specified in this manual. The quality assurance activity must also be responsible for maintaining all necessary test, inspection, and maintenance records for each unit received for service.

All instrumentation and inspection equipment used must be calibrated and controlled in accordance with ISO 10012-1, with all standards traceable to the National Bureau of Standards or an equivalent standards regulatory authority.

The quality assurance activity must be responsible for certifying that personnel, skills, and materials meet the requirements of the work to be performed. Components of the DC generator undergoing servicing that are recovered as products of disassembly must be examined 100% to determine serviceability.

The quality assurance activity must maintain documented evidence that specifications applicable to special processes such as soldering, non-destructive testing, plating, etc.; have been complied with during servicing and/or repair of the generator.

6. Safety Advisory

This manual describes physical and chemical processes that require the use of chemicals or other commercially available materials that require precautionary attention.

The user of this manual should obtain material safety data sheets and Occupational Safety and Health Act (OSHA) Form 20 or equivalent from the manufacturers or suppliers of materials to be used. The user must become completely familiar with and follow all manufacturer/supplier procedures, recommendations, warnings, and cautions for the safe use, handling, storage, and disposal of the materials. User of this manual are also advised to refer to applicable safety information contained in the "NIOSH Occupational Guideline for Chemical Hazards" published by the United States Department of Labor.

WARNING: ALERT OPERATING AND MAINTENANCE PERSONNEL TO POTENTIAL HAZARDS THAT COULD RESULT IN PERSONAL INJURY; THEY DO NOT REPLACE THE MANUFACTURER'S RECOMMENDATIONS.

CAUTION: ALERT OPERATING AND MAINTENANCE PERSONNEL TO CONDITIONS THAT COULD RESULT IN EQUIPMENT DAMAGE.

7. Materials List

The materials listed in this paragraph are required for processes throughout this manual. Warnings and/or cautions will precede the use of the materials listed in Table i.

WARNING: **BEFORE HANDLING ANY OF THE FOLLOWING MATERIALS, BE AWARE OF ALL HANDLING, STORAGE, AND DISPOSAL PRECAUTIONS RECOMMENDED BY THE MANUFACTURER OR SUPPLIER. FAILURE TO COMPLY WITH MANUFACTURER OR SUPPLIER RECOMMENDATIONS CAN RESULT IN SERIOUS INJURY, PHYSICAL DISORDER, OR DEATH.**

Material	Used in…
Chem film, chromate	REPAIR
Chem film, dichromate	REPAIR
Electrical Resin	REPAIR and ASSEMBLY
Isopropyl alcohol	CLEANING, CHECK, REPAIR
Lubricating oil	ASSEMBLY
Methyl Cyanoacrylate Adhesive	ASSEMBLY
Conformal Coating	REPAIR
Reducer (Thinner)	REPAIR

Table i - Hazardous Materials

8. Non-Safran Power Authorized Components and Processes Policy

Safran Power authorizes the use of genuine Safran Power spare parts which meet engineering design specifications and quality standards, and have traceability to having been procured and certified to these specifications by the Safran Power Quality Assurance incoming and in process inspection systems. The Safran Power Spares Portal is the only authorized distributor of genuine Safran Power USA replacement parts and complete units.

It is the obligation of all repair and service facilities to provide the FAA, or any other in-country air authority, with proper traceability documentation indicating approval of all spare parts, materials, and processes to ensure configuration compliance and continued air worthiness.

The use of any non-Safran Power parts, or any parts not having been submitted to Safran Power Quality Assurance inspection systems will invalidate any and all factory warranties. All Safran Power warranties are automatically voided on any Safran Power designed unit that has been modified by the installation of any unauthorized parts, materials, or unapproved processes supplied by other outside services. The repair station's quality assurance activity must assume product liability for all units that have been modified in this fashion.

Damage resulting from the use of non-Safran Power replacement parts, materials, or processes is not covered by the Safran Power warranty or service policy for any product or for any application.

9. Abbreviations and Acronyms

The following is a list of the abbreviations and acronyms used in this document.

A	Ampere
AC	Alternating Current
A/D	Analog to Digital
ADE	Anti-Drive End
AR	As Required
ASC	Auxiliary Start Connector
° C	Degree Celsius
CMM	Component Maintenance Manual
D/A	Digital to Analog
DC	Direct Current
DE	Drive End
° F	Degree Fahrenheit
FAA	Federal Aviation Administration
GCS	Generator Control Switch
GCU	Generator Control Unit
gr/in	grain/inch
gm/mm	gram/millimeter
Hz	Hertz
ID	Inside Diameter
ISO	International Standardization Organization
KPa	Kilopascals
L	Liter
Lbs	Pounds
LRU	Line Replaceable Unit

MIL	Military Specification
MS	Millisecond
O/C	Overcurrent
OSHA	Occupational Safety Health Administration
POR	Point of Regulation
PP	Peak to Peak
PSIG	Pounds per square inch gauge
PWB	Printed Wire Board
RMS	Root/Mean/Square
RPM	Revolutions Per Minute
SI	Systeme Internationale
SP	Safran Power
V	Volt or Voltage
Vcc	Voltage, Power Supply
VDC	Voltage Direct Current
µ	Micro
µF	MicroFarad
Ω	Ohm
±	Plus or Minus
≤	Less than or equal to

DESCRIPTION AND OPERATION

1. Equipment Description

The 30086 Series II DC Generator is an air-cooled, brushless, DC Generator manufactured by Safran Power. The generator is designed for cable interface with a 51545-001B Generator Control Unit (GCU) and a 28 VDC control bus.

The DC Generator consists of a rotor assembly that is enclosed by and rotates within a stator and housing assembly (see Figure 1). The rotor assembly has a hollow rotor shaft which contains the spline-fitted drive shaft engaged at the anti-drive end of the generator. The rotor assembly is supported by two main bearings mounted in the drive end bearing support and in the anti-drive end bearing support assembly. There is one auxiliary bearing adjacent to each of the two main bearings. The auxiliary bearings are normally motionless and are activated only in the event of a primary bearing failure. The anti-drive end bearing support assembly is a part of the stator and housing assembly.

At the drive end, a clutch-type dampener assembly absorbs torsional vibration generated by changes in engine gearbox speed and electrical load conditions. The dampener assembly consists of a hub, backplate, friction ring, and dampener plate. A fan, installed on the anti-drive end of the drive shaft, draws in air to permit self-cooled operation at all rated conditions. The unit includes electrical sensing for over-current, speed, and bearing failure. This output voltage control and ripple voltage sensing interacts with the GCU to protect and control power circuits and equipment.

The QAD (Quick-Attach-Detach) kit eases generator installation and removal, to and from the aircraft. A QAD Mounting Kit is comprised of a mounting adapter that attaches to the engine gear box accessory drive pad, and a V-band clamp which secures the generator to the mounting adapter. The DC Generator and its associated parts are listed in the ILLUSTRATED PARTS LIST section.

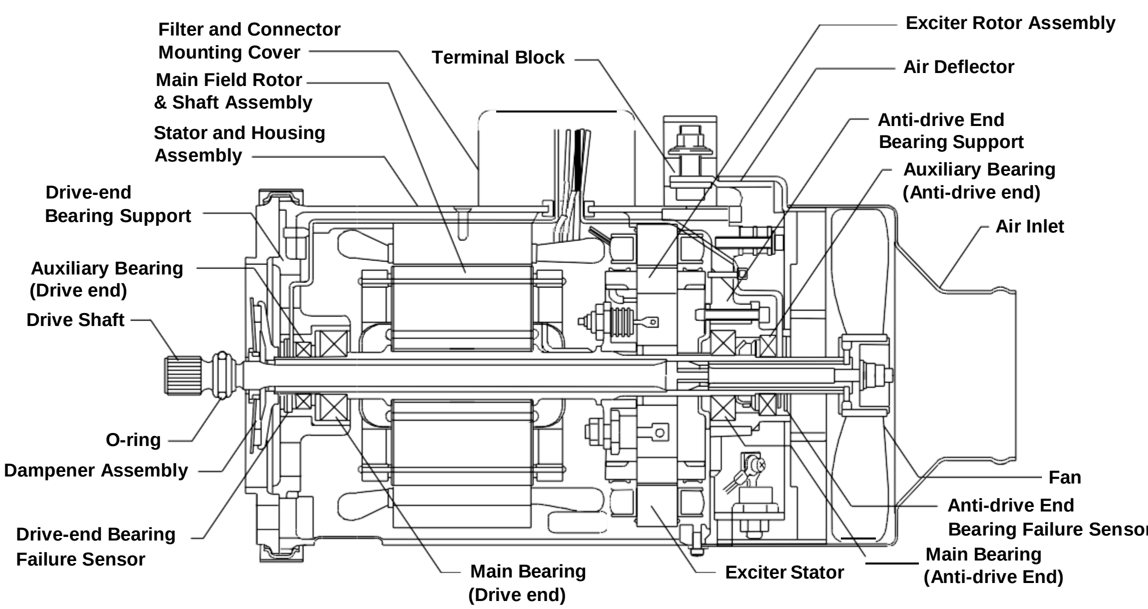


Figure 1 - 30086 Series II DC Generator

2. Equipment Specifications

Characteristic	Specification
Rated Power Output	12 kW
Rated Voltage	29.5 VDC @ 6,700 to 13,236 RPM
Speed Range	6,700 to 13,236 RPM; overspeed 15,000 RPM
Continuous Load in Speed Range	400A @ 6,700 to 13,236 RPM
Direction of Rotation	Counterclockwise (viewed from drive end)
Drive Shaft Shear Torque	1,600 in-lbs (169 N·m) maximum
Overall Length (from gearbox face)	13.50 inch (342.8 mm)
Housing Diameter	6 inch (152 mm) nominal
Air Inlet Opening Diameter	3.00 inch (76.2 mm)
Weight	27.6 lbs (12.5 kg) less QAD Mounting Kit [0.90 lbs (0.4 kg)]
Overhung Moment	165 in-lbs (18.6 N·m) maximum
Electrical Connector	38999/20FD97PN
Mating Connector	38999/26FD97SN
Output Terminal Designations	Positive B+ Negative E–
Mounting Flange and Spline	Drive spline per MS3332-1P except with 12-tooth (0.60 inch PD) spline per AS972B

Table 1 - Equipment Specifications

3. Equipment Improvements and Modifications

The model 30086 Series II DC Generator may incorporate one or more modifications. A modification is indicated by a letter in the MOD status block on the nameplate or modification status label. Information regarding modifications are detailed in the service bulletins in the SERVICE BULLETIN LIST found in the front of this CMM. Table 1 shows the latest MOD status of each generator model.

30086-010	30086-011	Description
-	A	30086-331 Drive End Bearing Sensor 30086-341 Anti-Drive End Bearing Sensor
-	B	Conformal coating of Filter and Connector Mounting Box according to SB 30086-011-24-02
-	C	Printed Wiring Board 30086-350 Sealing according to SB 30086-011-24-03
-	D	Printed Wiring Board 30086-350A Sealing according to SB 30086-011-24-03

Table 2 - MOD Status

4. DC Generator Operation

A. Excitation and Output (See Figure 2)

(1) The aircraft control bus, through the GCU, provides a 28 VDC signal to the exciter stator winding. The exciter voltage sets up a steady magnetic field that produces a voltage in the exciter rotor. When the rotor assembly is driven, the exciter rotor generates three, AC voltages.

(2) The AC voltages are rectified by three separate circuits that convert the full-wave AC voltages to half-wave, passing only the positive side of the signal. The rectified AC voltages are applied across the main rotor windings.

(3) When combined, the rectified AC voltage acts as a steady DC voltage creating a strong magnetic field in the main field rotor winding. As the rotor is driven, the main stator windings produce three, separate AC voltages that are sent through parallel sets of output diodes. One set of diodes pass the positive voltage, while the other set passes the negative voltage.

(4) The combined output of the three AC voltages results in a steady DC voltage signal at a single positive terminal (B+) and a single negative terminal (E–). The voltage between the B+ and E– terminals is the nominal output of the generator.

(5) If the excitation current supplied to the exciter field remains steady, the amplitude of the output voltage will vary with changes in rotor speed or electrical load. Generator output voltage regulation is achieved by changing the level of excitation current to the exciter field under varying speeds and load conditions.

B. Rotor Speed Sensing Circuit (See Figure 2)

Dropping resistor R2 across the current transformer (CT) provides speed sensing for the GCU.

C. Bearing Failure Sensing Circuit (See Figure 2)

NOTE: Activation of a bearing failure sensor requires that the DC Generator be disassembled and the bearings and bearing failure sensors be inspected and replaced.

(1) Model 30086-010

When the drive end bearing or the anti-drive end bearing fails, the rotor shaft touches one of the two bearing failure sensor rings to momentarily close a circuit and indicate a fault.

(2) Model 30086-011

When the drive end bearing or the anti-drive end bearing fails, the rotor shaft abrades one of the two bearing failure sensor rings to permanently open a circuit and indicate a fault.

D. Radio Frequency Interference (RFI) Filter (See Figure 2)

Electromagnetic interference created during generator operation is filtered to ground by capacitor C2.

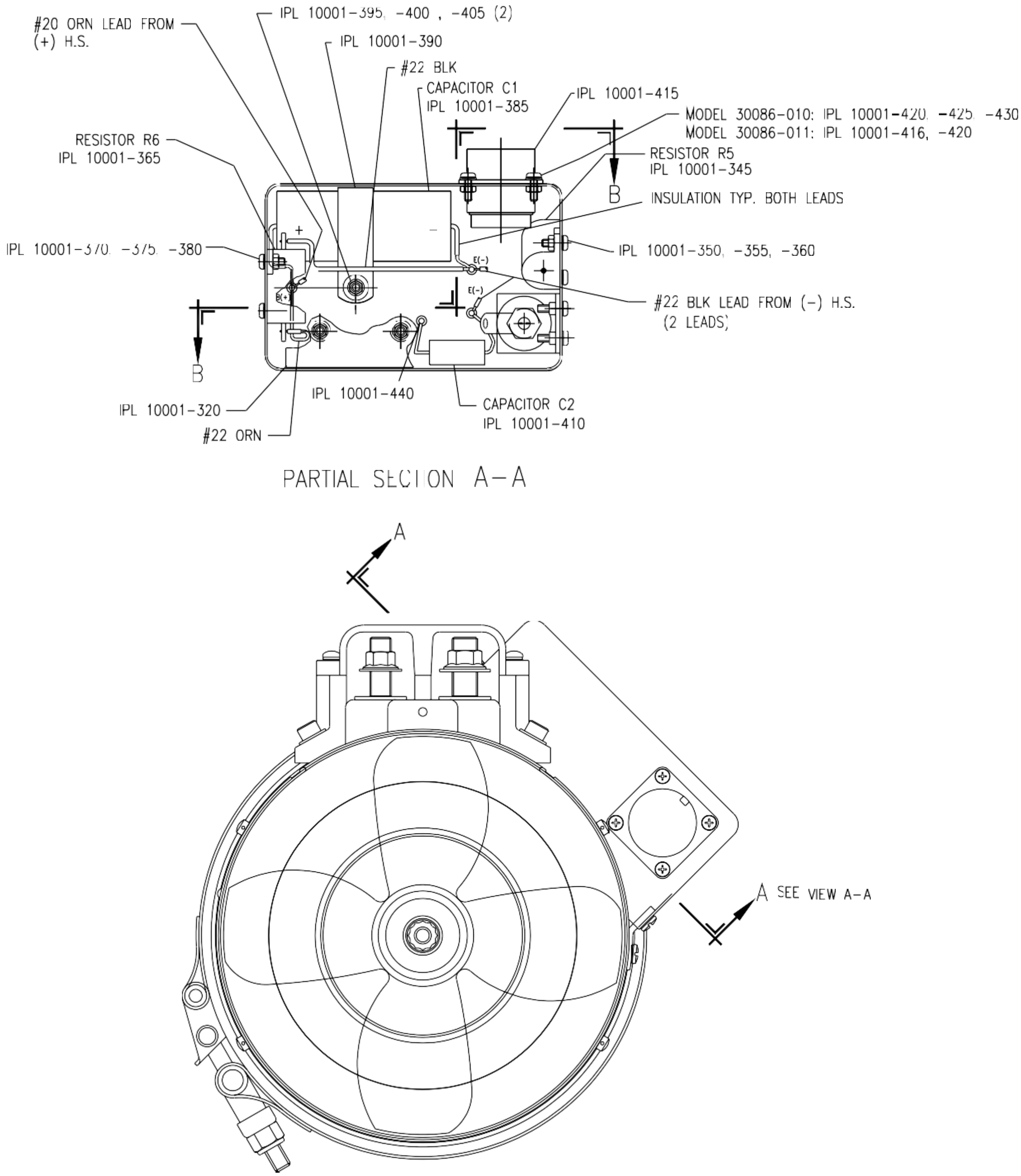


Figure 2 - Generator Schematic and Connection Diagram (Sheet 1 of 4)

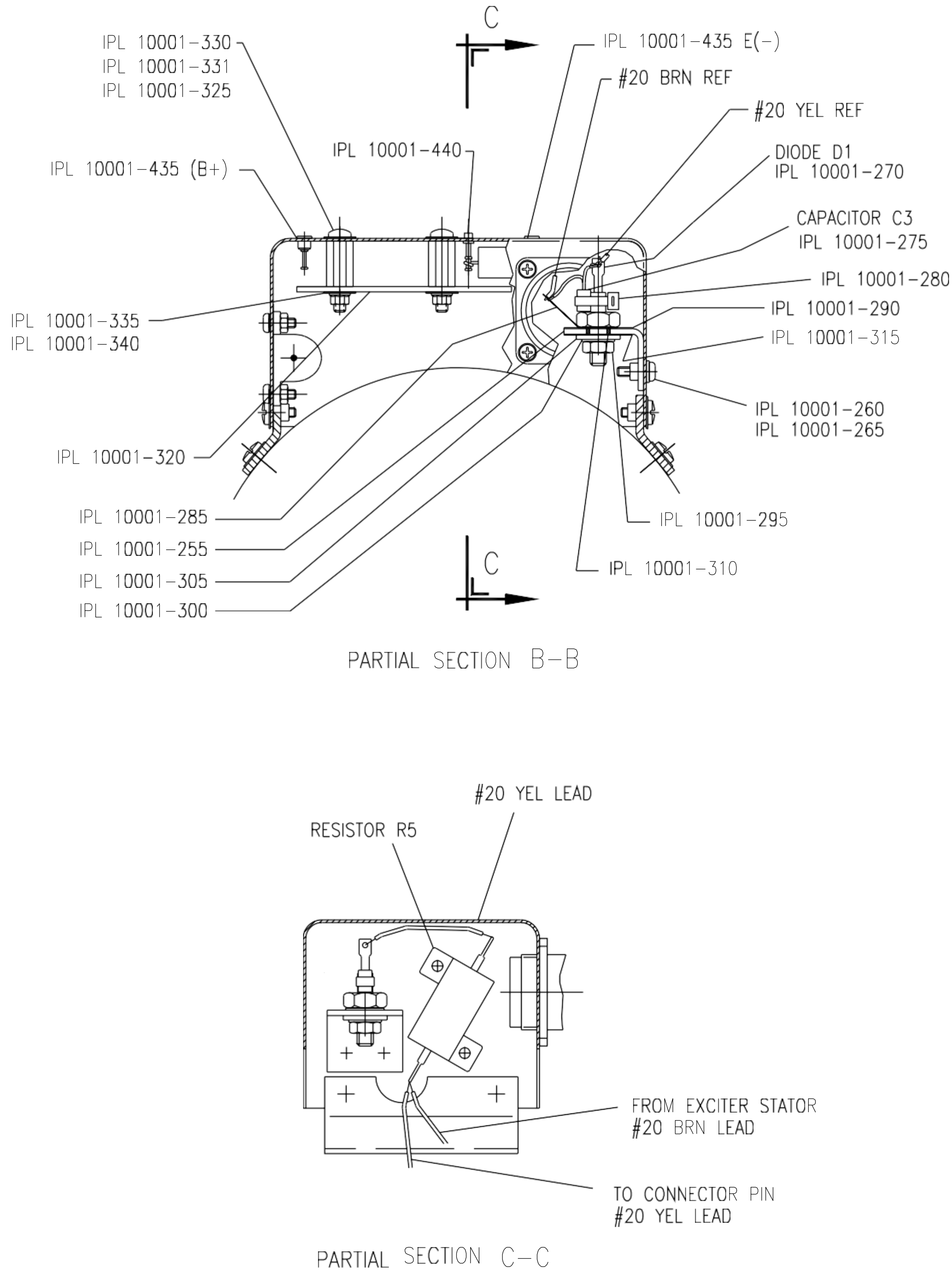
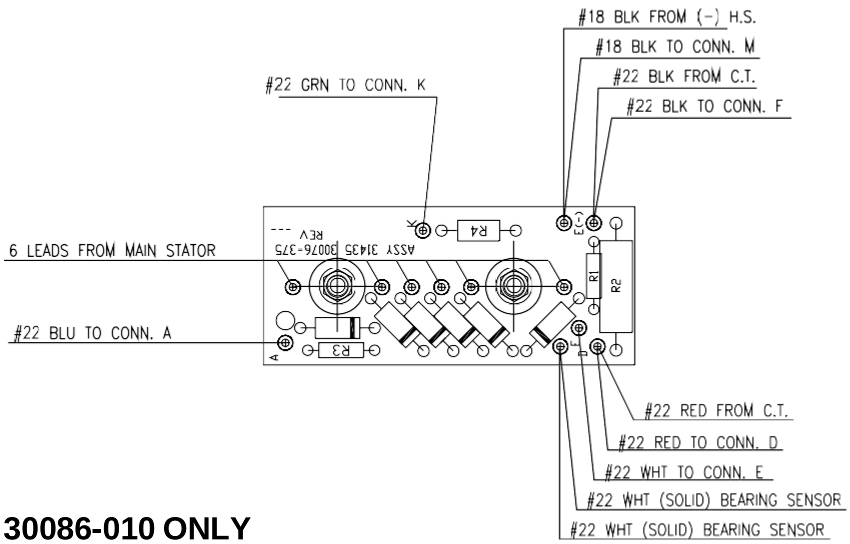
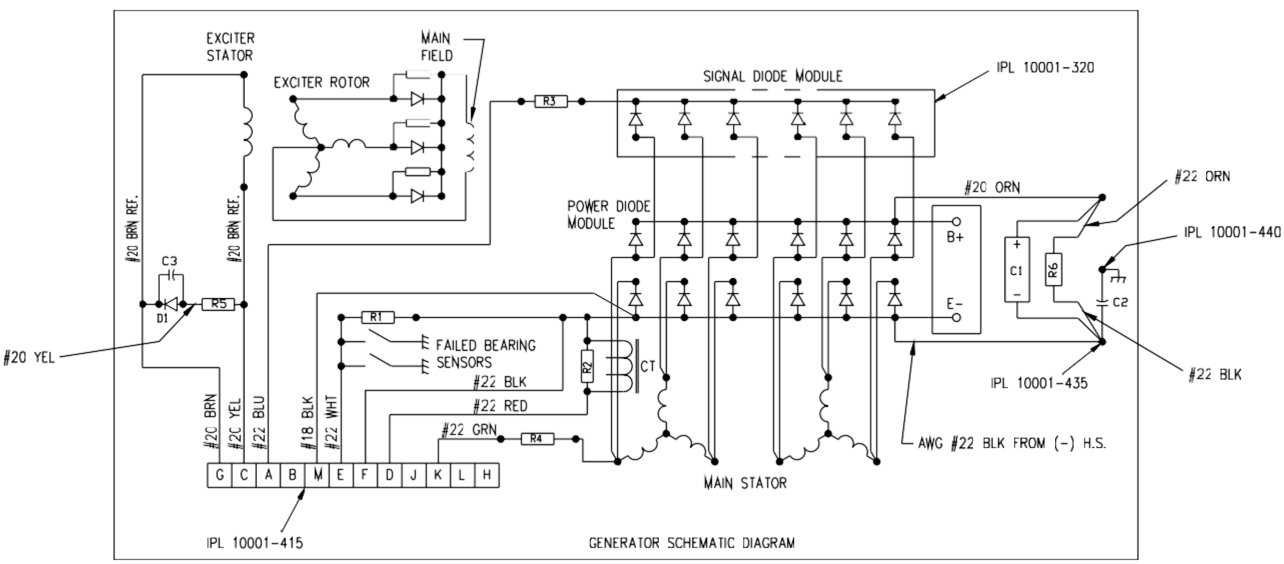


Figure 2 - Generator Schematic and Connection Diagram (Sheet 2 of 4)



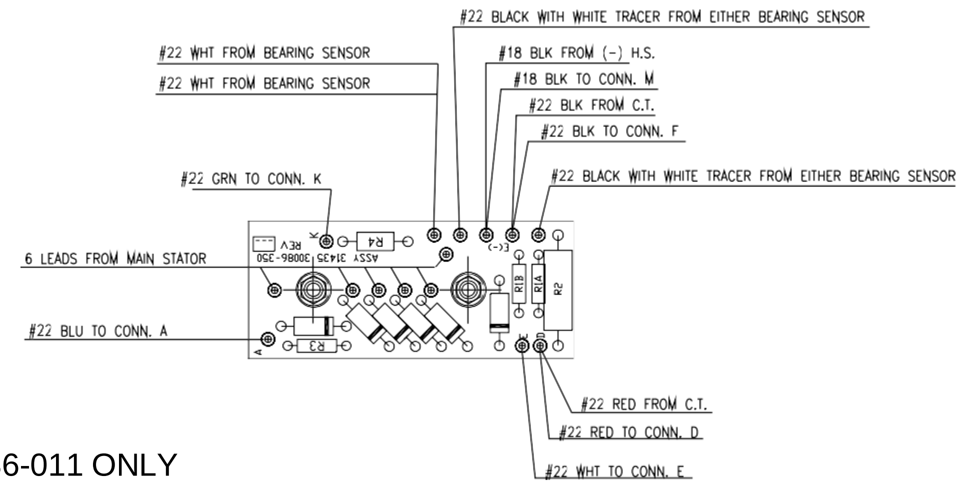
30086-010 ONLY

PWB WIRING CONNECTION



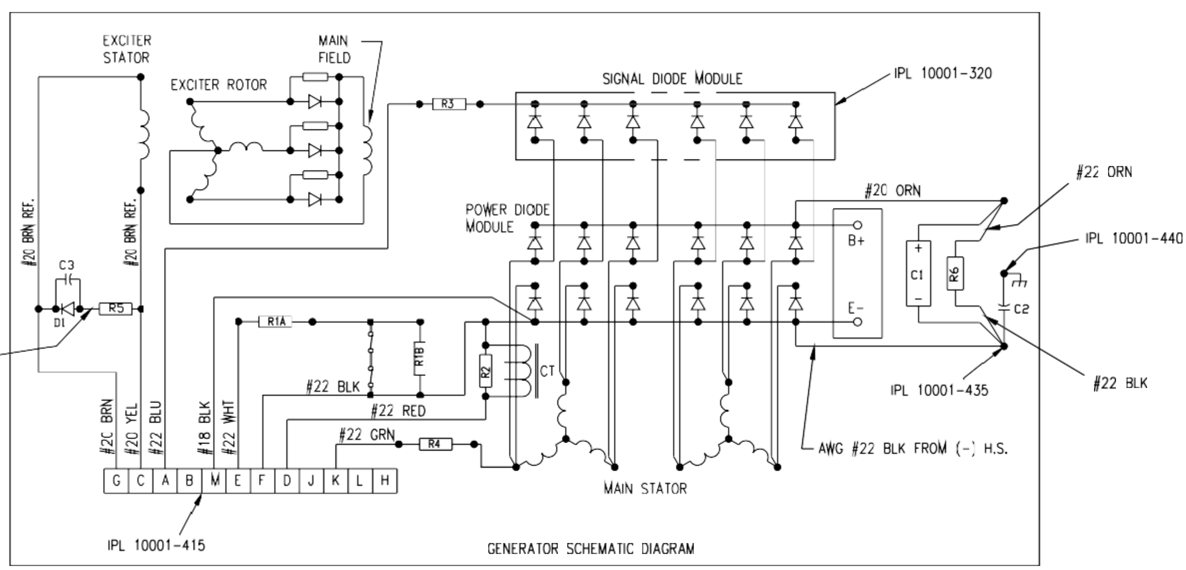
30086-010 ONLY

Figure 2 - Generator Schematic and Connection Diagram (Sheet 3 of 4)



30086-011 ONLY

PWB WIRING CONNECTION



30086-011 ONLY

Figure 2 - Generator Schematic and Connection Diagram (Sheet 4 of 4)

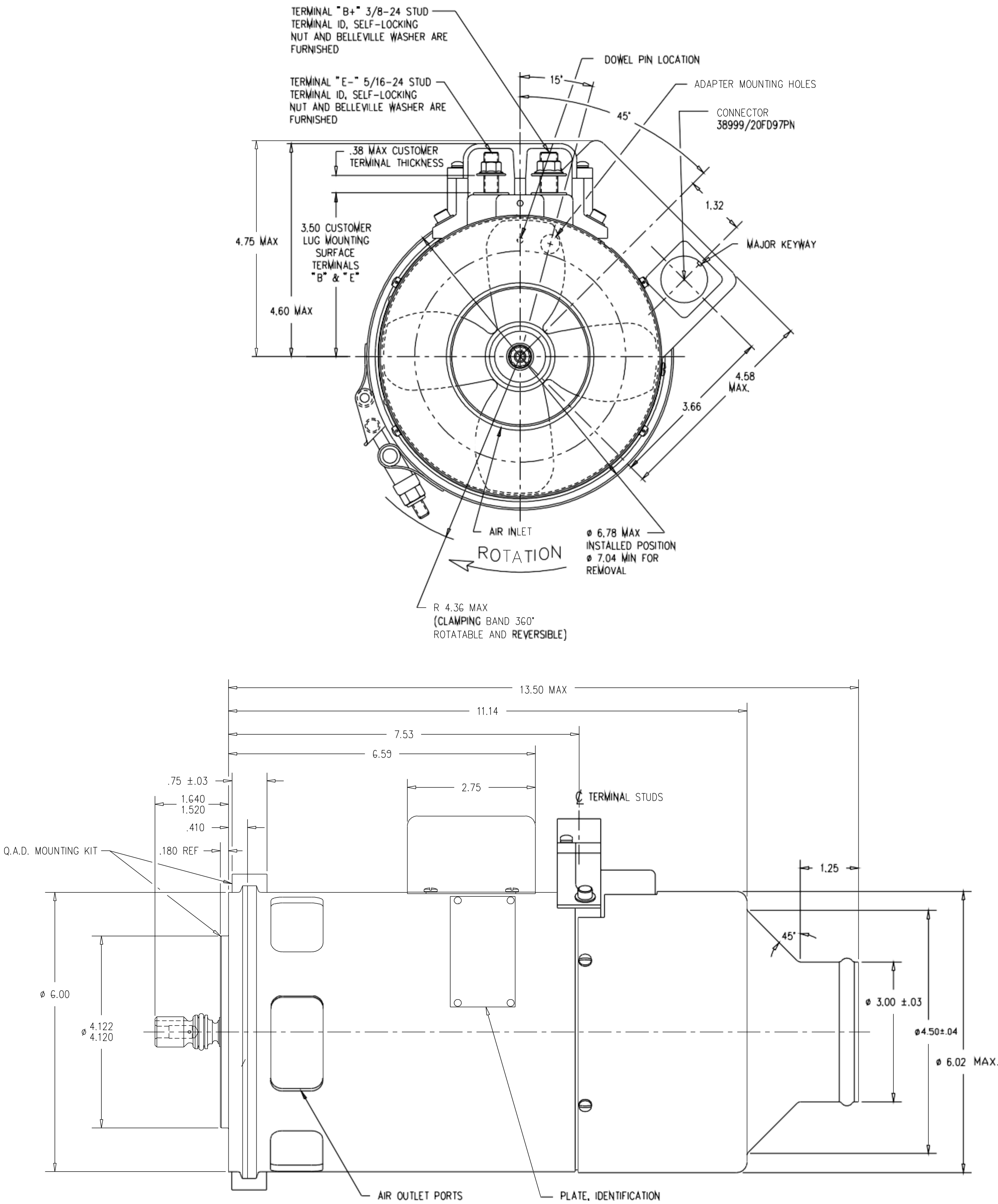


Figure 3 - DC Generator - 30086-010/011 General Outline

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TESTING AND FAULT ISOLATION

1. Introduction

WARNING: TAKE EXTREME CARE WHEN PERFORMING "LIVE CIRCUIT" TESTING AND FAULT ISOLATION PROCEDURES. ALL POWER MUST BE OFF BEFORE REMOVING OR REPLACING TEST EQUIPMENT, INSTRUMENTS OR ASSEMBLIES. DC GENERATOR CAN PRODUCE HIGH OUTPUT CURRENT CAPABLE OF CAUSING SEVERE SHOCK OR DEATH.

CAUTION: IF A 30086-010 GENERATOR IS RETURNED FROM SERVICE FOR A CONDITION OF "FAILED BEARING," THE POSSIBILITY EXISTS THE BEARING FAILURE SENSOR(S) IS WORN TO THE POINT THAT IT WILL NO LONGER GIVE THE FAILED BEARING SIGNAL. THE UNIT MUST BE DISASSEMBLED TO THE POINT NECESSARY TO INSPECT ALL BEARINGS, BEARING FAILURE SENSORS, AND BEARING LINERS ACCORDING TO THE PROCEDURES IN THE CHECK SECTION.

CAUTION: IF A 30086-011 GENERATOR IS RETURNED FROM SERVICE FOR A CONDITION OF "FAILED BEARING," A TRUE BEARING FAILURE WILL RESULT IN AN IRREVERSIBLE CHANGE IN THE FAILED BEARING CIRCUIT RESISTANCE. VERIFY THE FAILED BEARING SIGNAL ACCORDING TO PROCEDURES IN THIS SECTION PRIOR TO DISASSEMBLY AND INSPECTION.

Prior to performing any testing, confirm that the generator is clean (Refer to CLEANING section) and in good mechanical condition by inspection (Refer to CHECK section).

The acceptance test constitutes a complete functional checkout of the Generator and should be performed in total if unit is disassembled, cleaned, and reassembled.

Procedures in this section are performance tests and are classified as either verification tests or acceptance tests. A verification test is conducted to assist in fault isolation or to confirm cause for removal before repairing or servicing a Generator. An acceptance test is performed after repairing or servicing a Generator.

Only after a unit is restored and acceptance testing is completed (in the sequence given in this section) can zero operating hours "Time-Since-Restoration" (TSR) be assigned.

Record all test results on a copy of the data sheet provided at end of this section.

2. Test Conditions

Unless otherwise specified, all of the following apply to a test.

Parameter	Operating Condition
Ambient Temperature	50° to 104° F (10° to 40° C)

Table 1001 - Test Conditions

Parameter	Operating Condition
Barometric Pressure	Ambient pressure at sea level 27 to 33 inch (690 to 840 mm) of mercury
Relative Humidity	25 to 95%
Speed Tolerance	±100 RPM
Unit Mounting	Drive shaft positioned horizontally
Forced Cooling Air	Forced cooling air is not required.
Load Current Tolerance	±2.5 Amps DC
Terminal Voltage Tolerance	±0.5 VDC

Table 1001 - Test Conditions (Continued)

3. Test Equipment

Equivalent substitutes may be used for items listed. Use instruments with accuracy and calibration in compliance with ISO 10012-1, Part 1.

Equipment (Quantity)	Range and Accuracy or Equipment Rating	Reference Designators
DC Voltage Regulator (1) or Generator Control unit (1)	Range: 0 to 36 VDC Safran Power, P/N 51545-001B/-002A	GCU
Quick-Attach-Detach Mounting Kit (1)	Safran Power, P/N 30081-520 or P/N 30081-521	Not Illustrated
Digital Multimeter	Can measure up to 1000V AC and DC	Not Illustrated
DC Voltmeter (2)	Range: 0 to 50 VDC Accuracy: ±0.12 VDC	V_1,V_3
AC Voltmeter (1) (Equalizer)	Range: 0 to 4 VAC Accuracy: ±0.12 VDC	V_4
DC Millivoltmeter (1)	Range: 0 to 500 mV Accuracy: ±1% of reading	V_5
DC Power Supply (1)	Rating: 20V, 10 A	Variable DC Power Supply
Generator Drive Stand (1)	Range: 5,500 to 15,000 RPM Rating: 25 HP	Not Illustrated
High Potential Tester (1)	Rating: 250 Volts RMS, 60 Hz	Not Illustrated
Megohmmeter (1)	Range: 0 to 250 V Accuracy: 2% of full range	Not Illustrated

Table 1002 - Test Equipment

Equipment (Quantity)	Range and Accuracy or Equipment Rating	Reference Designators
Milliohm Meter, (1)	Range: 200 m to 2 KΩ Accuracy: ± 0.75%	Not Illustrated
Ohmmeter, Analog (1)	Range: 0 to 150 K Ω Accuracy: ± 0.5%	Not Illustrated
Oscilloscope, Dual Trace (1)	Digital: Bandwidth of 100 MHz, Sampling Rate of 100 MS/Second Analog: Bandwidth of 60 to 100 MHz	Dual Trace Oscilloscope
Precision Shunt (1)	Rating: 500 A; 500 mVDC	SH_1
Generator Load Switch (1)	Rating: 30 V, 400 A	SW_1
Push-Pull Switch (1)	Rating: 30 VDC, 10 A	SW_2
Switch, Exciter Field (1)	Rating: 30 VDC, 10 A	SW_3
Variable DC Load Bank (1)	Rating: 30 VDC, 0 to 400 A	Variable Load Bank
Freeze mist		FreeZ-It Antistat Chemtronics Kenesaw, GA 30152-4386 Ph: 800-645-5244 Ph: 770-424-4888

Table 1002 - Test Equipment (Continued)

NOTE: The 500 amp shunt SH_1 and 500 millivolt meter V_5 are configured to display a 1:1 millivolts to amperes ratio on the voltmeter scale. The millivolt meter displays the generator current in amperes where 100 mV is equal to 100 A.

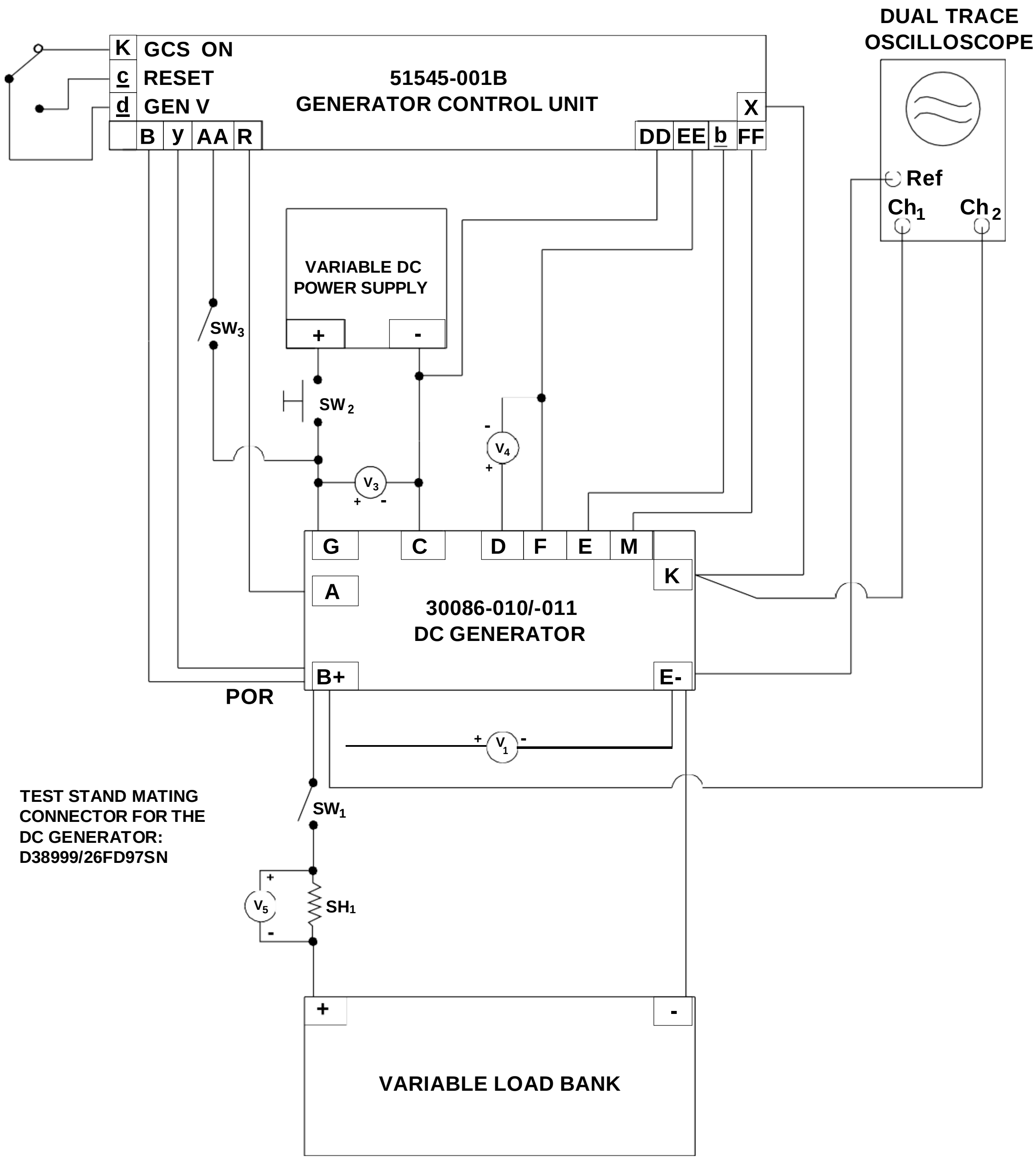

Figure 1001 - Generator Test Connection Diagram

4. Test Preparation

Numbers in parentheses ( ) refer to item numbers given in Figure 10001 of the ILLUSTRATED PARTS LIST unless otherwise specified.

A. Perform an Initial Inspection

NOTE: The parameters for completing the initial inspection are found in Paragraph 5.A.5. of the CHECK section.

Perform an initial inspection of the DC generator in a brightly lit work area to determine its overall condition.

CAUTION: IF A 30086-011 GENERATOR IS RETURNED FROM SERVICE FOR A CONDITION OF “FAILED BEARING”, A TRUE BEARING FAILURE WILL RESULT IN AN IRREVERSIBLE CHANGE IN THE FAILED BEARING CIRCUIT RESISTANCE.

B. Perform a Failed Bearing Signal Verification Inspection (30086-011 only) (SIL 30086-011-24-01)

NOTE: This inspection is necessary only for 30086-011 generators returned from service for a condition of “failed bearing”. The 30086-010 generator does not contain the failed bearing circuit configuration which enables this inspection.

(1) To verify that the generator exhibits a true bearing failure signal under static conditions, measure the resistance between connector pins E and F as shown in Figure 5005.

(a) The resistance must be between 105,000 and 112,000 Ω.

(2) If a bearing failure signal is verified, do not proceed with testing.

(a) Visually examine for any signs of rubbed bearing sensors. The green epoxy and the connections could be damaged.

REPAIR or REPLACE the bearing sensor.

(b) If either of the two bearing sensors have been rubbed by the rotor shaft, then disassemble the generator for bearing replacement.

(3) If a bearing failure signal is not verified (the E-F resistance of an operational generator with all bearings in good condition is between 8,000 and 8,500 Ω), proceed with the freeze mist test in the Paragraph 8.M.(3) of the CHECK section.

C. Attach the Air Inlet (80) to the Anti-drive End Bearing Support (10004-75)

(1) Press the air inlet into place over the air deflector (105) and fan (90).

NOTE: Make sure that the fan turns freely without touching the air inlet.

(2) Secure the air inlet and the air deflector to the anti-drive end bearing support with four screws (85).

D. Install the Generator onto the Drive Stand

CAUTION: WHEN MOUNTING THE GENERATOR TO THE TEST STAND, SUPPORT THE GENERATOR TO PREVENT DAMAGE TO THE DRIVE SHAFT.

(1) Lubricate the exposed surface of the o-ring (115) with lubricating grease, MIL-G-81322.

(2) Install the applicable spline adapter and mounting adapter (25) onto the drive stand.

(3) While supporting the anti-drive end of the generator, align and install the drive end to the mounting adapter plate.

(4) Make sure the drive stand and the generator mating splines are correctly engaged.

(5) Install the V-band clamp (10) and tighten the self-locking nut (15) to a torque of 70 in.-lbs. (8.02 N-m).

E. Connect the Generator to the Electrical Test Circuit

(1) Turn off all power to the generator drive stand.

(2) Connect the generator to the test circuit (see Figure 1001).

(3) Do not connect the GCU (voltage regulator) or dual trace oscilloscope to the test circuit at this time.

(4) Assemble the terminal block hardware to the terminal block. Refer to the ASSEMBLY section for instructions.

(5) Use a digital multimeter to measure the following resistance measurements.

(a) Measure connector pin M and generator terminal E (-) - Resistance must be less than 0.5 Ω.

(b) Measure connector pin F and generator terminal E (-) - Resistance must be less than 0.5 Ω.

5. Test Procedures

This section provides acceptance test procedures and the sequence in which they are to be accomplished. Record test findings on a copy of the Verification/Acceptance Test Report located at the back of this section.

WARNING: IF A FAILED BEARING INDICATION OCCURS AT ANY TIME DURING THE TEST, DISCONTINUE TESTING IMMEDIATELY. THE GENERATOR MUST BE DISASSEMBLED TO THE EXTENT NECESSARY TO DETERMINE THE CAUSE OF THE BEARING FAILURE.

CAUTION: IF AN ACCEPTANCE TEST LIMIT IS EXCEEDED BY EVEN A SMALL MARGIN, DO NOT CONTINUE ACCEPTANCE TESTING. BE AWARE THAT THE DECISION TO CONTINUE TESTING THE GENERATOR AFTER AN ACCEPTANCE TEST LIMIT IS EXCEEDED CAN DAMAGE THE GENERATOR.

A. Residual Voltage Test 1

(1) Operating Instructions: Disconnect the GCU and operate the generator at 5,520 RPM at no load (SW_1 open).

(2) With the variable DC power supply output set at 17 to 19 VDC, close switch SW_2 for 5 seconds.

(3) Turn the power supply OFF and open switch SW_2.

(4) Measure and record the residual voltage between terminals B+ and E- at voltmeter V_1.

(a) The residual voltage at voltmeter (V_1) must be 1.5 to 5.0 VDC.

(5) Connect the GCU to the test circuit with switch SW_3 closed.

B. Continuous Operating Speed and Equalizing Voltage Test 1

(1) Operating Instructions: Adjust output voltage V_1 at generator terminals B+ and E- to 29.5 VDC with the GCU voltage adjustment potentiometer and then operate the generator for 15 minutes at 12,000 RPM with a 400 A load (V_5).

(2) Measure and record the exciter field voltage at voltmeter (V_3) and the equalizing voltage at voltmeter (V_4).

(a) The exciter field voltage must not be greater than 7.5 VDC (V_3).

(b) The equalizing voltage at voltmeter (V_4) must be between 3.50 and 3.70 VAC RMS.

CAUTION: MAKE SURE THAT THE OSCILLOSCOPE IS CALIBRATED BEFORE TAKING ANY INSTRUMENT READINGS.

(3) Check the operating of the speed sensing circuit by using the oscilloscope to measure the voltage between pin K and output terminal E-.

(a) The voltage must be 18 ±4 VAC peak-to-peak.

(b) The frequency should be approximately 600Hz when the generator is operating at 12,000 RPM.

(4) Immediately proceed to the Minimum Speed Test.

C. Minimum Speed Test

(1) Operating Instructions: Operate the generator at 7,200 RPM, 29.5 Volts (V_1), and 400 A load (V_5) for 5 minutes.

(2) Measure and record the exciter field voltage at voltmeter (V_3). Monitor the bearing failure function.

(a) The exciter field voltage at voltmeter (V_3) must not exceed 11.0 VDC.

(b) There must be no indication of bearing failure.

D. Ripple Voltage and Diode Detector Bridge Check

(1) Operating Instructions: Operate the generator at 7,200 RPM, 29.5 Volts (V_1), and 400 A load (V_5).

(2) Connect Channel 1 of the oscilloscope to pin A. Connect Channel 2 to terminal B+.

(3) Connect the reference lead for both channels to output terminal E-.

(4) Set Channels 1 and 2 of the oscilloscope to 2 VAC/div amplitude and 2.5 to 5.0 milliseconds sweep time.

(5) Measure and record both polarities of the output voltage ripple voltage. Monitor the bearing failure function.

(a) The ripple voltage measurement of the power diode bridge for each required operating condition on the oscilloscope must not exceed 1.5 V peak for either polarity.

(b) There must be no indication of bearing failure.

(6) Observe and compare the output waveforms of the diode detector bridge circuit (mating connector pin A to output terminal E-) and the generator ripple voltage (generator terminal B+ to output terminal E-) displayed on the oscilloscope.

(a) The waveform of the power diode and signal diode bridge networks must show a similar periodic variation over a minimum of twelve consecutive commutation peaks without any unusual peaks or voids.

(b) See Figure 1002 and Figure 1003, Figure 1004 for acceptable and unacceptable voltage ripple.

(7) Remove the 400 A load. Observe the output waveforms of the diode detector bridge circuit (mating connector pin A to output terminal E-) and the generator ripple voltage (generator terminal B+ to output terminal E-).

(a) The waveform of the diode detector bridge circuits must be similar to the ripple voltage and there should be no unusual high peaks or voids.

(8) Disconnect the oscilloscope from the test circuit.

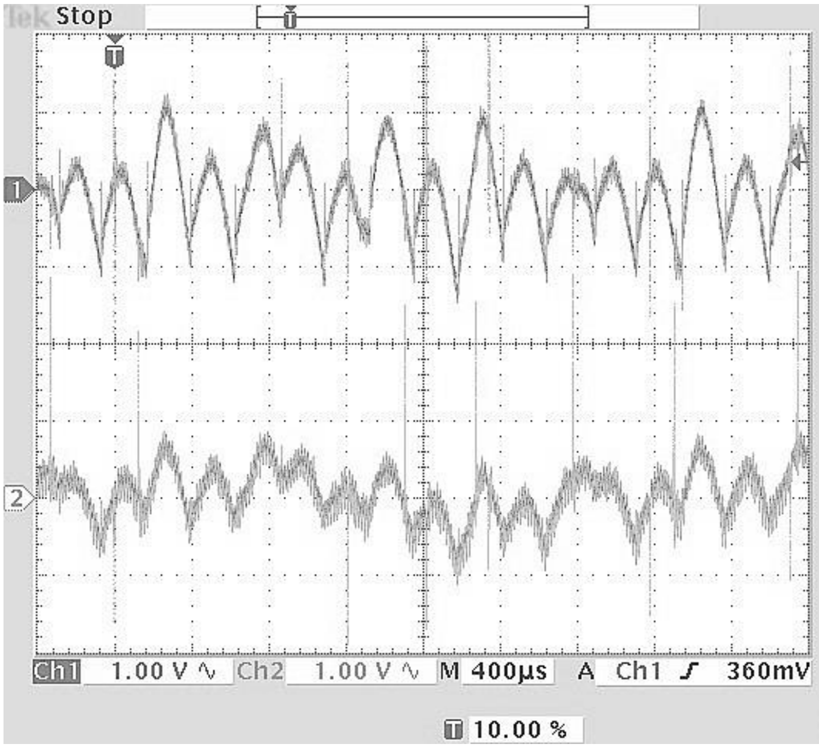

Figure 1002 - Acceptable Ripple Voltage Trace

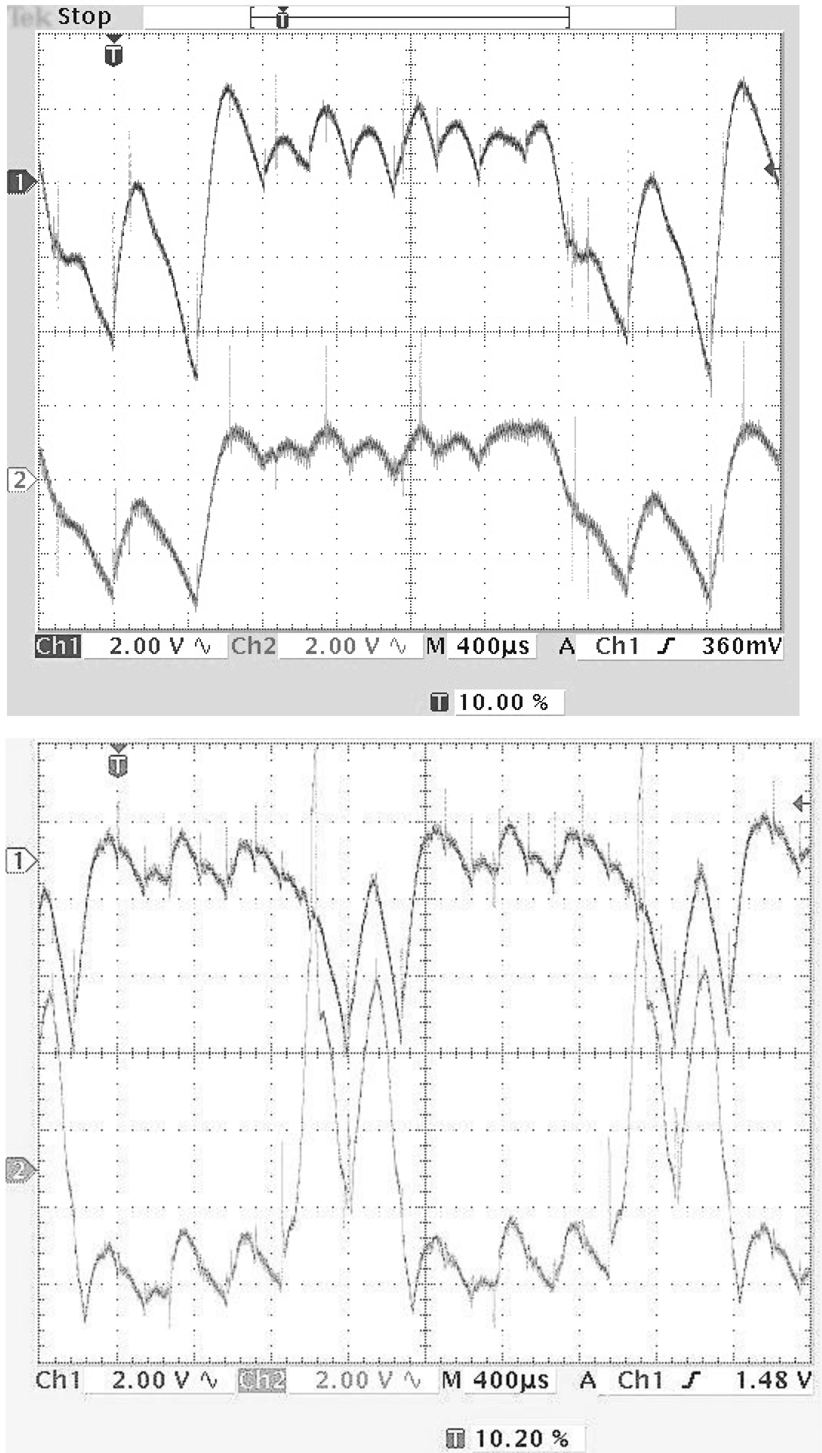

Figure 1003 - Unacceptable Ripple Voltage (one open diode) Trace

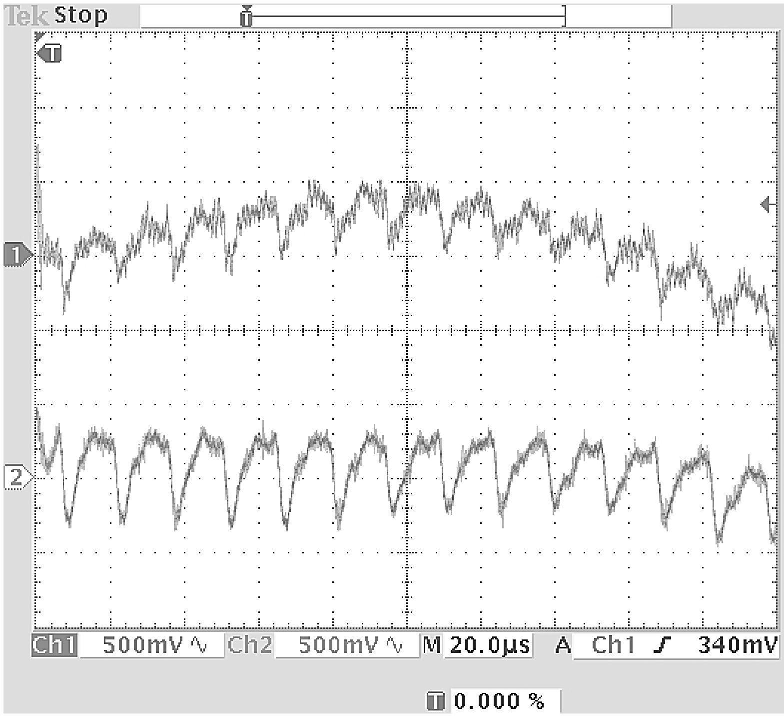

Figure 1004 - Unacceptable Ripple Voltage (terminal E– not connected properly) Trace

E. Overspeed Test

(1) Operating Instructions: With the generator hot from testing and the exciter field switch (SW_3) open, increase the generator speed to 15,000 RPM for 5 minutes.

(a) There must be no indication of excessive noise, vibration, loosening of parts or mechanical failure.

(b) Monitor the bearing failure function.

1 There must be no indication of bearing failure.

F. Continuous Operating Speed and Equalizing Voltage Test 2

(1) Operating Instructions: Operate the generator at 12,000 RPM, 29.5 Volts (V_1), and 400 A load (V_5) for 5 minutes.

(2) Measure and record the exciter field voltage at voltmeter (V_3).

(a) The exciter field voltage must not be more than 7.5 VDC.

(b) The equalizing voltage at voltmeter (V_4) must be 3.50 to 3.70 V AC RMS.

G. Residual Voltage Test 2

(1) Operating Instructions: Operate the generator at 5,520 RPM, with the field switch (SW_3) and the load switch (SW_1) open.

(2) Measure and record the residual voltage at voltmeter (V_1).

(a) The residual voltage at voltmeter V_1 must be 1.5 to 5.0 VDC.

H. Dielectric Test

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING HIGH POTENTIAL TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

CAUTION: FAILURE TO TURN OFF THE HIGH POTENTIAL TESTER POWER BEFORE CONNECTING OR DISCONNECTING HIGH VOLTAGE ELECTRICAL LEADS CAN CAUSE SERIOUS DAMAGE TO THE GENERATOR.

CAUTION: DIELECTRIC TESTING IS ACCOMPLISHED DURING ACCEPTANCE TESTING AND ONLY FOR GENERATORS THAT HAVE BEEN FULLY CLEANED.

(1) Test Preparation:

(a) Turn off all power to the test stand.

(b) Disconnect the generator from the test circuit.

CAUTION: THE EMI CAPACITOR (C2) MUST BE DISCONNECTED FROM GROUND (BRACKET) FOR THIS TEST.

(c) Remove the filter and connector mounting cover.

(d) Isolate the filter and connector mounting cover to avoid contact with the frame of the generator.

(e) Connect a jumper between the generator output terminals B+ and E-.

(f) Connect the positive (red) lead of the high potential tester to the connected terminals B+ and E-.

(g) Connect the negative (black) lead to a non-coated surface of the generator frame.

(2) Operating Instructions:

CAUTION: INCREASE AND DECREASE TEST VOLTAGES SLOWLY (100 VOLTS PER SECOND, MAXIMUM). INCREASING AND DECREASING VOLTAGE TOO QUICKLY CAN CAUSE DAMAGE TO THE GENERATOR.

(a) Turn on power to the dielectric tester and slowly increase voltage to 250 VAC RMS, commercial frequency to each of the following circuits.

1 Between the connected output terminals B+ and E- and the housing frame.

2 Between the connected output terminals B+ and E- and mating connector pin G.

3 Between mating connector pin G and the frame.

(b) Maintain the test voltages for one minute.

(c) After one minute, slowly reduce the high potential voltage to zero. Turn off the power supply.

(d) Acceptance Limits:

1 There must be no evidence of arc-over, flash-over, dielectric breakdown or fluctuation, or a steady increase in leakage current. Leakage current must not exceed 5 mA.

I. Insulation Resistance Test

(1) Test Preparation:

WARNING: **BEFORE YOU USE THE HIGH VOLTAGE TESTER, MAKE SURE THAT THE POWER SWITCH IS IN THE OFF POSITION. MAKE SURE THAT NO PERSON TOUCHES THE EQUIPMENT OR PROBES. THIS WILL PREVENT DEATH OR INJURY FROM ELECTRIC SHOCK.**

CAUTION: THIS INSULATION TEST ONLY APPLIES TO FULLY CLEANED GENERATORS.

(a) Connect the positive (red) lead of the megohmmeter to the connected terminals B+ and E-.

(b) Connect the negative (black) lead to a non-coated surface of the generator frame.

CAUTION: INCREASE AND DECREASE TEST VOLTAGES SLOWLY (100 VOLTS PER SECOND, MAXIMUM). INCREASING AND DECREASING VOLTAGE TOO QUICKLY MAY CAUSE DAMAGE TO THE GENERATOR.

(2) Operating Instructions: Turn on power to the megohmmeter and slowly apply 250 VDC to each of the following circuits.

1 Between the connected terminals B+ and E- and the housing frame.

2 Between the connected terminals B+ and E- and mating connector pin G.

3 Between mating connector pin G and the frame.

(3) Maintain each test voltage for 1 minute.

(4) Turn off the power supply.

(5) Measure and record the insulation resistance in each circuit.

(a) The insulation resistance in each circuit must be greater than 100 MΩ.

(6) Re-assemble the filter and connector mounting cover to the housing.

J. Bearing Failure Sensor Circuit Test (model 30086-011)

(1) Operating instructions: To verify that the bearing failure sensor circuit is functional, measure the resistance between connector pins E and F.

(a) The resistance of the bearing failure sensor circuitry must be between 8,000 and 8,500 Ω.

K. EMI Filter Check

(1) Check the operation of the EMI capacitor (C2) (1-410).

(2) Measure the capacitance between the output terminals B+ and E- and an unpainted surface on the electrical connector. The frequency must be from 900 to 1100 Hz at ambient room temperature.

(a) The capacitance of the EMI capacitor (C2) (1-410) must be from 3.5 to 4.5 μF.

(b) Replace the EMI capacitor (C2) (1-410) if the capacitance values are not in limits.

(c) Refer to the ASSEMBLY section to replace the EMI capacitor (C2) (1-410).

6. Fault Isolation Tables

The following tables list faults that may occur during acceptance testing, performance testing, or when in service. For each fault, probable cause are listed along with related corrective actions. When a fault is detected, perform the corrective actions necessary to return the generator to a serviceable condition. A complete acceptance test is required after the corrective action is accomplished.

FAULT	PROBABLE CAUSE	CORRECTIVE ACTION
Repeated Unconfirmed Faults	Load sharing fault (will not share load with other generator)	Check for a bad sensor connection or loose crimps at the red wire connecting Pin D to R2.
	The generator is off bus	1.) Test the ripple voltage and diode detector bridge check. 2.) Check all ground connections. 3.) Check for damaged lead wires or bad solder connections in the connector enclosure. 4.) Check for loose pin crimp connections. 5.) Check the rotor assembly for damaged S1 and S2 leads. 6.) Check the rotor assembly leads T7, T8 and T9 and pay particular attention to where the leads can come in contact with the exciter hub. 7.) Check the rotor assembly for cracked or broken jumpers between the diode and resistor.
A. and G. Residual Voltage Tests 1 and 2		
No generator output voltage.	The test setup is incorrect.	Check for proper connections.
	The rotor windings are shorted or grounded.	Perform dielectric test to the rotor assembly according to the procedure in the CHECK section.
		Replace the rotor assembly if it fails the dielectric test.
	The stator windings are shorted or grounded.	Perform dielectric test to the stator and housing assembly according to the procedure in the CHECK section.
		Replace the stator and housing assembly if it fails the dielectric test.

FAULT	PROBABLE CAUSE	CORRECTIVE ACTION
The residual voltage limit is exceeded	The main stator windings are shorted or grounded	Perform dielectric test to the main stator according to the procedure in the CHECK section.
		Replace the main stator if it fails the dielectric test.
B. and F. Continuous Operating Speed and Equalizing Voltage Tests 1 and 2		
The field voltage limit is exceeded.	An excessive load was applied during the test.	Check and adjust the applied load at the load bank as necessary.
High equalizing voltage (V_4)	The cooling air flow is low.	Check the entire air flow path for obstructions.
		Remove all obstructions.
	The rotor assembly is either grounded or shorted.	Perform the dielectric test to the rotor assembly according to the procedure in the CHECK section.
		Replace the rotor assembly if it fails the dielectric test.
	The stator and housing assembly is either grounded or shorted.	Perform the dielectric test to the stator and housing assembly according to the procedure in the CHECK section.
		Replace the stator and housing assembly if it fails the dielectric test.
C. Minimum Speed Test		
High exciter voltage	The cooling air flow is low.	Check the entire air flow path for obstructions.
		Remove all obstructions.
	The rotor assembly is either grounded or shorted.	Perform the dielectric test to the rotor assembly according to the protection in the CHECK section.
		Replace the rotor assembly if it fails the dielectric test.
	The stator and housing assembly is either grounded or shorted.	Perform the dielectric test to the stator and housing assembly according to the procedure in the CHECK section.
		Replace the stator and housing assembly if it fails the dielectric test.

FAULT	PROBABLE CAUSE	CORRECTIVE ACTION
D. Ripple Voltage and Diode Detector Bridge Check		
High ripple voltage or abnormal waveforms	The filter capacitor C1 is defective.	Replace filter capacitor C1.
	C1 open: the field will show a higher noise signal.	
	Stator rectifier diodes	Test diodes per Section Suggested Method for testing Diodes, SPECIAL PROCEDURES, Paragraph 4.G.
	The output diode (D1) or its leads are defective.	Replace the diode and repair any defective leads or soldered connections.
	The main stator windings are burned or faulty.	Replace the main stator.
Generator Dropping off Line	C1 Shorted	Replace Filter Capacitor C1
	Check Diode D1 for Open or Shorted	Replace D1
	Check for Open Resistor R5	Replace R5
E. Overspeed Test		
Noisy operation	The cooling fan blades are rubbing or the fans is out of balance.	Replace the cooling fan if it is damaged.
		NOTE: There are no authorized repair procedures to balance cooling fans.
		REPAIR or replace the air inlet if damaged.
	The bearings are either defective or were damaged during installation.	Replace the bearings as necessary.
	The rotor assembly is striking against the stator and housing assembly.	Replace the damaged part(s) as necessary.

FAULT	PROBABLE CAUSE	CORRECTIVE ACTION
The generator vibrates	The bearings are either defective or were damaged during installation.	Replace the bearings.
	The rotor assembly is out of balance.	REPAIR the rotor assembly as necessary. If out of balance condition cannot be corrected, replace the rotor assembly
H. Dielectric Test (High Potential)		
Generator insulation breakdown	The rotor assembly is either grounded or shorted.	Perform the dielectric test to the rotor assembly according to the procedure in the CHECK section.
		Replace the rotor assembly if it fails the dielectric test.
	The stator and housing assembly is either grounded or shorted.	Perform the dielectric test to the stator and housing assembly according to the procedure in the CHECK section.
		Replace the stator and housing assembly if it fails the dielectric test.
I. Insulation Resistance Test		
Low insulation resistance indicating breakdown	The stator and housing assembly is either grounded or shorted.	Replace the insulating washers and the sleeving installed in the left hand and right hand heatsinks.
		Perform the dielectric test to the stator and housing assembly according to the procedure in the CHECK section.
		Replace the stator and housing assembly if it fails the dielectric test.
J. Bearing Failure Sensing Circuits (30086-010 only)		
E-F Resistance is less than 9,000 Ω	Bearing(s) have failed	Inspect the bearings. Replace the bearings as necessary.
	One or both bearings failure sensors are defective	Test the individual sensors as given in the CHECK section
K. Bearing Failure Sensing Circuits (30086-011 only)		
E-F Resistance is 105,000 to 112,000 Ω	Bearing(s) have failed	Inspect the bearings. Replace the bearings as necessary.
	One or both bearings failure sensors are defective	Test the individual sensors as given in the CHECK section

FAULT	PROBABLE CAUSE	CORRECTIVE ACTION
E-F Resistance is less than 8,000 Ω	Short circuit between pins E and F of connector	Inspect and repair circuit between pins E and F to eliminate cause of short-circuit. See Figure 2 in the DESCRIPTION AND OPERATION section of this manual for circuit description.
L. EMI Filter Check		
Capacitance is not within limits	Capacitor C2 is not properly connected	Make sure the solder connections are satisfactory. Make sure the filter and connector mounting cover is properly attached to the housing.
	Capacitor C2 is defective	Replace the capacitor C2 as given in the ASSEMBLY section.

Verification/Final Acceptance Data Sheet

Model Number: 30086-________ Inspected by: ________

Serial Number: ________ Date: ________

Repair Shop: ________

Inspection/ Test	Requirements/Limits	Measure	Accept	Reject
Visual Inspection	Check for physical damage			
Residual Voltage Test 1	B+ to E- residual voltage (1.5 VDC min., 5.0 VDC max.)	VDC		
Continuous Operating Speed and Equalizing Voltage Test 1	Exciter field voltage (7.5 VDC max.)	VDC		
	Equalizing voltage D to F (3.50 VAC RMS min., 3.70 VAC RMS max.)	VAC, RMS		
	Speed sensing circuit (18 ± 4 VAC peak-to-peak)	VAC		
	Speed sensing circuit frequency (600 Hz at 12,000 RPM)	Hz		
Minimum Speed Test	Exciter field voltage (11.0 VDC max.)	VDC		
Ripple Voltage and Diode Detector Bridge Check	Ripple voltage (1.5 volts max for either polarity)	VDC		
	Diode detector bridge wave forms match ripple voltage with no unusual high peaks or voids			
	When load is removed: Diode detector bridge wave forms match ripple voltage with no unusual high peaks or voids			
Overspeed Test	No sign of electrical or mechanical failure			
Continuous Operating Speed and Equalizing Voltage Test 2	Exciter field voltage (7.5 VDC max.)	VDC		
	Equalizing voltage D to F (3.50 VAC RMS min, 3.70 VAC RMS max.)	VAC, RMS		
Residual Voltage Test 2	B+ to E- residual voltage (1.5 VDC min., 5.0 VDC max.)	VDC		

Inspection/ Test	Requirements/Limits	Measure	Accept	Reject
Dielectric Test (High Potential)	Any arc over, flash over or breakdown, fluctuations and/or a steady increase in leakage current, and leakage current greater than 5 mA indicates failure.	mA		
Insulation Resistance Test	Insulation resistance (100 MΩ min.)	MΩ		
Bearing Failure Sensor Test (30086-011)	There must be no indication of bearing failure, or open or short circuit.			
	Resistance E to F (8,000 to 8,500 Ω)	Ω		
Bearing Failure Sensor Test (30086-010)	There must be no indication of bearing failure, or open or short circuit.			
	Resistance E to F (9,000 to 11,000 Ω)	Ω		
EMI Filter Check	Capacitor C2 is within limits	3.5 to 4.5 μF		

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SCHEMATICS

1. Introduction

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DISASSEMBLY

1. Introduction

CAUTION: IF A 30086-010 GENERATOR IS RETURNED FROM SERVICE FOR A CONDITION OF “FAILED BEARING,” THE POSSIBILITY EXISTS THE BEARING FAILURE SENSOR(S) IS WORN TO THE POINT THAT IT WILL NO LONGER GIVE THE FAILED BEARING SIGNAL. THE UNIT MUST BE DISASSEMBLED TO THE POINT NECESSARY TO INSPECT ALL BEARINGS, BEARING FAILURE SENSORS, AND BEARING LINERS ACCORDING TO THE PROCEDURES IN THE CHECK SECTION.

CAUTION: IF A 30086-011 GENERATOR IS RETURNED FROM SERVICE FOR A CONDITION OF “FAILED BEARING,” A TRUE BEARING FAILURE WILL RESULT IN AN IRREVERSIBLE CHANGE IN THE FAILED BEARING CIRCUIT RESISTANCE. VERIFY THE FAILED BEARING SIGNAL ACCORDING TO PROCEDURES IN THE TEST AND FAULT ISOLATION SECTION PRIOR TO DISASSEMBLY AND INSPECTION.

This section gives the disassembly instructions for 30086 Series II DC Generator. Additional disassembly of major components is not necessary unless specifically instructed in the CHECK or TESTING AND FAULT ISOLATION sections. Unsolder permanent connections as required for repair or restoration of the unit.

NOTE: Always replace lock washers, screws, o-rings, and self-locking nuts regardless of their condition if removed during disassembly.

2. Disassembly Tools

WARNING: YOU MUST OBEY THE TOOL/EQUIPMENT MANUFACTURERS WARNINGS AND CAUTIONS SHOWN ON PACKAGING, CONTAINERS AND/OR INSTRUCTION LEAFLETS. IF YOU DO NOT, YOU CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT OR PROPERTY.

In addition to normal shop tools, the tools listed in Table 3001 are needed for disassembly.

Tool Description	Reference
Adapter, Rotor Shaft, Anti-Drive End	Figure 9001
Adapter, Rotor Shaft, Drive-End	Figure 9002
Arbor Press	Commercially Available
Bearing Puller	Commercially Available
Driver, Dampener Hub	Figure 9003
Driver, Dampener Plate	Figure 9004
Driver, Bearing, Inner Race	Figure 9005, Figure 9006
Driver, Bearing, Outer Race	Figure 9007, Figure 9008

Table 3001 - Disassembly Tools

Tool Description	Reference
Fixture, Drive End Bearing Support	Figure 9009
Fixture, Rotor and Stator Removal	Figure 9010
Mallet (leather or plastic)	Commercially Available
Pliers, snap ring	Commercially Available
Connector Pin Insertion/Extraction Tool	Commercially Available
Press Base, Press Bullet, Pressing Sleeve and Pressing Sleeve Adapter	Figure 9011
Soldering Equipment	Commercially Available
Split Plate	Figure 9012
Split Plate Support	Figure 9013
Support, Rotor Assembly, Horizontal	Figure 9014
Support, Rotor Assembly, Vertical	Figure 9015
Support, Stator and Housing Assembly, Horizontal	Figure 9016
Support, Stator and Housing Assembly, Vertical	Figure 9017
Wire Hook Tool	Locally Manufactured
Wrench, spline	Figure 9018
Spanner tool	Figure 9026

Table 3001 - Disassembly Tools (Continued)

3. Disassembly Materials

WARNING: BEFORE USING ANY OF THE FOLLOWING MATERIALS, BE AWARE OF ALL HANDLING, STORAGE, AND DISPOSAL PRECAUTIONS RECOMMENDED BY THE MANUFACTURER OR SUPPLIERS. FAILURE TO COMPLY WITH THE RECOMMENDATIONS MAY RESULT IN SERIOUS INJURY, PHYSICAL DISORDER OR DEATH.

In addition to normal shop materials, the materials listed in Table 3002 are needed for disassembly.

Item	Description/Specification	Reference
Ensolv™	Cleaning Agent	Enviro Tech International, Inc. Alameda, CA 94501 www.ensolv.com (V0S8S8)
Foam Cushion	Commercially Available	Commercially Available

Table 3002 - Disassembly Materials

Item	Description/Specification	Reference
Lubricating oil	MIL-L-6085B or MIL-C-81309, type III **FLAMMABLE**. Read the **WARNING** before using this material. Refer to the applicable MSDS for additional safety information.	Commercially Available
Solder Wick	Commercially Available	Commercially Available
Solder used on the stator and housing assembly.	sn63pb37 or sn63pb40	Commercially Available
Solder used on to the rotor assembly	sn95sb5	Commercially Available

Table 3002 - Disassembly Materials (Continued)

4. Disassembly of the DC Generator

The following procedures detail the disassembly of 30086 Series II DC Generator. Numbers in parentheses ( ) refer to item numbers in Figure 10001 of the ILLUSTRATED PARTS LIST unless otherwise specified.

NOTE: When a generator is removed for service, the QAD Mounting Kit usually stays on the aircraft.

A. Remove the QAD Mounting Kit (5) from the Generator (if present)

NOTE: The generator requires a V-band clamp and QAD kit for installation on the aircraft. When a generator is removed from service, the V-band clamp and QAD kit usually remains on the aircraft.

(1) Loosen the self-locking nut (15) from the T-bolt (20) and remove the V-band clamp (10).

(2) Remove the mounting adapter (25).

B. Remove the ID Plate (30)

NOTE: Do not remove the ID plate from the stator and housing assembly (465) unless it is damaged, unreadable.

NOTE: Record the information from the identification plate before it is removed to make sure the information is not lost by damage during removal.

(1) Remove and discard the four drive screws (35) attaching the ID plate (30) to the stator and housing assembly.

(2) Remove the ID plate. Keep it for reference when transferring the information to a replacement ID plate.

C. Remove the Terminal Block Cover (40) from the Terminal Block (10004-100)

(1) Remove the screws (45), lock washers (55), and flat washers (50) attaching the terminal block cover to the terminal block. Discard lock washers.

(2) Remove the terminal block cover.

(3) Remove the self-locking nut (60) from terminal block stud ‘B’ and remove the Belleville washer (65). Discard self-locking nut.

(4) Remove the self-locking nut (70) from terminal block stud ‘E’ and remove the Belleville washer (75). Discard self-locking nut.

D. Remove the Air Inlet (80)

(1) Remove and discard the screws (85) attaching the air inlet to the anti-drive end bearing support (10004-75).

(2) Pull the air inlet away from the stator and housing assembly.

E. Remove the Fan (90)

NOTE: Hold the drive spline with a spline wrench to prevent the drive shaft from turning while removing the self-locking hex nut.

(1) Remove the self-locking hex nut (95) and flat washer (100) that secures the fan to the drive shaft.

(2) Remove the fan from the rotor shaft and drive shaft.

F. Remove the Air Deflector (105)

(1) Pull the air deflector away from the left-hand (10004-45) and right-hand (10004-50) heatsinks that are attached to the anti-drive end bearing support.

G. Remove the Drive Shaft (110) with Attached Dampener Hub (130), O-ring (115), Dampener Plate (120), and Friction Ring (125) from the Rotor Assembly (195)

WARNING: DRIVE SHAFT IS UNDER TENSION. BE CERTAIN ANTI-DRIVE END OF GENERATOR IS NOT POINTED TOWARD YOU OR PERSONAL INJURY COULD RESULT.

CAUTION: DO NOT USE EXCESSIVE FORCE WHEN TAPPING THE DRIVE SHAFT; EXCESSIVE FORCE MAY DAMAGE IT’S THREADS.

(1) Temporarily re-install fan nut to protect threads with finger pressure then lightly tap with a hammer to disengage.

(2) Lightly tap the anti-drive end of the drive shaft with a leather or plastic mallet to disengage it from the shaft of the rotor assembly.

(3) Remove nut and pull the drive shaft out of the drive end of the generator.

(4) Remove the friction ring from the drive shaft.

(5) Remove and discard the O-ring (not shown).

(6) Remove the dampener plate from the dampener hub.

H. Remove the Dampener Hub (130) from the Drive Shaft (110) (see Figure 3001)

NOTE: Do not remove the dampener hub from the drive shaft unless the dampener hub or the drive shaft are damaged.

CAUTION: POSITION A FOAM CUSHION UNDER THE DRIVE SHAFT TO PREVENT THE DRIVE SHAFT FROM BEING DAMAGED.

(1) Position a foam cushion and the drive end bearing support fixture on the table of an arbor press.

(2) Position the dampener hub driver on the drive shaft on the flat side of the dampener hub.

(3) Insert the drive spline through the center of the support cylinder until the dampener hub plate rests on the support cylinder.

(4) Press down gently on the anti-drive end of the drive shaft with the arbor press until the dampener hub disengages from the drive shaft.

(5) Install the self-locking hex nut (95) temporarily to protect the threads.

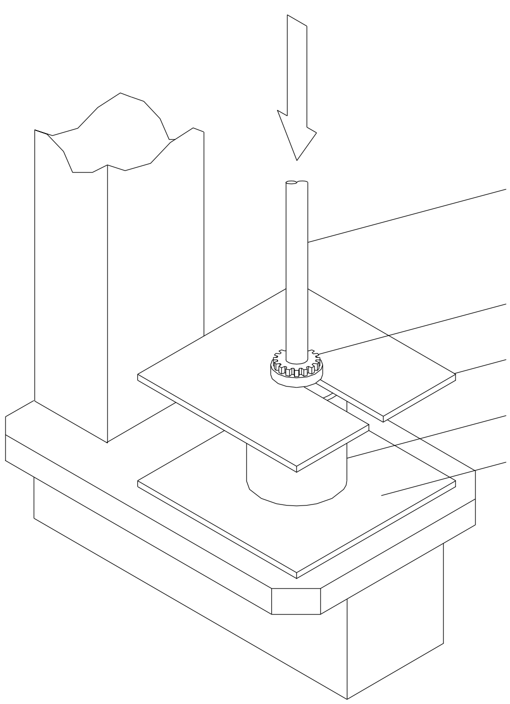


Figure 3001 - Dampener Hub Removal

I. Remove the Dampener Backplate (135) from the Rotor Shaft (see Figure 3002)

CAUTION: FAILURE TO USE THE DRIVE END ROTOR SHAFT ADAPTER WHEN REMOVING THE DAMPENER BACKPLATE CAN CAUSE PERMANENT DAMAGE TO THE ROTOR SHAFT OR DRIVE END BEARING SUPPORT.

(1) Tape the jaws of the bearing puller to prevent damaging the dampener backplate during removal.

(2) Position the drive end rotor shaft adapter into the rotor shaft.

(3) Remove the dampener backplate from the drive end of the rotor shaft using a suitable bearing puller.

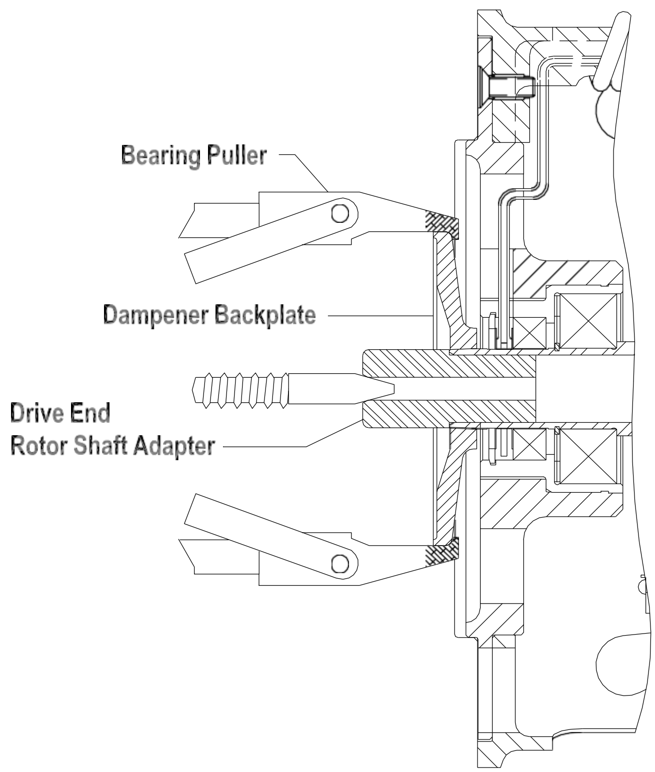


Figure 3002 - Dampener Backplate Removal

J. Remove the Filter and Connector Mounting Cover (240) (see Figure 3003)

(1) Position the stator and housing assembly onto a horizontal stator and housing assembly support.

(2) Remove and discard the screws (245) and flat washers (250) attaching the filter and connector mounting cover to the filter and connector mounting cover brackets (445).

(3) Carefully pull the filter and connector mounting cover away from the filter and connector mounting cover brackets.

NOTE: Do not pull the lead wires tight while pulling the filter and connector mounting cover away from the stator and housing assembly.

NOTE: It is not necessary to unsolder the lead wires from their connections to perform an inspection of the filter and connector mounting cover and the internal components. The parameters of this inspection is found in the CHECK section.

NOTE: Unsolder permanent connections as required for repair or restoration of the unit. If any lead wire needs to be removed from the connector box PWB in the group shown in the Figure 3004, all other lead wires, which connect to the noted six studs, must be removed.

(4) Remove the following lead wires:

(a) The lead wires from the six studs shown in Figure 3004.

(b) One, Black, AWG #22 lead wire attached to the filter capacitor (10001-385).

(c) One, Orange, AWG #20 lead wire attached to the filter capacitor (10001-385).

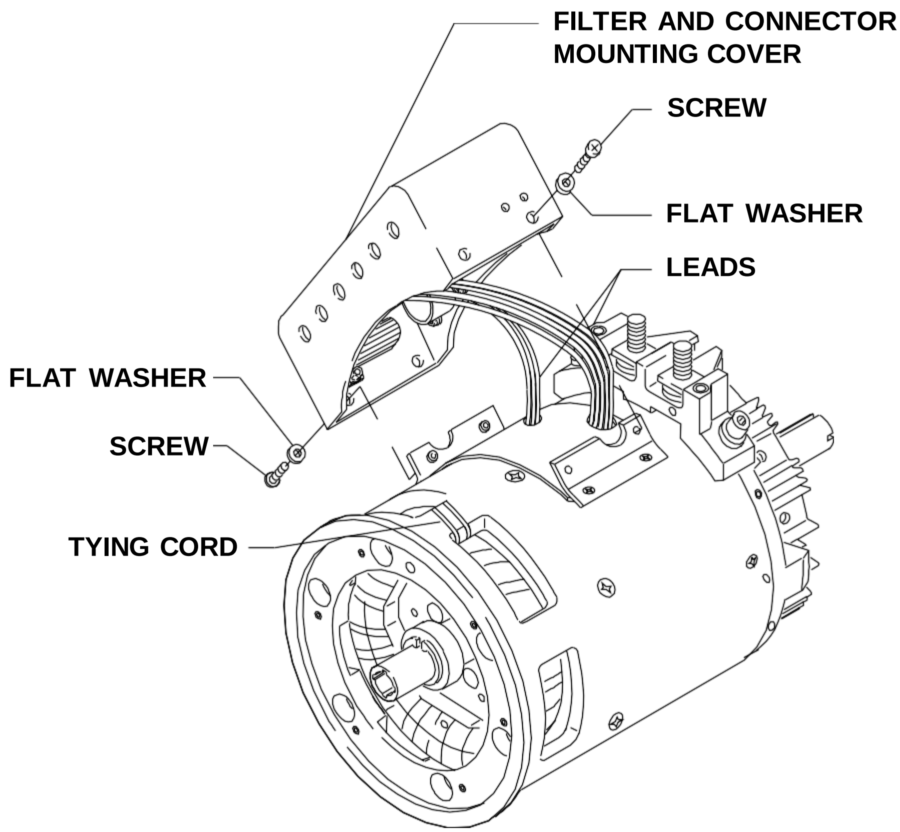
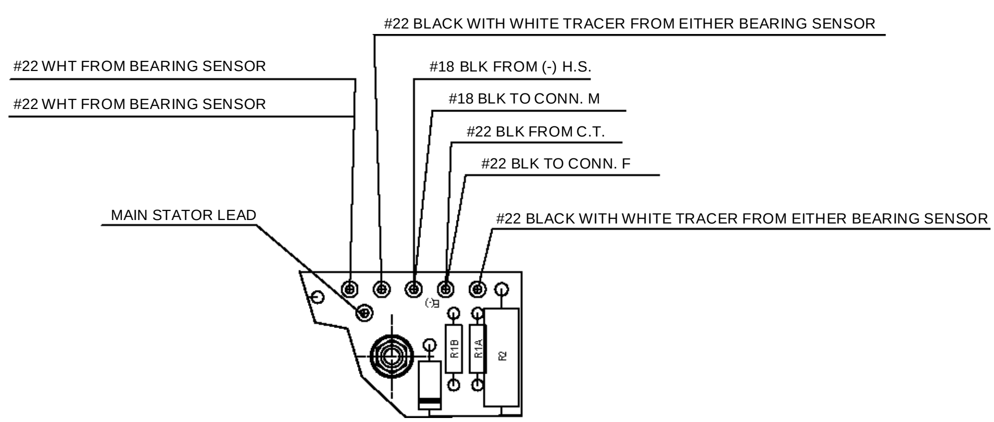


Figure 3003 - Removing the Filter and Connector Mounting Cover



PWB WIRING CONNECTION

NOTE: REMOVE RTV SILICONE SEALANT AND UNSOLDER THE LEADS FROM THE TERMINALS.

Figure 3004 - Removing the RTV Silicone Sealant

K. Remove the Drive End Bearing Support (175) with Attached Rotor Assembly (195) from the Stator and Housing Assembly (465) (see Figure 3005)

NOTE: At restoration, disconnect the electrical leads of the drive end bearing failure sensor (150) before removing the drive end bearing support.

(1) Position the generator onto a horizontal stator and housing assembly support.

WARNING: BEFORE YOU USE CLEANING SOLVENT, PUT ON A RESPIRATOR, RUBBER APRON, RUBBER GLOVES AND EYE PROTECTION. THIS WILL PREVENT INJURY FROM SPILLS AND FROM THE FUMES. IF YOU GET SOME ON YOUR SKIN OR IN YOUR EYES, FLUSH WITH CLEAN WATER AND GET MEDICAL AID.

(2) Remove tying cord by removing the conformal coating using EnSolv™ cleaning agent.

(a) Use a plastic pick and plastic bristle brush to remove the conformal coating.

(3) Make sure the leads from the six studs in Figure 3004 are unsoldered.

NOTE: Refer to ANSI/IPC J-STD-001 for soldering specification.

CAUTION: USE MINIMAL FORCE WHEN PULLING ON THE BEARING SENSOR LEADS. THIS CAN DAMAGE THE POTTING THAT BONDS THE LEADS TO THE SENSOR.

(4) Use a wire hook tool to pull the electrical lead of the drive end bearing failure sensor out of the filter box and stator housing.

(5) Remove the self-locking strap (160) that secures the electrical lead of the anti-drive end bearing failure sensor (170) to the anti-drive end bearing support.

(6) Unsolder the electrical lead of the anti-drive end bearing failure sensor.

NOTE: Refer to ANSI/IPC J-STD-001 for soldering specification.

(7) Remove and discard the four screws (230) attaching the bearing retainer.

(8) Remove and discard the screws (176) attaching the drive end bearing support (175) to the stator and housing assembly.

(9) Remove the drive end bearing support assembly with attached rotor assembly.

(a) Tap the anti-drive end of the rotor assembly with a plastic mallet to release the drive end bearing support with attached rotor.

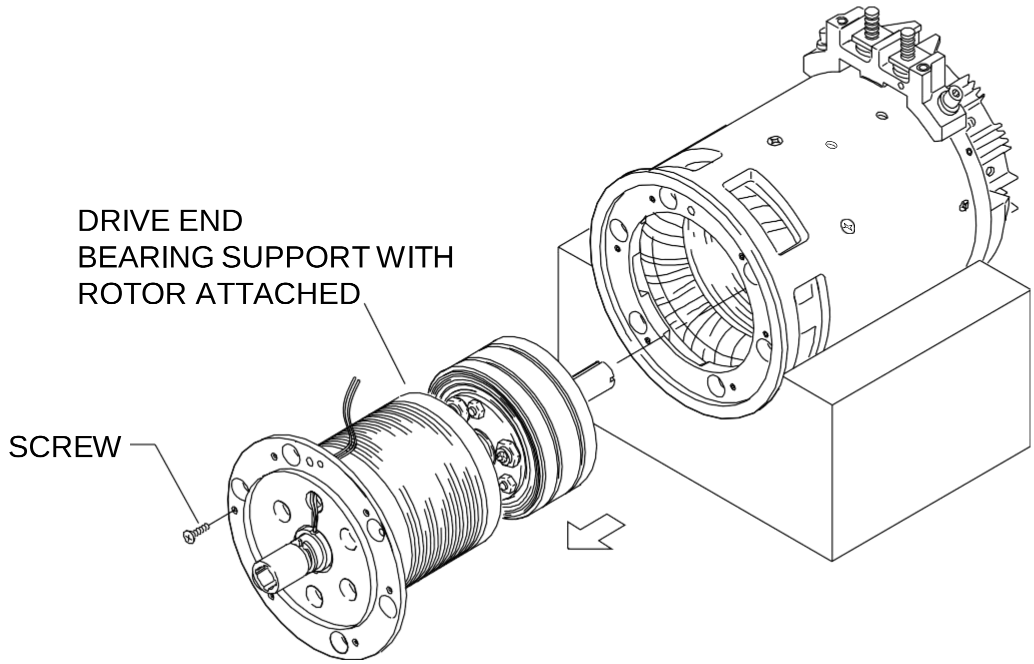


Figure 3005 - Drive End Bearing Support with Attached Rotor and Associated Items Removal

L. Remove the Drive End Auxiliary Bearing (190) and Drive End Bearing Failure Sensor (150) from the Drive End Bearing Support (see Figure 3006)

(1) Using snap ring pliers, remove the retaining ring (140) that secures the drive end bearing failure sensor (150) to the drive end bearing support.

NOTE: The retaining ring (140) can be reused if it passes the inspection criteria given in the CHECK section.

(2) Carefully pull the drive end bearing support off of the rotor shaft.

(3) Remove the spring wave washer (185) from the drive end of the rotor shaft.

NOTE: The spring wave washer (185) can be reused if it passes the inspection criteria given in the CHECK section.

(4) Remove the round machine key (145) with a magnet.

(5) If not at restoration, remove drive end bearing sensor (150) as follows:

NOTE: When the drive end auxiliary bearing is to be replaced, remove the drive end bearing failure sensor and drive end auxiliary bearing continuing at Paragraph 4.L.(1).

CAUTION: USE MINIMAL FORCE WHEN PULLING ON THE BEARING SENSOR LEADS. THIS CAN DAMAGE THE POTTING THAT BONDS THE LEADS TO THE SENSOR.

CAUTION: DO NOT REMOVE DRIVE END BEARING FAILURE SENSOR UNLESS NECESSARY.

(a) Carefully remove the drive end bearing failure sensor (150) from the drive end bearing support (10001-175).

1 Apply light pressure to the back side of the drive end auxiliary bearing.

NOTE: The drive end auxiliary bearing and the drive end bearing failure sensor will be removed at the same time.

(b) Use a cotton swab to apply a light lubricant on the inside diameter of the bearing liner at the outside edge of the bearing failure sensor to assist in the removal.

NOTE: The drive end bearing failure sensor is installed in accordance with the procedures in the ASSEMBLY section of this manual.

(c) If the drive end bearing failure sensor cannot be removed by hand, perform the following steps (see Figure 3006):

1 Position the drive end bearing support fixture on the table of an arbor press.

2 Position the drive end bearing support on the drive end bearing support fixture with the outside face on the fixture.

3 Position the inner race bearing driver on the drive end auxiliary bearing.

4 Carefully press the drive end bearing failure sensor and drive end auxiliary bearing from the drive end bearing support liner.

NOTE: Pressing the auxiliary bearing from the drive end bearing support will require the auxiliary bearing to be replaced. Reference CHECK section Paragraph 6.A.

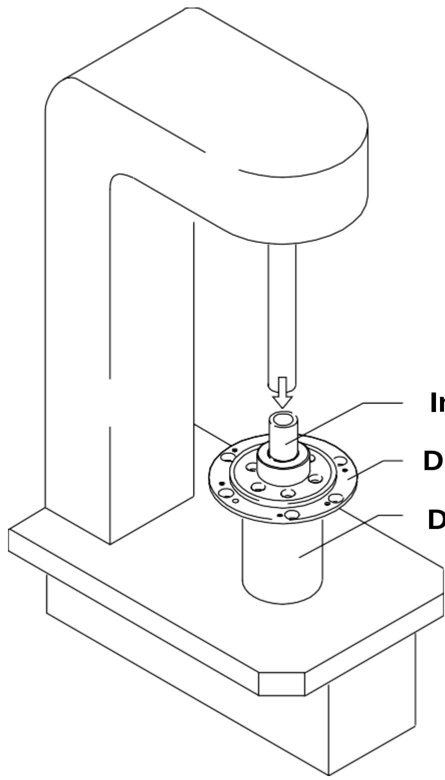


Figure 3006 - DE Bearing Removal from Support

M. Remove the Retaining Ring (200) and Drive End Main Bearing (205) from the Rotor Assembly (see Figure 3007)

CAUTION: USE EXTREME CARE WHEN REMOVING AND TRANSPORTING THE ROTOR ASSEMBLY.

(1) Position the rotor assembly onto a vertical rotor assembly support, drive end up.

(2) Remove and discard the retaining ring from the drive end of the rotor shaft using snap ring pliers.

CAUTION: FAILURE TO USE THE DRIVE END ROTOR SHAFT ADAPTER WHEN REMOVING THE DRIVE END MAIN BEARING FROM THE ROTOR SHAFT CAN CAUSE PERMANENT DAMAGE TO THE ROTOR SHAFT.

(3) Position the drive end rotor shaft adapter into the drive end of the rotor shaft.

(4) Remove the drive end main bearing from the drive end of the rotor shaft using a drive end rotor shaft adaptor and a suitable bearing puller. Discard the drive end main bearing.

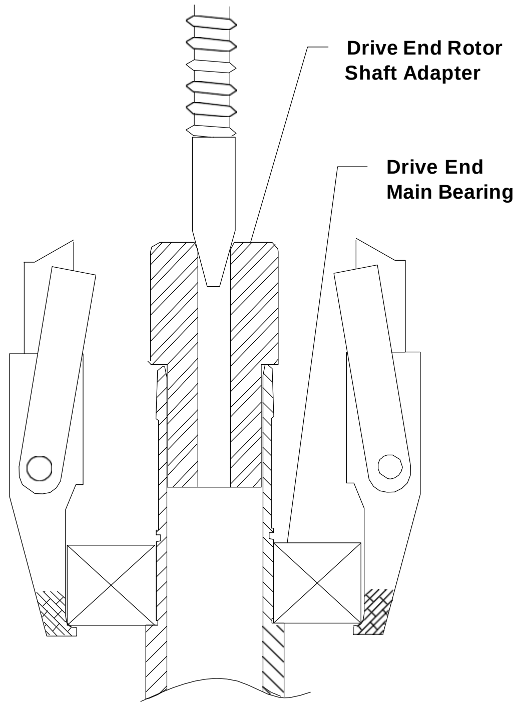


Figure 3007 - DE Bearing Removal from Rotor Shaft

N. **Remove the Bearing Retaining Nut (210), Bearing Retaining Key Washer (215), Anti-drive End Main Bearing (220) and Bearing Retainer (225) from the Rotor Assembly (see Figure 3008)**

CAUTION: USE EXTREME CARE WHEN REMOVING AND TRANSPORTING THE ROTOR ASSEMBLY.

(1) Position the rotor assembly onto a vertical rotor assembly support, anti-drive end up. Bend the locking tab of the key washer free of the nut.

(2) Remove the bearing retaining nut (210) with a spanner tool and the bearing retaining key washer (215) from the anti-drive end of the rotor shaft.

CAUTION: FAILURE TO USE THE ANTI-DRIVE ROTOR SHAFT ADAPTER WHEN REMOVING THE ANTI-DRIVE END MAIN BEARING FROM THE ROTOR SHAFT CAN CAUSE PERMANENT DAMAGE TO THE ROTOR SHAFT.

(3) Position the anti-drive end rotor shaft adapter into the anti-drive end of the rotor shaft.

(4) Remove the anti-drive end main bearing from the anti-drive end of the rotor shaft using a suitable bearing puller. Discard the anti-drive end main bearing.

(5) Slide the bearing retainer off of the rotor shaft.

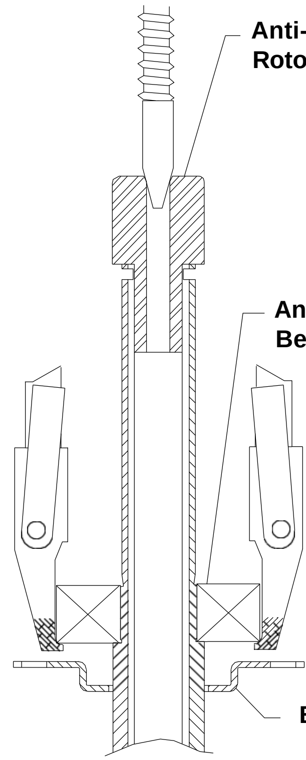


Figure 3008 - Anti-Drive End Bearing Removal

O. Remove the Anti-drive End Auxiliary Bearing (235) and Anti-drive End Bearing Failure Sensor (170) from the Anti-drive End Bearing Support (see Figure 3009)

CAUTION: FAILURE TO PROPERLY SUPPORT THE STATOR AND HOUSING ASSEMBLY WHILE THE ANTI-DRIVE END AUXILIARY BEARING IS PRESSED OUT OF THE ANTI-DRIVE END BEARING SUPPORT CAN CAUSE PERMANENT DAMAGE TO THE STATOR AND HOUSING ASSEMBLY.

(1) Using snap ring pliers, remove the retaining ring (155) that secures the anti-drive end bearing failure sensor to the anti-drive end bearing support.

NOTE: The retaining ring (155) can be reused if it passes the inspection criteria given in the CHECK section.

(2) Remove the round machine key (165) with a magnet.

(3) If not at restoration, remove anti-drive end bearing sensor (170) as follows:

NOTE: When the anti-drive end auxiliary bearing is to be replaced, remove the anti-drive end bearing failure sensor and anti-drive end auxiliary bearing continuing at Paragraph 4.O.(4)

CAUTION: USE MINIMAL FORCE WHEN PULLING ON THE BEARING SENSOR LEADS. THIS CAN DAMAGE THE POTTING THAT BONDS THE LEADS TO THE SENSOR.

CAUTION: DO NOT REMOVE ANTI-DRIVE END BEARING FAILURE SENSOR UNLESS NECESSARY.

(a) Using a wire hook, pull the anti-drive end bearing sensor leads out through the stator housing.

(b) Carefully remove the anti-drive end bearing failure sensor (10001-170) from the anti-drive end bearing support (10004-75).

1 Apply light pressure to the back side of the sensor.

NOTE: The anti-drive end auxiliary bearing and the anti-drive end bearing failure sensor will be removed at the same time.

(c) Use a cotton swab to apply a light lubricant on the inside diameter of the bearing liner at the outside edge of the bearing failure sensor to assist in the removal.

NOTE: The anti-drive end bearing failure sensors is installed in accordance with the procedures in the ASSEMBLY section of this manual.

(4) Position the vertical stator and housing assembly support on the arbor press table.

(5) Position the stator and housing assembly, drive end up, onto the vertical stator support.

(6) Position the inner race bearing driver on the anti-drive end auxiliary bearing.

(7) Carefully press the anti-drive end bearing failure sensor anti-drive end auxiliary bearing out of the anti-drive end bearing support.

NOTE: Pressing the auxiliary bearing from the anti-drive end bearing support will require the auxiliary bearing to be replaced. Reference CHECK section Paragraph 6.A.

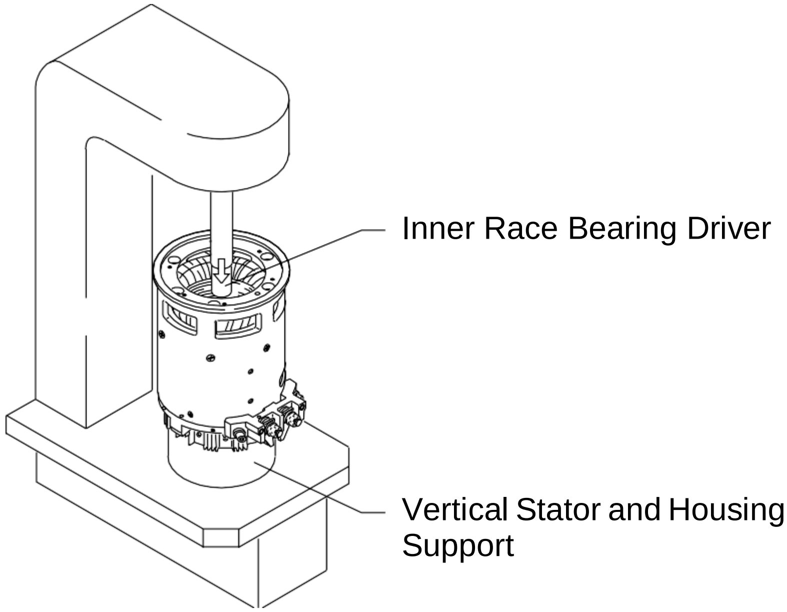


Figure 3009 - Anti-Drive End Auxiliary Bearing Removal

P. Remove the Diode Mounting Bracket (255) from the Filter and Connector Mounting Cover (240) (see Figure 3010)

(1) Remove and discard screws (260), washers (265) attaching the diode mounting bracket to the filter and connector mounting cover (240).

NOTE: Do not pull the lead wires that are soldered to the diode tight when removing the diode mounting bracket.

(2) Carefully pull the diode mounting bracket with attached diode away from the filter and connector mounting cover.

NOTE: Do not disassemble the diode (with attached C3 capacitor) from the diode mounting bracket unless damage is found.

(3) Unsolder the lead wires from the diode (270) and terminal lug (285).

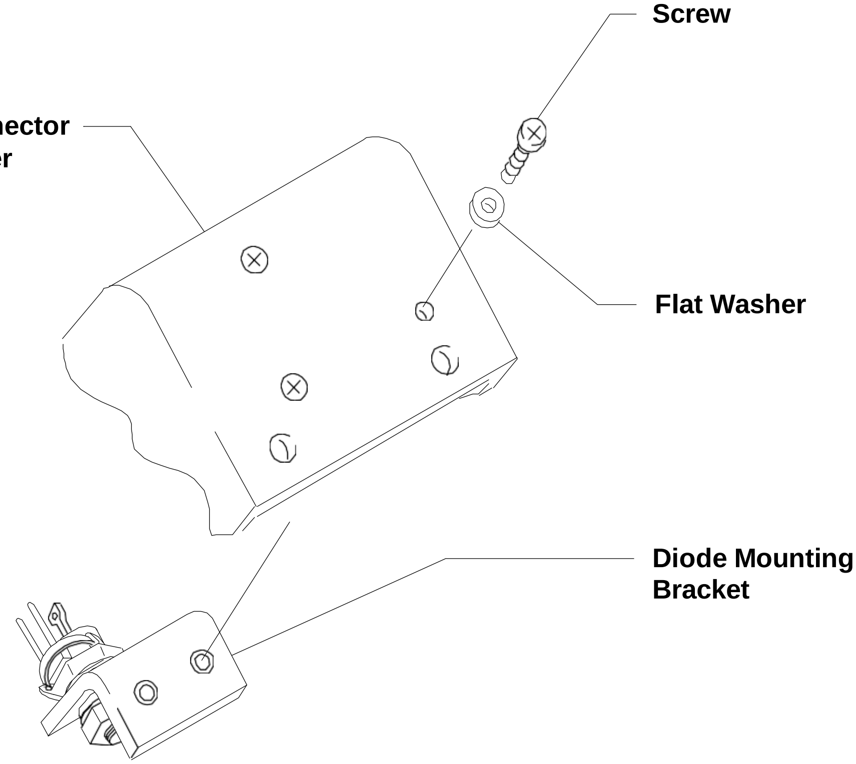


Figure 3010 - Removing Diode Mounting Bracket from Filter and Connector Mounting Cover

Q. Remove the Diode (270) with Attached C3 Capacitor (275) and Terminal Lug (285) from the Diode Mounting Bracket (255) (see Figure 3011)

(1) Remove the nut (295), lock washer (300), flat washer, (305), bushing (310), and insulator (315) attaching the diode and terminal lug to the diode mounting bracket.

NOTE: Do not disassemble or remove the self-locking strap (280) that secures the capacitor to the diode. If parts are damaged, replace the capacitor and diode as a pair.

(2) Remove the terminal lug (285) and insulator (290) from the diode. Discard the terminal lug and insulator.

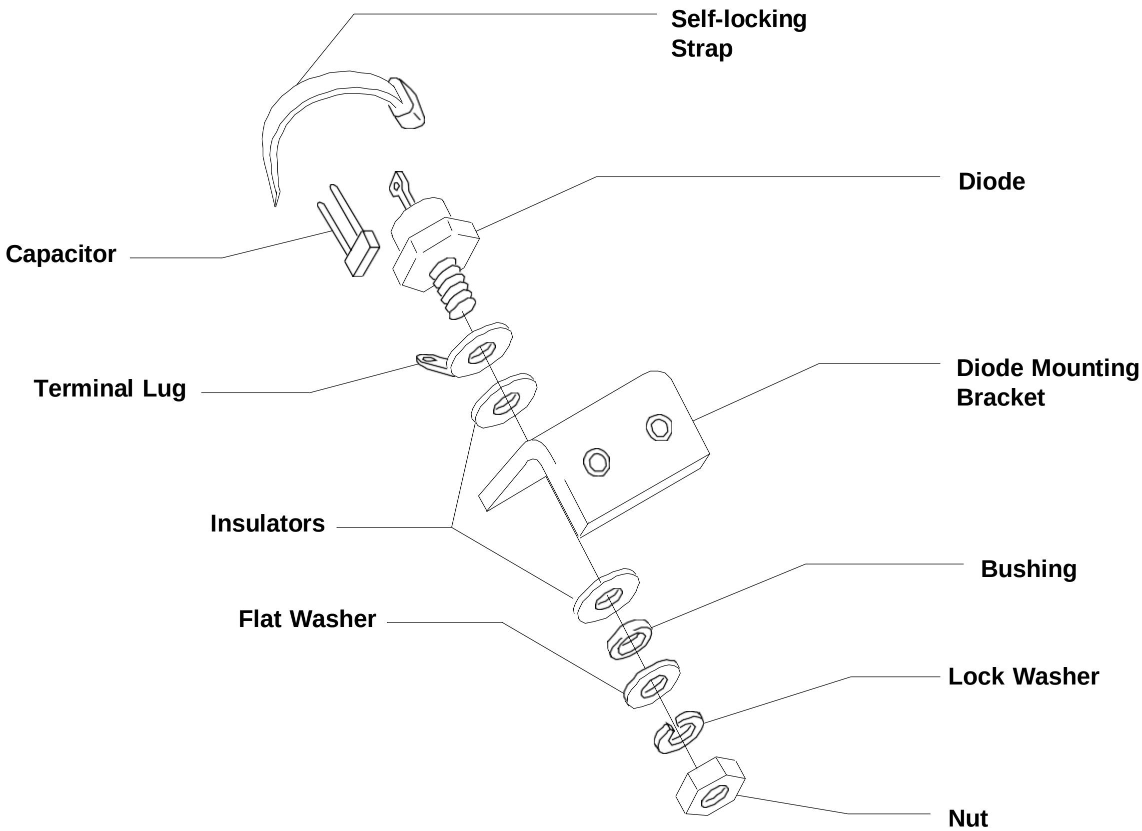


Figure 3011 - Removing Diode and Terminal Lug from Diode Mounting Bracket

R. Remove the Printed Wiring Board Assembly (320) from the Filter and Connector Mounting Cover (240) (see Figure 3012)

(1) Remove the two screws (330), flat washers (331 and 335), and self-locking nuts (340) attaching the spacer sleeves (325) and printed wiring board assembly to the filter and connector mounting cover (240).

(2) Remove the conformal coating from the soldered lead wires on the PWB according to the procedure in the REPAIR section.

(3) Unsolder the lead wires and remove the printed wiring board assembly.

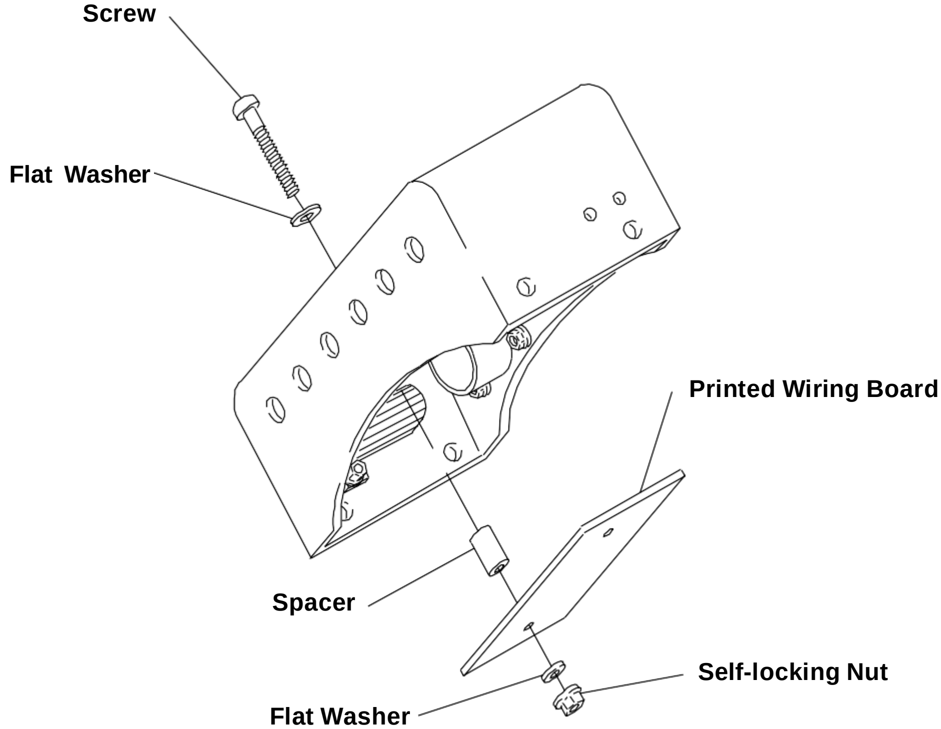


Figure 3012 - Removal of Printed Wiring Board from Filter and Connector Mounting Cover

S. Remove Resistors R5 (345) and R6 (365) from the Filter and Connector Mounting Cover (240) (see Figure 3013)

(1) Remove the screws (350), self-locking nuts (355), and flat washers (360) attaching the R5 resistor to the filter and connector mounting cover (240).

(2) Unsolder the R5 resistor leads. Remove the resistor.

(3) Remove the screws (370), self-locking nuts (375), and flat washers (380) attaching the R6 resistor to the filter and connector mounting cover (240).

(4) Unsolder the resistor R6 leads. Remove the resistor.

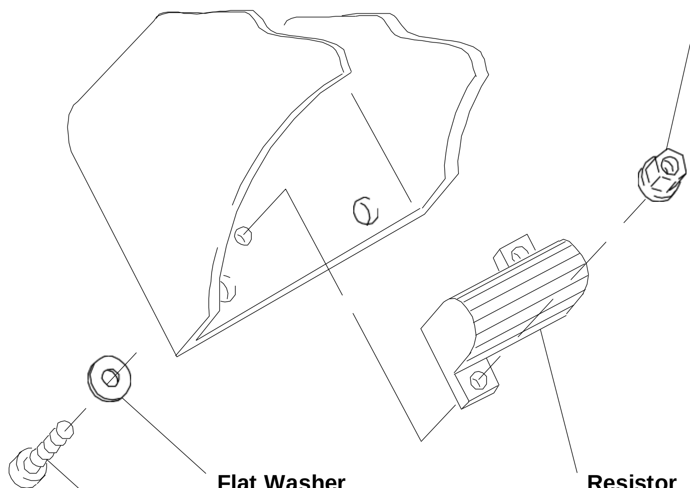


Figure 3013 - Removing Resistors R5 and R6

T. Remove Capacitors C1 (385) and C2 (410) from the Filter and Connector Mounting Cover (240) (see Figure 3014)

(1) Unsolder capacitor C1 leads.

(2) Use a small, sharp knife to cut away the electrical resin that bonds capacitor C1 to the filter and connector mounting cover (240).

(3) Remove the screw (395), self-locking nut (400), and flat washers (405) attaching the loop clamp (390) to the filter and connector mounting cover. Remove capacitor C1.

(4) Unsolder capacitor C2 leads.

(5) Use a small, sharp knife to cut away the electrical resin that bonds capacitor C2 to the filter and connector mounting cover.

(6) Remove capacitor C2.

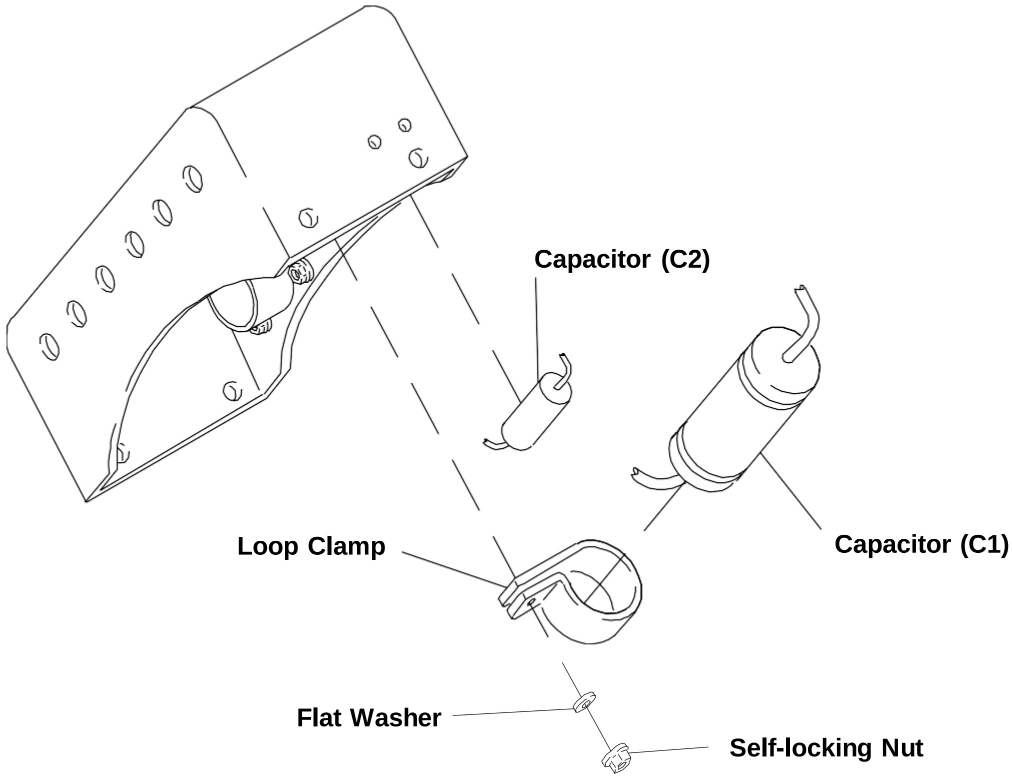


Figure 3014 - Removing Capacitors C1 and C2

U. Remove the Receptacle Connector (415) from the Filter and Connector Mounting Cover (240) (see Figure 3015)

(1) On model 30086-010 only, remove and discard the four screws (420), self-locking nuts (425), and flat washers (430) attaching the connector to the filter and connector mounting cover (240).

(2) On model 30086-011 only, remove and discard the four screws (420). Remove connector retainer (416) attaching the connector to the filter and connector mounting cover (240).

(3) Remove the pins from the connector with a pin insertion/exertion tool. Set the connector aside.

NOTE: Do not remove the pins from the connector unless damage is found.

NOTE: Do not disassemble the terminal posts (435) and terminal lug (440) from the filter and connector mounting cover. Their removal will cause damage to the filter and connector mounting cover. If a terminal is found to be faulty, replace the filter and connector mounting cover.

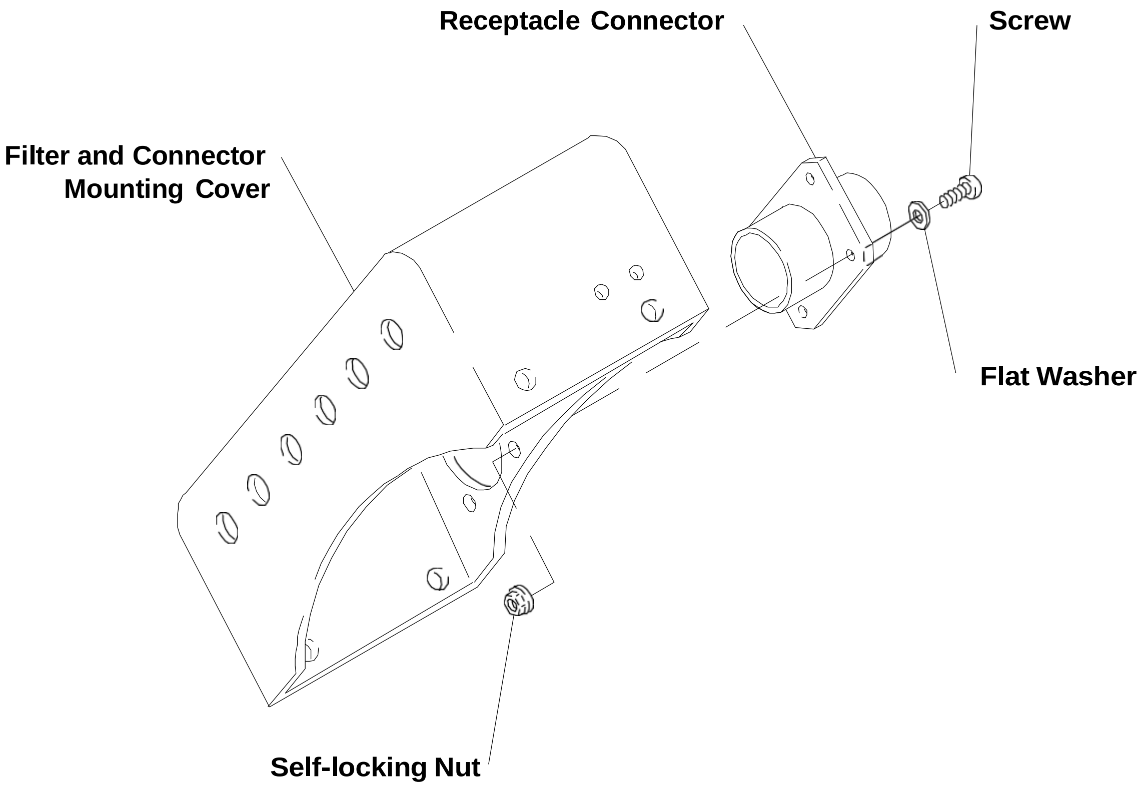


Figure 3015 - Removing Connector on Model 30086-010

V. **Remove the Filter and Connector Mounting Cover Brackets (445) and the Gasket Cover (450)**

NOTE: It is not necessary to remove the filter and connector mounting cover brackets or the gasket cover from the stator and housing assembly unless damage is found.

(1) Remove the four screws (455) and flat washers (460) attaching the two filter and connector mounting brackets and gasket cover to the stator and housing assembly.

5. Disassembly of the Printed Wiring Board Assembly

Refer to REPAIR Paragraph 12. For the further disassembly instructions for printed wiring components that are being removed from the printed wiring board for examination purposes only. Do not cut the component lead wires if the part is not damaged.

The following procedure gives the disassembly instructions for printed wiring board assembly components that are determined to be unserviceable. Numbers in parentheses ( ) refer to Figure 10003 of the ILLUSTRATED PARTS LIST.

NOTE: Do not disassemble the printed wiring board assembly further than necessary to replace components that are determined to be unserviceable.

A. Remove Resistors R1, R1A (5), R1B (10), R2 (15), R3 (20), and R4 (25), where applicable, from the Printed Wiring Board (40)

(1) Cut the lead wires of resistor R1 through R4.

(2) Use a sharp knife to cut through the bonding material below the resistor.

(3) Remove and discard the resistors and remaining bonding material.

(4) Remove the cut off resistor leads according to the instructions in the REPAIR section.

B. Remove the Diodes (30) CR1 through CR6 from the Printed Wiring Board (40)

(1) Cut the lead wires of diodes CR1 through CR6.

(2) Use a sharp knife to cut through the bonding material below the diodes.

(3) Remove and discard the diodes and remaining bonding material.

(4) Remove the cut off diode leads according to the instructions in the REPAIR section.

NOTE: Do not disassemble the terminals (35) from the printed wiring board; their removal will cause damage to the board. If a terminal is found to be faulty, discard the printed wiring board.

6. Disassembly of the Rotor Assembly

The following procedure gives disassembly instructions for the rotor assembly. Numbers in parentheses ( ) refer to items in Figure 10002 of the ILLUSTRATED PARTS LIST. Do not disassemble the rotor assembly further than necessary to examine, repair, or replace parts determined to be unserviceable. Do not disassemble the rotor shaft from the main rotor; they are balanced and maintained and replaced as a single service part.

A. Remove the Retaining Ring (5) from the Main Field Rotor and Shaft Assembly (65)

Remove the retaining ring (5) from rotor and shaft assembly (65).

B. Remove Diodes (15) and Resistors (30) from the Diode and Resistor Mounting Bracket (45) (see Figure 3016)

CAUTION: USE EXTREME CARE WHEN REMOVING AND TRANSPORTING THE ROTOR ASSEMBLY.

(1) Unsolder the leads from the exciter rotor assembly (50) to the diodes.

(2) Remove the hex nuts (20) and lock washers (25) attaching the diodes to the diode and resistor mounting bracket (45).

NOTE: Main field rotor lead S2 will be disconnected when the diode attaching hardware is removed.

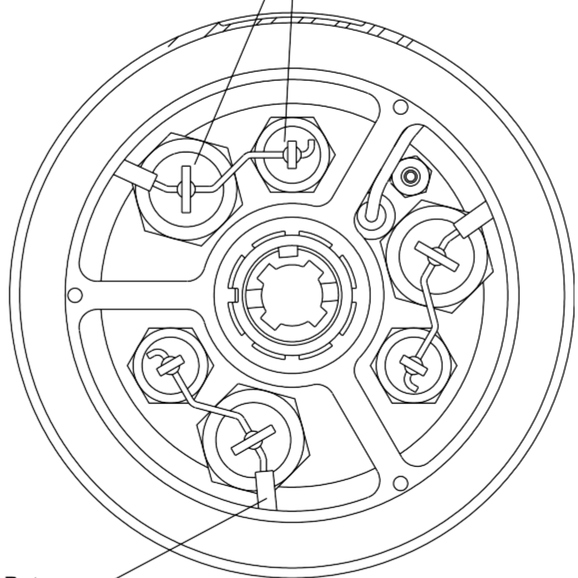


Figure 3016 - Diode and Resistor Removal

(3) Push the terminal lug (60) and main field rotor lead against the main field rotor windings to prevent damage to the lead during Paragraph 6.C.

(4) Remove the integral nuts and lock washers attaching the resistors to the diode and resistor mounting bracket.

(5) Remove the diodes and resistors as a pair from the diode and resistor mounting bracket (3 places).

NOTE: If a diode or resistor needs to be replaced, unsolder the small leads between the diode and resistor pair.

C. Remove the Exciter Rotor Assembly (50), Diode and Resistor Mounting Bracket (45), and Square Key (55) from the Main Field Rotor and Shaft Assembly (65) (see Figure 3017)

CAUTION: DO NOT REMOVE THE MAIN FIELD ROTOR FROM THE ROTOR SHAFT. THEY ARE REPLACED AS A SINGLE SERVICE PART.

(1) Unsolder main field rotor lead S1, and exciter rotor lead T10 from the terminal post attached to the diode and resistor mounting bracket.

NOTE: It is not necessary to remove the terminal post from the diode and resistor mounting bracket. Remove the terminal post only if damage is found.

(2) If damage is found, remove the nut attaching the terminal post (35) to the diode and resistor mounting bracket. Discard the nut and terminal post.

(3) Remove the tying cord and straighten main field rotor lead T10 to prevent it from being damaged during disassembly.

(4) Position a split plate support onto the arbor press table. Push some foam into the bottom of the split plate support.

(5) Lower the drive end of the rotor assembly into the split plate support and position the split plate into position underneath the diode and resistor mounting bracket.

(6) Position the press bullet onto the rotor shaft.

WARNING: LUBRICATING OIL IS FLAMMABLE AND CAN BE HARMFUL IF SWALLOWED. DO NOT USE NEAR OPEN FLAMS OR SPARKS. USE IN A WELL-VENTILATED AREA.

(7) Apply lubricating oil to the press bullet and the exposed area of the rotor shaft.

(8) Carefully press down onto the press bullet with the arbor press.

(9) Pull the exciter rotor assembly and diode and resistor mounting bracket off of the press bullet.

NOTE: The square key may remain on the rotor shaft when removing the diode and resistor mounting bracket. If the key remains on the rotor shaft, it will cut a slot in the bracket. One slot is permitted provided that during assembly it is lined up with the keyway.

(10) Gently pull exciter rotor assembly lead T10 through the grommet in the diode and resistor mounting bracket.

(11) Remove the grommet (40) from the diode and resistor mounting bracket.

(12) If required, remove the square key from the rotor shaft.

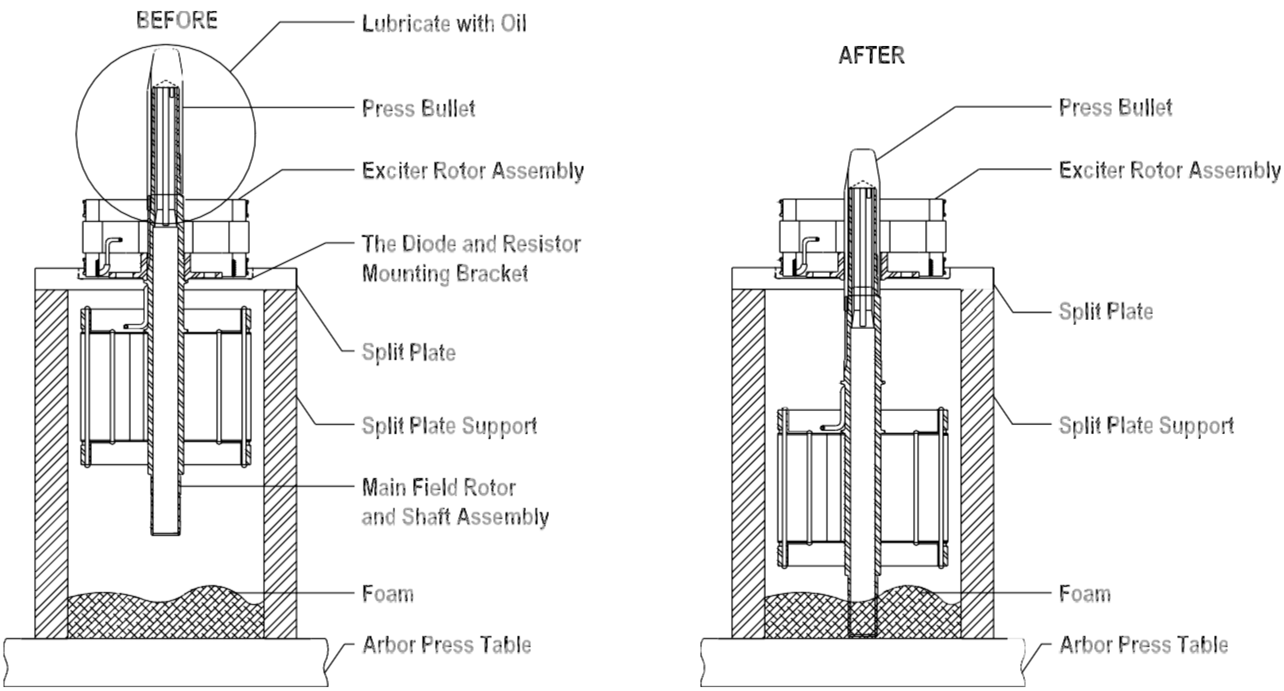


Figure 3017 - Exciter Rotor Assembly Removal

7. Disassembly of the Stator and Housing Assembly

The following procedure gives the disassembly instructions for the stator and housing assembly. Numbers in parentheses ( ) refer to items in Figure 10004 of the ILLUSTRATED PARTS LIST. Do not disassemble the stator and housing assembly further than is necessary to examine, repair, or replace parts determined to be unserviceable.

CAUTION: THIS EQUIPMENT CONTAINS PARTS SENSITIVE TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD). USE ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) PRECAUTIONARY PROCEDURES WHEN TOUCHING, REMOVING OR INSERTING ESDS PARTS OR ASSEMBLIES IDENTIFIED BY THE ESDS SYMBOL.

A. Remove the Left-hand (15) and Right-hand (30) Rectifiers from the Left-hand (45) and Right-hand (50) Heatsinks (see Figure 3018)

NOTE: Replace screws, nut and washers that are damaged, deformed, corroded, burnt, delaminated or have other apparent defects.

(1) Remove the screws (5) and self-locking nuts (10) attaching the main stator lead wires to the rectifiers.

NOTE: There is no authorized repair procedure for terminal lug replacement. The main stator must be returned to Safran Power, Repair and Overhaul for remanufacture if damage to the terminal lugs is found.

(2) Remove the hex nuts (20) and belleville washers (25) attaching the rectifiers and AWG #18 and AWG #22 lead wires and terminals lugs (140) to the left-hand heatsink. Remove the rectifiers from the left-hand heatsink.

(3) Remove the hex nuts (35) and belleville washers (40) attaching the rectifiers and the AWG #20 lead wire with terminal lug (140) to the right-hand heatsink. Remove the rectifiers from the right-hand heatsink.

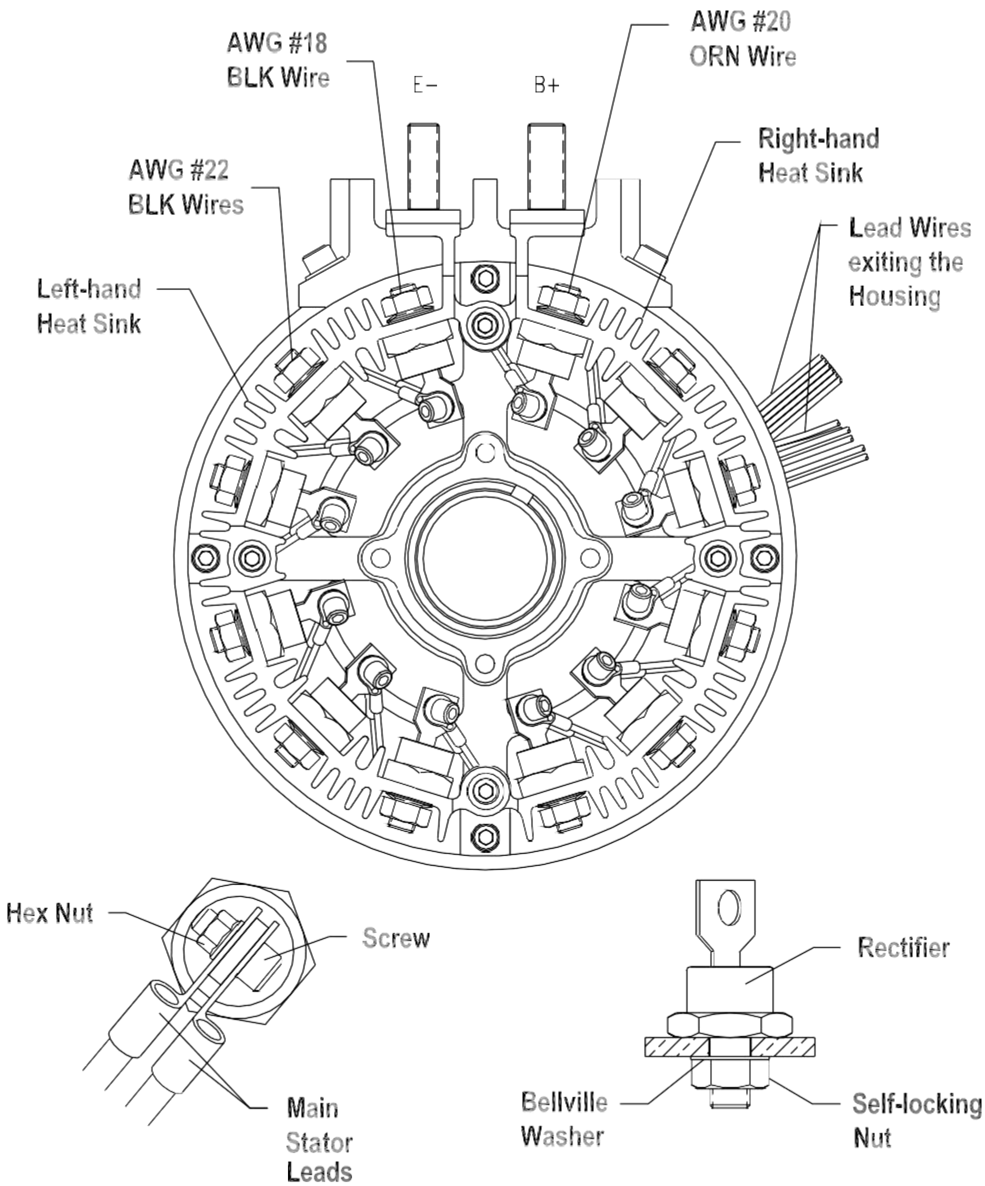


Figure 3018 - Removing the Rectifiers from the Heatsinks

B. Remove the Left-hand (45) and Right-hand Heatsinks (50) from the Anti-drive End Bearing Support (75) (see Figure 3019)

(1) Remove the screws (55), flat washers (60), insulating washers (65), and insulating sleeves (70) attaching the heatsinks to the anti-drive end bearing support.

(2) Discard the screws (55) and insulating sleeves (70).

(3) Replace flat washers (60) and insulating washers (65) that are damaged, deformed, corroded, burnt, delaminated or have other apparent defects.

(4) Carefully lift the left-hand heatsink off of the left terminal post. Carefully lift the right-hand heatsink off of right terminal post.

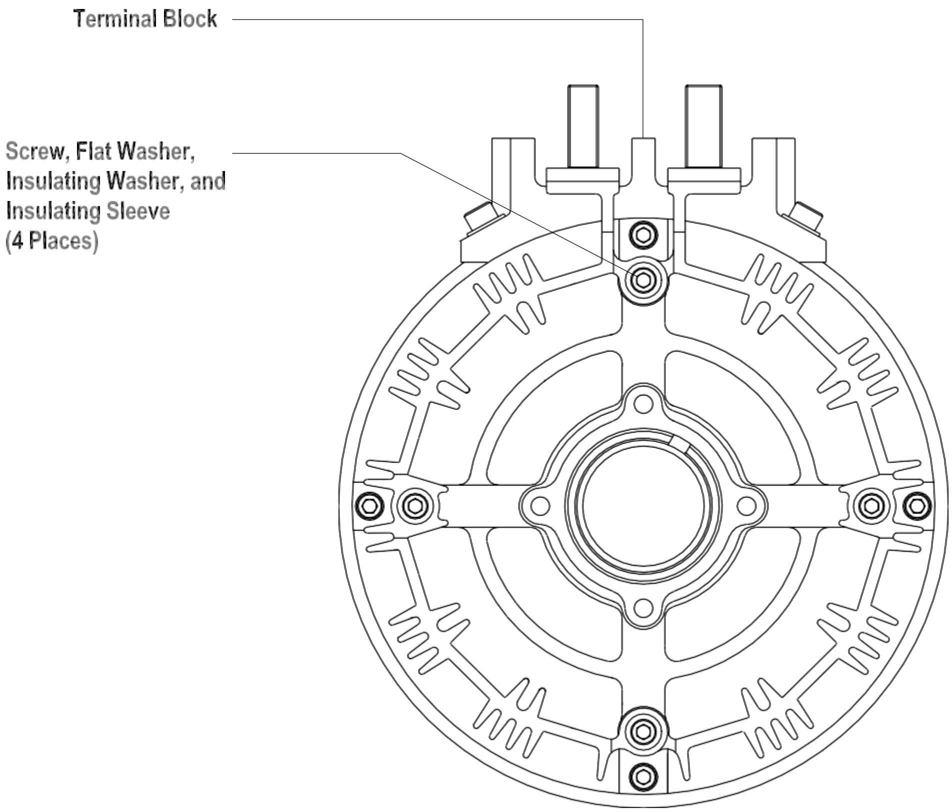


Figure 3019 - Removing the Heatsinks from the Anti-Drive End Bearing Support

C. Remove the Anti-drive End Bearing Support (75) with attached Terminal Block (100) from the Housing (145)

(1) Remove and discard the screws (80), flat washers (81), and lock washers (82) attaching the anti-drive end bearing support to the stator and housing.

(2) Carefully lift the anti-drive end bearing support away from the housing and main stator leads.

D. Remove the Terminal Block (100) from the Anti-drive End Bearing Support

(1) Remove the screws (105) and flat washers (110) attaching the terminal block (100) to the anti-drive end bearing support.

(2) Remove the terminal block.

E. Remove the Threaded Inserts (85 and 90) from the Anti-drive End Bearing Support

NOTE: Do not remove the threaded inserts from the anti-drive end bearing support unless damage is found.

F. Remove the Exciter Stator (115) from the Housing (see Figure 3020)

(1) Remove and discard the screws (120) attaching the exciter stator to the housing.

(2) Heat the housing assembly in an oven at 400° to 450° F (205° to 230° C) for 30 minutes.

(3) Position a rotor and stator removal fixture on a work surface that the exciter stator can pass through and that can support the housing.

WARNING: WEAR INSULATED GLOVES AND OBSERVE ALL SAFETY PRECAUTIONS WHEN HANDLING HEATED PARTS TO AVOID PERSONAL INJURY.

(4) Remove the heated housing from the oven.

(5) Tap the anti-drive end of the housing over the hole in the rotor and stator removal fixture until the exciter stator slides out of the housing.

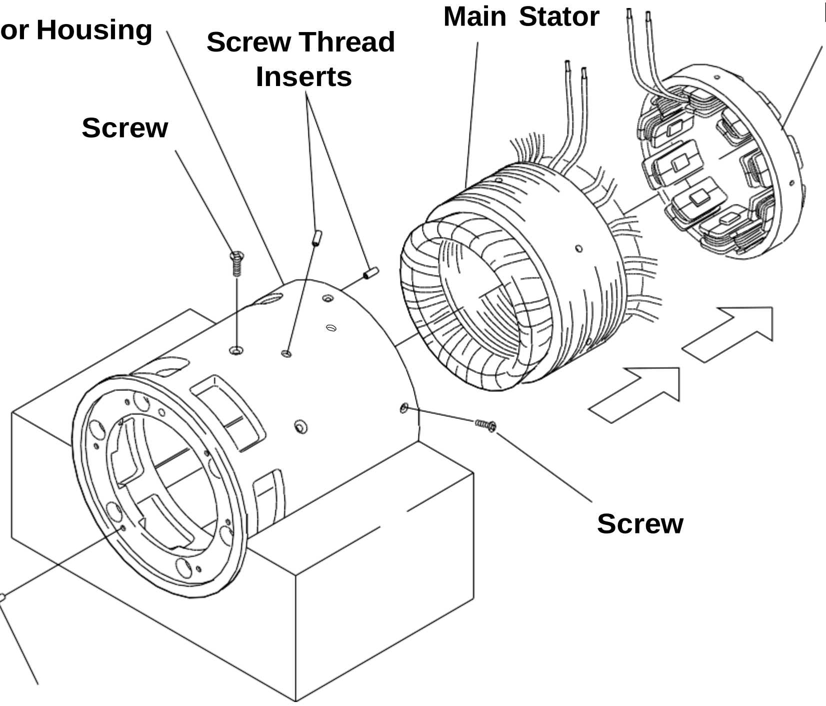


Figure 3020 - Removing the Stators from the Housing

G. Remove the Main Stator (125) from the Housing (145) (Figure 3020)

NOTE: The main stator cannot be removed without the exciter stator removed from the housing first.

(1) Remove and discard the screws (130) attaching the main stator to the housing (145).

(2) Remove the grommet (135) from the housing.

(3) Use hook to pull main stator lead wires and red and black connector wires through hole in housing. Fold wires over into main stator inside diameter.

NOTE: If wires were removed as described in Paragraph 4.J.(4), omit this step.

(4) Heat the housing in an oven at 400° to 450° F (205° to 230° C) for 30 minutes.

WARNING: WEAR INSULATED GLOVES AND OBSERVE ALL SAFETY PRECAUTIONS WHEN HANDLING HEATED PARTS TO AVOID PERSONAL INJURY.

(5) Position a rotor and stator removal fixture on a work surface that the main stator can pass through and that can support the housing.

(6) Remove the heated housing from the oven.

(7) Tap the anti-drive end of the housing over the hole in the rotor and stator removal fixture until the main stator slides out of the housing.

(8) Remove the terminal lugs (140) from the AWG #18, AWG #20 and AWG #22 wires only if damage is found.

H. Remove the Threaded Inserts (150 and 155) from the Housing (see Figure 3020)

NOTE: Do not remove the threaded inserts from the housing unless damage is found.

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CLEANING

1. Introduction

This section provides the cleaning procedures for the DC Generator.

2. Cleaning Materials

Table 4001 lists the materials required to clean the generator.

WARNING: **YOU MUST OBEY THE TOOL/EQUIPMENT MANUFACTURERS WARNINGS AND CAUTIONS SHOWN ON PACKAGING, CONTAINERS AND/OR INSTRUCTION LEAFLETS. IF YOU DO NOT, YOU CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT OR PROPERTY.**

WARNING: **ISOPROPYL ALCOHOL IS TOXIC AND FLAMMABLE; DO NOT USE NEAR OPEN FLAMES, WELDING AREAS, OR ON HOT SURFACES. INHALATION OF VAPORS CAN CAUSE DROWSINESS, DIZZINESS, AND HEADACHE. CONTACT WITH SKIN CAN CAUSE IRRITATION. USE IN A WELL-VENTILATED AREA.**

Material	Description/Specification	Source
Brush	Non-metallic, soft bristle	Commercially available
Cleaning pads (scotch brite) /Wiping cloths	Lint-free, soft fabric	Commercially available
	Formula 1990 GD Application: Spray wash cleaning	Brulin and Company, Inc. 2920 Dr. Andrew J Brown Ave. Indianapolis, Indiana 46205-4066 USA Phone: (1) 317-923-3211 FAX: (1) 317-925-4596 www.brulin.com CAGE Code V94058
Isopropyl alcohol Refer to the material safety data sheet for additional safety information.	TT-I-735, Grade A FLASH Point: 53° F (12° C), Flammable	Commercially available

Table 4001 - Cleaning Materials

3. Cleaning Procedures

Before performing the CHECK, REPAIR, ASSEMBLY, acceptance testing, and final inspection procedures, the components of the generator must be cleaned, rinsed, and dried. All signs of moisture, oil, and other contamination must be removed from the internal structure of the generator to make sure all parts and circuits function correctly. Clean the generator according to the following procedures.

WARNING: WHEN YOU USE COMPRESSED AIR, ADJUST THE PRESSURE TO 29 PSI (200 KPA) MAXIMUM. PUT ON EYE PROTECTION TO PREVENT INJURY.

CAUTION: MAKE SURE THAT COMPRESSED AIR FOR USE TO CLEAN/DRY THE COMPONENTS IS FREE FROM OIL AND WATER. THIS WILL PREVENT CONTAMINATION OF THE COMPONENTS.

A. Blow Out Dirt Particles

(1) Put the air inlet, air deflector, metal dampener components, drive shaft, empty filter and connector mounting cover, rotor assembly, drive end bearing support, and the stator and housing assembly into a ventilated air spray booth.

(2) Blow away all evidence of dirt with clean, dry, compressed air.

B. Clean the Parts and Assemblies

(1) Wash the parts using one or more of the approved cleaning procedures outlined in Table 4002.

WARNING: DETERGENT CAN BE DANGEROUS TO PERSONS. USE ONLY IN AN AREA WITH A GOOD FLOW OF AIR. DO NOT BREATHE THE FUMES. PREVENT SKIN CONTACT. PUT ON PROTECTIVE CLOTHING AND EYE PROTECTION.

CAUTION: DO NOT SOAK ALUMINUM OR IVD COATED PARTS FOR MORE THAN 30 MINUTES. A CHEMICAL REACTION MAY RESULT THAT WILL LEAVE THE PART IN AN UNSERVICEABLE CONDITION.

CAUTION: DO NOT DO ULTRASONIC CLEANING ON MAGNESIUM OR ALUMINUM PARTS.

Procedure	Instructions
Spray	Put the parts into a high pressure spray wash booth using detergent Brulin 1990 GD.
	CAUTION: LIMIT THE PRESSURE TO CLEAN PARTS. HIGH PRESSURE CAN REMOVE OR DAMAGE SURFACE COATINGS, CONNECTIONS AND INSULATION.
	Spray the parts with a solution of detergent and water. Refer to the material technical data sheet for the recommended dilution of water and detergent and solution temperature.

Table 4002 - Cleaning Procedures

Procedure	Instructions
Agitation	Put all parts into an agitation tank and clean using detergent Brulin 1990 GD and de-ionized water. Refer to the manufacturers specification for the recommended dilution of water and detergent and solution temperature.
	Clean parts until all evidence of dirt can be removed with a soft bristle brush or cleaning rag.
Soak	Put all parts into a soaking tank and clean using detergent Formula 815 GD, 815GD-NF, or Brulin 1990 GD and de-ionized water. Refer to the manufacturers specification for the recommended dilution of water and detergent and solution temperature.
	Soak the parts until all evidence of dirt can be removed with a soft bristle brush or cleaning rag.

Table 4002 - Cleaning Procedures (Continued)

C. Rinse the parts.

NOTE: Use minimal pressure to rinse the parts.

(1) Put the parts into a high pressure spray booth.

(2) Flush the part with hot de-ionized water or steam.

D. Repeat the applicable cleaning procedure as necessary until the parts are clean and free of dirt and residue.

E. Dry the parts.

(1) Remove any remaining moisture from the parts with a dry lint-free cloth.

WARNING: WEAR INSULATED GLOVES AND OBSERVE ALL SAFETY PRECAUTIONS WHEN HANDLING HEATED PARTS TO AVOID PERSONAL INJURY.

(2) Put the cleaned parts in an oven at a temperature of 250° ± 10° F (120° ± 5.6° C) for 2 1/2 hr ± 15 min.

WARNING: ISOPROPYL ALCOHOL IS TOXIC AND FLAMMABLE; DO NOT USE NEAR OPEN FLAMES, WELDING AREAS, OR ON HOT SURFACES. INHALATION OF VAPORS CAN CAUSE DROWSINESS, DIZZINESS, AND HEADACHE. CONTACT WITH SKIN CAN CAUSE IRRITATION. USE IN A WELL-VENTILATED AREA.

(a) Check each part for dirt by wiping with isopropyl alcohol on a clean, lint-free cloth.

F. Clean the electrical components and printed wiring board.

(1) Use isopropyl alcohol with a soft bristle brush to remove oily film from all electrical components. A spray mist application is acceptable if immediately followed by wiping and drying.

(2) Clean corrosion from diode terminals and wire terminal lugs using a scotch brite pad to make sure good electrical conductivity.

NOTE: Exposed base metal on the diodes or terminal lugs after cleaning is not acceptable.

WARNING: WHEN YOU USE COMPRESSED AIR, ADJUST THE PRESSURE TO 29 PSI (200 KPA) MAXIMUM. PUT ON EYE PROTECTION TO PREVENT INJURY.

CAUTION: MAKE SURE THAT COMPRESSED AIR FOR USE TO CLEAN/DRY THE COMPONENTS IS FREE FROM OIL AND WATER. THIS WILL PREVENT CONTAMINATION OF THE COMPONENTS.

(3) Dry the parts with cleaning cloths or clean, dry, low velocity compressed air, at 29 psig (200 kPa) maximum pressure.

4. Cleaning After Liquid Penetrant Inspection

A. Description

This specifies the procedure for cleaning part(s) after liquid penetrant inspection. Cleaning is necessary to remove residual penetrant or developer that could cause interference in processing or service requirements. Rinse parts fully with water and fully dry to make sure there is no interference in processing or service requirements.

B. Procedure

(1) Rinse the part(s) immediately after liquid penetrant inspection:

(a) The parts must be fully rinsed using water by manual or automated spray to remove the liquid penetrant.

1 Fully rinse the part(s) and aggressively agitate the part while it is immersed.

2 Pour the rinse water out from the part(s). Hold the part(s) vertical, open end down, for approximately one minute to drain.

(b) The part(s) surfaces must be visually examined under a black light after rinsing to make sure all the liquid penetrant has been removed.

1 Part(s) which show remaining liquid penetrant after rinsing must be fully cleaned and examined again.

(2) Drying of part(s) after rinsing:

CAUTION: REMAINING WATER USED FROM THE RINSING PROCEDURE MUST BE REMOVED. FAILURE TO OBEY DRYING INSTRUCTIONS CAN RESULT IN CORROSION OF THE MATERIAL.

(a) Remove the rinse water from the part(s) with a dry lint-free cloth.

WARNING: WHEN YOU USE COMPRESSED AIR, ADJUST THE PRESSURE TO 29 PSI (200 KPA) MAXIMUM. PUT ON EYE PROTECTION TO PREVENT INJURY.

CAUTION: MAKE SURE THAT COMPRESSED AIR FOR USE TO CLEAN/DRY THE COMPONENTS IS FREE FROM OIL AND WATER. THIS WILL PREVENT CONTAMINATION OF THE COMPONENTS.

(b) Use compressed air to remove rinse water.

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HOT MATERIALS CAN CAUSE SEVERE BURNS TO SKIN. WEAR THERMAL PROTECTIVE CLOTHING WHEN HANDLING HEATED PARTS.

(c) Immediately put the washed and rinsed part(s) in a vented oven at a temperature of 240 to 260° F (116 to 127° C) for a minimum of 2 hours.

1 The part(s) is to be positioned horizontally on a rack or on a block that will hold it in position.

(d) After the part(s) is fully dried and has cooled.

1 Check for indications of possible corrosion caused by the liquid penetrant.

a Reject the part(s) if corrosion is found.

2 If no corrosion is found, put the part(s) in a polyethylene bag with a bag of desiccant and seal it with tape, twist tie or rubber band.

3 The part(s) must be kept in a bag until just before assembled on the generator.

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CHECK

1. Introduction

This section provides initial and detailed component inspection procedures for DC generators returning from service for scheduled and unscheduled repair or service. Complete an initial inspection of the generator before beginning any testing or disassembly. The results of this inspection will determine if a generator is in satisfactory condition for a verification test or if it will need further disassembly, inspection, and/or replacement of parts.

This section provides figures and tables with information that is needed to perform a satisfactory inspection of the generator components. The inspection procedures are visual and require sufficient lighting and a 7X to 10X magnifier. Inspect only components and assemblies accessible as a result of disassembly or repair. During Repair and servicing of the generator, all primary components must be inspected to find out if they are serviceable. All soldering and desoldering procedures must be done to ANSI/IPC J-STD-001, Class 3.

A part must be rejected if wear or damage is outside the acceptance limits or if the part is not serviceable.

CAUTION: ANY USE OF PARTS, MATERIALS, OR PROCESSES NOT AUTHORIZED BY SAFRAN POWER FOR THE MAINTENANCE OR SERVICE OF THESE UNITS MAY AFFECT THEIR CONTINUED FLIGHTWORTHINESS OR INVALIDATE CERTIFICATION.

2. Inspection Tools and Materials

WARNING: YOU MUST OBEY THE TOOL/EQUIPMENT MANUFACTURERS WARNINGS AND CAUTIONS SHOWN ON PACKAGING, CONTAINERS AND/OR INSTRUCTION LEAFLETS. IF YOU DO NOT, YOU CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT OR PROPERTY.

The following tools and materials are needed to inspect the generator and its components.

Tool Description	Reference
Brush, non-metallic, soft bristle	Commercially available
Lint Free Cloth	CCC-C-456
Dial indicator	Commercially available
Dynamic balancer	Commercially available
High potential tester	Table 1002
Isopropyl alcohol	Table 4001
Digital Multi-meter	Table 1002

Table 5001 - Inspection Tools

Tool Description	Reference
Surge Tester	Surge Test Procedure - SPECIAL PROCEDURES Paragraph 4.
LCR Meter	Commercially available
Freeze Mist	FreeZ-It Antistat Chemtronics Kenesaw, GA 30152-4386 Ph: 800-645-5244 Ph: 770-424-4888
CDHT - Compression Digital Hand Tester or equivalent	Larson Systems Inc. Minneapolis, MN 55449-4425 Ph: 763-780-2131 www.larsonsystems.com (VOPWK9) or Commercially available
Power Supply, 230 VDC	Commercially available

Table 5001 - Inspection Tools (Continued)

3. General Information

Check Acceptance Limit Measurements for individual components are found in FITS AND CLEARANCES section of this CMM. If part does not meet acceptance limits, discard. Use the following procedures for all inspections.

A. Examine the Generator and its Components Visually for:

- Signs of corrosion
- Chipped-off enamel
- Nicks, cracks, dents, scratches
- Gouging, scoring or glazing mating surfaces
- Fretting corrosion on mating surfaces
- Loose or defective attaching parts
- Distortion
- Discoloration
- Crossed or stripped threads
- Condensation at drain holes
- Torn or cracked seals
- Galling or glazing of friction lining residue

- Bent or distorted springs
- Rounding, stripping or uneven wear on gear teeth

B. Examine Electrical Components Visually for:

- Loose or defective attaching parts
- Damage caused by excessive heat
- Electrical arcing paths
- Corroded contacts or terminals
- Loose, bent, or defective electrical connector, contacts or terminals
- Corroded electrical pins or connector
- Bent connector pins
- Loose, broken or shorted terminations

4. Non-Destructive Test (NDT) Inspections.

A. Reference the paragraphs below for various non-destructive tests:

(1) Unless otherwise specified, do magnetic particle inspections IAW ASTM-E1444. Unless otherwise specified, acceptance criteria must be IAW MIL-STD-1907 Table I, Grade A.

(2) Unless otherwise specified, do liquid penetrant inspections IAW ASTM-E1417-99, type 1 Method A or B, sensitivity 2 or higher. Unless otherwise specified, acceptance criteria must be IAW MIL-STD-1907 Table II, Grade C.

(3) Unless otherwise specified, do electrical inspections at commercial frequency. Conduct electrical inspections at a temperature of 50° to 104° F (10° to 40° C).

5. Initial Inspection

NOTE: If damage is found during inspection, stop the inspection immediately and begin further disassembly of the generator using the instructions in the DISASSEMBLY section.

A. Visually Inspect the Generator in a Brightly Lit Work Area in Accordance with Paragraph 3.A. and Paragraph 3.B.

(1) If shipping or handling damage is evident, stop the inspection and notify your supervisor.

(2) If operational damage exists, write down the components that need to be replaced or repaired and continue the inspection.

B. Clean the Generator Exterior

WARNING: ISOPROPYL ALCOHOL IS FLAMMABLE; DO NOT USE NEAR OPEN FLAMES, WELDING AREAS, OR ON HOT SURFACES. INHALATION OF VAPORS CAN CAUSE DROWSINESS, DIZZINESS, AND HEADACHE. CONTACT WITH SKIN CAN CAUSE IRRITATION. USE IN A WELL-VENTILATED AREA.

(1) Clean the surface of the generator with clean, lint-free cloth, CCC-C-456, or suitable equivalent wet with isopropyl alcohol

(2) If required, loosen dirt or grease with a clean, soft bristle brush.

C. Check for Rotor and Parts for Rubbing and Touching

(1) Turn the drive shaft spline counter-clockwise (when facing the drive end). The rotor assembly should rotate without any indication of scraping or noise from bearings.

D. Examine the Seating Between the Housing and both End Bell Assemblies

(1) The end bell assemblies must be fully seated on the stator and housing assembly.

(2) Make sure all attaching screws are tight.

6. Replacing Service Parts and Common Hardware

A. Service Parts (SIL 30086-011-24-02)

The auxiliary bearings do not need to be replaced each time the rotor assembly is removed from the DC Generator. Auxiliary bearings are not in use during operation of the generator unless there is a main bearing failure. A generator can retain the auxiliary bearings in use during a repair if the unit is not at restoration if it meets the following requirements:

NOTE: At restoration, all auxiliary bearings must be replaced even if they meet the requirements for continued service as listed.

CAUTION: GENERATORS THAT ARE RETURNED TO SERVICE WITHOUT REPLACEMENT OF THE AUXILIARY BEARINGS MUST BE LABELED REPAIRED ONLY.

(a) A bearing puller or press has not been used to remove the auxiliary bearings.

(b) The main bearings have not failed. If the generator is being repaired and either main bearing is found to have failed the auxiliary bearings must also be replaced.

(c) The generator is not being restored. At each scheduled restoration, the auxiliary bearings must be replaced even if there is no evidence that there was contact with the rotor shaft.

(d) Total calender time after zero operating hours TSO has been assigned must not be more than 4 years.

(e) There is no indication of gouging, scoring, glazing, or wear on the inside diameter of the bearing made by contact with the rotor shaft.

(f) There is no indication of contamination by foreign particles, signs of corrosion, or damage to the auxiliary bearings. Contamination is defined as metallic dust or flakes, chemical residue, more than usual amount of oil, or any other contamination that is not typically found in the generator at repair or restoration.

B. Common Hardware

During repair or servicing, replace all exposed hardware and flat washers that are damaged, deformed, corroded, or have other apparent defects.

Always replace lock washers, screws, o-rings, and self-locking nuts regardless of their condition if removed during disassembly.

7. Inspection of Generator Parts and Assemblies

A. Repair or Service Inspection

Examine only those components that have been disassembled for repair or service. Do not disassemble any component for inspection unless given instructions to do so in this section or in the TESTING AND FAULT ISOLATION section.

B. The Following Terms are Referenced in this Section

- DISCARD
  If damage of the part is found or the part is outside of the acceptance limits in the FITS AND CLEARANCES section, the part must be removed and replaced with a new one.

- REPAIR
  If damage to the part is found or the part is outside of the acceptance limits in the FITS AND CLEARANCES section, the part can be Repaired by a procedure found in the REPAIR section.

- DISASSEMBLE
  If damage to the part is found to a part in an assembly, or part of the assembly is outside of the acceptance limits in the FITS AND CLEARANCES section, you can Disassemble the part from the assembly and Repair or replace the damaged part(s).

- REPLACE
  If damage that causes a part to be outside of the acceptance limits in the FITS AND CLEARANCES section or there is no Repair procedure for that part, replace the part. Retain the following parts to submit for remanufacture: rotor assembly and stator and housing assembly.

C. Dimensions and points

Letters (i.e., A, B, C, D, etc.) in an illustration in this section indicate dimensions or points.

D. Surfaces

Numbers (i.e., 1, 2, 3, 4, etc.) in an illustration indicate surfaces.

8. <u>Inspection of Parts and Assemblies</u>

The following procedures are the basic instructions for examining parts and assemblies of the generator. Numbers in parentheses () refer to items found in figures in the ILLUSTRATED PARTS LIST.

A. V-band Clamp (10001-10)

(1) Examine the part IAW the procedures listed in Paragraph 3.A.

(a) DISCARD if damaged.

B. Mounting Adapter (10001-25) (see Figure 5001)

(1) Examine the part IAW the procedures found in Paragraph 3.A.

(a) DISCARD if damaged.

(2) Visually examine the mating surfaces for eroded surface coatings and pitting due to fretting. If surface erosion or pitting is found, measure pilot flange (A) and pilot bore (B) diameters. (See Figure 5001).

(a) DISCARD the mounting adapter if the pilot flange and/or pilot bore diameter is not within limits listed in the FITS AND CLEARANCES section.

(b) If the diameters are within limits listed but the mating surface coatings are worn, REPAIR the surface coatings.

(3) Visually examine the mating surface for gouging, scoring, or glazing.

(a) REPAIR the mounting adapter if minor damage is found.

(b) DISCARD the mounting adapter if damage cannot be repaired.

(4) Use a surface plate and matching gage blocks at four quadrants to check parallelism of surface (1) to surface (2) for warping.

(a) Disregard normal surface imperfections that don't represent warpage and are below high points of surface after stoning minor raised imperfections.

<u>1</u> Dichromate bare magnesium per MIL-M-3171 after stoning.

(b) DISCARD the mounting adapter if parallelism is not within the limits in the FITS AND CLEARANCES section.

(5) Perform a liquid penetrant inspection (IAW) Paragraph 4.A.(2).

(a) DISCARD the mounting adapter if damage is found.

(6) Measure the guide pin height and make sure that the fit is tight.

(a) REPAIR the mounting adapter if the height does not meet the limits listed in the FITS AND CLEARANCES section.

(b) REPLACE the mounting adapter if the guide pin hole is oversized and the damage cannot be repaired.

(7) Check mounting adapter surface A, B, and C for corrosion (See Figure 5002). If corrosion exists:

(a) Using Scotch-Brite™, remove all corrosion.

WARNING: USE OF METHYL ALCOHOL IS PROHIBITED FOR CLEANING MAGNESIUM ALLOYS (SEE SECTION 3.2.1 OF AMS-M-3171).

(b) Wipe all surfaces clean using isopropyl alcohol.

(8) Visually check surfaces A, B, and C for pitting (See Figure 5002). If any of the following exist, replace the mounting adapter:

- If surface A is pitted.
- If pitted area of either surface B or surface C exceeds 25% of that surface.
- If pit depth on surface B is greater than 0.030 inch (0.762 mm).
- If pit depth on surface C is greater than 0.005 inch (0.127 mm).

(9) If the pitting does not exceed the requirements above, repair the pitted surfaces in accordance with the procedures in the REPAIR section.

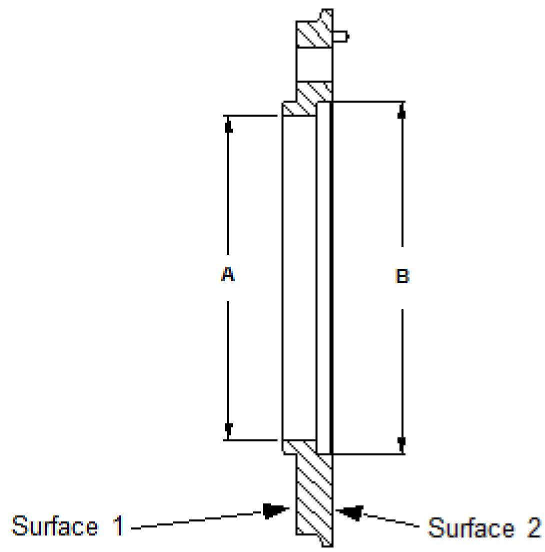


Figure 5001 - Inspecting the Mounting Adapter

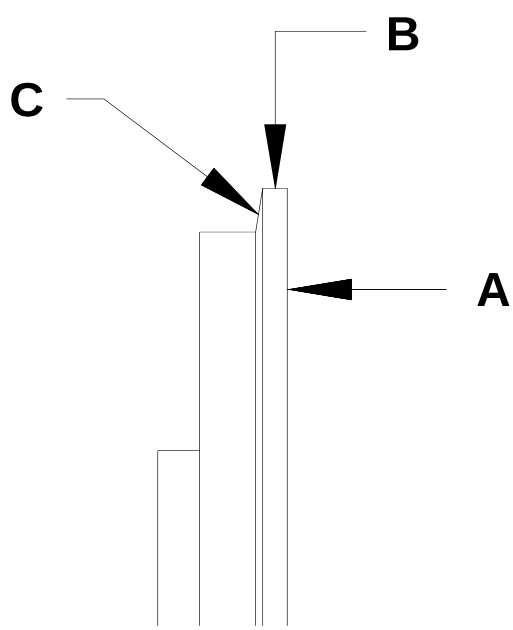


Figure 5002 - Corrosion Inspection of Surfaces on the Mounting Adapter

C. Identification Plate (10001-30)

NOTE: ID plates with superficial nicks, dents and scratches that do not interfere with the legibility of the identification nameplate, can be reused providing they are sealed with acrylic coating.

(1) Visually inspect ID plate per Paragraph 3.A. If damage exists or the information is faded or unreadable:

(a) Retain the plate, identification if information is difficult to read.

(b) DISCARD the plate, identification if damage is found.

1 Transfer the information from the old nameplate to a replacement nameplate.

(2) Make sure the drive screws are tight and in place.

(a) Remove and DISCARD the loose drive screws.

D. Terminal Block Cover (10001-40)

(1) Visually inspect terminal block cover per Paragraph 3.A.

(a) DISCARD the terminal block cover if damage is found.

E. Air Inlet (10001-80)

(1) Visually inspect air inlet per Paragraph 3.A.

(a) DISCARD the air inlet if damage is found.

(2) Visually examine all surfaces for dents, nicks, and scratches that reduce the clearance between the sidewall and the fan.

(a) REPAIR the air inlet if damage is found.

(b) DISCARD the air inlet if damage extends to the mounting or inlet flanges.

(3) Visually examine the mounting and inlet flanges for gouging, scoring, or glazing. Repair the flange(s) if damage is found.

(a) DISCARD the air inlet if damage cannot be repaired.

F. Fan Assembly (10001-90)

(1) Visually inspect fan assembly IAW Paragraph 3.A.

(a) DISCARD the fan if damage is found.

(2) Visually examine the fan blades for warping, nicks, and scratches.

(a) DISCARD the fan if excessive damage is found.

(3) Visually examine the two captive drive screws for tightness.

(a) DISCARD the fan if damage is found.

G. Air Deflector (10001-105)

(1) Visually inspect air deflector IAW Paragraph 3.A.

(2) Visually examine all surfaces for cracks or fractures.

(a) One axial crack is permitted on the outside diameter panel only.

1 The crack must not have an open space or missing material.

(b) Cracks or other damage are not permitted on the vanes or in the area covering the B+ and E- leads.

1 DISCARD the deflector if cracks, fractures or missing material are found in these areas.

(3) Verify air deflector modified as specified by SB 30086-010-24-02.

H. Drive Shaft (10001-110) and Dampener Hub (10001-130)

(1) Visually examine all surfaces for cracks.

(a) Disassemble the drive shaft and dampener hub if damage is found.

(b) DISCARD the damaged part(s).

(2) Visually examine all surfaces for dents, nicks, and scratches.

(a) REPAIR the drive shaft and dampener hub if minor damage is found.

(3) Visually examine the rotor shaft mating spline, the drive spline, and the dampener hub for rounding, stripping, or uneven wear with the use of 7X to 10X magnifier.

(a) Disassemble the drive shaft and dampener hub if damage is found.

(b) DISCARD the damaged part(s).

(4) Visually examine the screw threads for crossed or stripped threads.

(a) REPAIR the threads if two or less threads are damaged.

(b) Disassemble the drive shaft and dampener hub if two or more threads are damaged.

(c) DISCARD the drive shaft.

(5) Measure the drive spline diameter over two gage pins.

(a) Disassemble the drive shaft and dampener hub if the diameter is not within limits listed in the FITS AND CLEARANCES section.

(b) DISCARD the drive shaft.

(6) Perform a magnetic particle inspection IAW Paragraph 4.A.(1).

NOTE: Examine the drive shaft and dampener hub mating surfaces only if the dampener hub was removed from the drive shaft.

(a) DISCARD the drive shaft and dampener hub if damage is found.

(7) Visually examine the mating surfaces for gouging, scoring, or glazing.

(a) DISCARD the drive shaft and dampener hub if damage is found.

I. Friction Ring (10001-125)

(1) Visually examine all surfaces for cracks.

(a) DISCARD the friction ring if damage is found.

(2) Measure the friction ring.

(a) DISCARD the friction ring if the thickness is not within limits listed in the FITS AND CLEARANCES section.

J. Dampener Plate (10001-120)

(1) Visually examine all surfaces for cracks.

(a) DISCARD the dampener plate if damage is found.

(2) Visually examine all surfaces for nicks and scratches.

(a) REPAIR the dampener plate if minor damage is found

(3) Visually examine the mating surfaces for gouging, scoring, or gazing.

(a) REPAIR the dampener plate if minor damage is found.

(4) Visually examine the spline teeth for rounding, stripping, or uneven wear.

(a) DISCARD the dampener plate if damage is found.

(5) Measure the dampener plate thickness.

(a) DISCARD the dampener plate if it is below the acceptance limits in the FITS AND CLEARANCES section.

(6) Use the spline gauge (GG98678) to check the splines of the dampener plate(120), or measure the distance between pins of the spline teeth.

(a) The dampener plate (170) is acceptable if the plate has a tight fit on the spline gauge or does not fit.

(b) The dampener plate must be discarded if the plate fits easily on the spline gauge or is loose.

(c) If measuring the distance between spline teeth, DISCARD if distance is above the acceptance limit in the FITS AND CLEARANCES section.

(7) Perform a magnetic particle inspection IAW Paragraph 4.A.(1).

(a) DISCARD the dampener plate if damage is found.

K. Dampener Backplate (10001-135) (see Figure 5003)

(1) Visually examine all surfaces for cracks.

(a) DISCARD the dampener backplate if damage is found.

(2) Visually examine all surfaces for nicks and scratches.

(a) REPAIR the dampener backplate if minor damage is found.

(3) Visually examine the mating surfaces for gouging, scoring, or glazing.

(a) DISCARD the dampener backplate if damage is found.

(4) Measure dimension “A”.

(a) DISCARD if minimum dimension listed in FITS AND CLEARANCES section cannot be met.

(5) Perform a magnetic particle inspection IAW Paragraph 4.A.(1).

(a) DISCARD the dampener plate if damage is found.

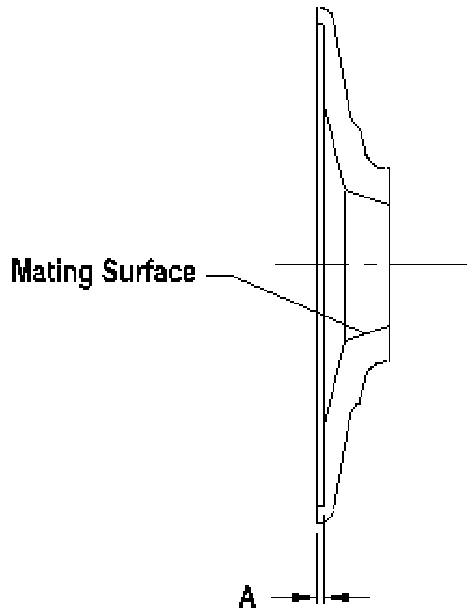


Figure 5003 - Dampener Backplate - Dimensional Inspection

L. Spring Washer (10001-185) (See Figure 5004)

(1) Visually examine all surfaces for evidence of corrosion, cracks, galling, glazing or scoring.

(a) DISCARD the spring washer if damage is found.

(2) Use a Compression Digital Hand Tester, or equivalent and measure the force required to compress the spring from the free height (H_F) to the compressed height (H_C).

(a) DISCARD if the load listed in the FITS AND CLEARANCES section is not met.

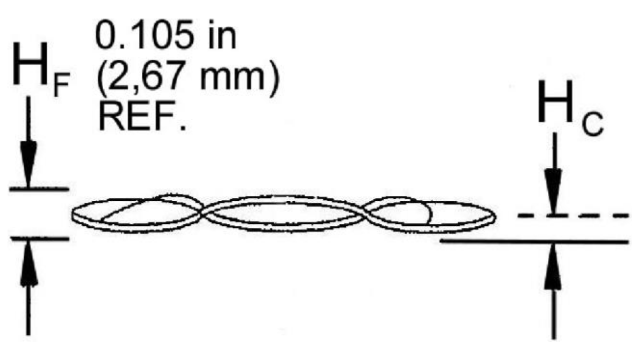


Figure 5004 - Spring Washer - Load Inspection

M. Inspection of Belleville washers (10001-65 and -75) (See Figure 5005)

(1) Visually examine all surfaces for cracks or fractures.

(a) DISCARD the belleville washer if damage is found.

(2) Use a Compression Digital Hand Tester, or equivalent and measure the force required to compress the washer from the free height (HF) to the compressed height (HC).

(a) DISCARD the washer if you do not get the load. See the Table 5002

Item No.	Free Height (HF)	Compressed Height (HC)	Acceptance Limits
10001-65	0.059 in. (1,50 mm)	0.049 in. (1,25 mm)	210 - 281 lbs. (95 - 127 kg)
10001-75	0.048 in. (1,22 mm)	0.040 in. (1,02 mm)	123 - 175 lbs. (56 - 79 kg)

Table 5002 - Belleville Washer Inspection

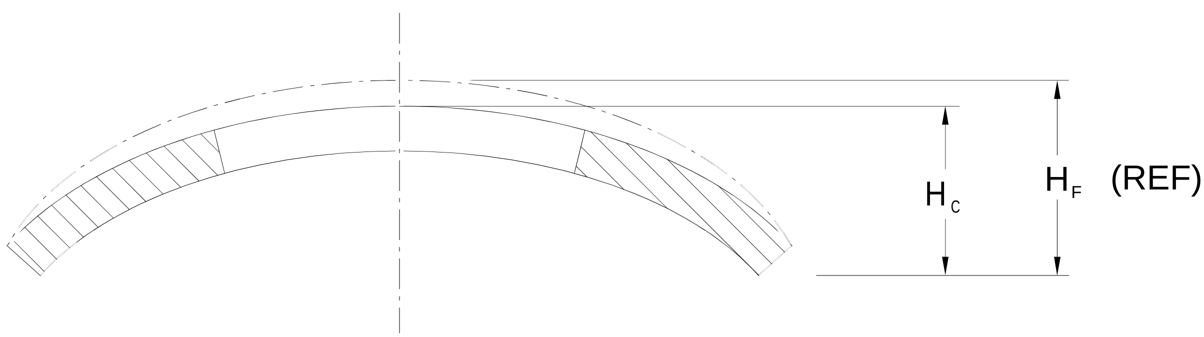


Figure 5005 - Belleville Washer - Load Inspection

N. Retaining Rings (10001-140 and -155)

(1) Visually examine all surfaces for cracks or fractures.

(a) DISCARD the retaining rings if damage or distortion is found.

(2) Make sure that the retaining rings have not been associated with a bearing failure and should fully seat in the groove of the bearing liner.

(a) DISCARD the retaining rings if fails the check given in above Paragraph 8.N.(2).

O. Drive End Bearing Failure Sensor (10001-150) and Anti-drive End Bearing Failure Sensor (10001-170)

Model 30086-010 only:

(1) Visually examine all surfaces for cracks or fractures.

(a) DISCARD the bearing failure sensor if damage is found.

(2) Verify that the I.D. of the bearing failure sensors have not rubbed at all on the drive shaft.

(a) Make sure that the epoxy primer coating is intact and completely covers the I.D. of the bearing sensor and no sensor conductor is exposed.

(b) If damage to the coating is found, REPAIR in accordance with the procedure in REPAIR section.

<u>WARNING:</u> FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING HIGH POTENTIAL TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

<u>CAUTION:</u> FAILURE TO TURN OFF THE HIGH POTENTIAL TESTER POWER BEFORE CONNECTING OR DISCONNECTING THE HIGH POTENTIAL TESTER LEADS CAN CAUSE SERIOUS DAMAGE.

<u>CAUTION:</u> DIELECTRIC TESTING IS ACCOMPLISHED DURING ACCEPTANCE TESTING AND ONLY FOR GENERATORS THAT HAVE BEEN FULLY CLEANED.

(3) Perform dielectric test.

(a) Place sensor in test fixture.

(b) Apply 250 VAC between lead and test fixture for 1 minute.

(c) DISCARD if any arc over, flash over, fluctuation or increase in current leakage. Leakage more than 5 mA constitutes a failure.

Model 30086-011 only:

(1) Visually examine the inside diameter of the disc for damage.

(a) DISCARD the bearing failure sensor if the conductor is damaged or cracked.

(b) Make sure that the epoxy primer coating is intact and completely covers the I.D. of the bearing sensor and no sensor conductor is exposed.

(c) If damage to the coating is found, REPAIR in accordance with the procedure in REPAIR section.

(2) Visually examine the bearing sensor lead wires for damage.

(a) Inspect the exposed lead wire under a 10x optical device for broken or damaged strands.

1 If the exposed wire is damaged, DISCARD the bearing failure sensor, it cannot be repaired.

2 If more than 1/16 inch (1,6 mm) of wire beyond the O.D. of the ceramic remains exposed, DISCARD the bearing failure sensor, it cannot be repaired.

3 If the wires are not damaged and do not have more than 1/16 inch (1,6 mm) of wire beyond the OD of the ceramic exposed, REPAIR the bearing sensor leads following Paragraph 9.C.

(3) Test the integrity of the individual bearing failure sensors as follows:

NOTE: The following procedure assumes that the sensors are soldered to the pins on the printed wiring board.

NOTE: Do all soldering and unsoldering procedures per ANSI/IPC J-STD-001, Class 3.

NOTE: The bearing failure sensors can be removed from the generator without removing end bells or bearings. See SPECIAL PROCEDURES section of this manual for bearing failure sensor removal.

NOTE: For units being serviced for restoration, resistance of the individual bearing failure sensor is specified in the FITS AND CLEARANCES section of the CMM.

(a) Remove the drive end and anti-drive end bearing failure sensors from the bearing liners as given in the SPECIAL PROCEDURES section or DISASSEMBLY section of this manual to protect the bearings from the freeze mist.

(b) Monitor the resistance across the pins E and F as shown in Figure 5006.

NOTE: See Figure 7025 in the ASSEMBLY section for the layout of electrical connector pins.

WARNING: CONTENTS OF SPRAY CANISTER ARE PRESSURIZED, AVOID PUNCTURE OF CAN. USE SPRAY WITH ADEQUATE VENTILATION. AVOID SKIN AND EYE EXPOSURE TO SPRAY. OBSERVE MANUFACTURERS WARNINGS.

CAUTION: BEARING FAILURE SENSOR MUST BE REMOVED FROM THE BEARING LINER TO PROTECT THE BEARING FROM THE FREEZE MIST.

(c) Apply freeze mist to the potting around the bearing failure sensor leads and to the inside diameter of the bearing failure sensor near the potting on the drive end sensor for 5 to 7 seconds from a distance of 1 to 2 inches (25,4 to 50,8 mm). Focus the spray on the channel where leads enter disc as shown in Figure 5007.

(d) If the resistance increases to 105,000 - 112,000 Ω or an erratic resistance reading greater than 8500 Ω is noted the bearing failure sensor is faulty and must be replaced.

WARNING: **CONTENTS OF SPRAY CANISTER ARE PRESSURIZED, AVOID PUNCTURE OF CAN. USE SPRAY WITH ADEQUATE VENTILATION. AVOID SKIN AND EYE EXPOSURE TO SPRAY. OBSERVE MANUFACTURERS WARNINGS.**

CAUTION: BEARING FAILURE SENSOR MUST BE REMOVED FROM THE BEARING LINER TO PROTECT THE BEARING FROM THE FREEZE MIST.

(e) Apply freeze mist to the potting around the bearing failure sensor leads and to the inside diameter of the bearing failure sensor near the potting on the anti-drive end sensor for 5 to 7 seconds from a distance of 1 to 2 inches (25,4 to 50,8 mm). Focus the spray on the channel where leads enter disc as shown in Figure 5007.

(f) If the resistance increases to 105,000 to 112,000 Ω or an erratic resistance reading greater than 8500 Ω is noted the bearing failure sensor is faulty and must be replaced.

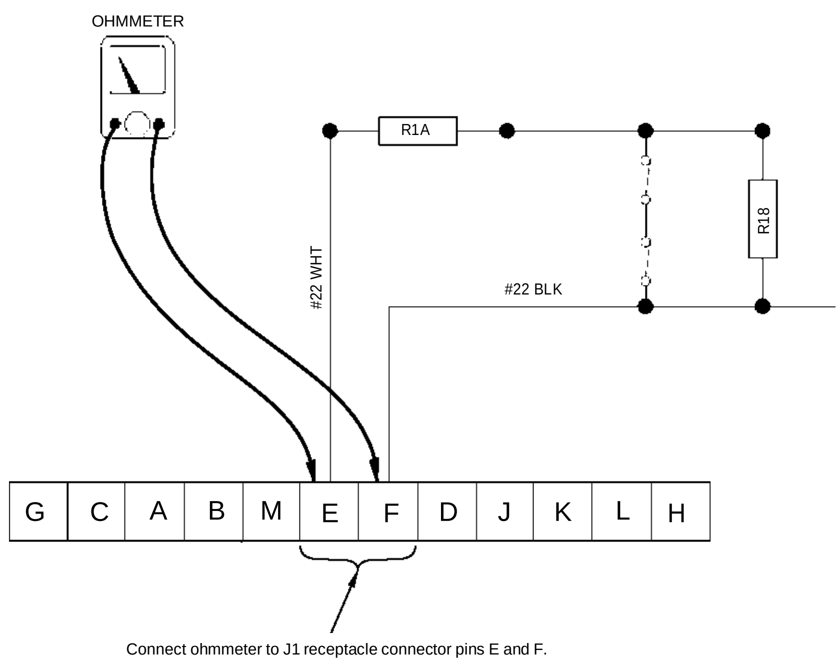


Figure 5006 - Printed Wiring Connection Board

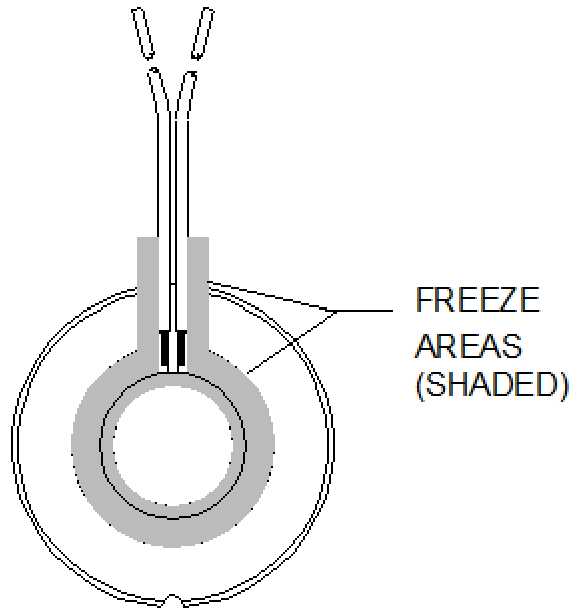


Figure 5007 - Sensor Check Area

P. Drive End Bearing Support (10001-175) (see Figure 5008)

(1) Visually examine all surfaces for cracks.

(a) DISCARD the drive end bearing support if damage is found.

(2) Visually examine all surfaces for dents, nicks, and scratches.

(a) REPAIR the drive end bearing support if minor damage is found.

(3) Visually examine the mating surfaces for fretting and corrosion.

(a) DISCARD the drive end bearing support if damage is found.

(4) Visually examine the following mating surfaces for gouging, scoring, glazing:

(a) bearing liners

(b) surfaces mating with the stator and housing assembly

(c) surfaces mating with the mounting adapter

1 REPAIR the drive end bearing support if damage is found.

(5) Measure the bearing liner diameters A and B using a gage and equipment with an accuracy of 0.00004 inch (0.001 mm).

(a) If the bearing liner diameter(s) do not meet the acceptance limits in the FITS AND CLEARANCES section, REPAIR the drive end bearing support.

(b) DISCARD the drive end bearing support if damage is excessive.

(6) Measure the mounting adapter pilot diameter and stator housing pilot diameter C and D using a gage and equipment with an accuracy of 0.0001 inch (0,0025 mm).

(a) If the dimension(s) do not meet the acceptance limits in the FITS AND CLEARANCES section, DISCARD the drive end bearing support.

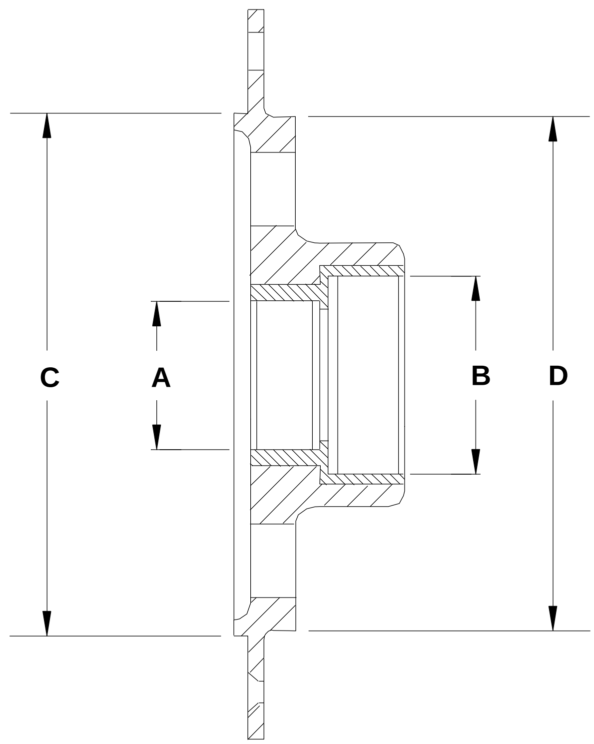


Figure 5008 - Drive End Bearing Support - Dimensional Inspection

Q. Bearing Retainer (10001-225)

(1) Visually examine all surfaces for cracks.

(a) DISCARD the bearing retainer if damage is found.

(2) Visually examine all surfaces for nicks, dents, and scratches.

(a) DISCARD the bearing retainer if any damage to the bearing mating surface is found.

(3) Visually examine the mating surfaces for gouging, scoring, or glazing.

(a) DISCARD the bearing retainer if excessive damage is found.

R. Filter and Connector Mounting Cover (10001-240), Diode Mounting Bracket (10001-255), D1 Diode (10001-270) (with attached C3 Capacitor (10001-275)), Printed Wiring Board Assembly (10001-320), R5 (10001-345) and R6 (10001-365) Resistors, C1 (10001-385) and C2 (10001-410) Capacitors, and Connector (10001-415) (see Figure 5009)

NOTE: It is possible to complete the following inspection of the filter and connector mounting cover and the internal components without desoldering the lead wires from their connections. Refer to the DISASSEMBLY section for instructions to remove the filter and connector mounting cover from the stator and housing assembly before starting this inspection. Detailed instructions for the inspection of the printed wiring board assembly and connector follow this inspection.

(1) Visually examine all surfaces for cracks or bends.

(a) If damage to the filter and connector mounting cover is found and no damage to the internal components is found, disassemble the components from the filter and connector mounting cover. DISCARD the filter and connector mounting cover.

(b) If damage is excessive, DISCARD the damaged filter and connector mounting cover and the internal components.

(2) Visually examine all surfaces for dents, nicks, and scratches.

(a) REPAIR the filter and connector mounting cover if minor damage is found.

(b) If damage is excessive, disassemble the internal components attached to the filter and connector mounting cover. DISCARD the filter and connector mounting cover and any damaged component(s).

(3) Visually examine all internal components for evidence of overheating.

(a) Disassemble all components from the filter and connector mounting cover if damage is found. DISCARD the damaged component(s).

(4) Visually examine all internal components for broken solder connections, missing or damaged components and damaged wiring.

NOTE: Do all soldering and unsoldering procedures per ANSI/IPC J-STD-001, Class 3.

(a) Disassemble all components from the filter and connector mounting cover if damage is found. DISCARD the damaged component(s).

NOTE: Do not perform the following checks unless component failure is suspected.

(5) Remove suspect resistor R5 or R6 and perform a resistance test.

(a) REPLACE the resistor(s) if the resistance is not within the limits in the FITS AND CLEARANCES section.

(6) Remove diode D1 and check the resistance IAW Paragraph 8.Z.(2).

(7) Measure the capacitance of the C3 capacitor using an LCR meter with the C3 mounted in the filter and connector mounting cover.

(a) Measure the capacitance value at the frequency shown in the FITS AND CLEARANCES section.

(b) The capacitor C3 is connected across diode D1. Connect the LCR meter positive lead on the cathode side of the diode, and connect the negative side of the LCR meter to the anode side of the diode.

(c) Discard the part if the capacitance value is not within the limits as shown in the FITS AND CLEARANCES.

(8) Remove suspect capacitor C1 or C2 and charge with an ohmmeter connected. Reverse the ohmmeter connectors.

(a) A momentary swing in the ohmmeter needle indicates the capacitor is good.

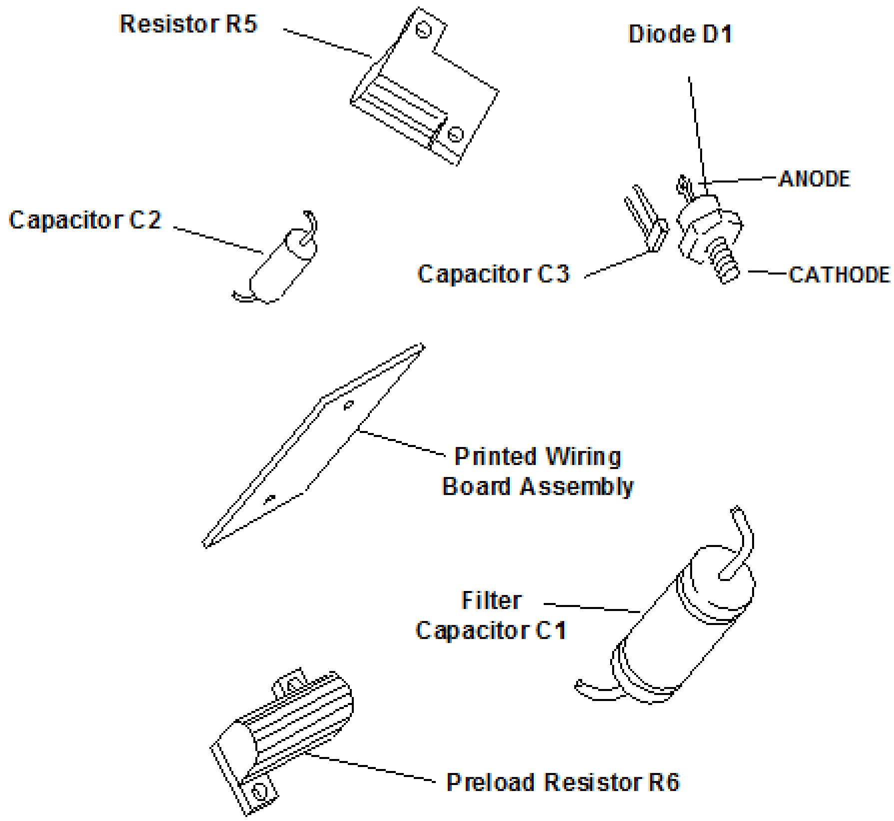


Figure 5009 - Inspecting the Filter and Connector Mounting Cover and Components

S. Printed Wiring Board Assembly (10001-320)

NOTE: Unless component failure is suspected, do not perform the following inspection.

(1) Remove the resistors and diodes from the printed wiring board according to the component removal procedure in the REPAIR section.

(a) Using an ohmmeter, measure the resistance of the resistors.

(b) Measure the resistance of the diodes.

(c) Charge capacitors using an ohmmeter. Reverse ohmmeter leads to capacitor. A momentary swing in the ohmmeter indicates the capacitor is good.

(d) REPLACE all faulty printed wiring board components according to the procedure in the REPAIR section.

T. Connector (10001-415)

(1) Make sure that the connector pins are not deformed, bent, or missing.

(a) Remove the pins from the connector only if damage is found. See DISASSEMBLY, Paragraph 4.U.

U. Rotor Assembly (10001-195)

NOTE: Do not disassemble the rotor assembly unless damage is found.

(1) Visually examine all surfaces for cracks.

(a) REPLACE the rotor assembly if damage is found.

(2) Inspect the security of the winding retaining bands.

(3) Visually examine the windings for damaged or deteriorated insulation, security of attachment, distortion, and evidence of overheating.

(a) REPAIR the damage if possible. If damage is excessive, replace the rotor assembly.

(4) Inspect the integrity of all visible solder joints and connections.

NOTE: Do all soldering and unsoldering procedures per ANSI/IPC J-STD-001, Class 3.

(a) REPAIR the damage if possible. If damage is excessive, replace the rotor assembly.

(5) Inspect the security of the diode and resistor mounting bracket and exciter rotor assembly on the rotor shaft.

(a) Disassemble the rotor assembly if the part(s) are loose on the rotor shaft. Inspect all parts after disassembly.

(6) Visually examine the bearing journals for gouging, scoring, or glazing.

(a) REPAIR the bearing journals if damage is found.

(7) Measure the bearing journal diameters A, B, and C with a gauge with an accuracy of 0.00004 inch (0.001 mm). See Figure 5010.

(a) Repair the bearing journals if they do not meet limits listed in the FITS AND CLEARANCES section.

(8) Examine internal rotor shaft spline for rounding, stripping, or uneven wear.

(a) Check the internal spline for too much wear by engaging a new drive shaft into the rotor internal spline. Reject the rotor shaft if too much play is found when engaging the drive shaft.

NOTE: An internal spline with too much wear will not engage tightly with a new drive shaft.

(b) REPLACE rotor shaft if damaged or REPAIR the rotor and shaft assembly IAW Safran Power General Repair Scheme (GRS) 3058 and GRS 004.

(9) Check the rotor assembly balance at two planes using a dynamic balancer.

(a) REPAIR the rotor assembly balance if it does not meet limits listed in the FITS AND CLEARANCES section.

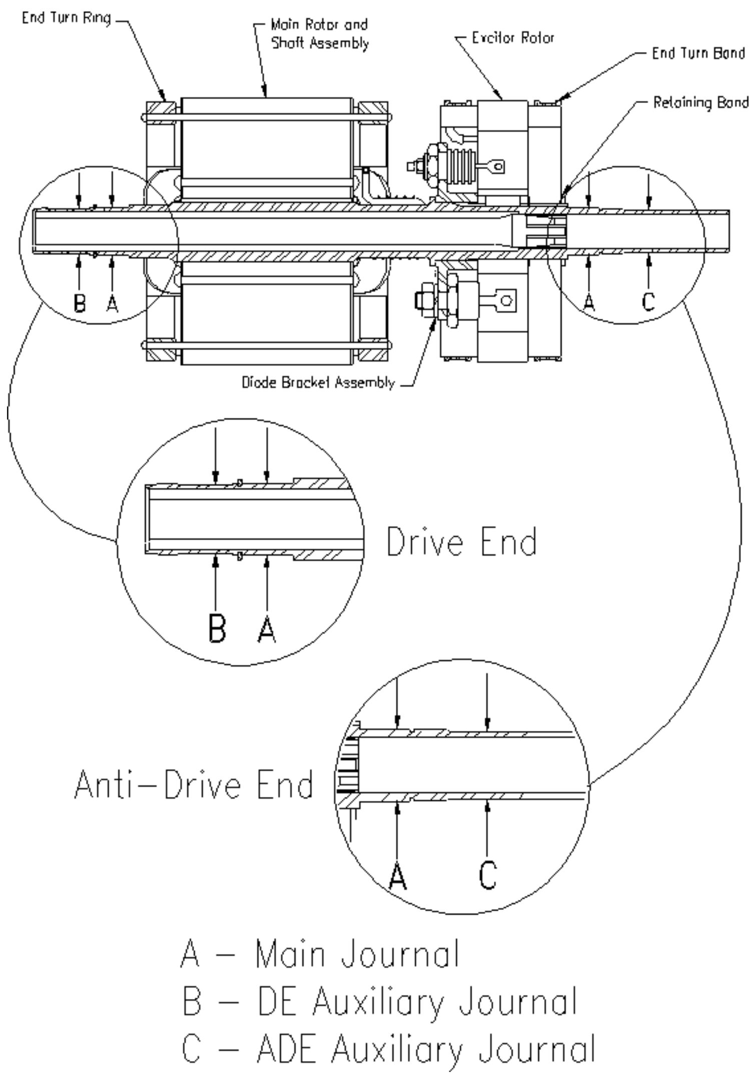


Figure 5010 - Inspecting the Rotor Assembly

V. Main Field Rotor and Shaft Assembly (10002-65)

(1) Visually examine the varnish coating of the exposed windings for cracks, flaking, burning, or discoloration.

(2) Visually examine all surfaces for melted or deformed parts.

(3) Measure bearing journal diameters using a gauge with an accuracy of 0.00004 inch (0.001 mm).

(a) REPAIR or REPLACE the rotor and shaft assembly if dimensions listed in FITS AND CLEARANCES are not within minimum and maximum limits.

(4) Examine the winding end-turn rings for tight (not loose) fit.

(a) REPLACE the rotor and shaft assembly if damage is found or REPAIR the rotor and shaft assembly IAW Safran Power General Repair Scheme (GRS) 3058 and GRS 004.

(5) Check the main field winding resistance to determine if the windings are shorted, grounded, or open.

(a) REPLACE the rotor and shaft assembly if the resistance is not within limits listed in the FITS AND CLEARANCES section or REPAIR the rotor and shaft assembly IAW Safran Power General Repair Scheme (GRS) 3058 and GRS 004.

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING HIGH POTENTIAL TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

CAUTION: FAILURE TO TURN OFF THE HIGH POTENTIAL TESTER POWER BEFORE CONNECTING OR DISCONNECTING THE HIGH POTENTIAL TESTER LEADS CAN CAUSE SERIOUS DAMAGE.

CAUTION: DIELECTRIC TESTING IS ACCOMPLISHED DURING ACCEPTANCE TESTING AND ONLY FOR GENERATORS THAT HAVE BEEN FULLY CLEANED.

(6) Perform a dielectric test (see Figure 5011).

(a) With the power OFF, connect the negative test lead to ground at (2).

(b) Attach the positive test lead to either mainfield lead.

(c) At a rate not to exceed 100 volts/sec, slowly adjust the output voltage to 250 VAC RMS, commercial frequency for 1 minute.

(d) Record leakage rate.

(e) Adjust the voltage back to 0.

(f) Repeat the test on the other lead.

(g) Turn the high potential tester power OFF.

(h) Disconnect the test leads.

(i) If the leakage rate is more than 2 mA, clean the assembly and repeat the test.

(j) Replace mainfield IAW GRS 3058 if it does not pass surge test

(7) Perform surge test on the main field rotor.

(a) Refer to SPECIAL PROCEDURES section in this manual for test equipment requirements and test instructions.

(b) REPAIR the rotor and shaft assembly IAW Safran Power General Repair Scheme (GRS) 3058 and GRS 004.

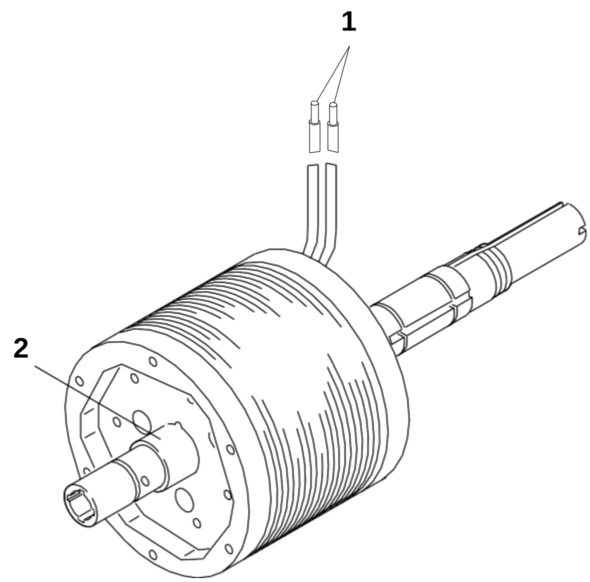
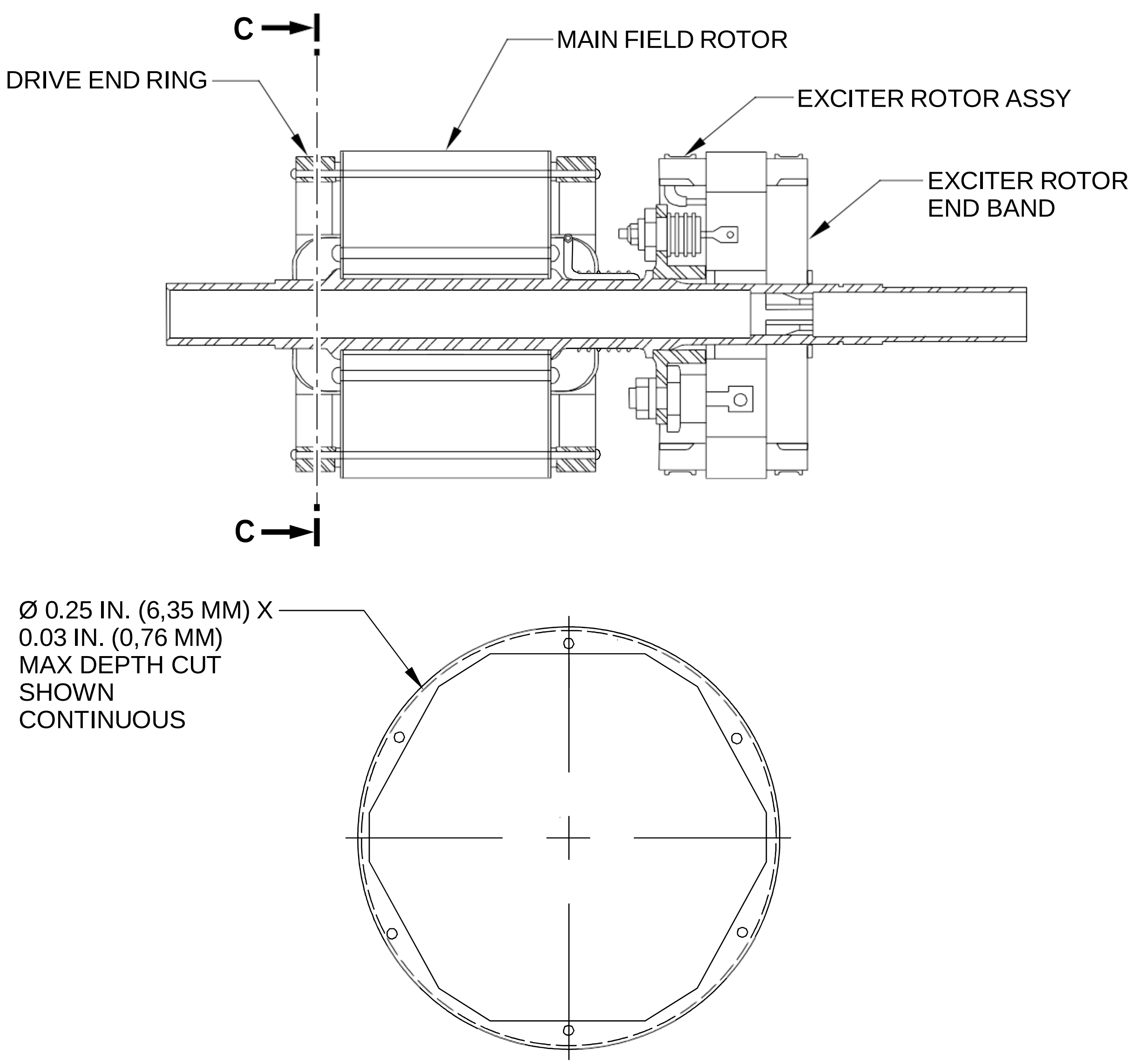


Figure 5011 - Main Field Rotor and Shaft Assembly Test Connections

W. Rotor Assembly-Main Field balance Machining Inspection (10001-195)

(1) Acceptable limits for the continuous cut on the main field rotor assembly is 0.25 in. (6.35 mm) diameter x 0.03 in.(0.762 mm) (See Figure 5012).

(2) Additional balancing cuts must be done IAW with the REPAIR section of the CMM.



SECTION
C-C

Figure 5012 - Acceptable Existing Machining Cuts on the Main Field Rotor for Affected Rotor Assemblies

X. Exciter Rotor Assembly (10002-50)

(1) Visually examine the varnish coating of the exposed windings for cracks, flaking, burning, or discoloration.

(2) Visually examine all surfaces for melted or deformed parts.

(3) Make sure that the end-turn bands are secure.

(4) Make sure the sleeving on the leads is not frayed or damaged. If necessary replace the damaged sleeving.

(5) Visually examine the inside of the hub (1) for gouging, scoring, or glazing.

(a) REPLACE the exciter rotor if damage is found.

(6) Perform a resistance test between each of the leads T7, T8, and T9 (white) and neutral lead T10 (black) (see Figure 5013).

(a) REPLACE the exciter rotor if the resistance is not within limits listed in the FITS AND CLEARANCES section.

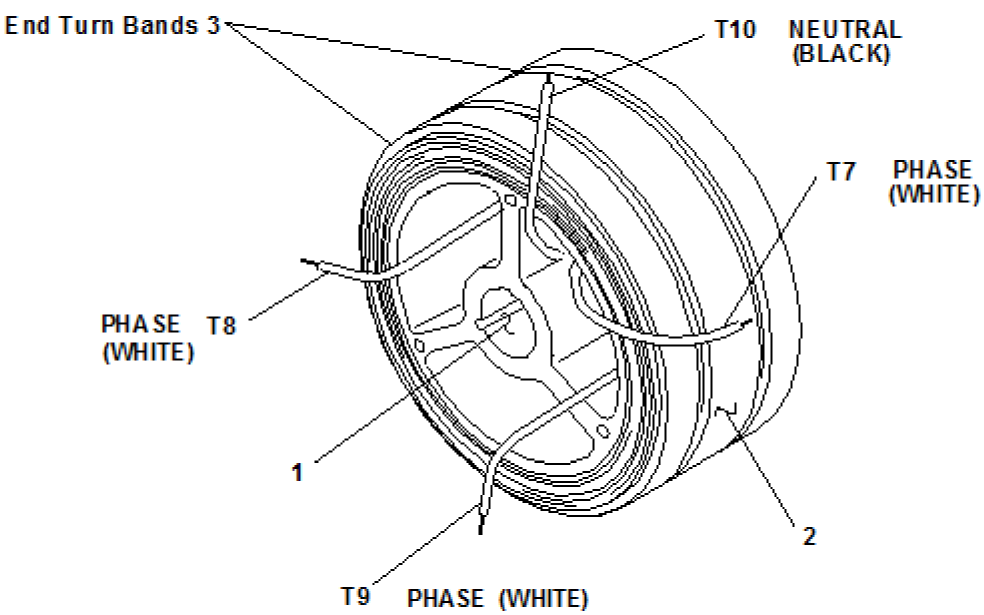


Figure 5013 - Testing the Exciter Rotor

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING HIGH POTENTIAL TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

CAUTION: FAILURE TO TURN OFF THE HIGH POTENTIAL TESTER POWER BEFORE CONNECTING OR DISCONNECTING THE HIGH POTENTIAL TESTER LEADS CAN CAUSE SERIOUS DAMAGE TO THE EXCITER ROTOR ASSEMBLY.

CAUTION: DIELECTRIC TESTING IS ACCOMPLISHED DURING ACCEPTANCE TESTING AND ONLY FOR GENERATORS THAT HAVE BEEN FULLY CLEANED.

(7) Perform a dielectric test (see Figure 5013).

(a) With the power OFF, connect the negative test lead to the stack (2).

(b) Attach the positive test lead to any rotor lead (T7, T8, T9, or T10).

(c) At a rate not to exceed 100 volts/sec, slowly adjust the output voltage to 250 VAC RMS, commercial frequency for 1 minute.

(d) Record the leakage rate.

(e) Adjust the voltage back to 0.

(f) Repeat the test for each lead.

(g) Turn the high potential tester power OFF.

(h) Disconnect the test leads.

(i) Acceptance:

1 If the leakage rate is more than 1 mA, CLEAN the exciter rotor and repeat the test.

2 If the exciter rotor fails the test again, REPLACE the exciter rotor.

(8) Perform surge test on the exciter rotor.

(a) Refer to SPECIAL PROCEDURES section in this manual for test equipment requirements and test instructions.

(b) REPLACE exciter rotor per applicable DISASSEMBLY/ASSEMBLY instructions if it does not pass the surge test.

Y. Diode and Resistor Mounting Bracket Assembly (10002-10)

(1) Visually examine all surfaces for flaking, burning, or discoloration.

(a) REPLACE bracket if damage is found.

(2) Visually examine all surfaces for dents, nicks, cracks, or warpage.

(a) REPLACE bracket if damage is found.

(3) Visually examine all surfaces for melted or deformed parts.

(a) Disassemble the diodes and resistors from the diode mounting bracket if damage is found. REPLACE the damaged part(s).

(4) Manually examine the diodes and resistors for tight fit with the bracket (10003-45).

(a) Remove the part(s) if the fit is loose.

(b) Clean the bracket.

(c) Test the part(s) as instructed below.

(5) Measure the inside diameter of the bracket using a gage and equipment with an accuracy of 0.00004 inch (1 micron).

(a) REPLACE the bracket if the inside diameter is not within the limits in FITS AND CLEARANCES section.

Z. Diodes (10002-15) and Resistors (10002-30)

NOTE: A resistance check of the diodes and resistors cannot be performed unless they are removed from the diode mounting bracket.

NOTE: Do the following inspection only if the diodes and resistors have been Disassembled from the diode mounting bracket because of possible damage.

(1) Perform a resistance test on the resistors using a digital multi-meter.

(a) REPLACE the resistor(s) if the resistance is not within limits listed in the FITS AND CLEARANCES section.

(2) Perform a forward and reverse test on the diodes using a digital multi-meter.

(a) REPLACE the diode(s) if the test limits are not within limits listed in the FITS AND CLEARANCES section.

AA.Diode and Resistor Mounting Bracket (10002-45)

(1) Visually examine the diode and resistor mounting bracket for cracks.

(a) DISCARD the diode and resistor mounting bracket if cracks are found.

(2) Visually examine the diode and resistor mounting bracket for gouging, scoring, glazing, or indications of material loss or deformation.

(a) DISCARD the diode and resistor mounting bracket if damage is found.

(3) Visually examine the diode and resistor mounting bracket for nicks, dents, and scratches.

(a) REPAIR the diode and resistor mounting bracket if minor damage is found.

(b) If damage is excessive, DISCARD the diode and resistor mounting bracket.

AB.Stator and Housing Assembly (10001-465)

(1) Visually examine all surfaces for cracks.

(a) Disassemble the stator and housing assembly if damage is found. DISCARD all damaged parts.

(2) Visually examine all surfaces for minor dents, nicks, and scratches.

(a) REPAIR the surfaces if possible.

(b) Disassemble the stator and housing assembly if damage is excessive. DISCARD all damaged parts.

(3) Visually examine the surface coatings for base and finish quality.

(a) REPAIR the surface coatings if minor damage is found.

(b) Disassemble the stator and housing assembly if damage is excessive. DISCARD the damaged housing.

(4) Visually examine the mating surfaces for fretting.

(a) Disassemble the stator and housing assembly if damage is excessive. DISCARD the damaged housing.

(5) Visually examine the mating surfaces for gouging, scoring, or glazing.

(a) REPAIR the mating surfaces if possible.

(b) Disassemble the stator and housing assembly if damage is excessive. Discard the damaged housing.

(6) Visually inspect the threaded inserts for crossed or stripped threads.

(a) Disassemble the threaded inserts from the stator and housing assembly if damage is found. Replace the damaged threaded inserts.

(7) Check housing surfaces A, B, and C for corrosion (See Figure 5014). If corrosion exists:

WARNING: USE OF METHYL ALCOHOL IS PROHIBITED FOR CLEANING MAGNESIUM ALLOYS (SEE SECTION 3.2.1 OF AMS-M-3171).

(a) Use Scotch-Brite™ to remove all corrosion.

(b) Wipe all surfaces clean using isopropyl alcohol.

(8) Visually check surfaces A, B, and C for pitting (See Figure 5014). If any of the following exist, REPLACE the housing assembly:

- If surface A is pitted.
- If pitted area of either surface B or surface C is continuous over more than a 30 degree section or exceeds 25% of that surface.
- If pitted area across more than 50% of the width of surface B is continuous over more than a 60 degree section.
- If pit depth on surface B is greater than 0.030 inch (0.762 mm).
- If pit depth on surface C is greater than 0.005 inch (0.127 mm).

(9) If the pitting does not exceed the requirements above, REPAIR the pitted surfaces in accordance with the procedures in the Standard Practices Document 1002, Surface Repair and Coating.

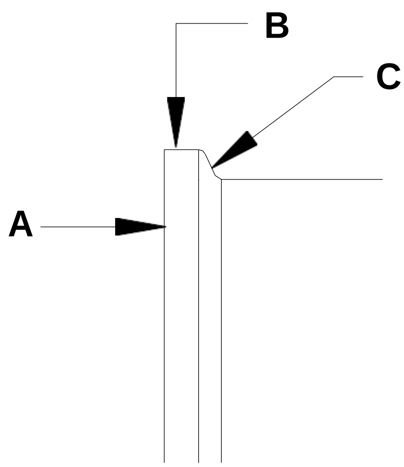


Figure 5014 - Corrosion Inspection Surfaces on the Housing

(10) Measure the minimum thickness of the wall of the housing at each of the six air exhaust passages.

(a) If wall thickness is less than the dimension specified in the FITS AND CLEARANCES section REPLACE the housing.

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING HIGH POTENTIAL TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

CAUTION: FAILURE TO TURN OFF THE HIGH POTENTIAL TESTER POWER BEFORE CONNECTING OR DISCONNECTING HIGH VOLTAGE ELECTRICAL LEADS CAN CAUSE SERIOUS DAMAGE TO THE STATOR AND HOUSING ASSEMBLY.

CAUTION: DIELECTRIC TESTING IS ACCOMPLISHED DURING ACCEPTANCE TESTING AND ONLY FOR GENERATORS THAT HAVE BEEN FULLY CLEANED.

(11) Perform a dielectric test.

CAUTION: THE EMI CAPACITOR (C2) (10001-410) MUST BE DISCONNECTED FROM GROUND (BRACKET) FOR THIS TEST.

(a) Remove the filter and connector mounting cover.

(b) Isolate the filter and connector mounting cover to avoid contact with the frame of the generator.

(c) Jumper the terminal leads together (B+ and E–).

(d) With the power OFF, connect the positive test lead to the jumpered terminals.

(e) Connect the negative lead to the housing.

(f) With the high potential tester output voltage at zero, turn the power on.

(g) At a rate not to exceed 100 volts/sec, slowly adjust the output voltage to 250 VAC RMS, commercial frequency for 1 minute.

(h) Record leakage rate and then adjust the voltage back to zero.

(i) Turn the high potential tester power off.

(j) Remove the positive test lead.

(k) Connect the positive test lead to connector pin G.

(l) Repeat the dielectric test.

(m) After the test is complete, remove the test leads.

(n) If the leakage rate is more than 5 mA, clean the stator and housing assembly and repeat the dielectric test.

(o) If the stator and housing assembly fails the dielectric test again, disassemble the stator and housing assembly.

AC.Diode Rectifiers (10004-30 and 10004-15)

NOTE: When troubleshooting a test failure, the diode rectifiers can be checked electrically without removing them from the heatsink per Paragraph 4.G., SPECIAL PROCEDURES Section.

NOTE: During restoration it is necessary to remove all 12 rectifiers to reapply new heatsink compound and to test each rectifier. Paragraph 2.A., INTRODUCTION Section.

(1) Disassemble the diode rectifiers from the right-hand and left-hand heatsinks.

(2) Visual inspection: Check for cracks, chips, and or voids within the diode.

(3) Check the rectifiers forward voltage and reverse current for each rectifier.

NOTE: To avoid damage to the diodes, only test if the diodes and resistors have been disassembled from the heatsinks.

WARNING: BEFORE YOU USE THE HIGH VOLTAGE TESTER, MAKE SURE THAT THE POWER SWITCH IS IN THE OFF POSITION. MAKE SURE THAT NO PERSON TOUCHES THE EQUIPMENT OR PROBES. THIS WILL PREVENT DEATH OR INJURY FROM ELECTRIC SHOCK.

(a) Forward Voltage Test:

1 Use a current limiting power supply that is capable of 250 V DC and a current capable of 200 mA.

2 Connect the power supply minus (-) terminal to the cathode of the diode and the plus (+) of the power supply to the anode of the diode.

3 Limit the current of the power supply to 100 mA ± 5mA.

4 The maximum forward voltage is 1.15 V.

(b) Reverse Current Test:

1 Use a current limiting power supply that is capable of 250 V DC and a current capable of 200 mA.

2 Connect the power supply lead plus (+) to the cathode side of the diode and the minus (-) of the power supply to the anode side of the diode.

3 Increase the power supply to 250 V ± 5 V.

4 The maximum reverse current is 2.0 mA.

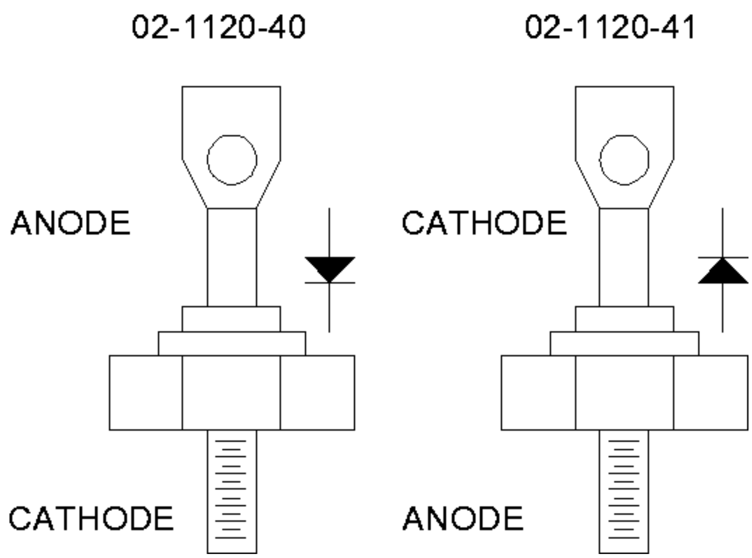


Figure 5015 - Rectifier Diodes

AD.Left-hand (10004-45) and Right-hand (10004-50) Heatsinks

(1) Visually examine all surfaces for cracks.

(a) DISCARD the heatsink(s) if damage is found.

AE. Anti-drive End Bearing Support (10004-75)

(1) Visually examine all surfaces for cracks.

(a) DISCARD the anti-drive end bearing support if damage is found.

(2) Visually examine all surfaces for dents, nicks, and scratches.

(a) REPAIR the anti-drive end bearing support if minor damage is found.

(3) Visually examine the mating surfaces for fretting and corrosion.

(a) DISCARD the anti-drive end bearing support if damage is found.

(4) Visually examine the mating surfaces for gouging, scoring, glazing.

- Bearing liners
- Surfaces mating with the stator and housing assembly
- Mating surface with the heatsinks or terminal block

(5) REPAIR the anti-drive end bearing support if damage is found.

(6) Measure the bearing liner diameters using a gage and equipment with an accuracy of 0.00004 inch (1 mm).

(a) If the bearing liner diameter do not meet the acceptance limits in the FITS AND CLEARANCES section restoration of the liner may be possible. Follow the procedures according to the REPAIR Section.

(b) DISCARD the anti-drive end bearing support if damage is excessive.

AF. Terminal Block (10004-110)

(1) Visually examine all surfaces for cracks.

NOTE: On the 30076-2181 terminal block only: Knit lines in the potting material that are exposed in the machined area under the “E” terminal are not considered cracks and are acceptable if the lines do not continue to the edges of the terminal block (see Figure 5016).

(a) DISCARD the terminal block if cracks are found.

(2) Visually examine all surfaces for dents, nicks, and scratches.

(a) DISCARD the terminal block if damage is found.

(3) Visually examine the terminal studs for crossed or stripped threads.

(a) REPAIR the terminal block studs if the thread damage is two or less thread turns.

(b) DISCARD the terminal block if the thread damage is more than two thread turns.

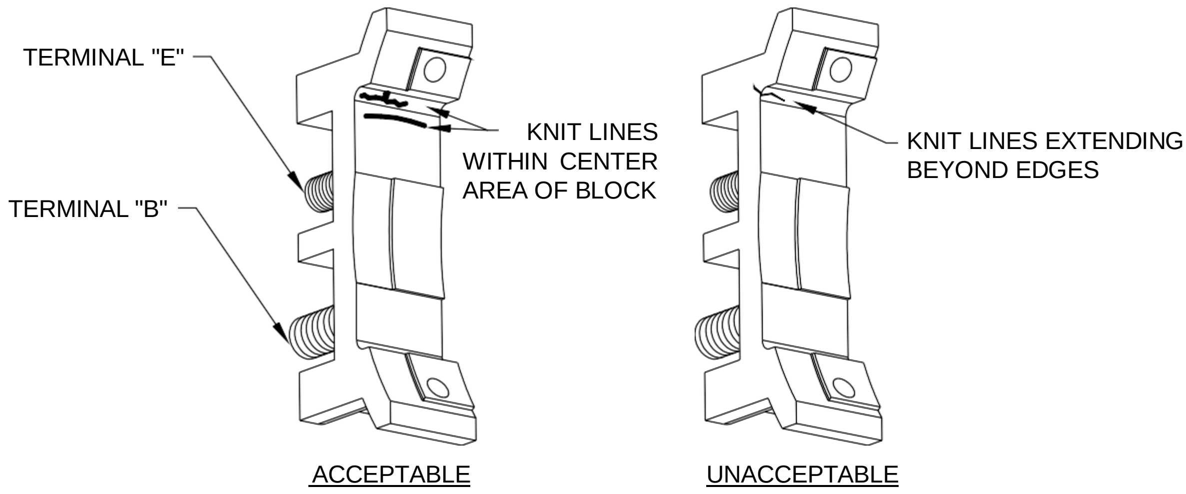


Figure 5016 - Terminal Block Knit Lines

AG. Exciter Stator (10004-115)

(1) Visually examine all surfaces for cracks.

(a) DISCARD the exciter stator if cracks are found.

(2) Visually examine the varnish coating on the windings for cracks, flaking, burning, or discoloration.

(a) DISCARD the exciter stator if cracks, flaking, burning, or discoloration are found.

(3) Visually examine the exciter stator for broken wires or damaged insulation.

(a) DISCARD the exciter stator if damage is found.

(4) Check the exciter stator winding resistance to determine if the windings are shorted, grounded, or open.

(a) REPLACE the exciter stator if the resistance is not within limits listed in the FITS AND CLEARANCES section.

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING HIGH POTENTIAL TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

CAUTION: FAILURE TO TURN OFF THE HIGH POTENTIAL TESTER POWER BEFORE CONNECTING OR DISCONNECTING HIGH VOLTAGE ELECTRICAL LEADS CAN CAUSE SERIOUS DAMAGE TO THE EXCITER STATOR.

CAUTION: DIELECTRIC TESTING IS ACCOMPLISHED DURING ACCEPTANCE TESTING AND ONLY FOR GENERATORS THAT HAVE BEEN FULLY CLEANED.

(5) Perform a dielectric test.

(a) With the power OFF, connect the negative test lead to the exciter stator stack.

(b) Connect the positive lead to either exciter stator lead.

(c) With the high potential tester output voltage at zero, turn the power on.

(d) At a rate not to exceed 100 volts/sec, slowly adjust the output voltage to 250 VAC RMS for 1 minute.

(e) Record the leakage rate.

(f) Slowly adjust voltage back to zero.

(g) Turn the high potential tester power off.

(h) Remove the positive test lead.

(i) Connect the positive test lead to the other exciter stator lead.

(j) Repeat the dielectric test.

(k) If the leakage rate is more than 1 mA, CLEAN the exciter stator and repeat the dielectric test.

(l) If the exciter stator fails the dielectric test again, DISCARD the exciter stator.

AH.Main Stator (10004-125)

(1) Visually examine all surfaces for cracks.

(a) DISCARD the main stator if cracks are found.

(2) Visually examine the lammelar coating on the windings for cracks, flaking, burning, or discoloration.

(a) DISCARD the main stator if cracks, flaking, burning, or discoloration are found.

(3) Visually examine the main stator for broken wires or damaged insulation.

(a) DISCARD the main stator if damage is found.

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING HIGH POTENTIAL TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

CAUTION: FAILURE TO TURN OFF THE HIGH POTENTIAL TESTER POWER BEFORE CONNECTING OR DISCONNECTING HIGH VOLTAGE ELECTRICAL LEADS CAN CAUSE SERIOUS DAMAGE TO THE MAIN STATOR.

CAUTION: DIELECTRIC TESTING IS ACCOMPLISHED DURING ACCEPTANCE TESTING AND ONLY FOR GENERATORS THAT HAVE BEEN FULLY CLEANED.

(4) Perform a dielectric test.

(a) With the power OFF, connect the negative test lead to the main stator stack.

(b) Connect the positive lead to the 24 leads from the main stator tied together.

(c) With the high potential tester output voltage at zero, turn the power on.

(d) At a rate not to exceed 100 volts/sec, slowly adjust the output voltage to 250 V AC RMS for 1 minute.

(e) Check and record leakage rate, and then adjust the voltage back to zero.

(f) Turn the high potential tester power off.

(g) Remove the positive and negative test lead.

(h) Connect the negative test lead to terminal T5 (see Figure 5017).

(i) Connect the positive test lead to terminal T15 (see Figure 5017).

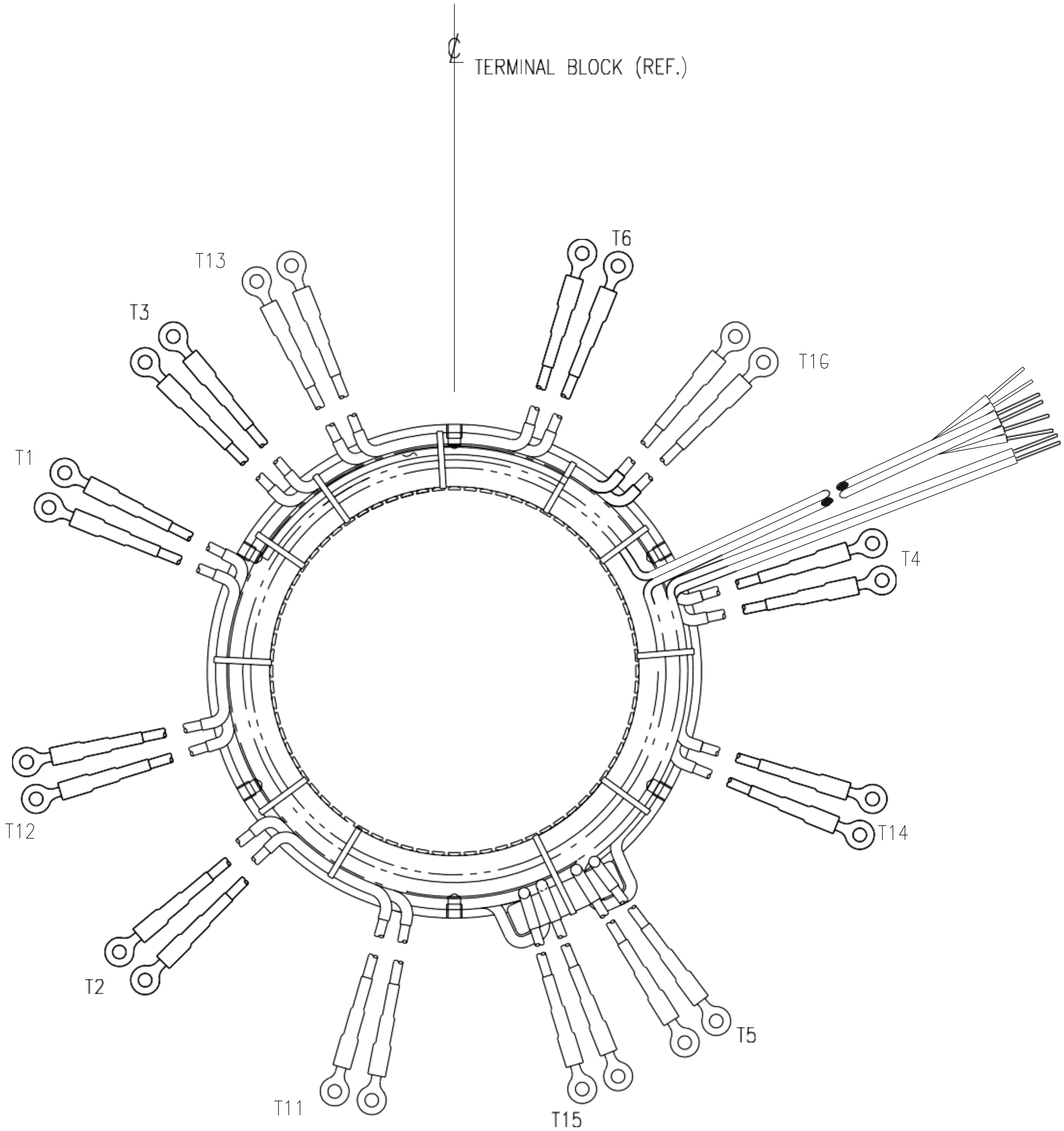


Figure 5017 - Main Stator Leads

(j) Repeat the dielectric test.

(k) If the leakage rate is more than 2 mA, CLEAN the main stator and repeat the dielectric test.

(5) If the main stator fails the dielectric test again, DISCARD the main stator.

(6) Perform surge test on main stator.

(a) Refer to SPECIAL PROCEDURES section in this manual for test equipment requirements and test instructions.

(b) REPLACE stator per applicable DISASSEMBLY/ASSEMBLY instructions if it does not pass the surge test.

(7) Perform resistance checks on diode signal lead wires.

The main stator contains two separate three phase windings. Leads T1 through T6 are connected to one winding and leads T11 through T16 are connected to the other winding. It is possible to make sure the six diode signal leads are connected to six different phases and the diode signal wire connections are secure using a milli-ohm meter. Figure 5018 shows stator leads (circled) that need checked.

(a) Visually make sure the six diode signal leads are connected to the correct stator lead.

1 Six of the main stator leads have diode signal lead wires connected to the terminal lug. The six leads have two lead wires in one sleeve.

2 Check to see if the diode signal wire leads are connected at the T1, T2, T6, T12, T14 and T16 locations as shown in Figure 5018.

a The other ends of these diode signal leads are connected to the printed wiring board assembly located in the connector enclosure.

3 Separate these six stator leads and temporarily identify them with the correct “T” number as shown in Figure 5018.

4 If any of the diode signal wire leads are in a different location, the phase connection is not correct. REPLACE the main stator.

(b) Make sure the diode signal lead wires are connected to six different phases.

1 Measure the resistance between the terminals.

a There should be a measurable resistance between the T1, T2 and T6 (single digit) leads.

b There should also be measurable resistance between the T12, T14 and T16 (double digit) leads.

2 When a resistance check is performed between a single digit lead and a double digit lead, there should be an open.

a If more than three signal leads show resistance to either the single digit or to the double digit stator leads, one or more of the signal leads are connected to the incorrect terminal lug. REPLACE the main stator.

b If there are more than three open measurements, one or more of the signal leads are broken or not attached to the terminal lug. REPLACE the main stator.

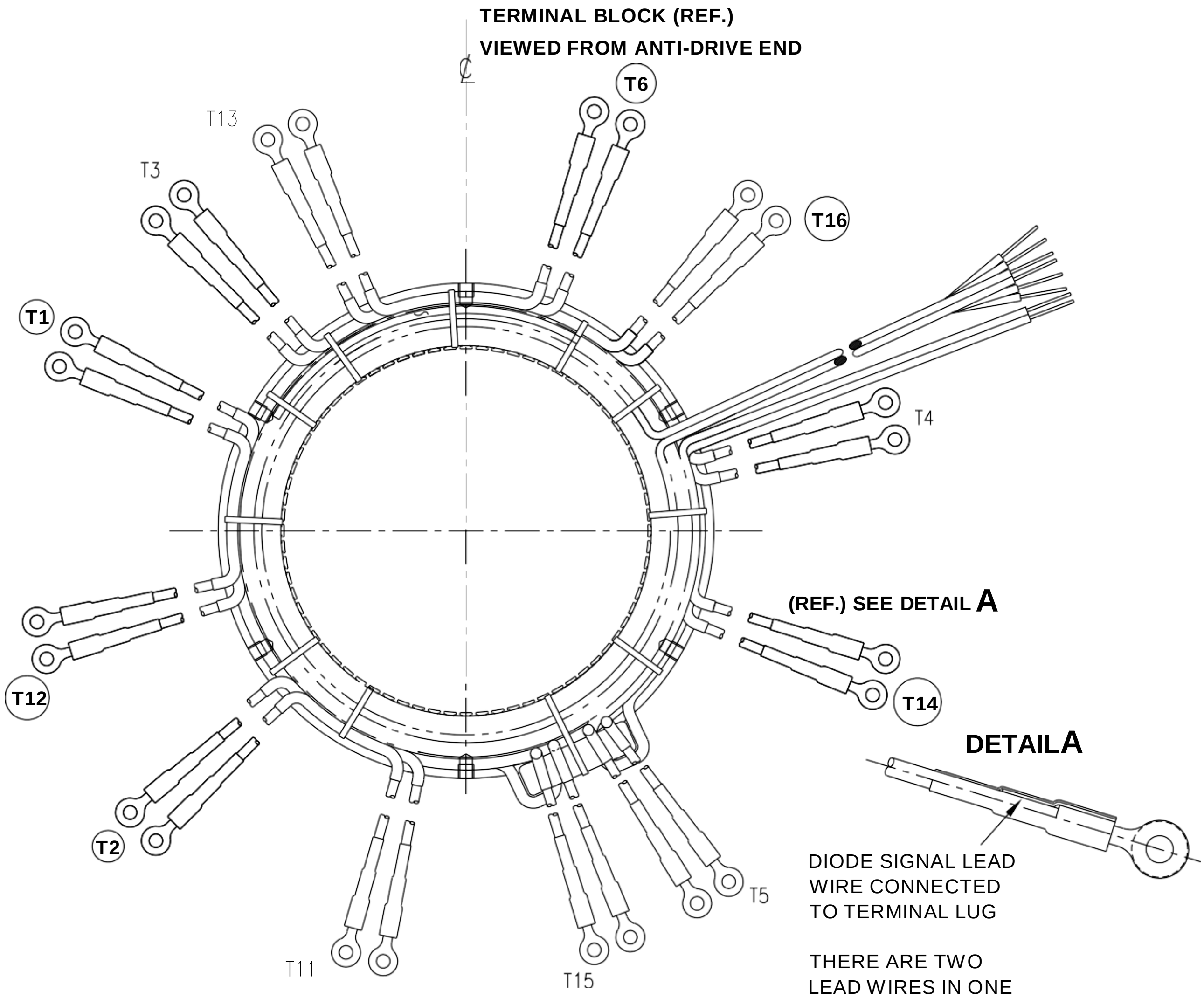


Figure 5018 - Main Stator Resistance Check on Diode Signal Lead Wires

AI. Current Transformer

(1) Perform a resistance test on the current transformer windings by measuring between connector pins D and F.

(a) REPLACE the current transformer if resistance is not within the limits in the FITS AND CLEARANCES section.

9. Terminology

Table 5003 lists the definitions of terms used to describe damage conditions.

Term	Definition	Probable cause
Corrosion	The chemical or electrochemical reaction between a material, usually a metal, and its environment that produces a deterioration of the material and its properties.	Environmental condition that causes deterioration.
Crack	A break in material.	Severe stress from overload or shock; possible extension of a scratch.
Dent	A small, smoothly rounded depression.	A sharp blow or excessive pressure.
Fretting	Wear that occurs between tight-fitting surfaces subjected to cyclical relative motion of extremely small amplitude. Usually, fretting is accompanied by corrosion, especially of the very fine wear debris.	Vibration between mating surfaces.
Fretting corrosion	The accelerated deterioration at the interface between contacting surfaces as the result of corrosion and slight oscillatory movement between the two surfaces.	Vibration between mating surfaces.
Galling	Transfer of metal from one surface to another.	Result of localized lubrication breakdown between sliding surfaces.
Glazing	Smoothing and creep of a surface.	Result of localized lubrication breakdown between sliding surfaces.
Gouging	Removal of surface metal, typified by rough and deep depressions.	Protruding objects, incorrectly aligned.
Nick	A sharp bottomed depression that may have rough outer edges.	Dropping, banging.
Rounding	Removal of surface metal at corners or dulling of edges.	Result of abrasion, vibration, or poor mating surfaces.
Scoring	Deep scratch following a path of part travel.	Result of localized lubrication breakdown between sliding surfaces.

Table 5003 - Terminology

Term	Definition	Probable cause
Scratch	A very shallow furrow or irregularity, usually longer than wide.	Movement of a sharp object across the surface.
Short	Evidence of sparking, arcing, or high current. Electrical condition where two conductors are connected by a path of very low resistance.	The result when two carrying conductors are connected by a path of negligible resistance.
Stripped thread	Thread of a nut, stud, bolt, or screw, damaged by tearing away parts of the thread.	Incorrect installation of threaded mating parts.
Tear	Parting of material.	Excessive tension, caused by an external force.
Wear	Slow removal of material. Wear may not be visible to the naked eye.	Result of abrasive substances contacting rolling surfaces and acting as a lapping compound.

Table 5003 - Terminology (Continued)

REPAIR

1. Introduction

This section provides authorized repair instructions for 30086-010, -011 DC Generators. Repairs are limited to:

- Repairing damaged surfaces
- Repairing damaged threads
- Replacing helicoil inserts
- Repair of the epoxy primer on the bearing sensors
- Restoring bearing liners and journals
- Balancing the rotor assembly
- Restoring surface coatings of parts and assemblies
- Replacement of faulty printed wiring board components
- Repairing damaged bearing sensor leads
- Application RTV silicone sealant
- Removal and replacement of the mounting adapter guide pin
- Machining anti-drive end bearing support and liner
- Repair of Main Stator Leads Using Splicing

Authorized repairs also include procedures by reference. Repair operations not referring to instructions given in this section are not authorized by Safran Power.

2. Repair Tools

In addition to normal shop tools, the following are necessary to repair the DC Generator.

CAUTION: THE USE OF PARTS, MATERIALS, OR PROCESSES NOT AUTHORIZED BY SAFRAN POWER FOR THE MAINTENANCE OR SERVICE OF THE DC GENERATOR MAY AFFECT CONTINUED FLIGHT WORTHINESS OR INVALIDATE ITS CERTIFICATION.

CAUTION: STEEL WOOL AND ABRASIVES CONTAINING IRON OR IRON OXIDE MUST NOT BE USED AT ANY TIME DURING REPAIR OPERATIONS.

Tool description	Reference
3/32 inch drive pin punch	Commercially available
Brush, non-metallic, soft bristle	Commercially available
Anti-Drive end support assembly grinding fixture	Figure 9021
Cleaning pads/wiping cloths, lint-free, soft fabric	Commercially available
Dynamic balancer	Commercially available
End mill (0.25 inch [6.4 mm] diameter)	Commercially available
Helicoil insertion/removal tool	Commercially available
India stone	Commercially available
Ink stamping tool	Commercially available
Lightweight hammer/mallet	Commercially available
Soldering equipment	Commercially available
Thread chasers	Commercially available
Drive End Bearing Liner Removal Fixture	Figure 9024
Drive End Bearing Liner Installation Fixture	Figure 9025

Table 6001 - Repair Tools

3. Repair Materials

Table 6002 lists the materials required to repair the DC Generator.

WARNING: BEFORE USING ANY OF THE FOLLOWING MATERIALS, BE AWARE OF ALL HANDLING, STORAGE, AND DISPOSAL PRECAUTIONS RECOMMENDED BY THE MANUFACTURER OR SUPPLIER. FAILURE TO COMPLY WITH THE RECOMMENDATIONS MAY RESULT IN SERIOUS INJURY, PHYSICAL DISORDER, OR DEATH.

Material	Description/Specification	Source
EnSolv™	Vapor degreasing solvent	Enviro Tech International, P.O. Box 5052, Alameda, CA

Table 6002 - Repair Materials

Material	Description/Specification	Source
Marking ink	Markem 7132 white	Markem Corp. Keene, NH
Chemical film, dichromate	For magnesium, MIL-M-3171, type III **FLAMMABLE AND TOXIC.** Read the **WARNING** before using this material. Refer to the Material Safety Data Sheet for additional safety information	Commercially available
Electrical Resin	3M Electrical Resin #10 Read the **WARNING** before using this material. Refer to the applicable Material Safety Data Sheet for additional safety information	3M Electrical Specialties Div. Austin, TX
Epoxy, Two Part Adhesive (used for bearing sensor repair)	Eccobond® 286 Parts A/B	Ellsworth Adhesives P.O. Box 1002 W129 N10825 Washington Drive Germantown, WI 53022-8202 Ph: 1-800-888-0698 FAX: 1-262-253-8619 www.ellsworth.com (V0PYJ1)
Epoxy Primer, BMS 10-11	Epoxy Primer, BMS 10-11 Primer Base: 515-K011 Curing Solution: 910-012 Thinner: 020x411 (As required) (Mix the primer base and curing solution in equal proportions)	PRC-Desoto, Inc. 6022 Corporate Way Indianapolis, IN 46278 Ph: (317) 290-1600 FAX: (317) 290-1300 www.ppg.com/prc-desoto/main.asp (V0LZE0)
Isopropyl alcohol	TT-I-735, Grade A FLAMMABLE. Read the **WARNING** before using this material. Refer to the Material Safety Data Sheet for additional safety information.	Commercially available
Sandpaper	400/600 grit	Commercially available
Reducer (Thinner)	Conap S-8	CONAP Inc. Olean, N.Y. 14760 Ph: 716-376-7817 www.conap.com

Table 6002 - Repair Materials (Continued)

Material	Description/Specification	Source
Solder	ANSI/IPC J-STD-001, Type sn63pb37 or sn63pb40 (used for the stator and housing assembly) and sn95sb5 (used for the rotor assembly)	Commercially available
Solder Wick	Not applicable	Commercially available
Zinc Chromate Primer	TT-P-1757, Composition G, Color Yellow	Commercially available
Wire, Lead	MIL-W-16878E/6, 24 AWG, White	Commercially available
Wire, Lead	MIL-W-16878E/6, 24 AWG, Black with white stripe	Commercially available
Wire, Lead	MIL-W-22759/1, 22 AWG, White	Commercially available
Tape, H-film, silicone adhesive (Kapton)	Polyimide film, pressure sensitive thermosetting silicone adhesive film backing, 0.003 ± 0.001 inch (0,08 ± 0,03 mm) thick	Commercially available
Sleeving, heat shrinkable	Sleeving, heat shrinkable, polyvinylidene fluoride, size as required, as supplied ID minimum.	Commercially available

Table 6002 - Repair Materials (Continued)

Table 6003 lists the materials required to apply RTV 3140 Silicone Sealant to printed wiring boards.

WARNING: **BEFORE USING ANY OF THE FOLLOWING MATERIALS, BE AWARE OF ALL HANDLING, STORAGE, AND DISPOSAL PRECAUTIONS RECOMMENDED BY THE MANUFACTURER OR SUPPLIER. FAILURE TO COMPLY WITH THE RECOMMENDATIONS MAY RESULT IN SERIOUS INJURY, PHYSICAL DISORDER, OR DEATH.**

Material	Description/Specification	Source
Clay	Permoplast	American Art Clay Co. 6060 Guion Road Indianapolis, IN 46254-1222 www.amaco.com (V01795)

Table 6003 - Repair Materials for Printed Wiring Board Silicone Sealant

Material	Description/Specification	Source
Coating, Acrylic	HumiSeal type 1B31, MIL-I-46058 *used to re-coat the I.D. Plate surface.	Chase Corp., HumiSeal Div. P.O. Box 770445 Woodside, NY 11377 Ph: 1-718-932-0800 Fax: 1-718-932-4345 www.humiseal.com (V0SR97)
Isopropyl Alcohol	TT-I-735, Grade A FLAMMABLE. Read the **WARNING** before using this material. Refer to the Material Safety Data Sheet for additional safety information.	Commercially available
Glass Pipette Dropper	70 mm length 1 ml increments	VWR Scientific Products Corporation 1310 Goshen Parkway West Chester, PA 19380 USA Ph: 800-932-5000 www.vwrsp.com (V0UA56)
Glass Stirring Rod	KIMAX glass or equivalent 125 mm length x 4 mm dia.	
Magnifying Glass	10x magnification	
Insulation, Sleeving, Fiberglass	Varglas A397 Acrylic Sleeving Size #14, #17 and #9 MIL-I-3190/3	Varflex Corporation Rome, NY 13440 Ph: 315-336-4400 www.varflex.com (V79074)
Silicone Sealant	RTV 3140	Dow Corning 3835 Copley Rd. Copley, OH 44321 www.dowcorning.com (V71984)
Thinner	OS-20	Dow Corning 3835 Copley Rd. Copley, OH 44321 www.dowcorning.com (V71984)
Vacuum Chamber	Pressure: 24.89 Torr/0.98 inch (25,0 mm) mercury Size: As Needed Pump: As Needed	Commercially Available

Table 6003 - Repair Materials for Printed Wiring Board Silicone Sealant (Continued)

4. Surface Repair

Repair corroded or damaged surfaces of parts that have qualified for repair according to the CHECK section inspection guidelines.

Remove corrosion, sharp edges, burrs, nicks, or scratches from cast surfaces, machined mating surfaces, and sealing surfaces using an india stone or sandpaper. Remove only the sharp edges or burrs that are above the surface of the part.

Remove minor raised edges, burrs, nicks, or scratches on any polished or load-bearing surface. Remove only the material that extends above the polished surface and make sure that the dimensional tolerances are within limits listed.

5. Thread Repair

A. Repair damaged threads as needed.

CAUTION: DO NOT USE A THREAD CUTTING DIE. UNREPAIRABLE DAMAGE CAN RESULT FROM USING A THREAD CUTTING DIE. THIS DOES NOT APPLY TO ALUMINUM RESISTOR THREADS, THE RESISTOR MUST BE REPLACED IF THREADS ARE DAMAGED.

(1) Repair damaged threads with a thread chaser.

(2) Remove any remaining sharp edges or burrs with an india stone.

(3) Apply a light coating of machine oil to repaired threads to prevent corrosion.

6. Helicoil Insert Replacement

A. Remove and replace damaged helicoil inserts as needed.

(1) Remove the damaged helicoil insert with a helicoil insertion/removal tool.

WARNING: KEEP ZINC CHROMATE PRIMER AWAY FROM SOURCES OF HEAT, SPARKS AND FLAME. ZINC CHROMATE PRIMER IS FLAMMABLE.

WARNING: DO NOT GET ZINC CHROMATE PRIMER ON YOUR SKIN AND DO NOT BREATHE THE FUMES. ZINC CHROMATE PRIMER IS A POISONOUS MATERIAL.

(2) Apply a thin coat of zinc chromate primer to the outer surface of the replacement helicoil insert.

(3) Install the helicoil insert to a depth of 0.02 to 0.04 inch (0.5 to 1.0 mm) below the part surface while the primer is still wet.

(4) Break off the helicoil installation tang.

7. Restoring Surface Coatings of Parts and Assemblies

Remove the surface coatings of parts and assemblies that have been damaged using plastic blasting equipment and procedures in accordance with (IAW) SPD 1003.

NOTE: Follow the quality assurance guidelines listed in SPD 1003 for the use of plastic media blasting equipment.

Restore the surface coatings of parts and assemblies according to the procedures in Safran Power SPD 1002.

8. Restoring Surface Coatings of Housing or Mounting Adapter

NOTE: The following repair applies to corrosion found near the mounting flange surfaces of the housing (10004-145) or mounting adapter (10001-25).

A. Restoration Procedure

(1) If any additional corrosion has been found during inspection, gently remove all corrosion using Scotch-Brite™.

(2) Clean surfaces A, B, and C (See Figure 5002 and Figure 5012) thoroughly in accordance with (IAW) Section 3.2.1 of AMS-M-3171. Allow to air dry completely.

(3) Apply dichromate chemical film to surfaces A, B, and C IAW AMS-M-3171, Type III and instructions on product container. Allow to air dry completely.

B. Inspecting the Restoration

(1) Check dichromate chemical film IAW AMS-M-3171, Type III and instructions on product container.

(2) Reapply as required.

9. Bearing Sensor(s) Repair

A. Restoration of Surface Coating

(1) If the epoxy primer coating on the ID is damaged, the sensor may be repaired by coating the I.D. with epoxy primer using spray or brush. The coating thickness must be 0.0005 to 0.002 inch (0,013 to 0,05 mm).

B. Repair of Sensor Leads

Model 30086-011 only;

(1) Select a location on the lead for the splice. Choose a location that will not be subjected to sharp bends and can easily be insulated and sleeved.

CAUTION: THE LEAD WIRES MUST BE STRIPPED USING A THERMAL STRIPPER. DO NOT USE MECHANICAL STRIPPER.

(2) Cut the damaged lead and strip approximately 1/4 inch (6,4 mm) of the lead insulation using a thermal stripper.

(3) The new lead wire must have the same coloring as the original lead wire. Leave sufficient length for assembly. Strip approximately 1/4 inch (6,4 mm) of the lead insulation using a thermal stripper.

(4) Solder the new lead wire to the bearing sensor lead using a side-by-side splice with a minimum lap length of 0.140 inch (3,56 mm), using solder alloy per J-STD-006, Type Sn95Sb5, in accordance with IPC-7711A (Sec. 8.1.4).

(5) Tape the solder joint with Kapton tape. Use a half lap pattern and continue the tape a minimum of 3/8 inch (9,5 mm) on each side of the soldered splice.

(6) Sleeve the repaired lead with the correct sized polyvinylidene fluoride heat shrink sleeving.

C. Repair of Sensor Leads with Exposed Wire Strands at Potting Area

NOTE: This repair is only to be used to repair bearing failure sensors with exposed stranded wire in the area where the lead wires exit the epoxy potting.

(1) Slide back all fiberglass sleeving enough to allow for the completion of this repair.

WARNING: ISOPROPYL ALCOHOL IS FLAMMABLE; DO NOT USE NEAR OPEN FLAMES, WELDING AREAS, OR ON HOT SURFACES. INHALATION OF VAPORS CAN CAUSE DROWSINESS, DIZZINESS, AND HEADACHE. CONTACT WITH SKIN CAN CAUSE IRRITATION. USE IN A WELL-VENTILATED AREA.

(2) Clean the area to be re-coated with epoxy using isopropyl alcohol.

NOTE: Pay special attention to the area directly around the two lead wires.

WARNING: WHEN YOU USE COMPRESSED AIR, ADJUST THE PRESSURE TO 29 PSI (200 KPA) MAXIMUM. PUT ON EYE PROTECTION TO PREVENT INJURY.

(3) Allow to air dry or accelerate drying by blowing on the area with compressed air, 29 PSIG (200 kPa) maximum.

(4) Rough up the surfaces of the existing epoxy and the ceramic area on the bearing failure sensor directly around the epoxy with a Scotch Brite® or similar pad.

NOTE: Use care to avoid removing ceramic material.

(5) Mix the two part epoxy by weight, 100 parts of Eccobond® 286 Part A and 180 parts of Eccobond® 286 Part B in a clean container.

(6) If the existing epoxy has exposed the leads within the slot, press the leads into the slot so they are as far below the face of the sensor as possible to allow for maximum coverage with the repair epoxy.

(7) Apply the mixed epoxy around the leads as they exit the original epoxy and blend the new epoxy down over the original epoxy.

NOTE: Make sure the epoxy completely covers each of the leads, and is at a a height of 0.100 to 0.130 inch (2,5 to 3,3 mm) above the O.D. and a minimum of 0.03 inch (0,76 mm) above the front face of the bearing failure sensor.

(8) Allow the two part epoxy to air cure for a minimum of 24 hours.

CAUTION: AVOID TOUCHING THE SLEEVING ON THE LEADS AND DO NOT REMOVE CERAMIC MATERIAL FROM THE FACE OR O.D. OF THE SENSOR.

(9) If required, use a small file and shape the epoxy to meet the dimensional requirements shown in Figure 6001.

(10) Replace fiberglass sleeving.

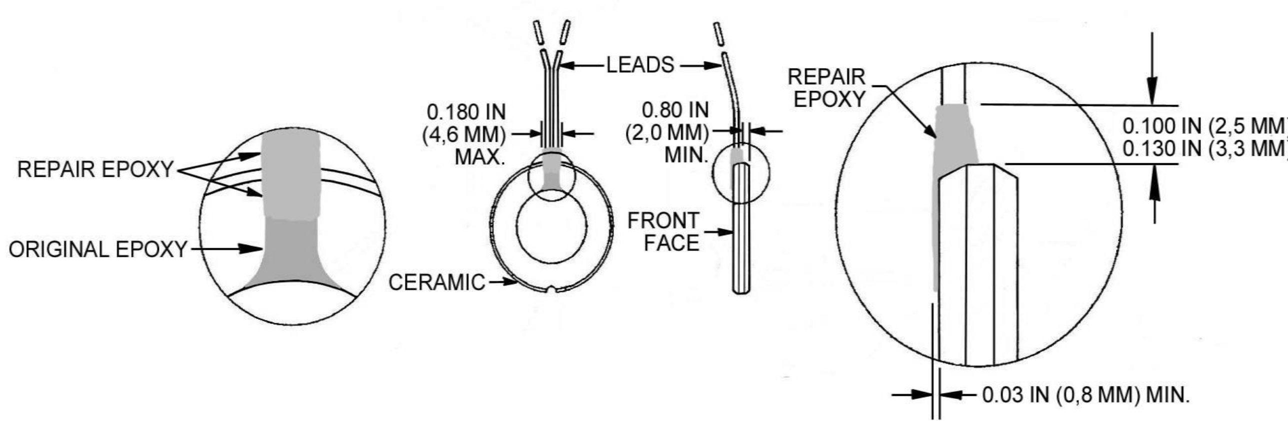


Figure 6001 - Repair of Exposed Lead Wires

10. Bearing Liner and Journal Restoration

See the following paragraphs for repair instructions for bearing liners and bearing journals.

A. Anti-Drive End Bearing Support Assembly

(1) Should the anti-drive end bearing support bearing liner or rotor journals wear beyond the limits given in the FITS AND CLEARANCES section, worn diameters may be repaired by electro deposition plating in accordance with Safran Power Standard Practice Document (SPD) 1000.

(2) After plating, the anti-drive end main bearing and auxiliary bearing liner diameters must be ground to within the dimensions listed in Figure 6002.

(3) Liquid penetrant inspect all anti-drive end bearing support assemblies that have undergone the plating/grinding process in accordance with (IAW) ASTM-E-1417. The acceptance criteria must be IAW MIL-STD-1907, Table II, grade C.

(4) Replacement of the bearing liner is not permitted. If replacement is necessary, replace the bearing support assembly with a new replacement bearing support assembly. Return the replaced bearing support assembly to Safran Power, Repair and Overhaul for examination and possible repair.

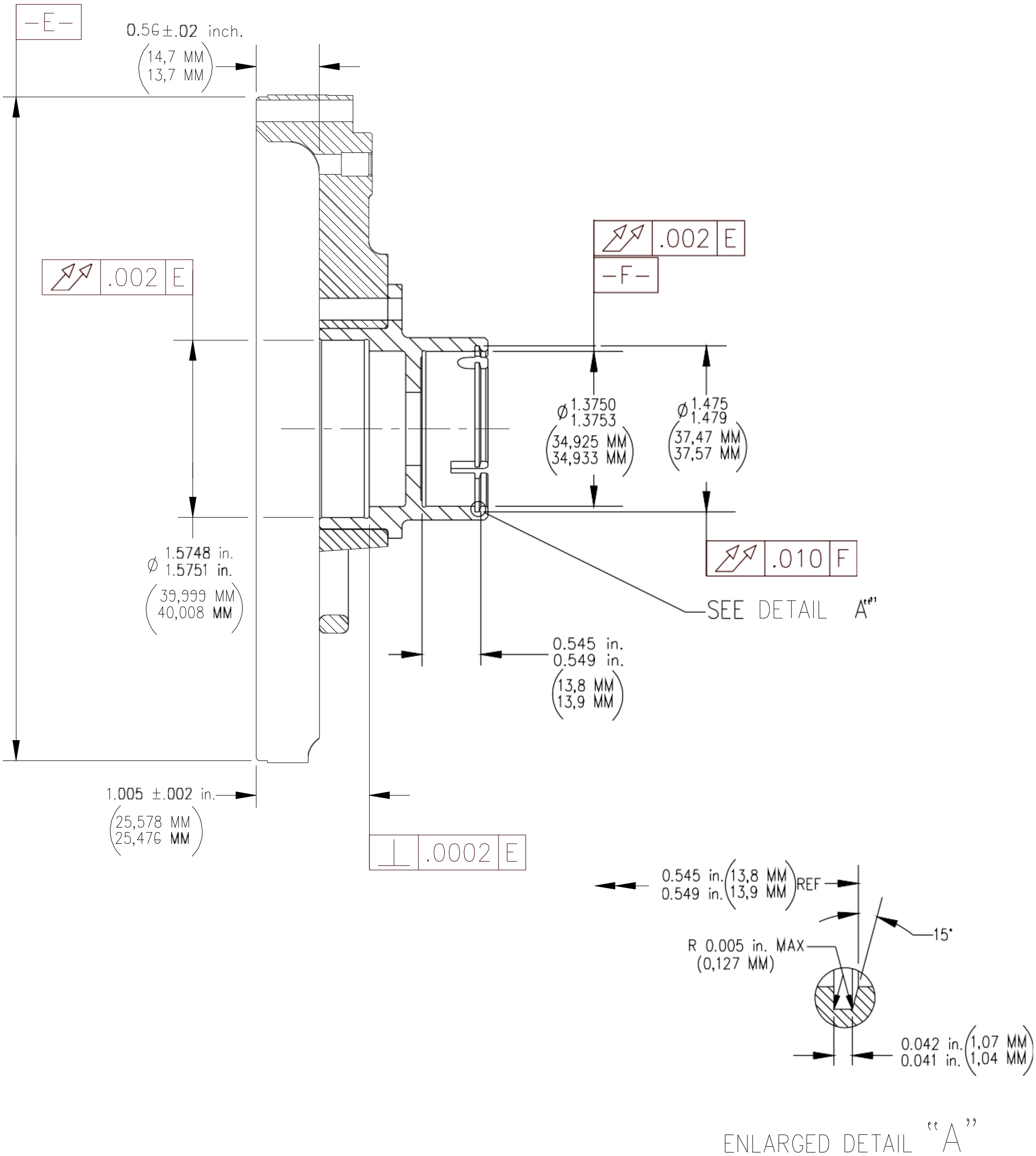


Figure 6002 - Anti-Drive End Bearing Liner Machining Requirements

B. Drive End Bearing Support Assembly

CAUTION: BEARING LINERS, P/N'S 30081-2030 AND 30081-2031, ARE NOT REPAIRABLE BY THE INSTRUCTIONS IN SAFRAN POWER SPD 1000. IF A LINER IS DEFECTIVE, IT MUST BE REPLACED.

(1) The following criteria must be used to determine which bearing liner is installed in the drive end bearing support. It is mandatory that the soft bearing liner (P/N 30081-2030) be replaced with the hard bearing liner (P/N 30081-2031).

(a) The generator must be disassembled to the extent necessary to remove the drive end bearing support.

(b) The part marking must be found on the drive end bearing support. If the part marking is not legible or cannot be located, visually inspect the finish on the ends of the installed bearing liner. The finish on the ends of the hard bearing liner is black oxide and is visible to the eye. The soft bearing liner has cadmium plating which may or may not be visible to the eye. The cadmium plating may appear to be a yellow or clear finish.

(c) If the unit was delivered with the P/N 30081-2021 drive end bearing support and the bearing liner is damaged; or, if the unit is returned from service after the initial bearing liner replacement and the bearing liner is damaged, the only acceptable repair of the drive end bearing support is to press out the damaged bearing liner and replace it with a new hard bearing liner.

(2) Special tools, fixtures, and equipment

A drive end bearing liner removal fixture (Figure 9024) and drive end bearing liner installation fixture (Figure 9025) are needed for this repair procedure.

(3) Remove the bearing liner from the drive end bearing support (see Figure 6003).

(a) Heat the drive end bearing support to 325° to 375° F (164° to 190° C) for no more than 2 hours.

(b) Put the base of drive end bearing liner removal fixture onto the arbor press table.

WARNING: USE EXTREME CAUTION WHEN HANDLING HOT PARTS. USE THE APPROPRIATE SAFETY AND HANDLING EQUIPMENT WHEN HANDLING HOT PARTS. CONTACT BETWEEN EXPOSED SKIN AND HOT PARTS CAN CAUSE SEVERE BURNING.

(c) Remove the drive end bearing support from the oven and, while still hot, put the drive end bearing support onto base of the drive end bearing liner removal fixture.

(d) Insert the drive end bearing liner driver into the bearing liner.

(e) Press the bearing liner out of the anti-drive end bearing support in the direction of the arrow in Figure 6003. Discard the bearing liner.

(f) Allow the drive end bearing support to cool to room temperature.

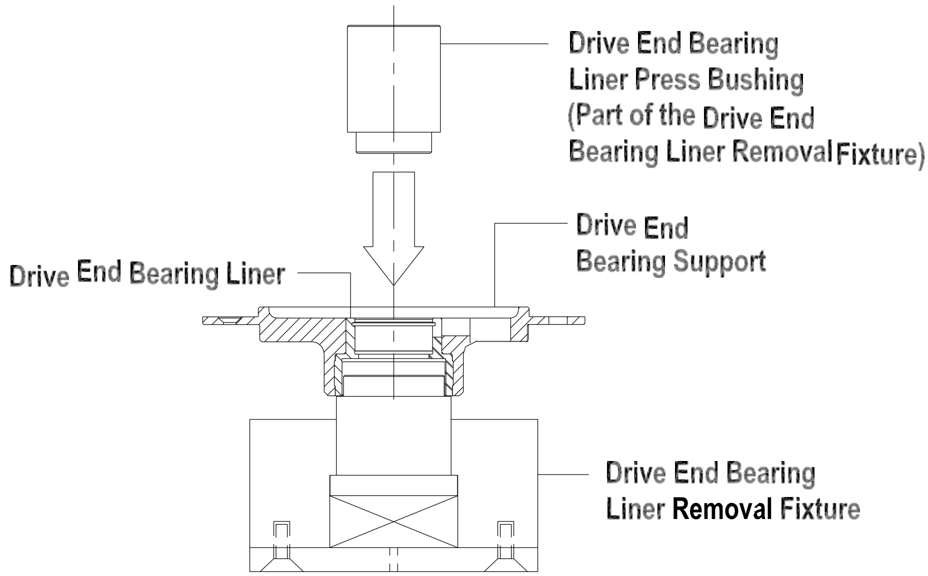


Figure 6003 - Removing the Drive End Bearing Liner

(4) Install a new bearing liner into the drive end bearing support (see Figure 6004).

(a) Heat the drive end bearing support to 325° to 375° F (164° to 190° C) for no more than 2 hours.

<u>WARNING:</u> KEEP ZINC CHROMATE PRIMER AWAY FROM SOURCES OF HEAT, SPARKS AND FLAME. ZINC CHROMATE PRIMER IS FLAMMABLE.

<u>WARNING:</u> DO NOT GET ZINC CHROMATE PRIMER ON YOUR SKIN AND DO NOT BREATHE THE FUMES. ZINC CHROMATE PRIMER IS A POISONOUS MATERIAL.

(b) Coat the drive end bearing liner with zinc chromate primer. Install the bearing liner into the bearing support while the zinc chromate primer is still wet.

(c) Put the drive end bearing liner installation fixture onto the table of an arbor press.

WARNING: WEAR INSULATED GLOVES AND OBSERVE ALL SAFETY PRECAUTIONS WHEN HANDLING HEATED OR CHILLED PARTS TO AVOID PERSONAL INJURY.

(d) Remove the drive end bearing support from the oven and, while still hot, put the support onto the base of the drive end bearing liner installation fixture. When properly installed on the fixture, an alignment pin will line up with the hole in the drive end bearing support that is on the same centerline as the slot in the drive end bearing support.

(e) Insert the drive end bearing liner driver into the bearing liner.

(f) Put the drive end bearing liner into the drive end bearing support bearing bore. Make sure to align the centerline of the slot in the drive end bearing liner with the slot in the drive end bearing support.

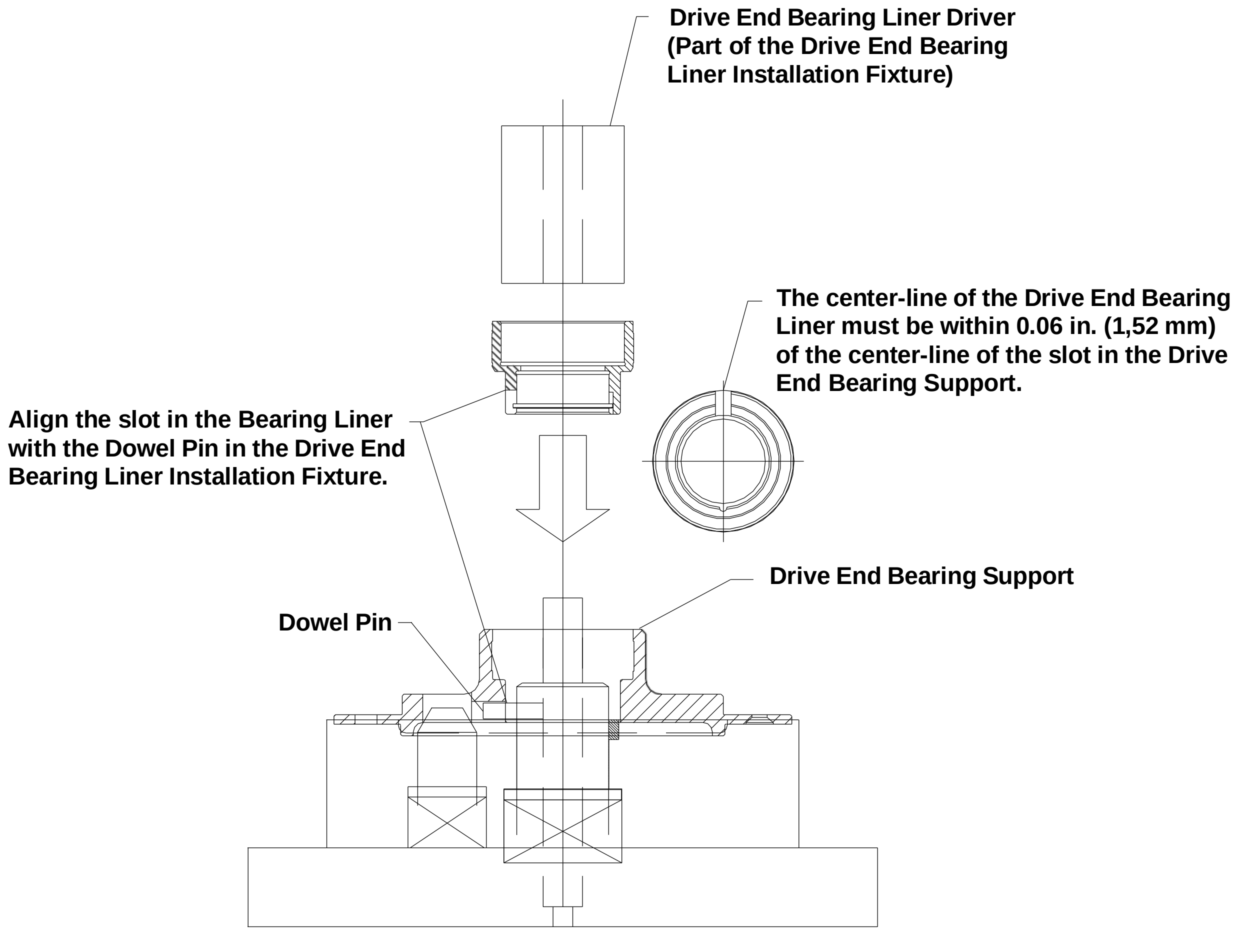


Figure 6004 - Installing the Drive End Bearing Liner

(g) Press the drive bearing liner into the drive end bearing support bore.

(h) Allow the drive end bearing support to cool to room temperature.

(i) Perform a liquid penetrant inspection on the anti-drive end bearing support per ASTM-E-1417. The acceptance criteria must be per MIL-STD-1907, table II, grade C.

(5) Machine the drive end bearing liner (see Figure 6005).

(a) Chuck on the 4.078/4.080 diameter against face -B-.

(b) Indicate the 4.121/4.123 diameter to as close to true as possible

(c) Grind the 1.1811/1.1814 diameter according to Figure 6005.

(d) Locate in the 1.1811/1.1814 diameter.

(e) Indicate the 4.078/4.080 diameter to insure concentricity within 0.001 inch.

NOTE: THE CENTER-LINE OF THE SLOT IN THE BEARING LINER MUST BE WITHIN 0.06 INCH OF THE CENTER-LINE OF SLOT IN THE DRIVE END BEARING SUPPORT.

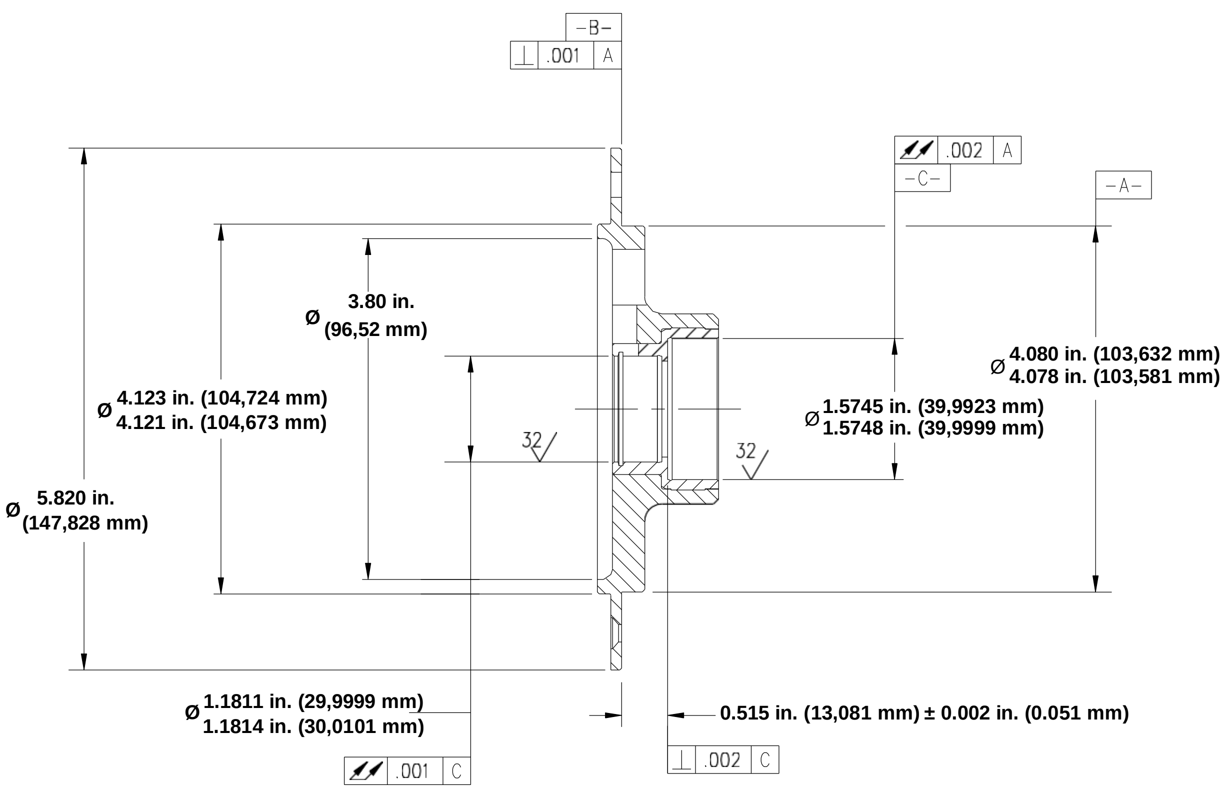


Figure 6005 - Machining and Inspecting the Drive End Bearing Liner

(f) Grind the 1.5745/1.5748 inner liner diameter to a depth of 0.563/0.570 inch according to Figure 6005.

(g) Remove all visible burrs from the machined surfaces

(h) Inspect the drive end bearing support for compliance with the dimensions in Figure 6005.

(6) Apply a touchup coat of dichromate chemical film IAW MIL-M-3171, Type III to all machined surfaces of the anti-drive end end bell.

(7) Re-identify the drive end end bell assembly (if necessary - see Paragraph 10.B.(1) in this section).

(a) If present, remove the original part number from the drive end end bell.

(b) Using an ink stamp tool and Markem 7132 white ink, apply P/N (30081-2021).

C. Rotor Assembly

If bearing journals are worn beyond the limits listed in the FITS AND CLEARANCES section, restoration may be possible. See Safran Power Standard Practice Document (SPD) 1000 for repair limitations and procedures for nickel plating.

11. Balancing the Rotor Assembly

Clean up the rotor shaft centers with a steel wire brush to ensure proper centering of the rotor assembly on the machine setup.

A. Use the following procedure to achieve proper rotor assembly balance.

(1) Set up a vertical mill with a 0.25 inch (6,4 mm) diameter end mill to remove material from the rotor assembly retaining bands.

(2) Install the rotor assembly onto the vertical mill machine.

(3) Make mill cuts in the drive end ring of the main field rotor and outer end band of the exciter rotor assembly to achieve proper balance. Existing cuts may be extended, or new cuts may be added in line with existing cuts. See Figure 6006 for mill cut specifications.

(4) Heat the rotor assembly in an oven to 175° to 225° F (80° to 110° C) for 1 hour minimum.

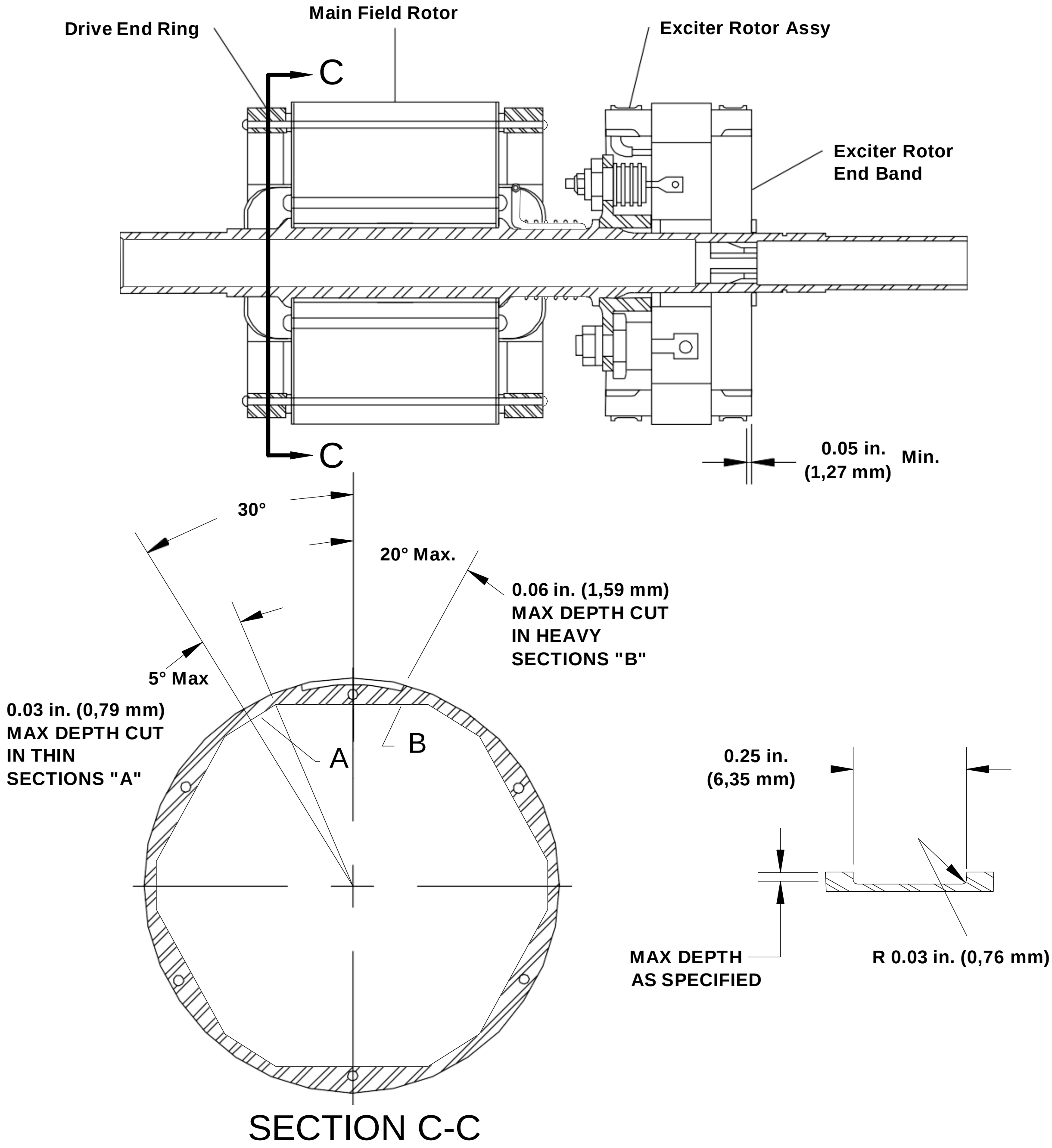


Figure 6006 - Balancing the Rotor Assembly

WARNING: USE EXTREME CAUTION WHEN HANDLING HOT PARTS. USE THE APPROPRIATE SAFETY AND HANDLING EQUIPMENT WHEN HANDLING HOT PARTS. CONTACT BETWEEN EXPOSED SKIN AND HOT PARTS CAN CAUSE SEVERE BURNING.

(5) While the rotor assembly is still hot, overspeed the rotor assembly for 5 minutes at 15,000 RPM. Check the rotor assembly balance. Re-balance if required.

B. Replace the rotor assembly if specifications listed in FITS AND CLEARANCES cannot be achieved.

C. Notes (see Figure 6006)

(1) Balance each end of the rotor to 5 grain-inches (8.2 gram-mm) or less, measured at the bearing journals. Remove material from one or more of the four retaining bands of the main field rotor or the exciter rotor assembly.

(2) Balance the drive end by removing material from the drive end ring with a 0.25 inch (6.4 mm) diameter end mill x 0.06 inch (1.5 mm) maximum depth.

(3) Balance the anti-drive end by removing material from the exciter rotor end band with a 0.25 inch (6.4 mm) diameter end mill x 0.03 inch (0.8 mm) maximum depth.

12. Replacing Faulty Printed Wiring Board Components

The use of parts, materials, or processes not authorized by Safran Power for the maintenance or service of these units may affect their continued flight worthiness or invalidate certification.

The repair of printed wiring board assemblies by anyone other than experienced personnel is not recommended. Unless a malfunction can be localized to a particular component, the entire assembly should be replaced to correct a fault.

Use low wattage temperature [40 W, 700° F (370° C) maximum idling temperature, 550° F (288° C) maximum working temperature] soldering and unsoldering tools.

To avoid heat damage, unsolder a joint within 3 seconds and solder a joint within 2 seconds.

Excessive pressure from a soldering or unsoldering tool can delaminate the circuit pads or runs. Use a light touch when using these devices.

A. Materials

(1) Solder:

CAUTION: USE ONLY RESIN-CORED SOLDER THAT CONFORMS TO FED. SPEC. ANSI/J-STD-006 AND HAS A COMPOSITION OF SN60 TO SN63. USE RESIN SOLDER FLUX WITH AN ALCOHOL BASE. DO NOT USE AN ACID-BASE SOLDER OR SOLDER FLUX TO INSTALL ELECTRICAL COMPONENTS.

(2) Soldering Flux:

(a) Flux must conform to the requirements of type RMA of ANSI/J-STD-006, or type RMA or type R of MIL-F-14256 unless otherwise specified.

(3) Cleaning and flux removal solvents:

(a) EnSolv and isopropyl alcohol must conform to the applicable documents listed in Table 6002.

B. Component Soldering and Unsoldering

(1) Identify the component by its reference designation and note its polarity (if applicable) and pin orientation before removing or replacing a component from printed wiring board.

(2) Refer to ANSI/IPC J-STD-001 for soldering and unsoldering specifications.

C. Bonded Components

Some components require secure support to the printed wiring board. Such components are secured to the printed wiring board with electrical resin.

(1) Remove the rubber-like bonding material from along the edges of the component by carefully grasping and removing pieces of the material with tweezers and a small knife. Make sure to use care to ensure that adjacent components or printed circuit conductors are not damaged during the removal process.

(2) Component replacement (see Figure 6007)

NOTE: The repaired areas of the printed wiring board assembly must be coated with conformal coating prior to the application of the electrical resin.

(a) Surfaces to be bonded must be clean and free from oil, grease, and other contaminants. All solvent must be completely evaporated before applying the electrical resin.

(b) Prime surfaces:

WARNING: **ELECTRICAL RESIN CAUSES EYE IRRITATION. ELECTRICAL RESIN MAY CAUSE SKIN AND RESPIRATORY SYSTEM IRRITATION. ELECTRICAL RESIN MAY CAUSE RESPIRATORY SENSITIZATION. ELECTRICAL RESIN MAY BE ABSORBED THROUGH THE SKIN. KEEP ELECTRICAL RESIN AWAY FROM EYES, SKIN, AND CLOTHING. WEAR PROTECTIVE GOGGLES AND IMPERVIOUS GLOVES. USE ELECTRICAL RESIN IN A WELL VENTILATED AREA. DURING MIXING AND CURING, ADDITIONAL VENTILATION MAY BE REQUIRED.**

1 Apply a thin coat of electrical resin to the surfaces to be bonded. Allow the electrical resin to dry for 30 to 45 minutes at room temperature before handling.

2 Coat the inner-facing surface of the component with electrical resin. The resin will bond only with contact pressure. See Figure 6007.

3 Place the component onto the printed wiring board in the correct location and orientation. Gently apply pressure to bond the component to the printed wiring board.

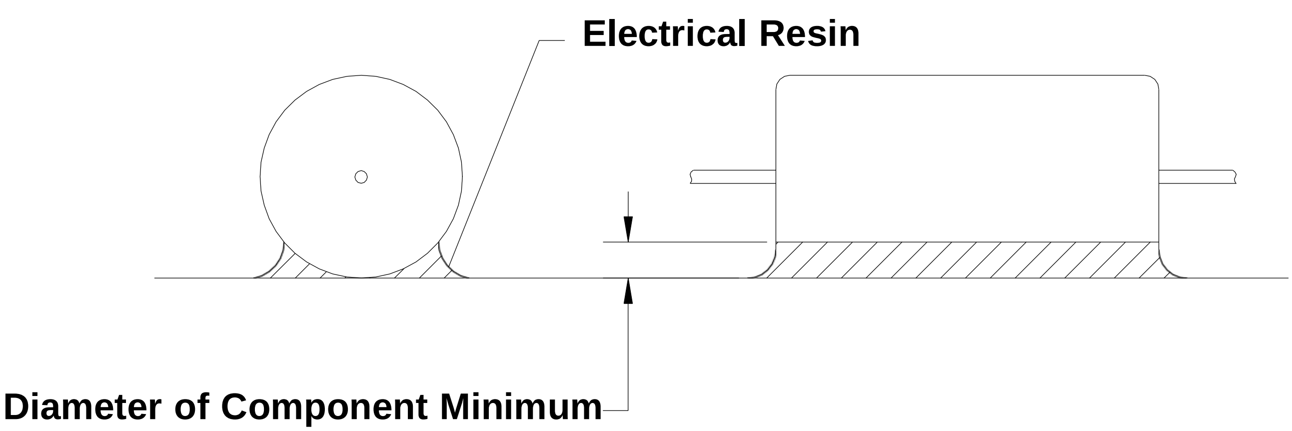


Figure 6007 - Replacement of Bonded Parts

(c) Remove excess electrical resin with a cloth moistened with EnSolv before curing.

(d) Allow the electrical resin to cure at room temperature with a minimum of 20% relative humidity for 14 hours. The electrical resin will become tack-free in approximately one hour.

13. Application and Removal of Conformal Coating (reference SB 30086-011-24-02)

Refer to Paragraph 14. for application of RTV 3140 silicone sealant.

14. Application of Conformal Coating RTV 3140 Silicone Sealant (reference SB 30086-011-24-03)

A. Disassembly and Preparation for RTV 3140 Silicone Sealant Application

CAUTION: DO NOT PULL ON OR STRAIN THE WIRES ATTACHED TO THE PRINTED WIRING BOARD. TOO MUCH FORCE CAN CAUSE THE WIRES TO BREAK AT THE SOLDER CONNECTION. WIRES THAT GET BROKEN MUST BE SOLDERED ACCORDING TO ANSI/IPC J-STD-001 BY A CERTIFIED PERSON IN AN AUTHORIZED REPAIR FACILITY.

(1) Disassemble the DC Generator to the extent necessary to access the PWB in filter and connector mounting cover as given in the DISASSEMBLY section.

(2) If the PWB P/N 30086-350 is defective, replace with new P/N 30086-350A as given in the DISASSEMBLY and ASSEMBLY sections.

NOTE: Do not re-attach the filter and connector mounting cover until the RTV 3140 silicone sealant is applied. See Figure 6008.

(3) Put the generator on a wooden cradle.

WARNING: ISOPROPYL ALCOHOL IS TOXIC AND FLAMMABLE; DO NOT USE NEAR OPEN FLAMES, WELDING AREAS, OR ON HOT SURFACES. INHALATION OF VAPORS CAN CAUSE DROWSINESS, DIZZINESS, AND HEADACHE. CONTACT WITH SKIN CAN CAUSE IRRITATION. USE IN A WELL-VENTILATED AREA.

(4) Clean the filter and connector mounting cover and internal components.

(5) Use isopropyl alcohol with a soft bristle brush to remove oily film from all electrical components.

NOTE: A spray mist application is acceptable if immediately followed by wiping and drying.

WARNING: COMPRESSED AIR USED FOR CLEANING MUST BE FREE OF OIL AND WATER. COMPRESSED AIR USED FOR CLEANING CAN CREATE AIRBORNE PARTICLES THAT CAN ENTER THE EYES. PRESSURE MUST NOT BE MORE THAN 30 PSIG (207 kPa). EYE PROTECTION IS REQUIRED.

(6) Dry fully with compressed air to let the RTV 3140 silicone sealant bond to all surfaces.

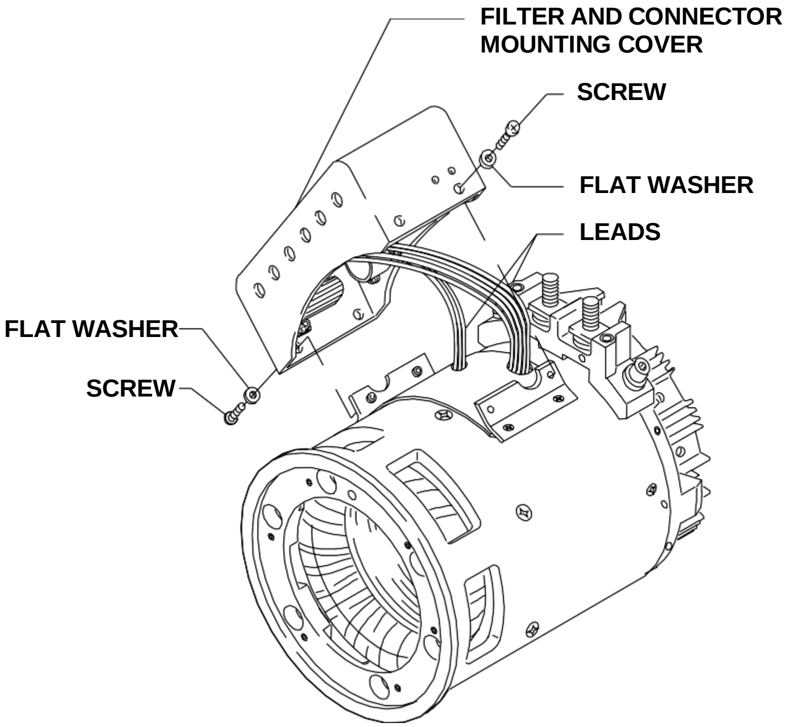


Figure 6008 - Removal of the Filter and Connector Mounting Cover

(7) Fully check the filter and connector mounting cover circuits and components according to CHECK section.

(8) Check the wires that attach to the PWB for loose, broken or shorted terminations.

(9) If damage is found, repair the wire connections as given in the REPAIR section. Replace insulation sleeving with MIL-I-3190/3 listed in the assembly materials.

(10) Install a cap on the outside of the connector plug to keep unwanted RTV 3140 silicone sealant out.

(11) When the filter and connector mounting cover is clean and fully dry, apply permoplast clay on the outside of the filter and connector mounting cover to seal all drain holes, but not the mounting holes.

NOTE: Use a hard backing support on the inside of the enclosure to stop the permoplast clay from extending inside of the hole or onto the PWB.

(12) Put the filter and connector mounting cover in a position where the main opening is facing up. See Figure 6009 for top view of filter and connector mounting cover.

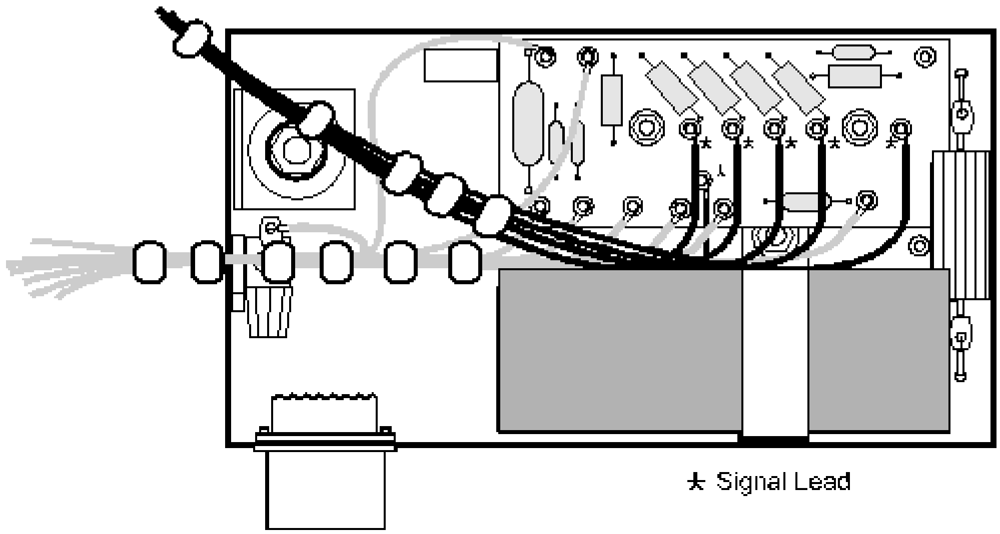


Figure 6009 - Top View of Filter and Connector Mounting Cover

B. Preparation of RTV 3140 Silicone Sealant

WARNING: **PERFORM THIS PROCEDURE IN A WELL VENTILATED AREA. WHEN EXPOSED TO WATER OR HUMID AIR, FUMES WILL BE CAUSED CONTAINING FLAMMABLE METHYL ALCOHOL. AVOID BREATHING VAPORS.**

WARNING: **USE PROPER EYE AND HAND PROTECTION. SAFETY GLASSES AS A MINIMUM.**

WARNING: **KEEP THE THINNER AWAY FROM HEAT, SPARKS AND FLAMES. STATIC ELECTRICITY CAN ACCUMULATE AND CAN IGNITE VAPORS.**

(1) Thin the RTV 3140 silicone sealant for use by adding OS-20 thinner as follows:

NOTE: Use Table 6004 for the thinning ratio mix.

NOTE: Prepare the mixture in a clean container.

(a) Pour required amount of RTV 3140 silicone sealant into the clean container.

(b) Pour required amount of OS-20 thinner into the container.

(c) Fully mix the 3140 RTV silicone sealant and OS-20 thinner together using a glass stirring rod or pipette.

3140 RTV (Grams)	OS-20 Thinner (Grams)	Total Weight (Grams)
40	10	50
60	15	75
100	25	125
140	35	175

Table 6004 - RTV 3140 Silicone Sealant Thinning Ratio Mix

(2) Degassing:

NOTE: This is required to remove bubbles and aeration that are injected into the mixture during the mixing of the sealant and thinner.

(a) Put the container with the silicone sealant mixture into a vacuum chamber and evacuate chamber to a pressure of 0.98 inch (25,0 mm) mercury.

(b) Keep the mixture in the vacuum chamber for a maximum of 3 minutes until the silicone sealant is free of bubbles. Then slowly release the vacuum and remove the container from the chamber.

NOTE: If some bubbles remain near the surface they can be removed by slowly stirring the top surface with a glass stirring rod or pipette.

NOTE: Apply the silicone sealant immediately after degassing before the thinner evaporates. The silicone sealant mixture will get thicker when in the open atmosphere and will become difficult to apply. The estimated maximum pot life for the mixture is 30 minutes. Cover the silicone sealant when not in use, this will help keep the potting life during transportation or periods of time when the silicone sealant is not used.

C. Application of Silicone Sealant

NOTE: For spot application of silicone sealant when wires must be removed and replaced reference Paragraph D.

WARNING: PERFORM THIS PROCEDURE IN A WELL VENTILATED AREA. WHEN EXPOSED TO WATER OR HUMID AIR, FUMES WILL BE CAUSED CONTAINING FLAMMABLE METHYL ALCOHOL. AVOID BREATHING VAPORS.

Acceptance Criteria:

- Silicone sealant mixture must completely cover the top side of the PWB as shown in Figure 6009.
- There must be no bubbles larger than the diameter of 0.04 inch (1,0 mm) or interconnected porosity that would let moisture bridge areas to cause short circuits between components.

- There must be no indication of blistering or lack of adhesion of the cured silicone sealant on the PWB when examined using a 10x magnification.

Procedure:

(1) Gradually pour a small stream of the silicone sealant over the center of the PWB from end to end. Let the sealant flow over the edges.

NOTE: Tilt the filter and connector mounting cover as necessary to let the sealant to flow to all areas.

(2) Continue to fill the filter and connector mounting cover with the sealant until the level on top of the PWB is approximately 0.250 inch (6,35 mm) thick.

NOTE: The sealant must flow to the opposite side of the PWB to fully coat the other side of the PWB.

NOTE: Make sure the terminal connections of the resistor mounted in the connector mounting cover is coated to provide corrosion protection.

(3) Pour sealant of the out filter and connector mounting cover that is too much.

(4) Let the sealant sit for 3 to 5 minutes then use a glass dropper to add sufficient silicone sealant to each of the PWB terminals and connections to fully encapsulate them.

NOTE: The final thickness of the coating on top of the PWB must be 0.04 inch (1,0 mm) minimum.

(5) Let the silicone sealant cure at ambient temperature for 12 hours prior to handling.

(6) After curing, remove the permoplast clay from the filter and connector mounting cover drain holes.

NOTE: Make sure the filter and connector mounting cover holes are not blocked internally by silicone sealant. Remove unwanted silicone sealant from blocking the drain holes if necessary.

(7) Remove the cap from the outside of the connector plug.

(8) Re-assemble DC Generator as given in ASSEMBLY section.

D. Rework of Sealant on PWB Terminals

NOTE: If the PWB has already been coated with 3140 RTV, the cured sealant can be removed from terminals so that the wires can be re-soldered. It is not necessary to fully re-coat the PWB if wires need to be replaced.

(1) Touch the terminal with a hot soldering iron, 750° F (399° C).

NOTE: This will weaken the sealant, making it easy to peel from the terminal area with the aid of a knife.

(2) Remove the wire as given in the DISASSEMBLY section of the referenced CMM.

WARNING: ISOPROPYL ALCOHOL IS TOXIC AND FLAMMABLE; DO NOT USE NEAR OPEN FLAMES, WELDING AREAS, OR ON HOT SURFACES. INHALATION OF VAPORS CAN CAUSE DROWSINESS, DIZZINESS, AND HEADACHE. CONTACT WITH SKIN CAN CAUSE IRRITATION. USE IN A WELL-VENTILATED AREA.

(3) Clean the exposed terminal and the area around it with isopropyl alcohol and a soft bristle brush.

(4) Attach the wire to the terminal as given in the REPAIR section of the referenced CMM.

WARNING: PERFORM THIS PROCEDURE IN A WELL VENTILATED AREA. WHEN EXPOSED TO WATER OR HUMID AIR, FUMES WILL BE CAUSED CONTAINING FLAMMABLE METHYL ALCOHOL. AVOID BREATHING VAPORS.

(5) After the soldered connection has cooled to room temperature, apply 3140 RTV that has been thinned per Paragraph C. Use a glass dropper to add sufficient silicone sealant to fully encapsulate the reworked area.

(6) Let the silicone sealant cure at ambient temperature for 12 hours prior to handling.

15. Repair of the Main Stator Lead(s) Using Splicing

Use the following repair procedure to splice new wire on the main stator leads connecting to the printed wiring board (PWB).

All six main stator leads wires should be lengthened if they do not already conform to Figure 7027.

A. Tools and materials required.

Exacto® knife, thermal wire strippers, soldering iron and lead wire (MIL-W-22759/1, AWG #22, WHT).

B. Removal of leads.

(1) Cut the tie cord from the main stator lead bundle as required.

(2) Cut the main stator lead to where the finished spliced bundle is located in the connector box.

NOTE: The desired area to make the cut would be an area with no sharp bends in the leads.

(a) After cutting the wire, bend back and temporarily secure the lead section connected to the main stator.

(b) Strip approximately 5/16 inch (7,9 mm) lead insulation away using thermal strippers.

NOTE: Do not use mechanical wire strippers.

(3) Use an Exacto® knife or pick tool to remove the silicone sealant from the PWB main stator terminal post to the point where the lead is soldered.

CAUTION: MAKE SURE TO NOT DAMAGE OTHER LEADS OR SILICONE SEALANT NEAR OTHER TERMINAL POSTS.

(a) Cut around PWB terminal post to where the main stator lead is soldered.

(4) Desolder the scrap section of the lead from the terminal post.

NOTE: Do all desoldering procedures per ANSI/IPC J-STD-001.

(5) Discard the scrap section of lead wire.

(6) Clean the area where the cut was made to make sure all unwanted debris is removed.

C. Splicing of leads.

(1) Prepare a new piece of lead wire (MIL-W-22759/1, AWG #22, WHT) to be spliced onto the existing section.

NOTE: The existing lead wire can be discolored from impregnation varnish.

(a) The new lead wire(s) must be put in the main stator lead bundle as shown in Figure 6010.

NOTE: The longer main stator lead wire length will give technicians more flexibility when working inside the connector box.

(b) Strip approximately 5/16 inch (7,9 mm) lead insulation away using thermal strippers on both ends of leads.

NOTE: Do not use mechanical wire strippers.

(2) Solder the new lead wire to the existing main stator lead using the side-by-side method of lap splice IAW IPC-7711A (Sec. 8.1.4).

(a) Keep a minimum lap length of 0.25 inch (6,4 mm).

(b) Use soldering alloy type Sn95Sb5.

NOTE: Do all soldering procedures per ANSI/IPC J-STD-001.

(3) Tape the soldered joint using Kapton® tape.

(a) Use a half-lap pattern to tape a minimum of 3/8 inch (9,5 mm) on each side of the soldered splice.

(4) Sleeve each of the taped and spliced leads with appropriately sized heat shrinkable sleeving.

(5) Shrink the heatshrink sleeving on each of the leads using a heatgun.

D. Wrap up.

(1) Form the repaired lead(s) into the entire main stator lead bundle as shown in Figure 6010.

(2) Using tying cord, make ties in the recommended locations securing the main stator lead bundle as shown in Figure 6010.

(3) Make solder connections to the PWB following the ASSEMBLY section.

(4) Apply RTV silicone sealant to the PWB IAW SB 30086-011-24-03.

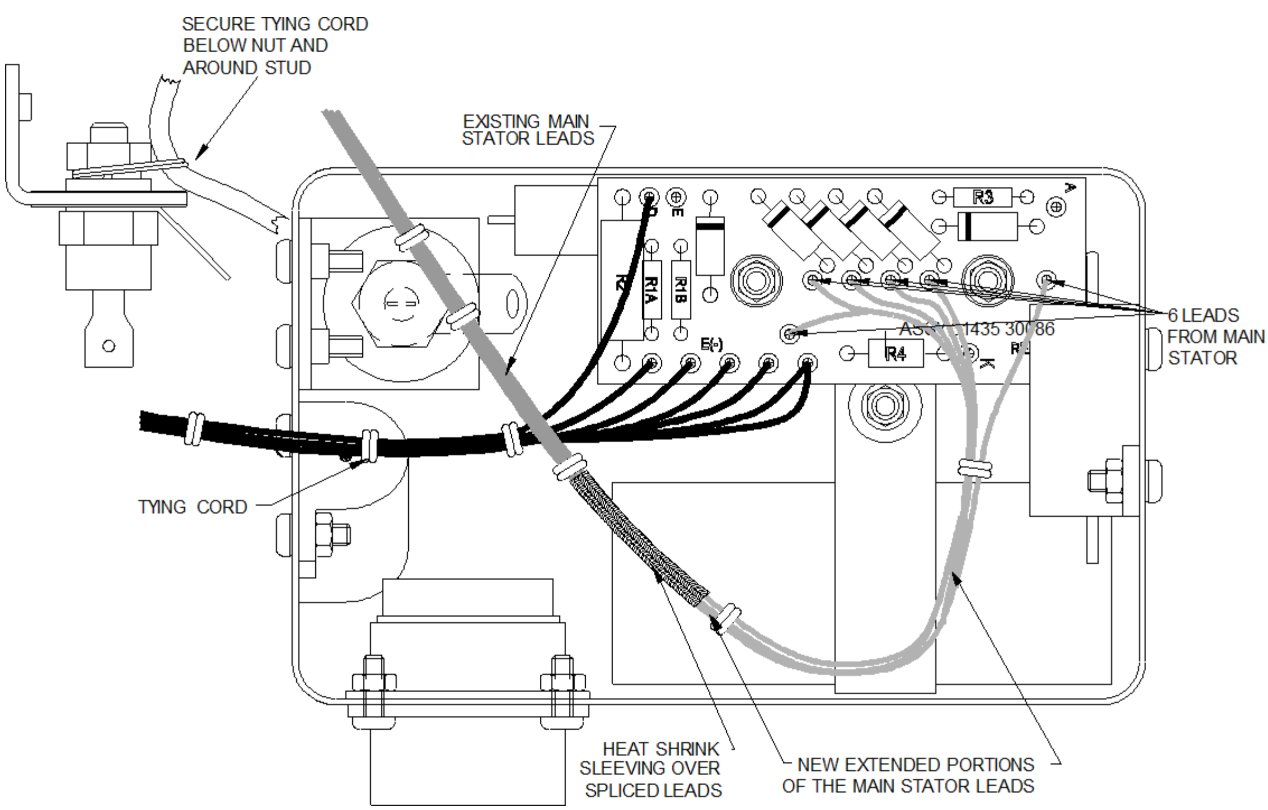


Figure 6010 - Splicing Repair of the Six Main Stator Leads Connecting to the PWB

16. Removal and Replacement of the Mounting Adapter Guide Pin (10001-26)

Use the following repair procedure to remove and replace the mounting adapter guide pin.

A. Tools

A 3/32 inch drive pin punch and a lightweight hammer are required to perform this repair procedure.

B. Procedure (see Figure 6011)

(1) Using the 3/32 inch drive pin punch and a light hammer, tap out the guide pin from the mounting adapter.

(2) Insert a new guide pin into the hole in the mounting adapter.

(3) Using the light hammer, lightly tap the guide pin into the hole.

NOTE: The finished height of the guide pin is to be 0.32 inch (8.12 mm) maximum, 0.275 inch (6,985 mm) minimum.

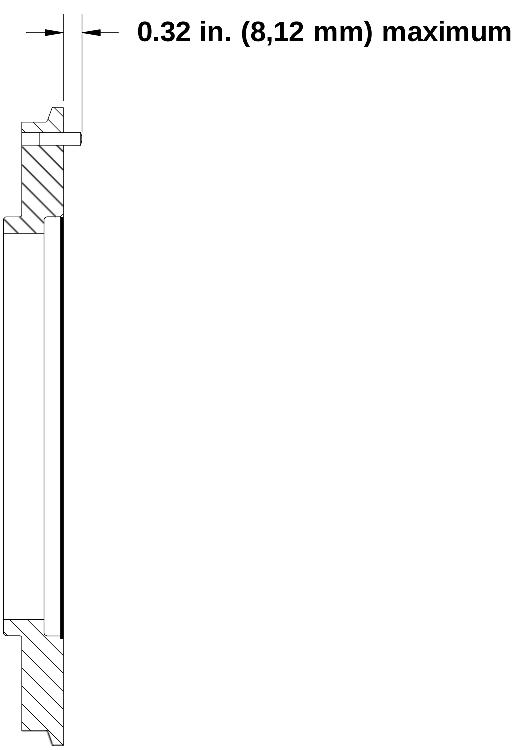


Figure 6011 - Repair of the Mounting Adapter Guide Pin

17. Repair of the current transformer (CT) and heat sink wires using splicing

Use the following repair procedure to splice the current transformer (CT) and heat sink wires.

All current transformer (CT) and heat sink wire leads wires should be lengthened if they do not already conform to Figure 7027.

A. Tools and materials required.

Exacto® knife, thermal wire strippers, soldering iron and lead wires (MIL-W-22759/1, AWG #18, BLK and AWG #22, BLK).

B. Removal of leads.

(1) Cut the tie cord from the current transformer (CT) and heat sink wire leads bundle as required.

(2) Cut the current transformer (CT) and heat sink wire leads to where the finished spliced bundle is located in the connector box.

NOTE: The desired area to make the cut would be an area with no sharp bends in the leads.

(a) After cutting the wire, bend back and temporarily secure the lead section connected to the current transformer (CT) and heat sink wires.

(b) Strip approximately 5/16 inch (7,9 mm) lead insulation away using thermal strippers.

NOTE: Do not use mechanical wire strippers.

(3) Use an Exacto® knife or pick tool to remove the RTV silicone sealant from the PWB current transformer (CT) and heat sink terminal post to the point where the leads are
soldered.

CAUTION: MAKE SURE TO NOT DAMAGE OTHER LEADS OR RTV SILICONE SEALANT NEAR OTHER TERMINAL POSTS.

(a) Cut around PWB terminal post to where the current transformer (CT) and heat sink leads are soldered.

(4) Desolder the scrap section of the leads from the terminal post.

NOTE: Do all desoldering procedures per ANSI/IPC J-STD-001.

(5) Discard the scrap section of lead wires.

(6) Clean the area where the cut was made to make sure all unwanted debris is removed.

C. Splicing of leads.

(1) Prepare a new piece of lead wires (MIL-W-22759/1, AWG #18, BLK and AWG #22, BLK) to be spliced onto the existing section.

NOTE: The existing lead wires can be discolored from impregnation varnish.

(a) The new lead wire(s) must be put in the current transformer (CT) and heat sink wire leads bundle.

NOTE: The longer current transformer (CT) and heat sink lead wires length will give technicians more flexibility when working inside the connector box.

(b) Strip approximately 5/16 inch (7,9 mm) lead insulation away using thermal strippers on both ends of leads.

NOTE: Do not use mechanical wire strippers.

(2) Solder the new lead wires to the existing current transformer (CT) and heat sink leads using the side-by-side method of lap splice IAW IPC-7711A (Sec. 8.1.4).

(a) Keep a minimum lap length of 0.25 inch (6,4 mm).

(b) Use soldering alloy type Sn95Sb5.

NOTE: Do all soldering procedures per ANSI/IPC J-STD-001.

(3) Tape the soldered joint using Kapton® tape.

(a) Use a half-lap pattern to tape a minimum of 3/8 inch (9,5 mm) on each side of the soldered splice.

(4) Sleeve each of the taped and spliced leads with appropriately sized heat shrinkable sleeving.

(5) Shrink the heatshrink sleeving on each of the leads using a heatgun.

D. Wrap up.

(1) Form the repaired lead(s) into the entire current transformer (CT) and heat sink wire leads bundle.

(2) Using tying cord, make ties in the recommended locations securing the current transformer (CT) and heat sink wire leads bundle as shown in Figure 7027.

(3) Make solder connections to the PWB following the ASSEMBLY section.

(4) Apply RTV silicone sealant to the PWB IAW Paragraph 14.

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ASSEMBLY

1. Introduction

This section gives the assembly instructions for 30086 Series II DC Generators. Assemble the DC Generator in a clean work area, away from machining or other metal removing operations. Clean all parts in accordance with (IAW) the procedures in the CLEANING section before final assembly.

2. Assembly Tools

In addition to normal shop tools, the tools listed in Table 7001 are needed for generator assembly.

Tool Description	Reference
Dampener Plate Driver	Figure 9004
Adapter, Rotor Shaft Adapter - Drive End	Figure 9002
Arbor Press	Commercially Available
Dielectric Tester	Table 1002
Drivers, Bearing - Inner Race	Figure 9005
Drivers, Bearing - Outer Race	Figure 9008
Support Fixture, Drive End Bearing	Figure 9009
Removal Fixture, Rotor and Stator	Figure 9010
Crimp tool must meet MIL-C-22520/1 standard for: - for pin barrel sizes 16-20 - for wire size 18-22 AWG	Commercially Available
Crimp tool AMP, P/N 49935 (Used for rotor assembly S1 ground terminal)	Commercially Available
Crimp tool AMP, P/N 47386 for wire size 16-22 AWG (Used to crimp the insulated terminal lugs on the outside of heatsinks)	Commercially Available
Crimp tool 615708	Astro Tool Corporation 21615 SW Tualatin Valley Highway Beaverton, OR 97006 USA Ph: 503-642-9853 FAX: 503-591-7766 http://www.astrotool.com
Turret M22520/1-03 (eight indent crimp style)	
Connector Pin Insertion/Extraction Tool	
Mallet (Leather or Plastic)	Commercially Available
Pliers, Snap Ring	Commercially Available
Press Base, Insertion Bullet, Pressing Sleeve, Pressing Sleeve Adapter	Figure 9011

Table 7001 - Assembly Tools

Tool Description	Reference
Soldering Equipment	Commercially Available
Horizontal Support, Stator and Housing Assembly	Figure 9016
Vertical Support, Stator and Housing Assembly	Figure 9017
Wrench, spline	Figure 9018
Wire Hook Tool	Commercially Available
thermo strippers - 18-22 AWG	Commercially Available
Drive End Bearing Sensor Insertion Tool	Figure 9019
Drive End Bearing Sensor Insertion Tool- Guide Rod	Figure 9019
Drive End Bearing Sensor Insertion Tool - Pressing Handle	Figure 9019
Anti-Drive End Bearing Sensor Insertion Tool	Figure 9020
Anti-Drive End Bearing Sensor Insertion Tool - Item 1	Figure 9020
Anti-Drive End Bearing Sensor Insertion Tool - Item 2	Figure 9020
Spanner Tool	Figure 9026
Strain relief bend tool P/N 31708-9920	Figure 9027

Table 7001 - Assembly Tools (Continued)

3. Assembly Materials

Table 7002 lists the materials required to assemble the generator.

WARNING: BEFORE USING ANY OF THE FOLLOWING MATERIALS, BE AWARE OF ALL HANDLING, STORAGE, AND DISPOSAL PRECAUTIONS RECOMMENDED BY THE MANUFACTURER OR SUPPLIER. FAILURE TO COMPLY WITH THE RECOMMENDATIONS MAY RESULT IN SEROUS INJURY, PHYSICAL DISORDER, OR DEATH.

Item	Description/Specification	Source
Acrylic coating	MIL-I-46058/HumiSeal 1B31, Type AR *used to re-coat the I.D. Plate surface.	Chase Corporation Woodside, NY 11377 Ph: (718) 932-0800 Fax: (718) 932-4345 www.humiseal.com (V0SR97)

Table 7002 - Assembly Materials

Item	Description/Specification	Source
Adhesive, Methyl Cyanoacrylate	A-A-3097 **FLAMMABLE** and **TOXIC.** Read the **WARNING** before using this material. Refer to the applicable Material Safety Data Sheet (MSDS) for additional safety information.	National Starch and Chemical Co. Permabond Division Englewood, NJ
Electrical resin	3M Electrical Resin #10 Read the **WARNING** before using this material. Refer to the applicable MSDS for additional safety information.	3M Electrical Specialties division Austin, TX
Electrical tape	Fiberglas, MIL-I-15126, Type GFT 3M P/N: No. 27	3M Electrical Specialties division Austin, TX
Epoxy, two-part kit	Two part resin: P/N 02-7001-26 EPON 828 Resin 100 and Versamid 125	Ellsworth Adhesives P.O. Box 1002 W129 N10825 Washington Dr Germantown, WI 53022-8202 Ph: (1) 800/888-0698 FAX: (1) 262/253-8619 www.ellsworth.com (V0PYJ1)
	Two part: (1 U.S. gallon each) GR P/N 05-651150 EPON 828 Resin100 (Part A) and GR P/N 05-651217 Versamid 125 (Part B)	Safran Power
Heatsink compound	PQ Compound Safran Power P/N 05-651831 Ellsworth Adhesives P/N 1978-DP	Safran Power or Ellsworth Adhesives P.O. Box 1002 W129 N10825 Washington Dr Germantown, WI 53022-8202 Ph: (1) 800/888-0698 FAX: (1) 262/253-8619 www.ellsworth.com (V0PYJ1)
Insulation, Sleeving	Heat shrinkable Safran Power P/N 56-811600	Safran Power

Table 7002 - Assembly Materials (Continued)

Item	Description/Specification	Source
Insulation, Sleeving Acrylic	Varglas A397 Acrylic Sleeving MIL-I-3190/3 Sizes # 9, 14, and 17.	Varflex Corporation Rome, NY 13440 Ph: 315-336-4400 www.varflex.com
Primer, Zinc Chromate Paste	TT-P-1757, Comp G. Color Y	Commercially available
Lubricating and Assembly Paste	Altemp QNB50 **FLAMMABLE.** Read the **WARNING** before using this material. Refer to the applicable MSDS for additional safety information	Klueber Lubrication Londonderry, NH Ph: (603) 647-4104 www.klueber.com (V3EZL6)
Lead wire	MIL-W-16878/4 (Type E) AWG #18 BLK, AWG #20 ORN, AWG #20 YEL, AWG #20 BRN, AWG #22 BLK, AWG #22 GRN, AWG #22 BLU, AWG #22 RED, AWG #22 ORN, AWG #22 WHT	Commercially available
Lead wire	QQ-W-343 (Type S)/Tinned AWG #18	Commercially available
Lockwire	MS20995C32/corrosion-resistant steel	Commercially available
Lubricating oil	MIL-L-6085B or MIL-C-81309, type III **FLAMMABLE**. Read the **WARNING** before using this material. Refer to the applicable MSDS for additional safety information.	Commercially available
Solder	ANSI/J-STD-006, Type sn95sb5 (used for the rotor assembly) and Sn63pb37 or Sn63pb40 (used for the stator and housing assembly) Spec: ANSI/IPC J-STD-001	Commercially available
Primer, Thread Locking	Loctite P/N 7649	Loctite Corporation Aurora, IL Ph: (860) 571-5100 www.loctite.com (V7V827)
Thread locking adhesive	MIL-S-22473/Loctite grade C Loctite P/N 08431	

Table 7002 - Assembly Materials (Continued)

Item	Description/Specification	Source
Cord, Tying	A-A-52084B, Finish B, Natural Color, Size 2 - 0.099/0.121 in. wide x 0.012/0.018 in. thick	Gudebrod, Inc. Pottstown, PA 19464 Ph: 610-327-4050 www.gudebrod.com

Table 7002 - Assembly Materials (Continued)

4. Assembly of the Stator and Housing Assembly

The following procedure details the assembly of the stator and housing assembly. Numbers in parentheses ( ) refer to item numbers in Figure 10004 of the ILLUSTRATED PARTS LIST unless otherwise specified.

A. Assemble the Threaded Inserts (150 and 155) into the Housing (if required)

WARNING: KEEP ZINC CHROMATE PRIMER AWAY FROM SOURCES OF HEAT, SPARKS AND FLAME. ZINC CHROMATE PRIMER IS FLAMMABLE.

WARNING: DO NOT GET ZINC CHROMATE PRIMER ON YOUR SKIN AND DO NOT BREATHE THE FUMES. ZINC CHROMATE PRIMER IS A POISONOUS MATERIAL.

(1) Apply zinc chromate primer to the threaded holes.

(2) Assemble the screw thread inserts (150 and 155) into the housing.

B. Assemble the Grommet (135) to the Housing (145)

Press a new grommet (135) into the round opening in the housing (145).

C. Assemble the Main Stator (125) into the Housing (see Figure 7001)

NOTE: There is no authorized repair procedure for terminal lug replacement. The main stator must be returned to Safran Power, Repair and Overhaul for remanufacture if damage to the terminal lugs is found.

(1) Attach the three terminal lugs (140) to the AWG #18, AWG #20 and AWG #22 wires if required.

WARNING: WEAR INSULATED GLOVES AND OBSERVE ALL SAFETY PRECAUTIONS WHEN HANDLING HEATED PARTS TO AVOID PERSONAL INJURY.

(2) Heat the housing in an oven at 400° to 450° F (205° to 230° C) for 30 minutes.

<u>WARNING:</u> THREAD LOCKING ADHESIVE IS HIGHLY FLAMMABLE AND TOXIC. DO NOT USE NEAR OPEN FLAMES OR SPARKS. USE IN A WELL-VENTILATED AREA.

(3) Apply thread locking primer followed by thread locking adhesive to the threads of six screws (130).

<u>NOTE:</u> Let the thread locking primer dry for a few minutes before applying the thread locking adhesive.

(4) Remove the heated housing from the oven and insert the main stator into the housing.

<u>NOTE:</u> Use care not to damage the current transformer attached to the main stator when the main stator is inserted into the housing.

(5) Align the holes in the main stator with the holes in the housing.

<u>NOTE:</u> The main stator must bottom against the inner surface of the housing.

(6) Carefully route the six main stator leads (white) and two current transformer leads (red and black) through the grommet in the housing.

(7) Attach the main stator to the housing with six screws (130).

(a) Tighten the screws to a torque of 13.5 to 18.0 in. lbs. (1.5 to 2.0 N·m).

(8) Check the continuity of the current transformer (red and black leads through grommet) to make sure that no damage was done during main stator installation.

(9) Form the 24 main stator leads tight against the inner diameter of the housing.

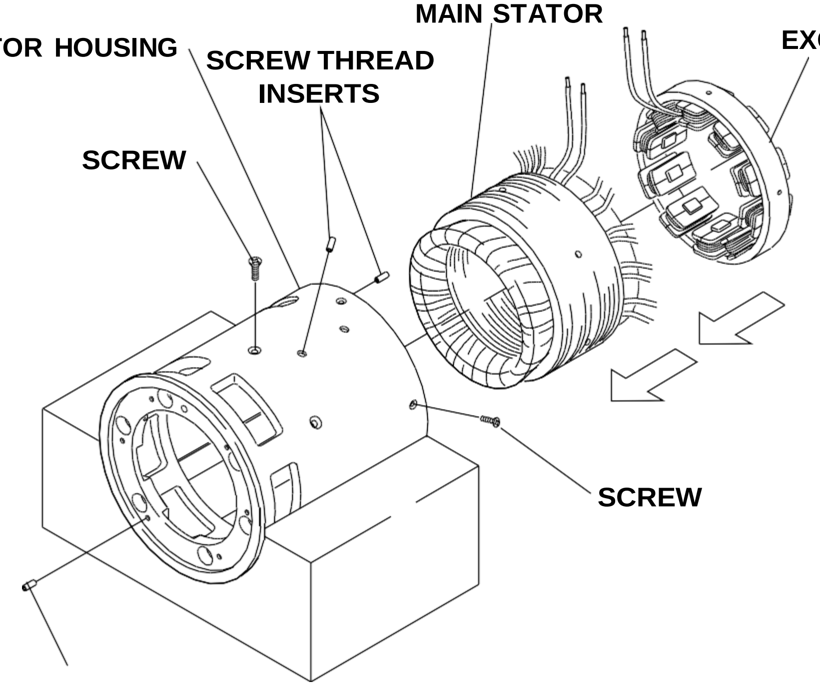

Figure 7001 - Assembling the Stators into the Housing

D. Prepare the Bearing Sensor and EMI Filter Lead Wires

(1) Cut a piece of AWG #18 wire to a length of 12 inch (288 mm).

(2) Insert the AWG #18 wire into the oval hole in the housing above the grommet and route the wire through the housing until it exits out the non drive end.

(3) Use the AMP crimp tool P/N 47386 to crimp a terminal lug onto the end of the AWG #18 wire that exits the housing at the non drive end.

(4) Bend the terminal lug end of the AWG #18 lead wire over the top of the housing to make sure that the lead wire is out of the way when the exciter stator is assembled into the housing.

(5) Cut two pieces of AWG #22 wire to a length of 12 inch (288 mm).

(6) Insert the AWG #22 wires into the oval hole in the housing above the grommet and route the lead wires through the housing until they exit out the non drive end.

(7) Combine the ends of the AWG #22 wires which exit the drive end of the housing and use the AMP crimp tool P/N 47386 to crimp a terminal lug onto the wires that exits the housing at the non drive end.

(8) Bend the terminal lug end of the AWG #22 wires over the top of the housing to make sure that the lead wires are out of the way when the exciter stator is assembled into the housing.

(9) Cut a piece of AWG #20 wire to a length of 12 inch (288 mm).

(10) Insert the AWG #20 wire into the oval hole in the housing above the grommet and route the wire through the housing until it exits out at the non drive end.

(11) Use the AMP crimp tool P/N 47386 to crimp a terminal lug onto the end of the AWG #20 wire that exits the housing at the non drive end.

(12) Bend the terminal lug end of the AWG #20 lead wire over the top of the housing to make sure that the lead wire is out of the way when the exciter stator is assembled into the housing.

E. Assemble the Exciter Stator (115) into the Housing

WARNING: WEAR INSULATED GLOVES AND OBSERVE ALL SAFETY PRECAUTIONS WHEN HANDLING HEATED PARTS TO AVOID PERSONAL INJURY.

(1) Heat the housing in an oven at 400° to 450° F (205° to 230° C) for 30 minutes.

WARNING: THREAD LOCKING ADHESIVE IS HIGHLY FLAMMABLE AND TOXIC. DO NOT USE NEAR OPEN FLAMES OR SPARKS. USE IN A WELL-VENTILATED AREA.

(2) Apply thread locking primer followed by thread locking adhesive to the threads of five screws (120).

NOTE: Let the thread locking primer dry for a few minutes before applying the thread locking adhesive.

(3) Remove the heated housing from the oven and insert the exciter stator into the housing.

(4) Carefully route the two exciter stator leads (brown) through the grommet in the housing and tuck behind the main stator leads.

(5) Align the holes in the exciter stator with the holes in the housing.

(6) Attach the exciter stator to the housing with five screws (120).

(a) Tighten the screws to a torque of 7.7 to 10.3 in. lbs. (0.87 to 1.16 N·m).

F. Perform a Dielectric Test

CAUTION: FAILURE TO TURN OFF THE HIGH POTENTIAL TESTER POWER BEFORE CONNECTING OR DISCONNECTING HIGH VOLTAGE ELECTRICAL LEADS CAN CAUSE SERIOUS DAMAGE TO THE GENERATOR.

CAUTION: DIELECTRIC TESTING IS ACCOMPLISHED DURING ACCEPTANCE TESTING AND ONLY FOR GENERATORS THAT HAVE BEEN FULLY CLEANED.

(1) Test Preparation:

(a) Turn off all power to the test stand.

(b) Disconnect the generator from the test circuit.

CAUTION: THE EMI CAPACITOR (C2) MUST BE DISCONNECTED FROM GROUND (BRACKET) FOR THIS TEST.

(c) Remove the filter and connector mounting cover.

(d) Isolate the filter and connector mounting cover to avoid contact with the frame of the generator.

(e) Connect a jumper between the generator output terminals B+ and E-.

(f) Connect the positive (red) lead of the high potential tester to the connected terminals B+ and E-.

(g) Connect the negative (black) lead to a non-coated surface of the generator frame.

(2) Operating Instructions:

WARNING: **FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING HIGH POTENTIAL TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.**

CAUTION: INCREASE AND DECREASE TEST VOLTAGES SLOWLY (100 VOLTS PER SECOND, MAXIMUM). INCREASING AND DECREASING VOLTAGE TOO QUICKLY MAY CAUSE DAMAGE TO THE GENERATOR.

(a) Turn on power to the dielectric tester and slowly increase voltage to 250 VAC RMS, commercial frequency to each of the following circuits.

1 Between the connected terminals B+ and E- and the housing frame.

2 Between the connected terminals B+ and E- and pin G.

3 Between pin G and the frame.

(b) Maintain the test voltages for one minute.

(c) After one minute, slowly reduce the high potential voltage to zero. Turn off the power supply.

(3) Acceptance Limits:

(a) There must be no evidence of arc-over, flash-over, dielectric breakdown or fluctuation, or a steady increase in leakage current.

(b) Leakage current must not exceed 5 mA.

G. Assemble the Threaded Inserts (85 and 90) into the Anti-drive End Bearing Support (75) (if required)

WARNING: KEEP ZINC CHROMATE PRIMER AWAY FROM SOURCES OF HEAT, SPARKS AND FLAME. ZINC CHROMATE PRIMER IS FLAMMABLE.

WARNING: DO NOT GET ZINC CHROMATE PRIMER ON YOUR SKIN AND DO NOT BREATHE THE FUMES. ZINC CHROMATE PRIMER IS A POISONOUS MATERIAL.

(1) Apply zinc chromate primer to the threaded holes.

(2) Assemble the screw thread inserts (85 and 90) into the anti-drive end bearing support.

H. Attach the Anti-drive End Bearing Support (75) to the Housing

WARNING: THREAD LOCKING ADHESIVE IS HIGHLY FLAMMABLE AND TOXIC. DO NOT USE NEAR OPEN FLAMES OR SPARKS. USE IN A WELL-VENTILATED AREA.

(1) Apply thread locking primer followed by thread locking adhesive to both the female threads in the housing and the male threads of the four screws (80).

NOTE: Let the thread locking primer dry for a few minutes before applying the thread locking adhesive.

(2) Thread the main stator leads through the anti-drive end bearing support.

(3) Attach the anti drive end bearing support to the housing with four screws (80), flat washers (81) and lock washers (82).

(4) Tighten the screws to a torque of 30.0 to 35.0 in. lbs. (3.4 to 4.0 N·m).

I. Attach the Terminal Block (100) to the Anti-drive End Bearing Support

(1) Attach the terminal block (100) to the anti-drive end bearing support assembly with two screws (105) and flat washers (110).

(2) Tighten the screws to a torque of 22.7 to 35.0 in. lbs. (2.6 to 4.0 N·m).

J. Assemble the Right-hand (30) and Left-hand (15) Rectifiers to the Right-hand Heatsink (50) and the Left-hand Heatsink (45) (see Figure 7002)

CAUTION: THIS EQUIPMENT CONTAINS PARTS SENSITIVE TO DAMAGE BY ELECTROSTATIC DISCHARGE (ESD). USE ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) PRECAUTIONARY PROCEDURES WHEN TOUCHING, REMOVING OR INSERTING ESDS PARTS OR ASSEMBLIES IDENTIFIED BY THE ESDS SYMBOL.

(1) Apply a thin layer of heatsink compound between the six rectifiers and the right-hand heatsink.

(2) Loosely attach the rectifiers to the right-hand heatsink with six hex nuts (35) and Belleville washers (40). Do not tighten the nuts.

(3) Apply a thin layer of heatsink compound between the six rectifiers and the left-hand heatsink.

(4) Loosely attach the rectifiers to the left-hand heatsink with six hex nuts (20) and Belleville washers (25). Do not tighten the nuts.

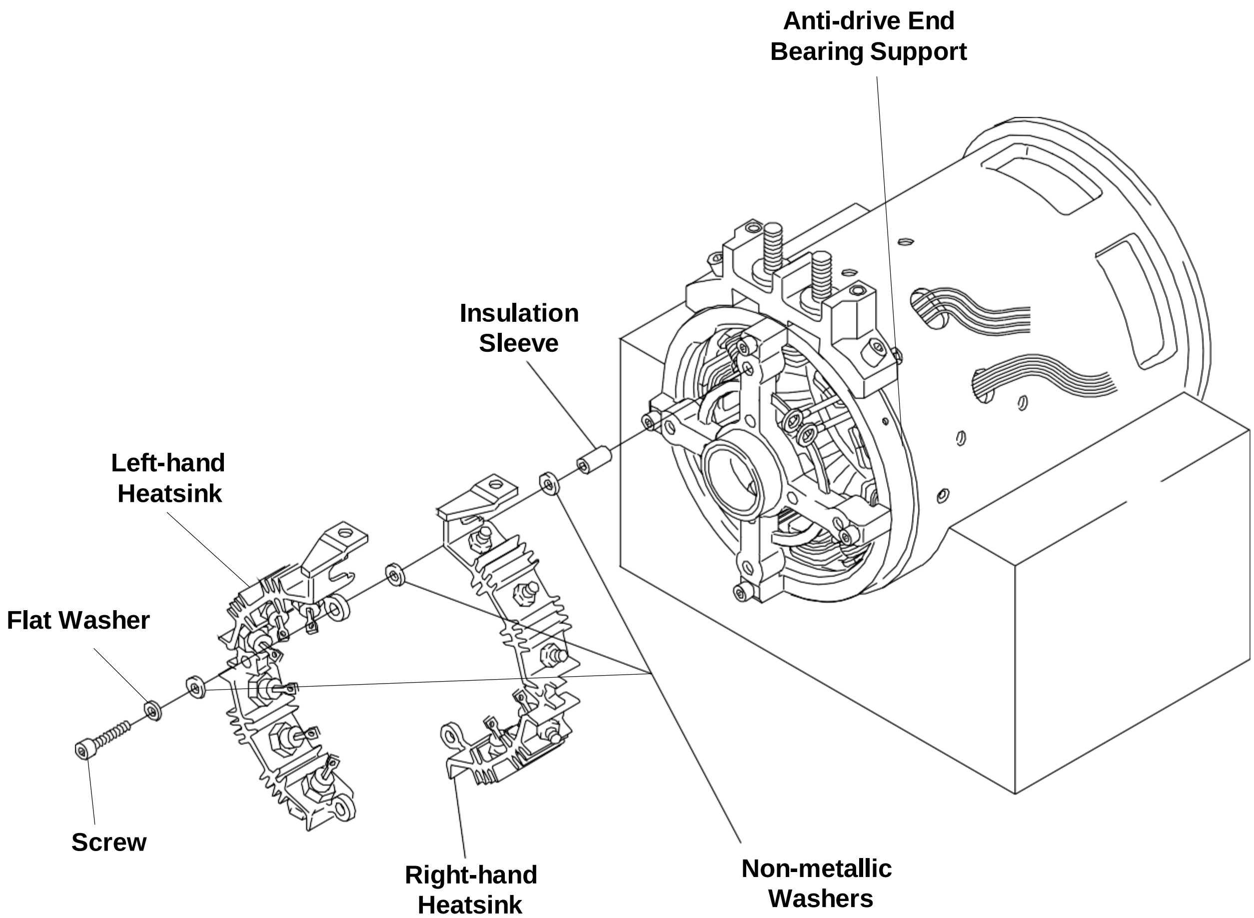

Figure 7002 - Assembling Right- and Left-Hand Heatsinks to Anti-Drive End Bearing Support

K. Assemble the Right-hand Heatsink (50) and the Left-hand Heatsink (45) to the Anti-drive End Bearing Support (75)

WARNING: THREAD LOCKING ADHESIVE IS HIGHLY FLAMMABLE AND TOXIC. DO NOT USE NEAR OPEN FLAMES OR SPARKS. USE IN A WELL-VENTILATED AREA.

(1) Apply thread locking primer followed by thread locking adhesive to four screws (55).

NOTE: Let the thread locking primer dry for a few minutes before applying the thread locking adhesive.

(2) Install the insulation sleeves (70) into the heatsink mounting holes in the anti-drive end bearing support.

(3) Insert the right terminal stud (B+) into the hole in the top of the right-hand heatsink.

(a) Position the right-hand heatsink on the anti-drive end bearing support.

(4) Insert the left terminal stud (E-) into the hole in the top of the left-hand heatsink.

(a) Position the left-hand heatsink on the anti-drive end bearing support.

(5) Attach the right-hand heatsink and left-hand heatsink to the stator and housing assembly with non-metallic washers (65), flat washers (60) and screws (55).

(a) Tighten the screws to a torque of 13.5 to 18.0 in. lbs. (1.5 to 2.0 N·m).

L. Attach the Leads to the Rectifiers (see Figure 7003)

CAUTION: TO AVOID DAMAGE TO RECTIFIER INSULATION AND TERMINALS, USE A BACK-UP WRENCH AND SUPPORT IT SECURELY TO AVOID SIDE LOADING THE RECTIFIER TERMINAL.

(1) Remove the hex nut and Belleville washer from the rectifier closest to terminal block terminal E–.

(2) Connect the AWG #18 black wire to the rectifier with the terminal lug located between the Belleville washer and the left-hand heatsink.

(3) Tighten the hex nut to a torque of 20 to 25 in. lbs. (2.3 to 2.8 N·m).

(4) Remove the hex nut and Belleville washer from the rectifier next to the rectifier that the AWG #18 wire was attached to in the previous instruction.

(5) Connect the two, AWG #22 wires to the rectifier with the terminal lug located between the Belleville washer and the left-hand heatsink.

(a) Tighten the hex nut to a torque of 20 to 25 in. lbs. (2.3 to 2.8 N·m).

(6) Remove the hex nut and Belleville washer from the rectifier nearest to terminal block terminal B+.

(7) Connect the AWG #20 wire to the rectifier with the terminal lug located between the Belleville washer and the right-hand heatsink.

(a) Tighten the hex nut to a torque of 20 to 25 in. lbs. (2.3 to 2.8 N·m).

(b) Tighten the remaining hex nuts on the rectifiers to a torque of 20 to 25 in. lbs. (2.3 to 2.8 N·m).

(8) Connect the main stator leads to the rectifier terminals with self-locking nuts (10) and screws (5).

(a) Tighten the screws to a torque of 15 to 19 in. lbs. (1.7 to 2.2 N·m).

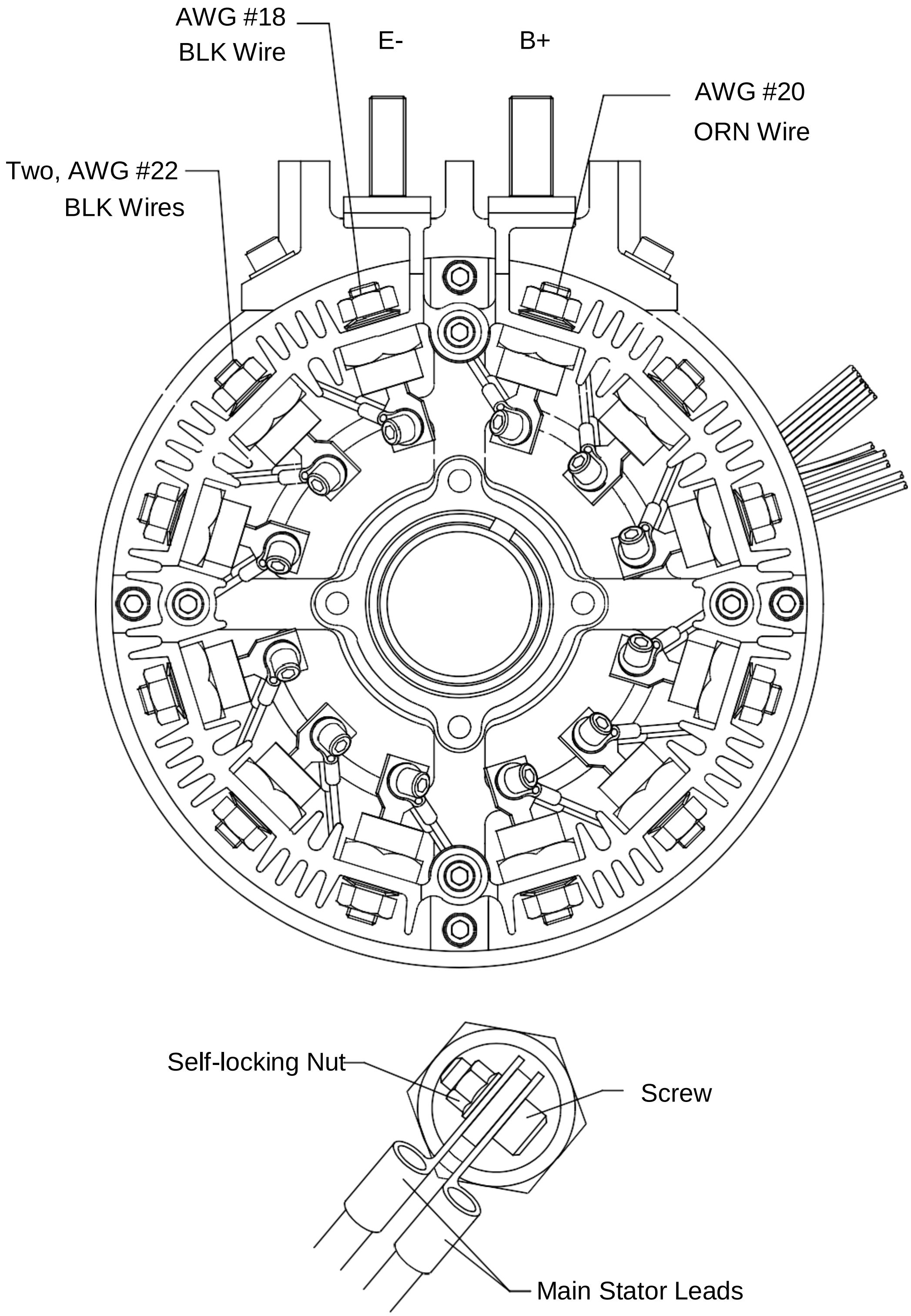

Figure 7003 - Wiring Leads to Rectifiers

5. Assembly of the Rotor Assembly

The following procedure details the assembly of the rotor assembly. Numbers in parentheses ( ) refer to item numbers given in Figure 10002 of the ILLUSTRATED PARTS LIST unless otherwise specified. Where applicable, refer to the torque specifications provided in the FITS AND CLEARANCES section.

A. Assemble the Grommet (40), Terminal Post (35), Diodes (15) and Resistors (30) to the Diode and Resistor Mounting Bracket (45)

(1) Attach the diodes to the diode and resistor mounting bracket with lock washers (25) and hex nuts (20).

(a) Do not tighten the hex nuts.

(2) Attach the resistors to the diode and resistor mounting bracket with the resistor lock washers and nuts.

(3) Insert the grommet into the diode and resistor mounting bracket.

NOTE: Make sure to position the split in the grommet toward the center of the diode and resistor mounting bracket.

(4) Attach the terminal post (35) to the diode and resistor mounting bracket with the nut furnished with the terminal post assembly and tighten to a torque of 8 to 12 in-lbs (0,9 to 1,4 N·m).

(5) If the terminal stud is replaced on the mounting bracket, use Loctite Grade C.

(6) Heat in an oven for 15 minutes at 212° ± 10° F (100° ± 12° C) or sit at room temperature for 12 hours.

B. Assemble the Diode and Resistor Mounting Assembly (10) to the Main Field Rotor and Shaft Assembly (65) (See Figure 7004 and Figure 7005)

(1) If necessary, apply a layer of electrical tape to the rotor shaft.

(2) If the insulation sleeving has been removed from the main field rotor leads, place a single piece of size #9 insulation sleeving over each lead.

(3) Strip the end from the S2 main field rotor lead.

NOTE: On new mainfield leads or on assemblies that have longer leads, cut both the S1 and S2 leads to a length of 2.125 ± 0.125 inch (53,98 ± 3,18 mm) from where the lead exits the mainfield coil.

(4) Use the AMP crimp tool P/N 49935 to crimp the terminal lug (60) onto the end of the AWG #16 wire S2 main field rotor lead.

(5) Chill the main field and rotor shaft assembly in a freezer for a minimum of 4 hours at -65° F (-55° C) in a freezer.

(6) Heat the diode and resistor mounting assembly in an oven for 30 minutes at 200° to 250° F (93° to 121° C).

WARNING: WEAR INSULATED GLOVES AND OBSERVE ALL SAFETY PRECAUTIONS WHEN HANDLING HEATED OR CHILLED PARTS TO AVOID PERSONAL INJURY.

(7) Remove the main field rotor and shaft assembly from the freezer.

(8) Put the main field rotor and shaft assembly, drive end down, onto a press base (Figure 9011) on the arbor press table (Figure 7005).

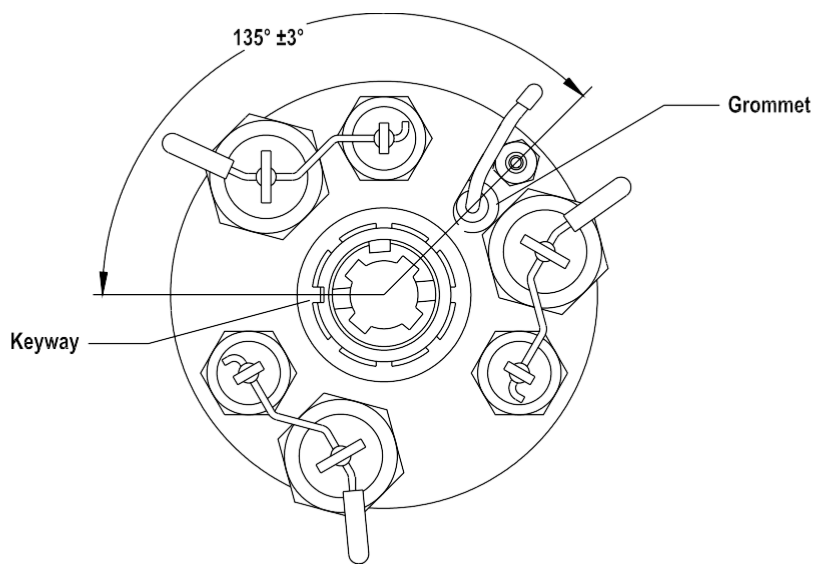

Figure 7004 - Diode and Resistor Installation

WARNING: LUBRICATING OIL IS FLAMMABLE AND CAN BE HARMFUL IF SWALLOWED. DO NOT USE NEAR OPEN FLAMES OR SPARKS. USE IN A WELL-VENTILATED AREA.

(9) Remove the diode and resistor mounting assembly from the oven and lubricate the inside diameter of the diode and resistor mounting bracket with lubricating oil.

(10) Align the grommet in the diode and resistor mounting bracket with respect to the keyway in the rotor shaft as shown in Figure 7004.

(11) Put the diode and resistor mounting assembly into position on the rotor shaft.

(12) Position the pressing sleeve onto the hub of the diode and resistor mounting bracket.

(13) Press down squarely with the arbor press onto the pressing sleeve adapter until the diode and resistor mounting assembly is completely seated on the shoulder of the rotor shaft. See Figure 7005.

NOTE: Do not release pressure quickly. Allow the diode and resistor mounting assembly to cool and shrink onto the rotor shaft before releasing pressure.

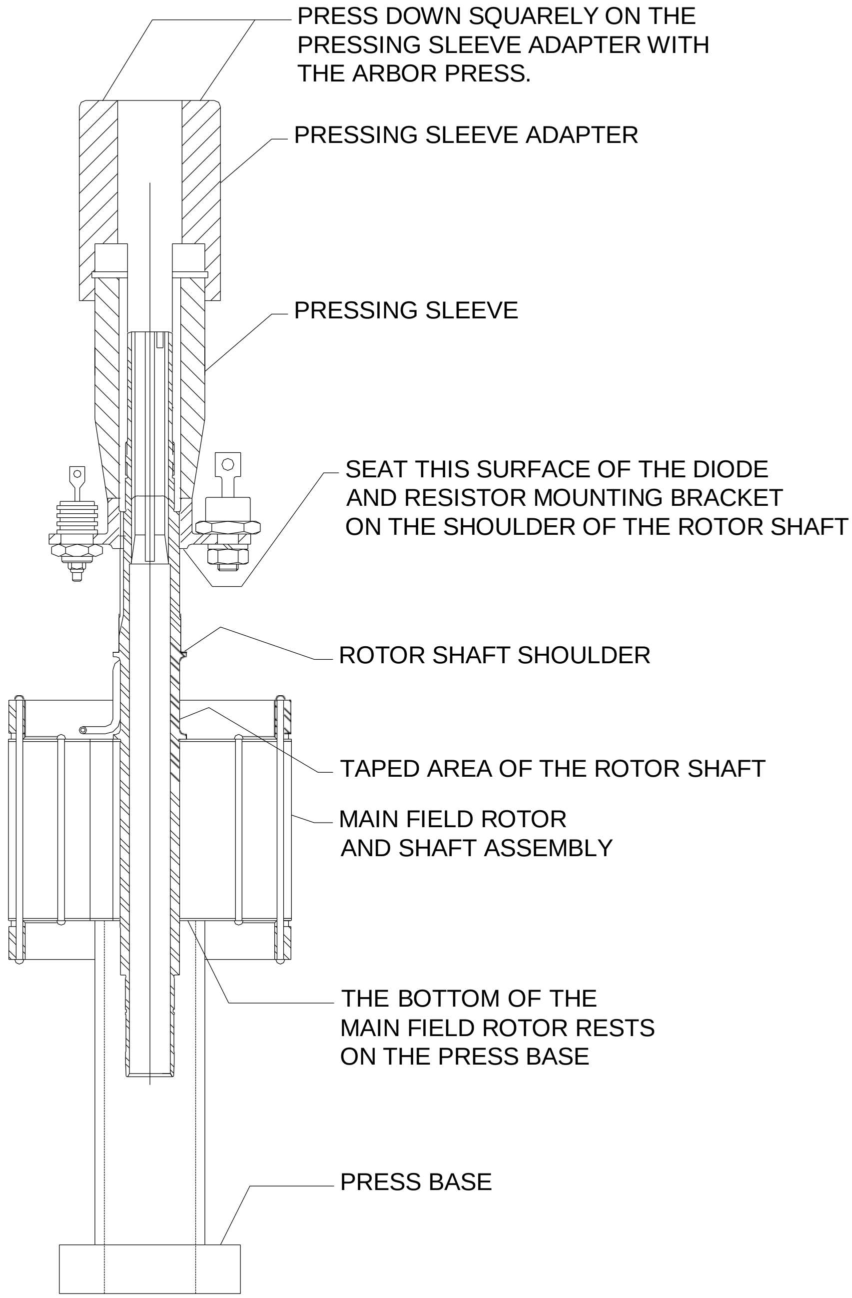

Figure 7005 - Diode and Resistor Mounting

C. Secure Main Field Rotor Leads S1 and S2 to the Rotor Shaft (see Figure 7006).

(1) Remove the nut (20) and lock washer (25) from the diode closest to main field rotor lead S2.

(2) Connect the terminal lug on main field rotor lead S2 to the diode with the terminal lug between the lock washer and the diode and resistor mounting bracket.

(3) Tighten the nuts attaching the diodes and resistors to the diode and resistor mounting bracket to a torque of 20 to 25 in. lbs. (2.3 to 2.8 N·m).

(4) Tie main field rotor leads S1 and S2 to the rotor shaft with a minimum of 5 turns of tying cord to spread across the entire length of the shaft between the main rotor and the mounting bracket.

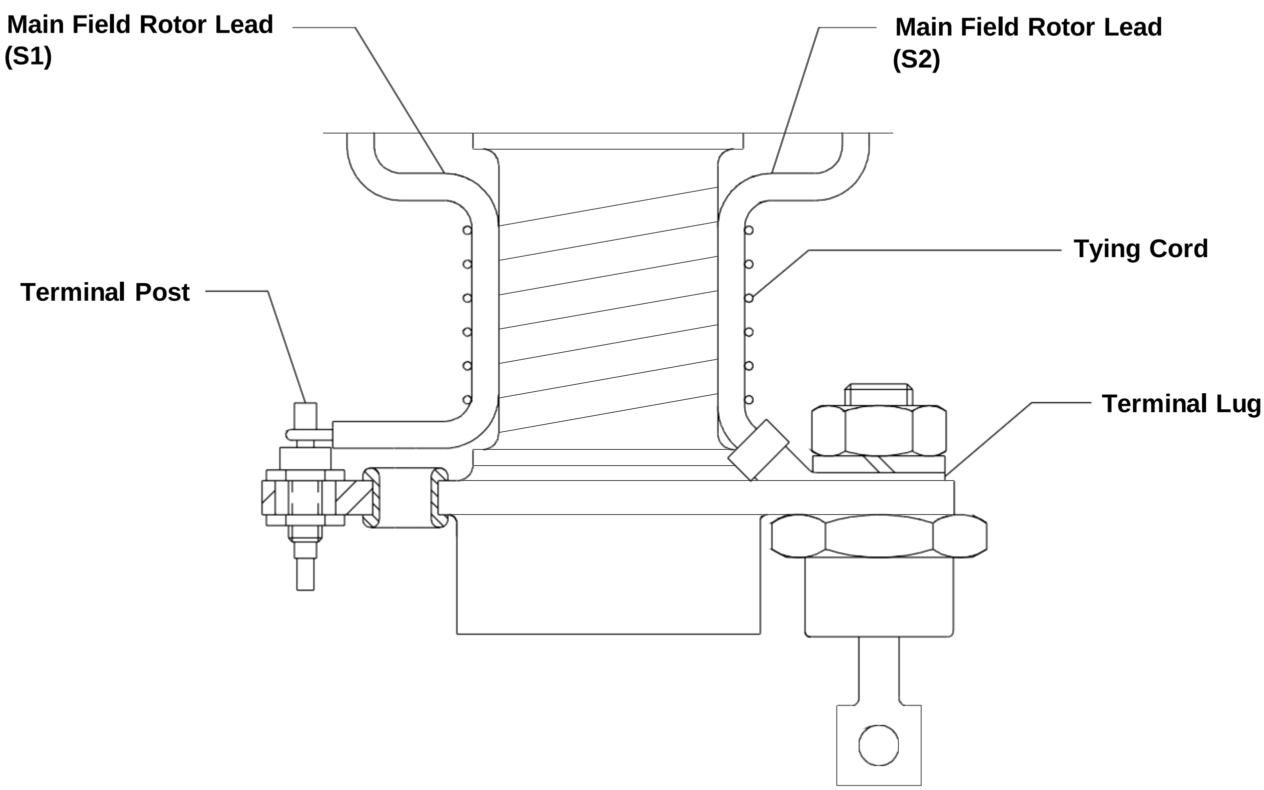

Figure 7006 - Securing Main Field Leads

D. Assemble the Square Machine Key (55) to the Main Field and Rotor Shaft Assembly.

WARNING: METHYL CYANOACRYLATE ADHESIVE IS HIGHLY FLAMMABLE AND TOXIC. DO NOT USE NEAR OPEN FLAMES OR SPARKS. USE IN A WELL-VENTILATED AREA. WEAR APPROVED GLOVES AND CLOTHING WHEN WORKING WITH THIS MATERIAL. DO NOT GET ADHESIVE IN EYES, ON SKIN, OR ON CLOTHING. CONTACT OF SKIN WITH THE ADHESIVE MAY RESULT IN THE RAPID BONDING OF SKIN-TO-SKIN OR SKIN-TO-MATERIAL. IN CASE OF CONTACT, FLUSH THE AFFECTED AREA (SKIN, EYES, CLOTHING) WITH WATER. SEEK MEDICAL ATTENTION IF ADHESIVE MAKES CONTACT WITH EYES OR SKIN.

If required, secure the square machine key into the keyway in the rotor shaft directly above the diode bracket assembly using A-A-3097 adhesive.

E. Assemble the Exciter Rotor Assembly (50) onto the Main Field Rotor and Shaft Assembly (see Figure 7007).

NOTE: When installing the exciter rotor assembly onto the rotor and shaft assembly, make sure that the connecting leads are facing the diode bracket assembly and the main field rotor.

NOTE: Make sure the #9 sleeving is on the exciter leads before you install the exciter on the rotor shaft.

(1) Heat the exciter rotor assembly in an oven to 450° F (232° C) for 2 hours.

WARNING: WEAR INSULATED GLOVES AND OBSERVE ALL SAFETY PRECAUTIONS WHEN HANDLING HEATED OR CHILLED PARTS TO AVOID PERSONAL INJURY.

WARNING: LUBRICATING OIL IS FLAMMABLE AND CAN BE HARMFUL IF SWALLOWED. DO NOT USE NEAR OPEN FLAMES OR SPARKS. USE IN A WELL-VENTILATED AREA.

(2) Remove the exciter rotor assembly from the oven and lubricate the inside diameter with lubricating oil.

(3) Put the main field rotor and shaft assembly, drive end down, onto a press base on the arbor press table.

(4) Put the insertion bullet (Figure 9011) into the rotor shaft with the exciter rotor alignment pin in the rotor shaft keyway.

(5) Put the exciter rotor assembly into position with the exciter rotor leads facing the diode bracket assembly.

(6) Align the tab in the exciter rotor assembly with the alignment pin in the insertion bullet.

(7) Feed exciter rotor assembly lead T10 through the grommet in the diode bracket assembly.

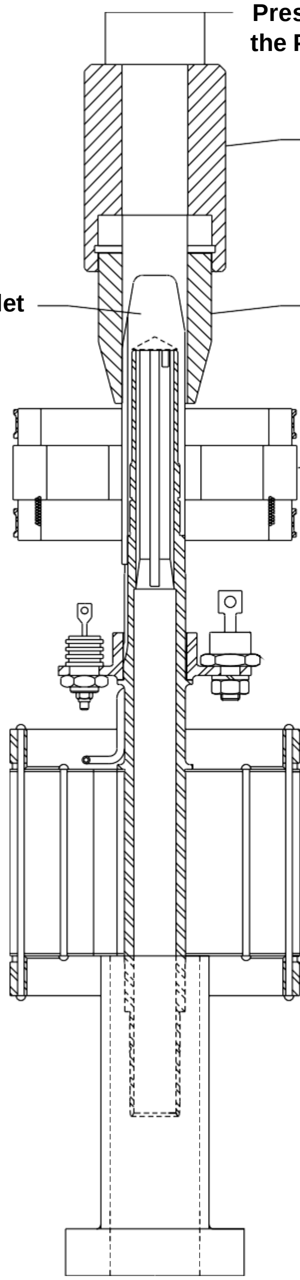

Figure 7007 - Assembly of Exciter Rotor Assembly

(8) Press the exciter rotor assembly onto the main field rotor and shaft assembly using the pressing sleeve and pressing sleeve adapter.

NOTE: Make sure that the exciter rotor assembly is fully seated against the diode bracket assembly.

NOTE: Do not release pressure quickly. Allow the exciter rotor assembly to cool and shrink onto the rotor shaft before releasing pressure.

F. Assemble the Retaining Ring (5) onto the Rotor Shaft

Install the retaining ring with one tab seated in the shaft keyway to retain the square key.

G. Make the Electrical Connections (see Figure 7008 and Figure 7009)

(1) Allow for a slight amount of lead wire flexibility and cut and strip main field rotor lead S1.

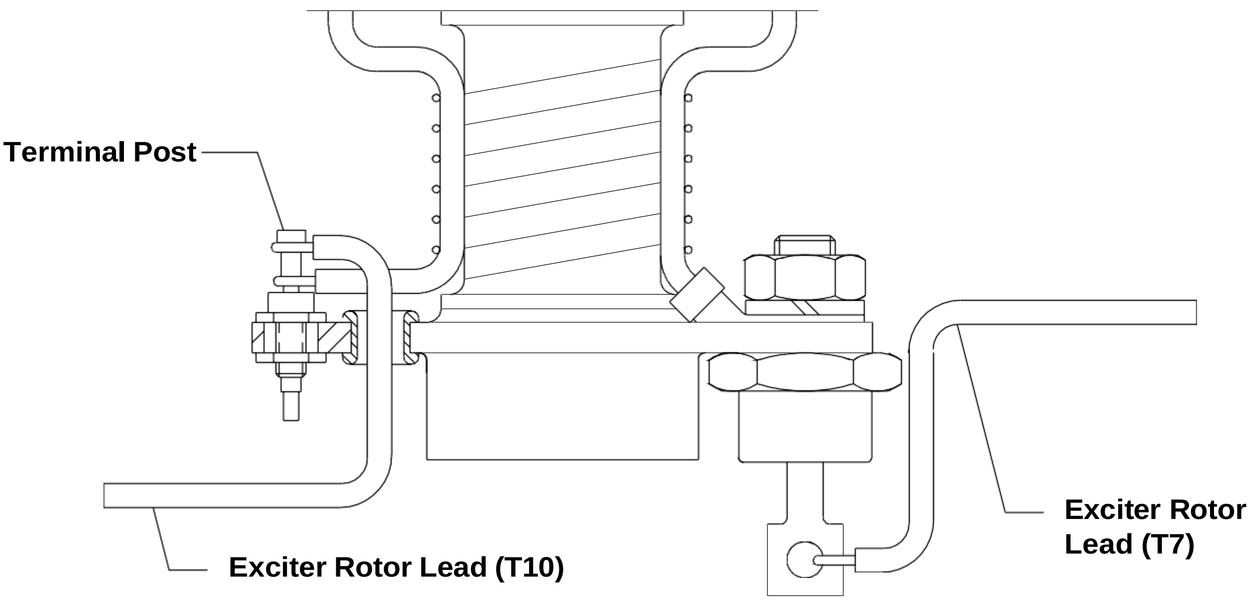

Figure 7008 - Connecting Exciter Rotor Leads

WARNING: **BEFORE ATTEMPTING ANY SOLDERING, PERSONNEL MUST BE FAMILIAR WITH TYPICAL SOLDERING PROCEDURES FOR AIRCRAFT ELECTRICAL WIRING. WEAR EYE PROTECTION AND AVOID BREATHING THE FUMES GENERATED BY SOLDERING OR SOLVENTS. AVOID THE INGESTION OF POISONOUS LEAD OXIDE FROM SOLDER.**

CAUTION: DIODES ARE HEAT SENSITIVE. USE HEATSINK BETWEEN THE DIODES AND POINTS OF HEAT APPLICATION DURING SOLDERING AND DESOLDERING OPERATIONS.

(2) Connect and solder main field rotor S1 lead and exciter rotor assembly T10 lead to the terminal post (35).

(a) Refer to ANSI/IPC J-STD-001 for soldering specification.

(3) Tie exciter rotor lead T10 to the nearest spoke of the exciter rotor assembly using tying cord.

NOTE: The tying cord knot must be located on the inside of the exciter rotor spoke.

(4) Connect each diode to the adjacent resistor using AWG #18 wire QQ-W-343 with the strain relief tool P/N 31708-9920.

(5) Connect and solder exciter rotor leads T7, T8, and T9 to the diodes.

(6) Mix and immediately apply the epoxy bonding cement to all the lacing and tying cord that is used on the rotor assembly.

(7) Allow the epoxy bonding cement to cure in an oven at 200° F (95° C) for 40 minutes.

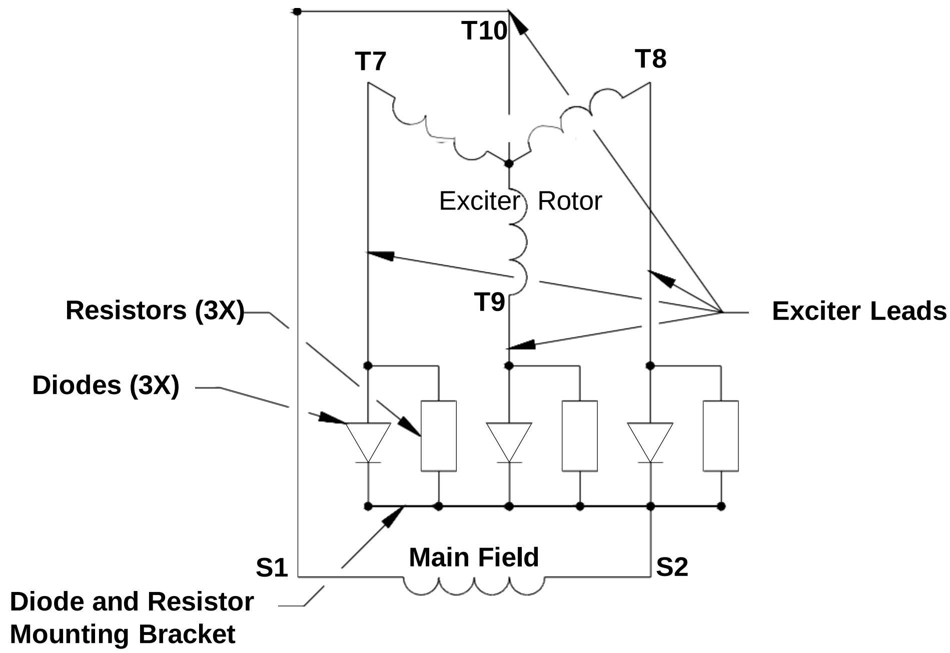

Figure 7009 - Diode and Resistor Wiring Diagram

H. Check the Rotor Assembly Balance

Balance and overspeed the rotor assembly balance according to the procedure in the REPAIR section.

6. Assembly of the Printed Wiring Board (see Figure 7010 and Figure 7011)

The following procedure details the assembly of the printed wiring board. Numbers in parentheses ( ) refer to item numbers given in Figure 10003 of the ILLUSTRATED PARTS LIST.

A. Assemble the Resistors (5, 10, 15, 20, and 25) and Diodes (30) to the Printed Wiring Board (40)

CAUTION: TAKE EXTREME CARE WHEN SOLDERING COMPONENTS TO THE PRINTED WIRING BOARD TO AVOID DAMAGE TO THE TERMINALS AND PRINTED CIRCUITS.

(1) As required, solder the four resistors R1 through R4, as applicable, to the printed wiring board in the locations shown according to the procedure in the REPAIR section.

(2) As required, solder diodes CR1 through CR6 to the printed wiring board in the locations shown according to the procedure in the REPAIR section.

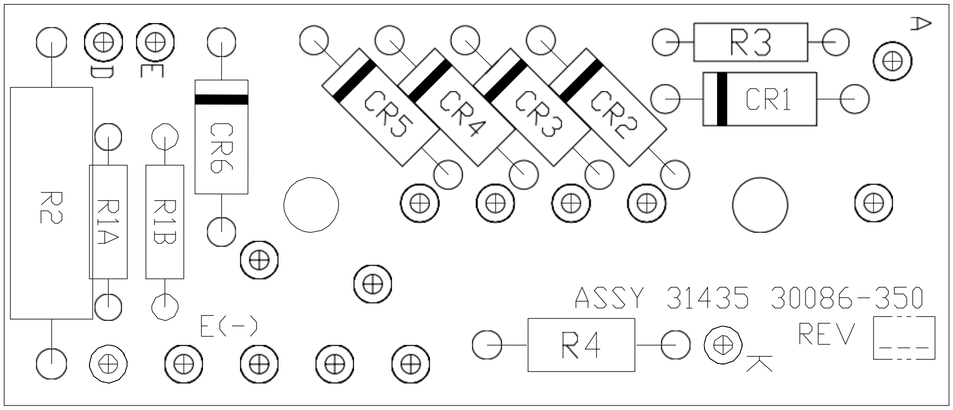

Figure 7010 - Assembly of Resistors and Diodes to Printed Wiring Board 30086-350/350A

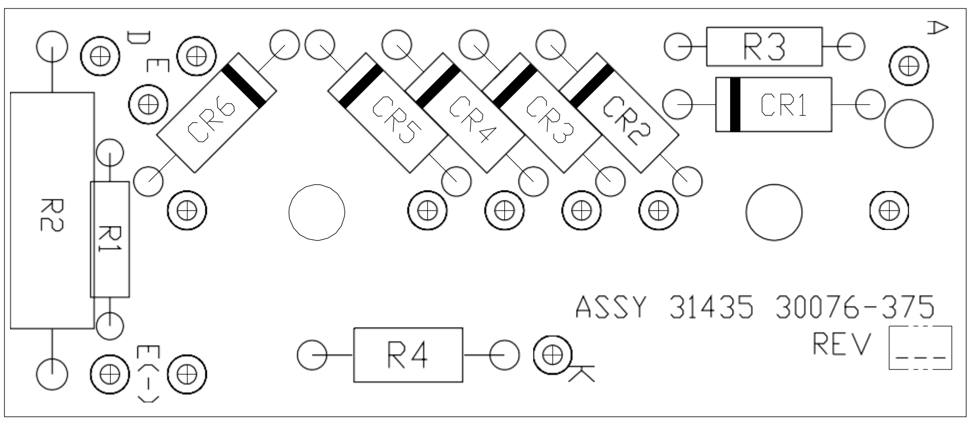

Figure 7011 - Assembly of Resistors and Diodes to Printed Wiring Board 30076-375

7. Final Assembly of the DC Generator

The following procedure details the final assembly of the generator. Numbers in parentheses ( ) refer to item numbers in Figure 10001 of the ILLUSTRATED PARTS LIST unless otherwise specified.

CAUTION: GENERATORS THAT ARE RETURNED TO SERVICE WITHOUT REPLACEMENT OF THE AUXILIARY BEARINGS MUST BE LABELED REPAIRED ONLY.

A. Assemble the Anti-drive End Auxiliary Bearing (235) into the Stator and Housing Assembly (465)

(1) Put the rotor and stator removal fixture (Figure 9010) on the arbor press.

(2) Put the stator and housing assembly, anti-drive end up, on the rotor and stator removal fixture.

(3) Apply lubricating and assembly paste to the outer diameter of the anti-drive end auxiliary bearing.

(4) Press the anti-drive end auxiliary bearing into the anti-drive end bearing support using the outer race bearing driver (see Figure 7012).

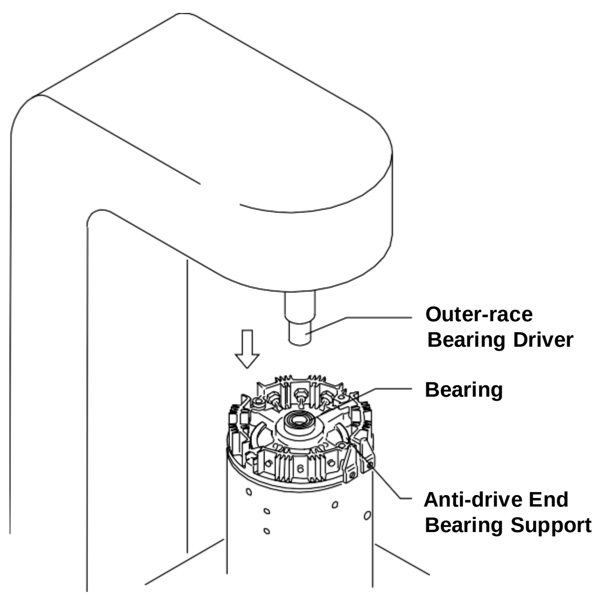

Figure 7012 - Installation of Anti-Drive End Auxiliary Bearing

B. Assemble the Anti-drive End Bearing Failure Sensor (170) to the Anti-drive End Bearing Support (10004-75)

(1) On model 30086-010 only, position the anti-drive end bearing failure sensor over the anti-drive end auxiliary bearing with either side facing outboard. Align notch in bearing sensor with notch in bearing liner.

(2) On model 30086-011 only, position the anti-drive end bearing failure sensor over the anti-drive end auxiliary bearing with the lead side facing outboard. Align notch in bearing sensor with notch in bearing liner.

(3) Put insulation sleeving of size # 17on anti-drive end bearing failure sensor leads.

CAUTION: ROUTE THE BEARING FAILURE SENSOR LEADS OUTBOARD OF THE END BELL REINFORCEMENT RING TO PREVENT INTERFERENCE WITH THE ROTOR. NOT DOING SO COULD LEAD TO DAMAGE OF THE SENSOR LEAD WIRE AND FALSE BEARING FAILURE INDICATION OF THE UNIT.

(4) Route the anti-drive end bearing failure sensor leads under the diode and through the outboard half of the end bell as illustrated in Figure 7013.

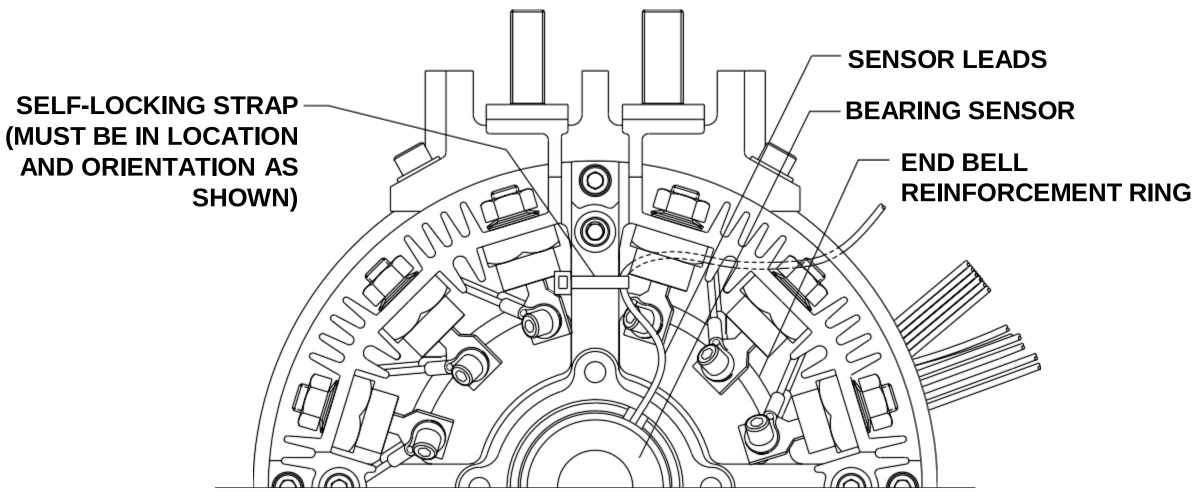

Figure 7013 - Bearing Failure Sensor Leads

CAUTION: ROUTE THE BEARING FAILURE SENSOR LEADS OUTBOARD OF THE EXCITER STATOR WILL TO PREVENT INTERFERENCE WITH THE ROTOR. NOT DOING SO COULD LEAD TO FALSE BEARING FAILURE INDICATION OF THE UNIT.

CAUTION: DO NOT ROUTE THE LEADS THROUGH THE “ROUND” HOLE WITH GROMMET. SEE Figure 7015.

(5) Continue routing leads down the inside of the stator housing on the outboard side of the exciter stator, and exit the leads through the “oval” shaped hole in the stator housing. See Figure 7014 and Figure 7015.

CAUTION: BE SURE TO ARRANGE THE HEAD OF SELF-LOCKING STRAP TO THE LEFT HAND SIDE OF THE END BELL RIB. THIS WILL ELIMINATE INTERFERENCE WITH THE FIRST DIODE LEAD.

(6) Secure the lead to the top spoke of the anti-drive end bearing support away from the exciter rotor cavity using a self-locking strap (160). See Figure 7013.

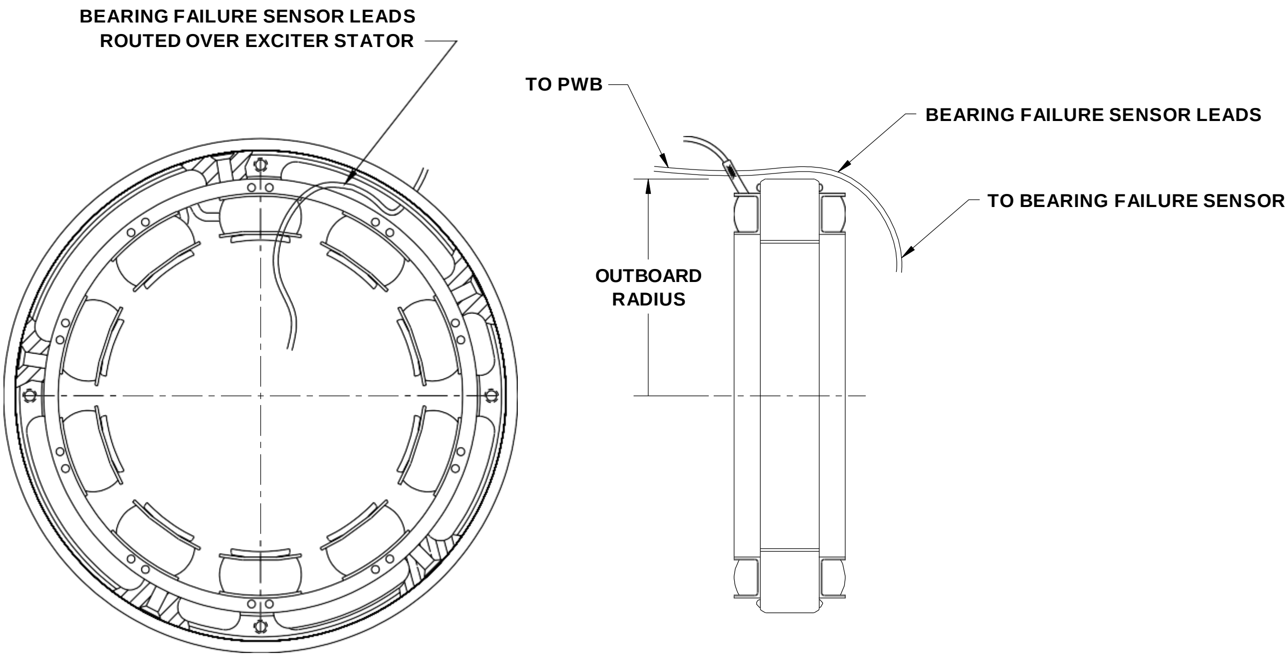

Figure 7014 - Bearing Failure Sensor Leads Routing

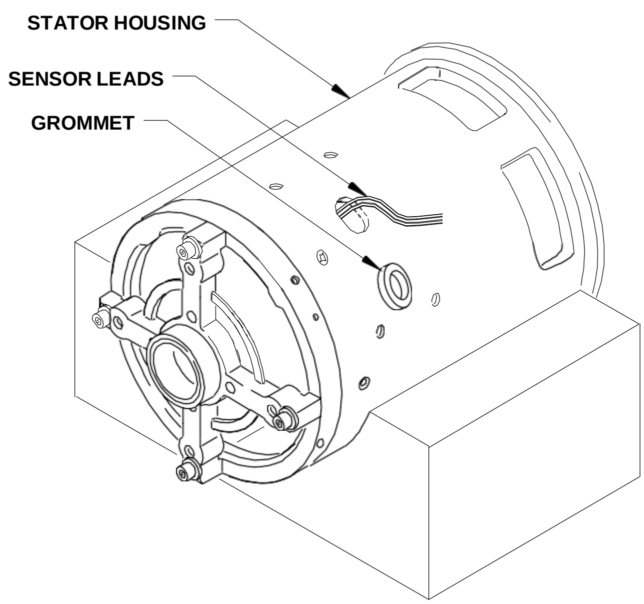

Figure 7015 - Sensor Leads - Oval Hole

(7) Position anti-drive end sensor insertion tool over the bearing failure sensor. See Figure 7016.

(8) Press the bearing failure sensor into the anti-drive end bearing support by pressing down on the piston in the anti-drive end sensor insertion tool.

CAUTION: WHEN REASSEMBLING A MODEL 30086-011 GENERATOR, BE SURE TO USE A ROUND KEY (165), EFFECT CODE B. IF A KEY WITH EFFECT CODE A WAS REMOVED FROM THE UNIT, REPLACE IT WITH THE PROPER KEY. THE KEY WITH EFFECT CODE B HAS A BLACK OXIDE FINISH AND A DIAMETER OF 0.091/0.089 INCH (2.31/2.26 MM). THE KEY WITH EFFECT CODE A HAS A PLAIN STEEL FINISH AND A DIAMETER OF 0.094/0.092 INCH (2.39/2.34 MM).

(9) Insert a round key (165) into the slot at the bottom of the anti-drive end bearing failure sensor, using the key insertion/extraction tool or tweezers.

(10) Secure the anti-drive end bearing failure sensor into place with a retaining ring (155).

(a) The retaining ring must be oriented where the opening in the retaining ring is in line with the leads of the bearing failure sensor and the flat side is always towards the sensor and fully seated.

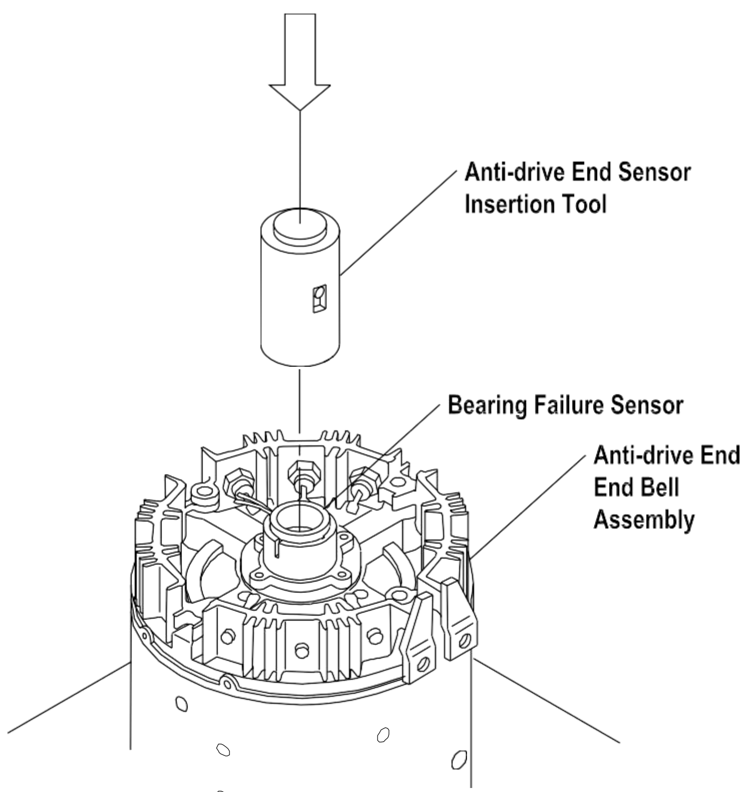

Figure 7016 - Inserting the Anti-drive End Bearing Failure Sensor

CAUTION: GENERATORS THAT ARE RETURNED TO SERVICE WITHOUT REPLACEMENT OF THE AUXILIARY BEARINGS MUST BE LABELED REPAIRED ONLY.

C. Assemble the Drive End Auxiliary Bearing (190) into the Drive End Bearing Support (175)

(1) Put the drive end bearing support fixture on the arbor press table.

(2) Put the drive end bearing support, outboard side up, on the fixture (see Figure 7017).

(3) Apply lubricating and assembly paste to the outer diameter of the drive end auxiliary bearing.

(4) Use the outer race bearing driver (see Figure 9007) to press the drive end auxiliary bearing into the bearing liner.

(5) Remove the drive end bearing support fixture and drive end bearing support from the arbor press.

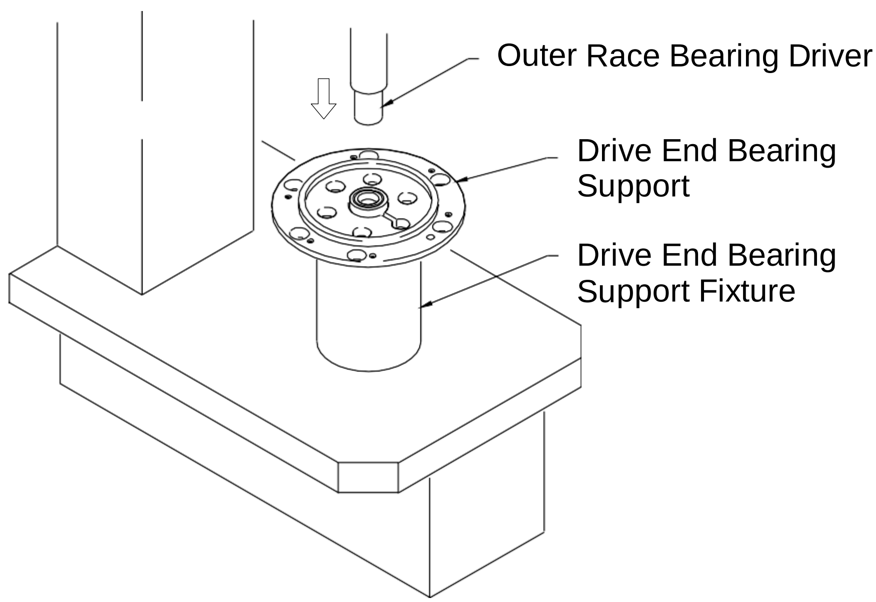

Figure 7017 - Assembly of the Drive End Auxiliary Bearing

D. Assemble the anti-drive end main bearing (220) and drive end main bearing (205) onto the rotor assembly (195).

(1) Check the rotor assembly balance according to the procedure in the REPAIR section.

(2) Carefully set the rotor assembly, anti-drive end up, onto the vertical rotor support on the arbor press table.

(3) Slide the bearing retainer (225) onto the rotor shaft.

(4) Use the inner race bearing driver (Figure 9005) to press the anti-drive end main bearing onto the rotor shaft tightly against the shaft shoulder.

(5) Slide the bearing retainer key washer (215) and bearing retaining nut (210) (Flat side away from rotor) onto the rotor shaft against the anti-drive end main bearing and use the spanner tool to tighten the nut to a torque of 75 to 100 in. lbs. (8.5 to 11.3 N·m).

(6) Carefully set the rotor assembly onto the vertical rotor assembly support, drive end up.

(7) Use the inner race bearing driver (Figure 9005) to press the drive end main bearing onto the rotor shaft. Using retaining ring pliers, secure the drive end main bearing with the retaining ring (200). Make sure the flat side of the retaining ring is against the bearing and fully seated.

(8) Remove the rotor assembly and support from the arbor press.

(9) Apply lubricating and assembly paste to the outer diameter of the anti-drive and drive end main bearings.

E. Insert the Rotor Assembly (195) into Stator and Housing Assembly (465) (see Figure 7018)

(1) Set the stator and housing assembly, anti-drive end down, in the vertical stator and housing assembly support on the arbor press table.

CAUTION: FAILURE TO USE THE DRIVE END ROTOR SHAFT ADAPTER DURING THIS OPERATION CAN CAUSE DAMAGE TO THE ROTOR SHAFT.

(2) Press the rotor assembly into the stator and housing assembly using the drive end rotor shaft adapter. Be careful not to let the shaft touch the bearing failure sensor.

NOTE: Make sure the bearing retainer holes are aligned with the mounting holes in the anti-drive end bearing support.

(3) Remove the stator and housing assembly and set it onto the horizontal stator and housing assembly support.

WARNING: KEEP ZINC CHROMATE PRIMER AWAY FROM SOURCES OF HEAT, SPARKS AND FLAME. ZINC CHROMATE PRIMER IS FLAMMABLE.

WARNING: DO NOT GET ZINC CHROMATE PRIMER ON YOUR SKIN AND DO NOT BREATHE THE FUMES. ZINC CHROMATE PRIMER IS A POISONOUS MATERIAL.

(4) Attach the bearing retainer, now seated against the inside face of the anti-drive end bearing support, with four screws (230).

(5) Apply zinc chromate primer to the entire length of each of the four screws to within 0.125 inch (3,18 mm) of the screw head.

(6) Install the screws while the zinc chromate primer is still wet and tighten the screws to a torque of 23 to 30 in. lbs. (2.6 to 3.4 N·m).

(7) Slide the spring washer (185) onto the rotor shaft.

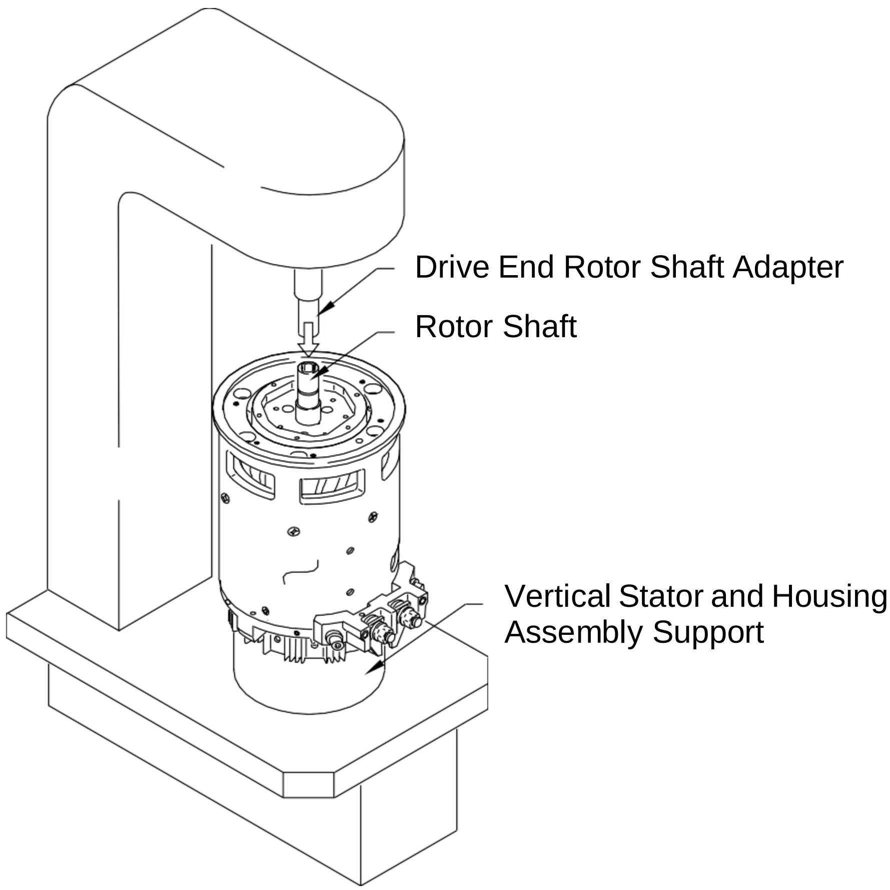

Figure 7018 - Inserting the Rotor Assembly into the Stator and Housing Assembly

F. Attach the Drive End Bearing Support (175) to the Stator and Housing Assembly (see Figure 7019)

(1) Set the drive end bearing support over the rotor shaft with the dowel pin hole at the 12 o’clock position in relation to the housing. Center of terminal block the 12 o’clock.

(2) Use the outer race bearing driver (Figure 9007) to press the drive end bearing support onto the rotor shaft of the rotor assembly until the drive end main bearing and spring washer seats into the bearing liner of the drive end bearing support.

(3) Attach the drive end bearing support to the stator and housing assembly with six screws (176).

(a) Tighten the screws to a torque 22 to 26 in. lbs. (2.5 to 2.9 N·m).

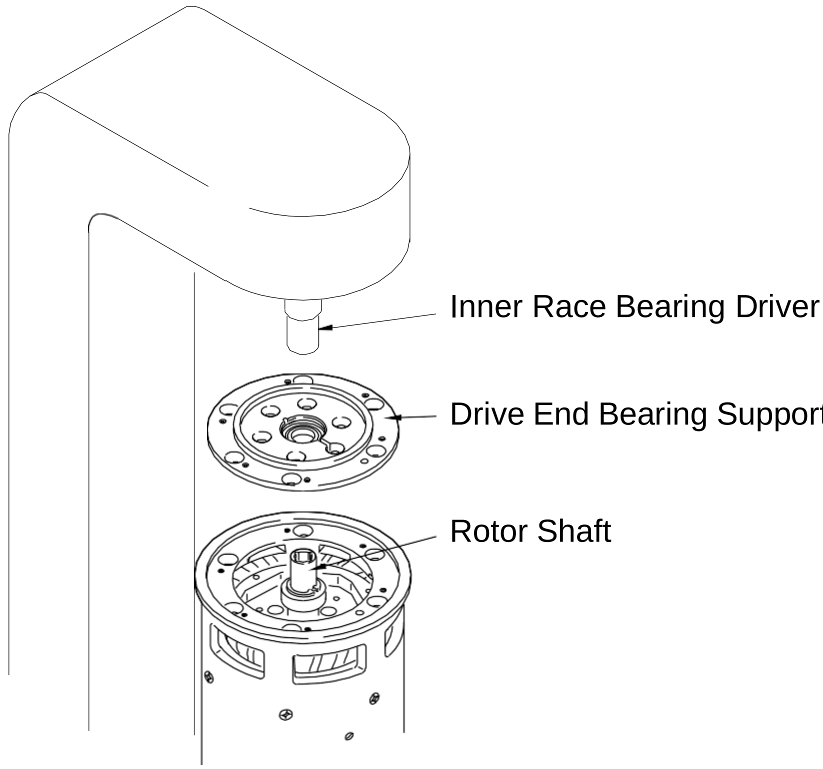

Figure 7019 - Attaching the Drive End Bearing Support

G. Assemble the Drive End Bearing Failure Sensor (150) onto the Rotor Shaft (see Figure 7020 and Figure 7021)

(1) On model 30086-010 only, position the drive end bearing failure sensor over the drive end auxiliary bearing with either side facing outboard. Align notch in bearing sensor with notch in bearing liner.

(1a) On model 30086-011 only, position the drive end bearing failure sensor over the drive end auxiliary bearing with the lead side facing outboard. Align notch in bearing sensor with notch in bearing liner.

(2) Route the drive end bearing failure sensor lead through the oval hole in the drive end bearing support.

(3) Route the lead above the main stator and through the grommet in the top of the housing.

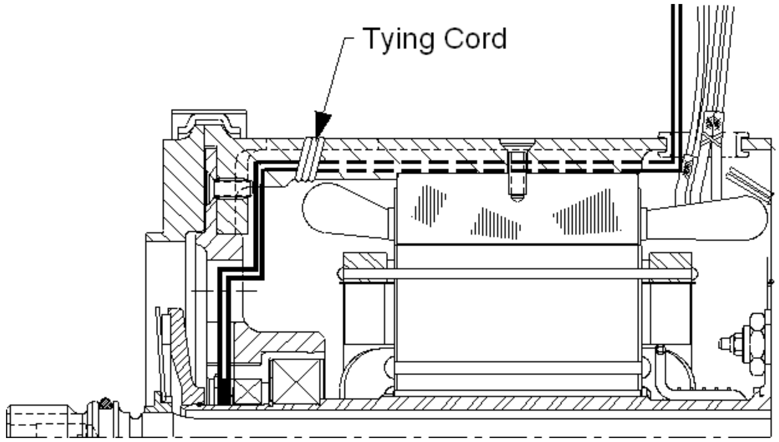

Figure 7020 - Sensor Lead Routing

(4) Insert the positioning rod of the drive end sensor insertion tool into the center of the rotor shaft.

(5) Press the drive end bearing failure sensor by pushing down on the handle of the drive end sensor insertion tool.

CAUTION: WHEN REASSEMBLING A MODEL 30086-011 GENERATOR, BE SURE TO USE A ROUND KEY (145), EFFECT CODE B. IF A KEY WITH EFFECT CODE A WAS REMOVED FROM THE UNIT, REPLACE IT WITH THE PROPER KEY. THE KEY WITH EFFECT CODE B HAS A BLACK OXIDE FINISH AND A DIAMETER OF 0.091/0.089 INCH (2.31/2.26 MM). THE KEY WITH EFFECT CODE A HAS A PLAIN STEEL FINISH AND A DIAMETER OF 0.094/0.092 INCH (2.39/2.34 MM).

(6) Insert the round key (145) at the bottom of the bearing failure sensor using tweezers.

(7) Secure the drive end bearing failure sensor with the retaining ring (140).

(a) The retaining ring must be oriented where the opening in the retaining ring is in line with the leads of the bearing failure sensor and the flat side is always towards the sensor and fully seated.

(8) Secure bearing leads to end bell using tying cord. Apply epoxy resin to knot on 30086-011 only.

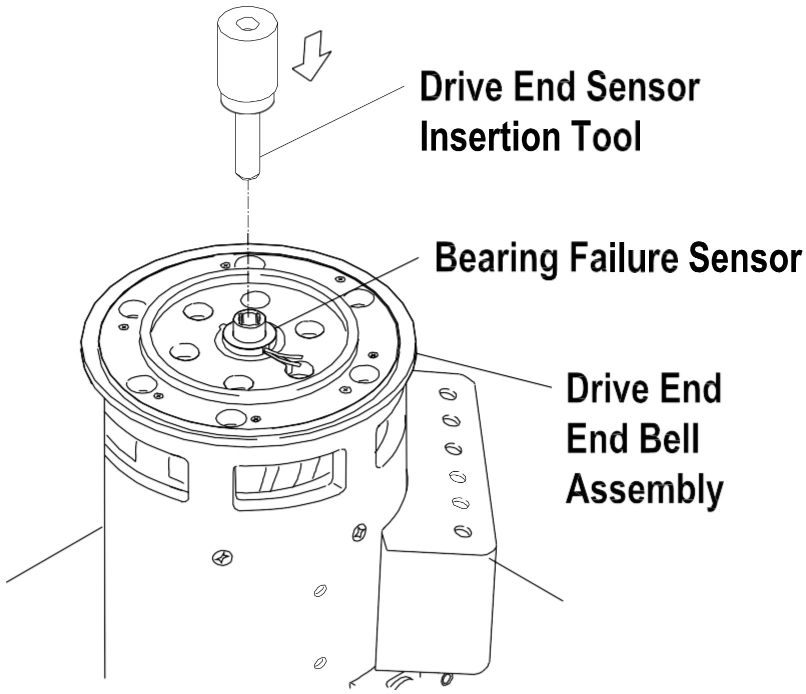

Figure 7021 - Inserting the Drive End Bearing Failure Sensor

H. Place the Dampener Backplate (135) and Friction Ring (125) onto the Rotor Shaft

(1) Twist the dampener backplate by hand onto the drive end of the rotor shaft until it is fully seated.

(2) Press the friction ring by hand into the recess of the dampener backplate.

I. Assemble the Dampener Hub (130) and Dampener Plate (120) onto the Drive Shaft (110)

CAUTION: DO NOT FORCE THE DAMPENER HUB ONTO THE MATING TAPER OF THE DRIVE SHAFT. THE HUB CAN FRACTURE IF EXCESSIVE PRESSURE IS USED.

(1) If the dampener hub was removed from the drive shaft, twist the dampener hub by hand onto the drive shaft taper and make sure it is fully seated.

(2) Set the dampener plate onto the dampener plate driver (Figure 9004).

(3) Insert the drive shaft through the dampener plate and dampener plate driver while aligning the plate and hub splines.

(4) Lightly tap the drive end of the drive shaft using a leather or plastic mallet to seat the dampener plate onto the dampener hub.

J. Insert the Drive Shaft (110) into the Rotor Shaft

CAUTION: DO NOT USE FORCE TO ENGAGE THE ROTOR SHAFT AND DRIVE SHAFT SPLINES. FAILURE TO ENGAGE THE SPLINES CORRECTLY CAN DAMAGE THE DRIVE SHAFT AND ROTOR SHAFT.

(1) Put the stator and housing assembly in the horizontal stator and housing support.

(2) Insert the drive shaft into the drive end of the rotor shaft.

(3) Push the drive shaft through the rotor shaft until the dampener plate is fully engaged against the friction ring.

(4) Turn the drive shaft by hand in the direction of rotation (counterclockwise at the drive end) to make sure that the rotor shaft and drive shaft splines are properly engaged.

K. Assemble the Terminal Posts (435) and Terminal Lug (440) to the Filter and Connector Mounting Cover

NOTE: The original filter and connector mounting cover must be discarded if the terminal posts and/or terminal lug were removed from the original filter and connector mounting cover. The removal of the terminal posts and terminal lug from the original filter and connector mounting cover will result in damage (i.e., oversized holes). The terminal posts and terminal lug may only be assembled into a new filter and connector mounting cover.

(1) Assemble 3 terminal posts into a new filter and connector mounting cover.

(2) Assemble the terminal lug into a new filter and connector mounting cover.

L. Attach the Cover Gasket (450) and the Filter and Connector Mounting Cover Brackets (445) to the Stator and Housing Assembly

(1) Route all of the leads exiting from the housing through the gasket cover. Put the cover gasket into position onto the housing.

(2) Attach the cover gasket and the filter and connector mounting cover brackets to the stator and housing assembly with four screws (455) and flat washers (460).

(a) Tighten the screws to a torque of 7.7 to 10.3 in. lbs. (0.87 to 1.16 N·m).

M. Attach Capacitor C1 (385) and Capacitor C2 (410) to the Filter and Connector Mounting Cover (see Figure 2 of the DESCRIPTION AND OPERATION section)

NOTE: All soldering operations must be performed according to the procedure in the REPAIR section.

(1) Tape the entire outer diameter of capacitor C1 with electrical tape.

(2) Insert capacitor C1 into the loop clamp (390).

NOTE: Before securing the loop clamp to the filter and connector mounting cover, make sure that the end of capacitor C1 is 1/4 inch (6 mm) away from the inside surface of the filter and connector mounting cover.

(3) Attach the loop clamp to the filter and connector mounting cover with a screw (395), a flat washer (405) (located between the screw and the filter and connector mounting cover), a flat washer (405), and a self-locking nut (400). Tighten the screw to a torque of 7.7 to 10.3 in. lbs. (0.87 to 1.16 N·m).

(4) Cut capacitor C1 and C2 leads to length required to make the connections to the terminal posts closest to the leads.

(5) Put insulation sleeving on capacitor C1 and C2 leads.

NOTE: The insulation must allow enough wire to extend out so it does not interfere with soldering.

(6) Connect and solder capacitors C1 and C2 to the terminal posts closest to their positions.

WARNING: VAPORS FROM ELECTRICAL RESIN MAY CAUSE EYE AND RESPIRATORY IRRITATION AND POSSIBLE RESPIRATORY SENSITIZATION. ELECTRICAL RESIN MAY BE ABSORBED THROUGH SKIN. WEAR APPROVED GLOVES AND GOGGLES WHEN WORKING WITH ELECTRICAL RESIN. AVOID CONTACT WITH EYES, SKIN AND CLOTHING. ALWAYS USE THIS MATERIAL IN A WELL-VENTILATED AREA AND AVOID BREATHING IN VAPORS.

(7) Bond capacitors C1 and C2 into position on the filter and connector mounting cover with electrical resin.

N. Attach the Resistors R5 (345) and R6 (365) to the Filter and Connector Mounting Cover (see Figure 2 of the DESCRIPTION AND OPERATION section)

NOTE: All soldering operations must be performed according to the procedure in the REPAIR section.

(1) Cut one piece of black lead wire AWG #22 to a length of 5-1/2 inch (132 mm).

(2) Cut one piece of orange lead wire AWG #22 to a length of 3 inch (72 mm).

(3) Solder the black lead wire to one end of resistor R6.

(4) Solder the orange lead wire to the other end of resistor R6.

(5) Put insulation sleeving on the 2 lead wires.

(a) The insulation must begin approximately 0.75 inch (19.0 mm) from receptacle connector.

(b) The insulation must allow enough wire to extend out so it does not interfere with soldering.

(6) Temporarily secure resistor R6 to the filter and connector mounting cover with two screws (370), flat washers (380), and self-locking nuts (375).

NOTE: Allow enough clearance to be able to solder connections to the terminal post below resistor R6.

(7) Solder the lead from the positive end of capacitor C1 and the orange lead from resistor R6 to the terminal post closest to the positive end of capacitor C1.

(8) Solder the lead from the negative end of capacitor C1 and the black lead from resistor R6 to the terminal closest to the negative end of capacitor C1.

(9) Bend one terminal lug on resistor R5 to a 90° angle towards the mounting leg. Bend the opposite terminal lug about 45° towards the same side of the resistor as the other R5 lug.

(10) Cut one piece of yellow lead wire AWG #20 to a length of 4 inch (96 mm).

(11) Cut one piece of yellow lead wire AWG #20 to a length of 5 inch (120 mm).

(12) Solder the 4 inch (96 mm) piece of yellow lead wire to the 90° bend terminal.

(13) Solder the 5 inch (120 mm) piece of yellow lead wire to the 45° bend terminal.

(14) Use thermo strippers to remove the insulation from the end of the yellow wire back approximately 3/16 ± 0.025 inch (4,7 ± 0,64 mm).

(15) Use the crimp tool P/N 615708 to crimp a connector pin onto the end of the yellow wire using a crimp tool adjusted for the wire 20 AWG and the pin barrel size 20. See Table 7003**.**

(a) Use finger pressure to inspect the crimp to make sure it does not wiggle or come loose.

(16) Put insulation sleeving (varglas) on the 2 lead wires.

(a) The insulation must begin approximately 0.75 inch (19.0 mm) from receptacle connector.

(b) The insulation must allow enough wire to extend out so it does not interfere with soldering.

(17) Temporarily secure resistor R5 to the filter and connector mounting cover with two screws (350), flat washers (360), and self-locking nuts (355).

NOTE: Orient resistor R5 on the filter and connector mounting cover with the 90° bend terminal towards the connector.

O. Make the Electrical Connections between the Printed Wiring Board Assembly (320) and the Connector (see Figure 7022 and Figure 7023).

NOTE: All soldering operations must be performed according to the procedure in the REPAIR section.

(1) Use thermo strippers to remove the insulation from the end of each wire back approximately 3/16 ± 0.025 inch (4,7 ± 0,64 mm). Prepare the wire to length specified below.

(a) Crimp a connector pin onto one end of each lead wire below using a crimp tool P/N 615708 adjusted for the wire 22 AWG and the pin barrel size 20. See Table 7003**.**

- 5 inch (120 mm) AWG #22 green lead wire. Solder the end of the wire to PWB terminal K.
- 6 1/2 inch (156 mm) AWG #22 blue lead wire. Solder the end of the wire to PWB terminal A.
- 6 inch (144 mm) AWG #22 red lead wire. Solder the end of the wire to PWB terminal D.
- 6 inch (144 mm) AWG #22 white lead wire. Solder the end of the wire to PWB terminal E.
- 4 inch (96 mm) AWG #22 black lead wire. Solder the end to the E(-) terminal closest to the R2 resistor on the PWB.

(b) Crimp a connector pin onto the lead wire below using a crimp tool P/N 615708 adjusted for the wire 18 AWG and the pin barrel size 16. See Table 7003.

- 4 inch (96 mm) AWG #18 black lead wire. Solder the end to the E(-) terminal closest to the other “E–” terminal on the PWB.

Pin Identifier	Wire Color/Size	Pin P/N
A	Blue #22	10001-417
D	Red #22	10001-417
E	White #22	10001-417
F	Black #22	10001-417
K	Green #22	10001-417
M	Black #18	10001-418
G	Brown #20	10001-418
C	Yellow #20	10001-418

Table 7003 - 22 AWG Wires for Repair

(2) Use finger pressure to inspect the crimp to make sure it does not wiggle or come loose.

(3) Inspect all soldered connections according to the criteria in the REPAIR section.

(4) Put insulation sleeving (Varglas) on all wires.

(a) The insulation must begin approximately 0.75 inch (19.0 mm) from receptacle connector.

(b) The insulation must allow enough wire to extend out so it does not interfere with soldering.

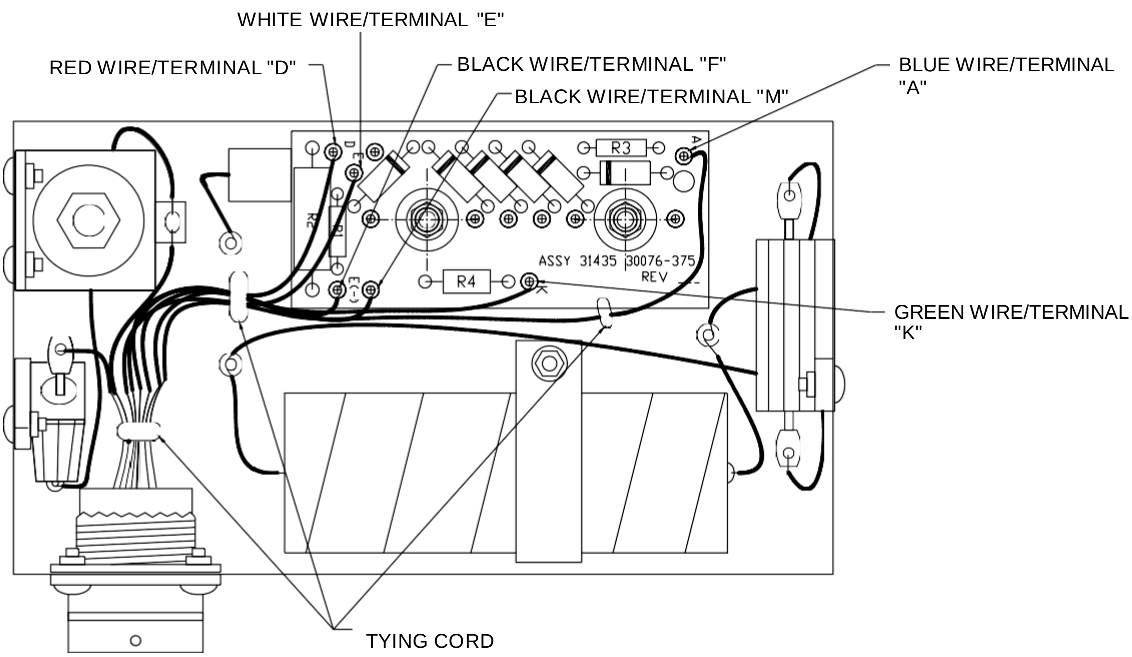

Figure 7022 - Model 30086-010 Connector Receptacle Connections

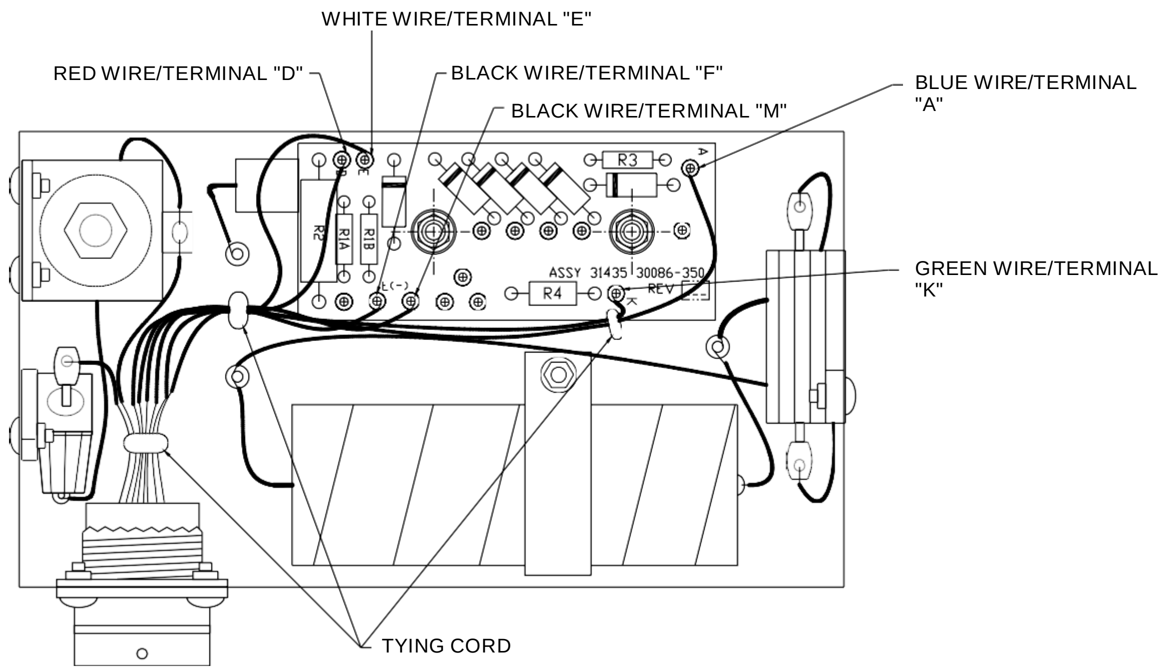

Figure 7023 - Model 30086-011 Connector Receptacle Connections

P. Attach the Printed Wiring Board Assembly (320) to the Filter and Connector Mounting Cover (see Figure 2 of the DESCRIPTION AND OPERATION section)

(1) Put a flat washer (331) onto each of the screws (330).

(2) Insert the screws into the printed wiring board assembly mounting holes in the filter and connector mounting cover.

(3) Put a spacer sleeve (325) onto each of the screws.

(4) Put the printed wiring board assembly onto the screws.

(5) Secure the printed wiring board assembly with two flat washers (335) and self-locking nuts (340).

(a) Tighten the screws to a torque of 7.7 to 10.3 in. lbs. (0.87 to 1.16 N·m).

Q. Tighten the Hardware that Attaches the R5 and R6 Resistors to the Filter and Connector Mounting Cover

(1) Tighten the screws, (370 and 350), that attach the R5 and R6 resistors to the filter and connector mounting cover.

(2) Tighten the screws to a torque of 4.2 to 5.5 in. lbs. (0.47 to 0.62 N·m).

R. Attach the D1 Diode (270) to the Diode Mounting Bracket (see Figure 2 of the DESCRIPTION AND OPERATION section)

NOTE: All soldering operations must be performed according to the procedure in the REPAIR section.

(1) Put a terminal lug (285) and insulator (290) onto the thread of the D1 diode.

(2) Attach the diode and terminal lug to the diode bracket (255) with an insulator (315), a bushing (310), a flat washer (305), a lock washer (300) and a nut (295).

NOTE: The insulators are assembled one on each side of the diode mounting bracket.

(a) Tighten the nut to a torque of 3.75 to 4.25 in.lbs. (0.4 to 0.5 N.m).

(3) Cut two pieces of insulation sleeving, 3/4 inch (18 mm) to 1 in. long.

(4) Put insulation sleeving on the C3 capacitor (275) lead wires.

(a) The insulation must allow enough wire to extend out so it does not interfere with soldering.

(5) Connect and solder the C3 capacitor lead wires to the D1 diode.

(a) Position capacitor C3 along side of diode D1. Bond capacitor C3 to diode D1 with electrical resin.

(b) Secure capacitor C3 to diode D1 with a self-locking strap (280).

(6) Connect and solder the yellow lead wire from the 90° bend on resistor R5 to the top of diode D1.

(7) Use thermo strippers to remove the insulation from the end of the brown wire back approximately 3/16 inch ± 0.025 inch (4,7 ± 0,64 mm).

(8) Cut a 4 inch (96 mm) length of brown lead wire. Strip the ends of the lead wire.

(9) Crimp a connector pin onto the end of the brown wire using a crimp tool adjusted for the wire 20 AWG and the pin barrel size 20. See Table 7003**.**

(a) Use finger pressure to inspect the crimp to make sure it does not wiggle or come loose.

(10) Solder one end of the brown lead wire to the terminal lug.

(11) Put insulation sleeving on the lead wire.

(a) The insulation must begin approximately 0.75 inch (19.0 mm) from receptacle connector.

(b) The insulation must allow enough wire to extend out so it does not interfere with soldering.

S. Attach the Diode Mounting Bracket (255) to the Filter and Connector Mounting Cover (240) (see Figure 7024).

(1) Attach the diode mounting bracket to the filter and connector mounting cover with two screws (260) and flat washers (265).

(2) Tighten the screws to a torque of 4.2 to 5.5 in. lbs. (0.47 to 0.62 N·m).

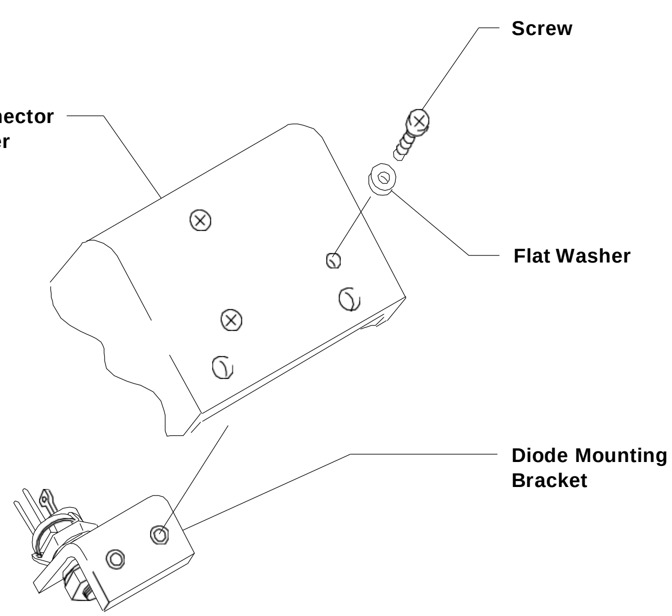

Figure 7024 - Attaching Diode Mounting Bracket to the Filter and Connector Mounting Cover

T. Insert the Connector Pins (see Figure 2 of the DESCRIPTION AND OPERATION section and Figure 7025)

(1) Insert the connector pins as follows:

(a) AWG #22 blue lead wire from PWB terminal A to connector pin A.

(b) AWG #20 yellow lead wire from R5 resistor to connector pin C.

(c) AWG #22 red lead wire from PWB terminal D to connector pin D.

(d) AWG #22 white lead wire from PWB terminal E to connector pin E.

(e) AWG #22 black lead wire from PWB terminal E(-) to connector pin F.

(f) AWG #20 brown lead wire from the D1 diode to connector pin G.

(g) AWG #22 green lead wire from PWB terminal K to connector pin K.

(h) AWG #18 black lead wire from PWB terminal E(-) to connector pin M.

(2) Check each pin to make sure it is locked into the receptacle connector.

(3) If one of the pins does not stay locked into the connector, then the mechanical lock tab in the connector is damaged. Remove all of the pins and replace the connector body.

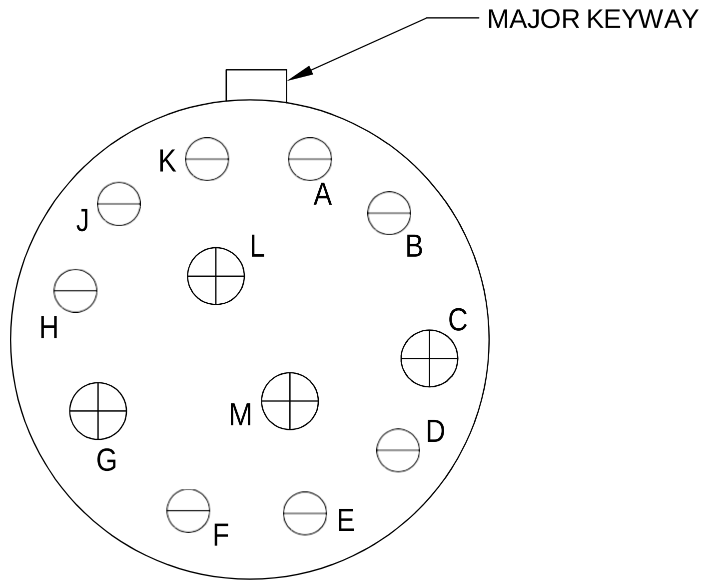

Figure 7025 - Electrical Connector Pins Layout

U. Attach the Connector (415) to the Filter and Connector Mounting Cover (see Figure 7026)

NOTE: Position the connector so that pin A is at the top when the filter and connector mounting cover is attached to the filter and connector mounting cover brackets.

(1) On model 30086-010, attach the connector to the filter and connector mounting cover with four screws (420), flat washers (430), and self-locking nuts (425).

(a) Tighten the screws to a torque of 4.2 to 5.5 in. lbs. (0.47 to 0.62 N·m).

(2) On model 30086-011, attach the connector to the filter and connector mounting cover with connector retainer (416) and four screws (420).

(a) Tighten the screws to a torque of 4.2 to 5.5 in. lbs. (0.47 to 0.62 N·m).

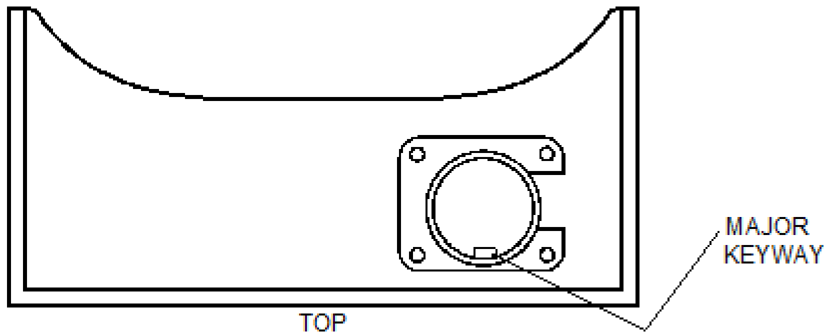

Figure 7026 - Interior of Cover

V. Complete the Electrical Connections (see Figure 7027 and Figure 7028)

NOTE: All soldering operations must be performed according to the procedure in the REPAIR section. Before connecting and soldering the leads exiting from the top of the stator and housing assembly, make sure that all leads are routed properly and that the length of the lead wires is sufficient.

(1) Complete the electrical connections according to Figure 7027 for the 30086-010 or Figure 7028 for the 30086-011.

(2) Inspect all soldered connections according to the procedure in the REPAIR section.

(3) Tie all wires as shown in Figure 7027 for the 30086-010 or Figure 7028 for the 30086-011.

W. Apply RTV Silicone Sealant

(1) Apply RTV silicone sealant to all soldered terminals on the PWB according to the procedure in the REPAIR section.

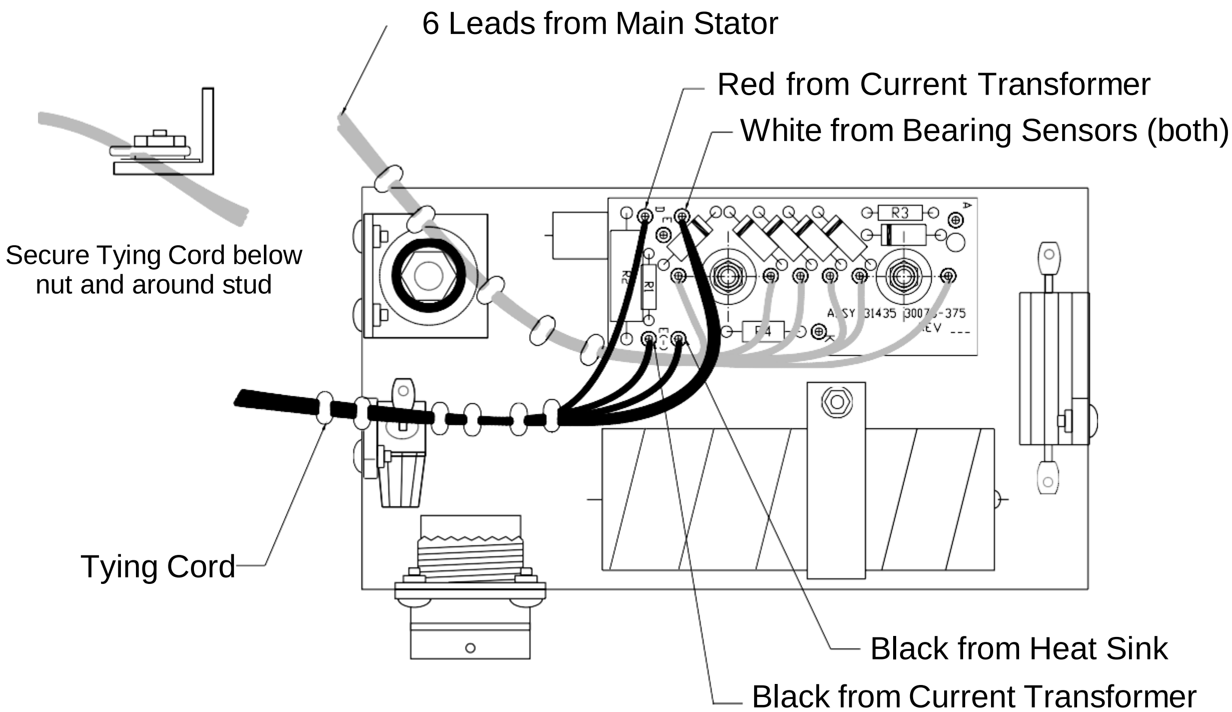

Figure 7027 - Model 30086-010 Final Wiring and Tying Cord Installation

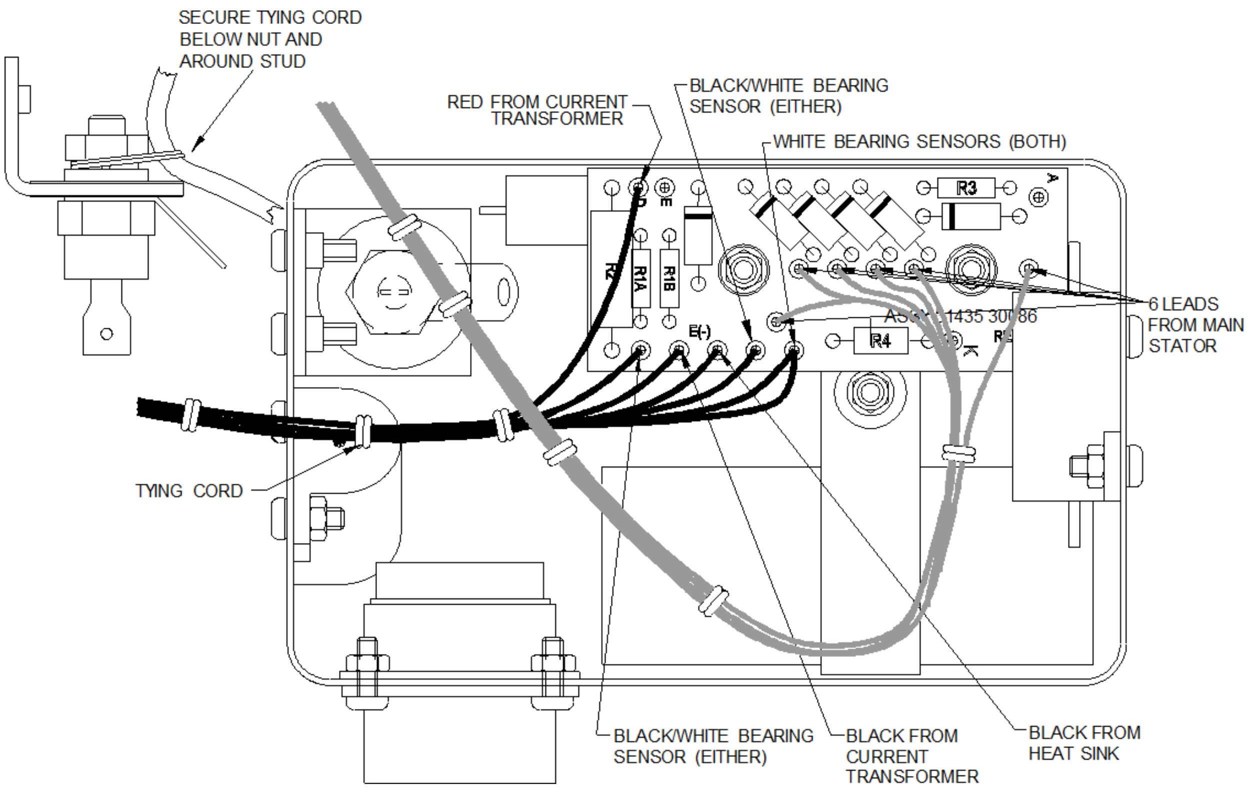

Figure 7028 - Model 30086-011 Final Wiring and Tying Cord Installation

X. Perform a Dielectric Test

WARNING: **FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING HIGH POTENTIAL TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.**

CAUTION: FAILURE TO TURN OFF THE HIGH POTENTIAL TESTER POWER BEFORE CONNECTING OR DISCONNECTING HIGH VOLTAGE ELECTRICAL LEADS CAN CAUSE SERIOUS DAMAGE TO THE GENERATOR.

CAUTION: DIELECTRIC TESTING IS ACCOMPLISHED DURING ACCEPTANCE TESTING AND ONLY FOR GENERATORS THAT HAVE BEEN FULLY CLEANED.

(1) Test Preparation:

(a) Turn off all power to the test stand.

(b) Disconnect the generator from the test circuit.

CAUTION: THE EMI CAPACITOR (C2) MUST BE DISCONNECTED FROM GROUND (BRACKET) FOR THIS TEST.

(c) Remove the filter and connector mounting cover.

(d) Isolate the filter and connector mounting cover to avoid contact with the frame of the generator.

(e) Connect a jumper between the generator output terminals B+ and E–.

(f) Connect the positive (red) lead of the high potential tester to the connected terminals B+ and E–.

(g) Connect the negative (black) lead to a non-coated surface of the generator frame.

(2) Operating Instructions:

CAUTION: INCREASE AND DECREASE TEST VOLTAGES SLOWLY (100 VOLTS PER SECOND, MAXIMUM). INCREASING AND DECREASING VOLTAGE TOO QUICKLY MAY CAUSE DAMAGE TO THE GENERATOR.

(a) Turn on power to the dielectric tester and slowly increase voltage to 250 VAC RMS, commercial frequency to each of the following circuits.

1 Between the connected terminals B+ and E– and the housing frame.

2 Between the connected terminals B+ and E– and pin G.

3 Between pin G and the frame.

(b) Maintain the test voltages for one minute.

(c) After one minute, slowly reduce the high potential voltage to zero. Turn off the power supply.

(3) Acceptance Limits:

(a) There must be no evidence of arc-over, flash-over, dielectric breakdown or fluctuation, or a steady increase in leakage current.

(b) Leakage current must not exceed 5 mA.

Y. Attach the Filter and Connector Mounting Cover (240) to the Filter and Mounting Cover Brackets

(1) Attach the filter and connector mounting cover to the filter and connector mounting cover brackets with four screws (245) and flat washers (250).

(a) Tighten the screws to a torque of 7.7 to 10.3 in. lbs. (0.87 to 1.16 N·m).

Z. Attach the Air Deflector (105) and the Fan (90) to the Drive Shaft

(1) Press the air deflector over the heatsinks.

(2) Slide the fan onto the drive shaft and over the end of the rotor shaft.

(3) Position the drive screws in the fan hub into the recesses in the rotor shaft.

(4) Secure the fan to the drive shaft with a self-locking double hex nut (95) and flat washer (100).

(a) Tighten the hex nut to a torque of 100 to 120 in. lbs. (11.3 to 13.6 N·m).

NOTE: Hold the drive spline with a spline wrench to keep it from turning when tightening the nut onto the drive shaft.

AA. Attach the Air Inlet (80) to the Stator and Housing Assembly

(1) Press the air inlet into place over the air deflector and fan.

NOTE: Make sure that the fan turns freely without touching the air inlet.

(2) Attach the air inlet to the anti-drive end bearing support with four screws (85).

(a) Tighten the screws to a torque of 25 to 30 in.-lbs. (2.8 to 3.4 N·m).

(3) Lockwire the four screws using MS20995C32 lockwire.

AB. Attach the Terminal Block Hardware and Terminal Block Cover (40) to the Terminal Block

(1) Attach a Belleville washer (75) and a self-locking nut (70) to terminal block stud E–.

(a) Only tighten the screw with your fingers.

(2) Attach a Belleville washer (65) and a self-locking nut (60) to terminal block stud B.

(a) Only tighten the screw with your fingers.

(3) Attach the terminal block cover (40) to the terminal block with two screws (45), lock washers (55), and flat washers (50) if the terminal block cover was returned with the unit.

NOTE: When a generator is removed from aircraft for service, the terminal block cover usually stays with the aircraft.

(a) Only tighten the screw with your fingers.

AC. Attach the Replacement ID Nameplate (30) to the Stator and Housing Assembly

(1) If the nameplate was removed due to damage or unreadability, transfer all information from the original nameplate to a replacement nameplate.

(2) Attach the nameplate to the stator and housing assembly with four drive screws (35).

AD. Attach the QAD Mounting Kit (5) to the Generator (if present)

(1) Put the rim clenching clamp (10) over the drive end bearing support.

(2) Put the mounting adapter (25) into the inner rim of the rim clenching clamp.

(3) Tighten the self-locking hex nut (15) onto the T-bolt (20).

(a) Tighten the nut to a torque of 70 in. lbs. (7.9 N·m).

8. Mandatory Acceptance Testing

All generators that have been serviced, repaired, or modified must be acceptance tested according to the procedures in the TESTING AND FAULT ISOLATION section before they are put in storage or returned to service.

9. Generator Shipment Preparation

Refer to STORAGE section for generator shipment preparation.

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FITS AND CLEARANCES

1. Torque Values

Table 8001 gives information necessary to tighten fasteners to specified torque. Values shown do not include frictional torque caused by self-locking devices or rundown resistance. Frictional torque values must be added to the specified torque.

Nuts, bolts, and screws not listed in Table 8001 are to be tightened in accordance with Safran Power methods and techniques or practices acceptable to your administration as specified in FAR PART 43.

Hardware Description	Torque Acceptance Limits
Self-locking Hex Nut (10001-15)	70 in-lbs (7.9 N·m)
Pan Head Screw (10001-45)	7.7-10.3 in-lbs (0.87-1.16 N·m)
Self-locking Nut (10001-60)	220-330 in-lbs (25-37 N·m)
Self-locking Nut (10001-70)	120-160 in-lbs (14-18 N·m)
Fillister Head Screw (10001-85)	25-30 in-lbs (2.8-3.4 N·m)
Self-locking Double Hex Nut (10001-95)	100-120 in-lbs (11.3-13.6 N·m)
Flathead Screw (10001-176)	22-26 in-lbs (2.5-2.9 N·m)
Bearing Retaining Nut (10001-210)	75-100 in-lbs (8.5-11.3 N·m)
Socket Head Cap Screw (10001-230)	23-30 in-lbs (2.6-3.4 N·m)
Binding Head Screw (10001-245)	7.7-10.3 in-lbs (0.87-1.16 N·m)
Pan Head Screw (10001-260)	4.2-5.5 in-lbs (0.47-0.62 N·m)
Hex Nut (10001-295)	3.75-4.25 in-lbs (0.4-0.5 N·m)
Pan Head Screw (10001-330)	7.7-10.3 in-lbs (0.87-1.16 N·m)
Self-locking Nut (10001-340)	7.7-10.3 in-lbs (0.87-1.16 N·m)
Pan Head Screw (10001-350)	4.2-5.5 in-lbs (0.47-0.62 N·m)
Self-locking Nut (10001-355)	4.2-5.5 in-lbs (0.47-0.62 N·m)
Pan Head Screw (10001-370)	4.2-5.5 in-lbs (0.47-0.62 N·m)
Self-locking Nut (10001-375)	4.2-5.5 in-lbs (0.47-0.62 N·m)
Binding Head Screw (10001-395)	7.7-10.3 in-lbs (0.87-1.16 N·m)
Self-locking Nut (10001-400)	7.7-10.3 in-lbs (0.87-1.16 N·m)
Pan Head Screw (10001-420)	4.2-5.5 in-lbs (0.47-0.62 N·m)
Self-locking Nut (10001-425)	4.2-5.5 in-lbs (0.47-0.62 N·m)
Hex Nut (10002-20)	20-30 in-lbs (2.3-3.4 N·m)
Socket Head Cap Screw (10004-5)	15-19 in-lbs (1.7-2.2 N·m)

Table 8001 - Torque Values

Hardware Description	Torque Acceptance Limits
Hex Nut (10002-30)	20-30 in-lbs (2.3-3.4 N·m)
Hex Nut used in terminal post assembly (10002-35)	8-12 in-lbs (0.9-1.4 N·m)
Hex Nut (10004-20)	20-25 in-lbs (2.3-2.8 N·m)
Hex Nut (10004-35)	20-25 in-lbs (2.3-2.8 N·m)
Socket Head Cap Screw (10004-55)	13.5-18.0 in-lbs (1.5-2.0 N·m)
Socket Head Cap Screw (10004-80)	30.0-35.0 in-lbs (3.4-4.0 N·m)
Socket Head Cap Screw (10004-105)	22.7-35.0 in-lbs (2.6-4.0 N·m)
Flat Head Screw (10004-120)	7.7-10.3 in-lbs (0.87-1.16 N·m)
Flat Head Screw (10004-130)	13.5-18.0 in-lbs (1.5-2.0 N·m)

Table 8001 - Torque Values (Continued)

2. Component Acceptance Limits

Refer to Table 8002 for generator component and subassembly acceptance limits. Paragraph designations in the CHECK column refer to the applicable inspection procedure found in the CHECK section. Item number in parentheses ( ) refer to item numbers given in the ILLUSTRATED PARTS LIST.

CHECK Para. Ref.	Nomenclature and IPL Number	Inspect for…8.B.	Acceptance Limits
8.B.	Mounting Adapter (10001-25)	Pilot flange diameter (A)	4.121 - 4.123 inch (104.673 - 104.724 mm)
		Pilot bore diameter (B)	4.123 - 4.125 inch (104.724 - 104.775 mm)
		Guide pin height	0.275 - 0.32 inch (6.98 - 8.13 mm) max.
		Parallelism of Surface 1 to Surface 2	0.002 inch
8.H.	Drive Shaft (10001-110)	Diameter over 0.1094 inch (2.779 mm) gage pins	0.757 inch (19.228 mm) min.
8.I.	Friction Ring (10001-125)	Thickness	0.060 inch (1.524 mm) min.

Table 8002 - Acceptance Limits

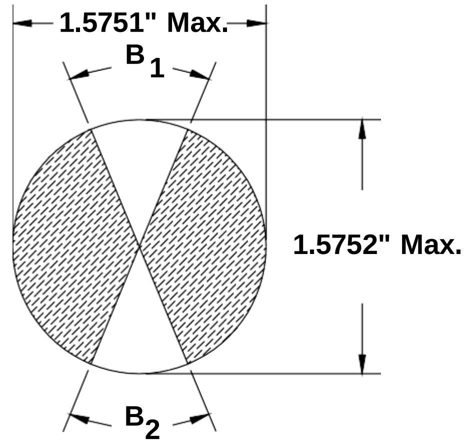
CHECK Para. Ref.	Nomenclature and IPL Number	Inspect for…8.B.	Acceptance Limits
8.J.	Dampener Plate (10001-120)	Thickness	0.038 inch (0.965 mm) min.
		Internal spline diameter between 0.090 inch (2.286 mm) diameter gage pins	0.655 inch (16.637 mm) max.
8.K.	Dampener Backplate (10001-135)	Minimum Dimension “A”	0.015 inch (0.381 mm)
8.L.	Spring Washer (10001-185)	Load to compress to H_C 0.052 inch (1,32 mm)	19 - 23 lbs. (8,6 - 10,4 kg)
8.M.	DE and ADE Bearing Failure Sensor for Model 30086-011 (10001-150 and -170)	Resistance across two lead wires	Less than 1 Ω
8.N.	Drive End Bearing Support (10001-175)	Bearing liner diameter “A”	1.1811 - 1.1814 inch (30.000 - 30.008 mm)
		Bearing liner diameter “B”	1.5745 - 1.5748 inch (39.992 - 40.000 mm) See Figure 8002
		Mounting adapter pilot bore “C”	4.121 - 4.123 inch (104.673 - 104.724 mm)
		Stator housing pilot bore “D”	4.078 - 4.080 inch (103.581 - 103.632 mm)
8.P.(5)	Resistors, R5 and R6	Resistance R5	2 ± 0.02 Ω
		Resistance R6	50 ± 0.5 Ω
8.P.(7)	Capacitor, C3 (10001-275)	Capacitance	0.09 to 0.11 µF, tested at 1 kHz. 77° F (25° C) ± 10%
8.S.	Rotor Assembly (10001-195) See Figure 5009	DE and ADE Main Bearing journal diameter “A”	0.6691 - 0.6694 inch (16.995 - 17.003 mm)
		DE Auxiliary Bearing journal diameter “B”	0.6547 - 0.6551 inch (16.628 - 16.638 mm)
		ADE Auxiliary Bearing journal diameter “C”	0.6110 - 0.6115 inch (15.519 - 15.532 mm)
		Balance	5 grain inches (8.2 gr mm) max. each end

Table 8002 - Acceptance Limits (Continued)

CHECK Para. Ref.	Nomenclature and IPL Number	Inspect for...8.B.	Acceptance Limits
8.U.	Exciter Rotor (10002-50)	Resistance test	Phase to phase 0.20 to 0.28 Ω Phase to neutral 0.10 to 0.14 Ω
8.V.	Diode and Resistor Mounting Bracket (10002-10)	Inside diameter	0.8430 - 0.8435 inch (21.4122 - 21.4249 mm)
8.W.	Diodes (10002-15) and Resistors (10002-30)	Resistor test	500 ± 5 Ω
		Diode test	1.0 V or less forward bias Overload (OL) for reverse bias
8.T.	Main Field Rotor and Shaft Assembly (10002-65)	Main field winding resistance	0.36 to 0.44 Ω
8.Y.	Housing (10004-155)	Housing wall thickness at exhaust passages	0.076 inch (1.93 mm) min.
8.Z.	Diode rectifiers (10004-15 and 10004-30) when removed from the heatsinks	Forward voltage test	The maximum forward voltage is equal to or less than 1.15 VDC (out of circuit)
		Reverse current test	The maximum reverse current is equal or less than 2.0 mA (out of circuit)
8.AB.	Anti-drive End Bearing Support (10004-75)	Bearing liner diameter outer	1.3750 - 1.3753 inch (34.925 - 34.933 mm)
		Bearing liner diameter inner	1.5748 - 1.5751 inch (40.000 - 40.008 mm) See Figure 8001
8.AD.	Exciter Stator (10004-115)	Winding resistance	3.4 to 3.9 Ω at 68° F (20° C)
8.AF.	Current Transformer	Winding resistance	3.0 to 3.7 Ω at 68° F (20° C)

Table 8002 - Acceptance Limits (Continued)

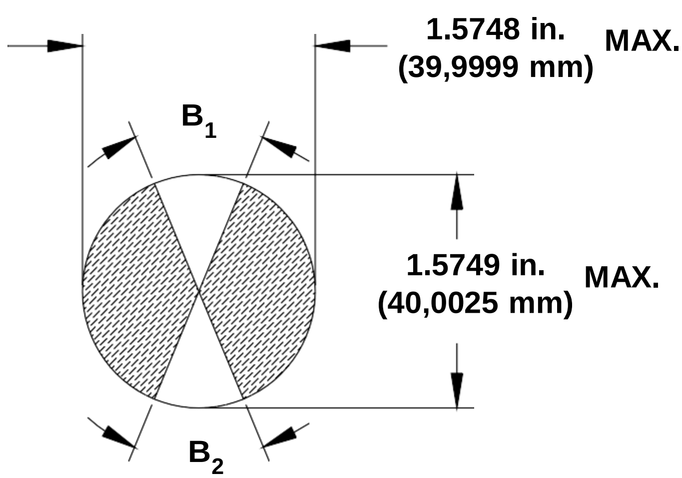
NOTE: During restoration inspection, bearing liner diameter “B” is acceptable if up to 25% of the circumference is 0.0001 inch (0.0025 mm) above the maximum diameter limit. For rotor journals, 0.0001 inch (0.0025 mm) is permitted on up to 25% of the circumference. This criteria does not apply to new or repaired bearing liners or journals.



$B_1 + B_2$ = 25% OF CIRCUMFERENCE

Figure 8001 - Measuring Bearing Liner Diameter “B” of the Anti-Drive End Bearing Support

NOTE: Acceptance criteria for used liners, not new or repaired liners.



$B_1 + B_2$= 25% OF CIRCUMFERENCE

Figure 8002 - Measuring Bearing Liner Diameter “B” of the Drive End Bearing Support

NOTE: Acceptance criteria for used liners, not new or repaired liners.

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SPECIAL TOOLS, FIXTURES, AND EQUIPMENT

1. Introduction

Table 9001 lists the approved special tools and fixtures necessary for generator service.

Nomenclature	Figure
Anti-Drive End Rotor Shaft Adapter	Figure 9001
Drive End Rotor Shaft Adapter	Figure 9002
Dampener Hub Driver	Figure 9003
Dampener Plate Driver	Figure 9004
Inner Race Bearing Driver - 0.884 Diameter	Figure 9005
Inner Race Bearing Driver - 0.975 Diameter	Figure 9006
Outer Race Bearing Driver - 1.175 Diameter	Figure 9007
Outer Race Bearing Driver - 1.565 Diameter	Figure 9008
Drive End Bearing Support Fixture	Figure 9009
Rotor and Stator Removal Fixture	Figure 9010
Arbor Press Base, Press Bullet, Insertion Bullet, Sleeve, and Sleeve Adapter	Figure 9011
Split Plate	Figure 9012
Split Plate Support	Figure 9013
Rotor Assembly Support - Horizontal	Figure 9014
Rotor Assembly Support - Vertical	Figure 9015
Stator and Housing Assembly Support - Horizontal	Figure 9016
Stator and Housing Assembly Support - Vertical	Figure 9017
Spline Wrench	Figure 9018
Drive End Bearing Sensor Insertion Tool, Guide Rod, and Pressing Handle	Figure 9019
Anti-Drive End Bearing Sensor Insertion Tool	Figure 9020
Anti-Drive End Bearing Support Assembly Grinding Fixture Inner Ring, Outer Ring, and Clamp	Figure 9021
Anti-Drive End Bearing Failure Sensor Fixture	Figure 9022
Drive End Bearing Failure Sensor Fixture	Figure 9023
Drive End Bearing Liner Removal Fixture	Figure 9024

Table 9001 - Special Tools, Fixtures, and Equipment

Nomenclature	Figure
Drive End Bearing Liner Installation Fixture	Figure 9025
Spanner Tool	Figure 9026
Strain relief tool P/N 31708-9920	Figure 9027

Table 9001 - Special Tools, Fixtures, and Equipment (Continued)

2. Tool Descriptions

The drawings in this section provide material and fabrication instructions for the tools listed in Table 9001. Where dimensions and fabrication instructions are provided, the tool or fixture is approved for local manufacture.

A. Drive and Anti-Drive Rotor Shaft Adapters (Figure 9001 and Figure 9002)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0, 25 mm), 0.XXX ± 0.005 (0, 125 mm). Angles ± 2°0’. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is: Brass, CD-260.

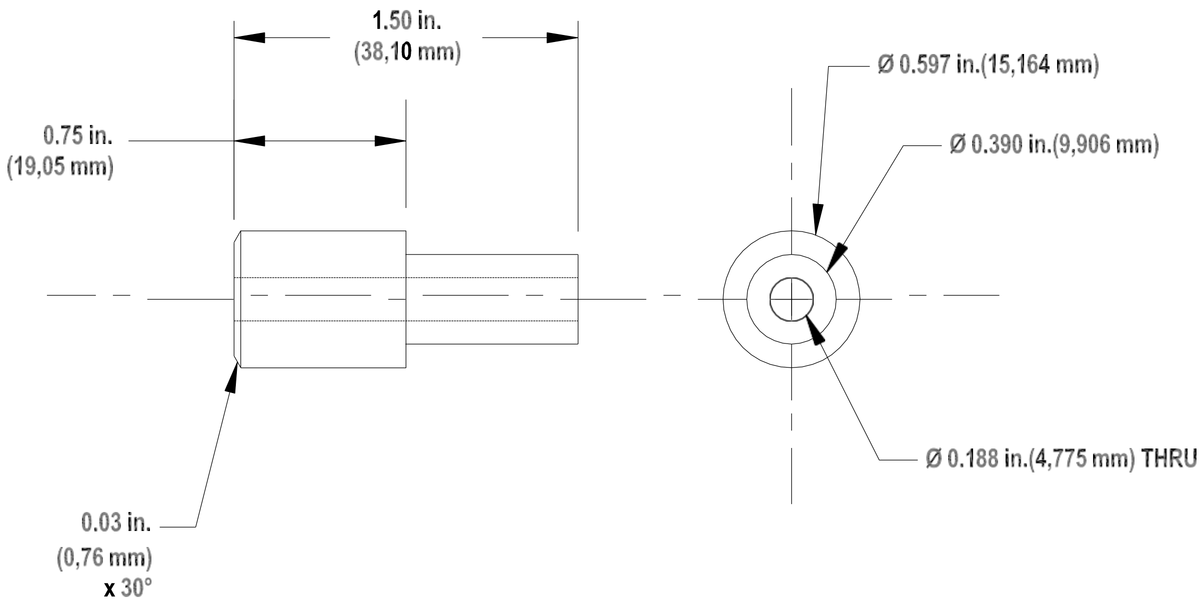


Figure 9001 - Anti-Drive End Rotor Shaft Adapter

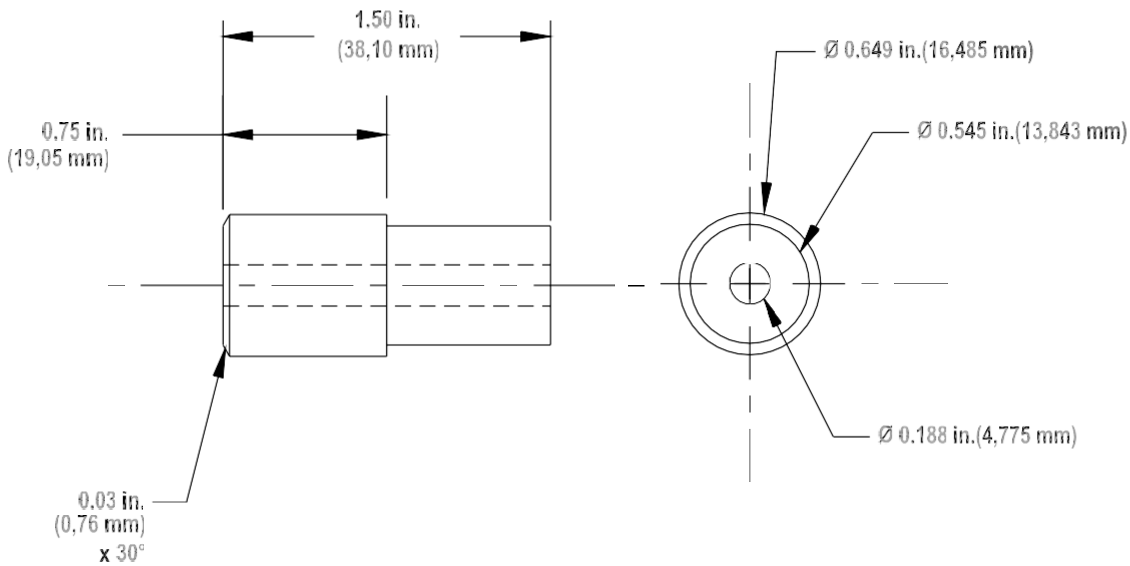


Figure 9002 - Drive End Rotor Shaft Adapter

B. Dampener Hub and Plate Drivers (Figure 9003 and Figure 9004)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,125 mm). Angles ± 2°0'. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is 1040 tool steel

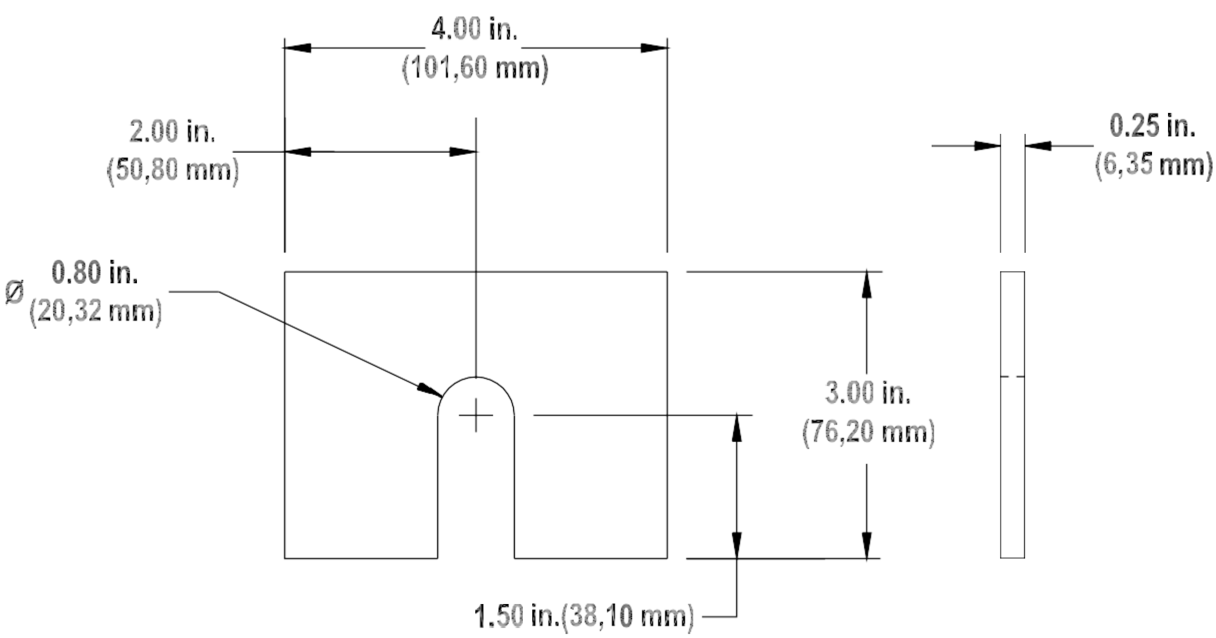


Figure 9003 - Dampener Hub Driver

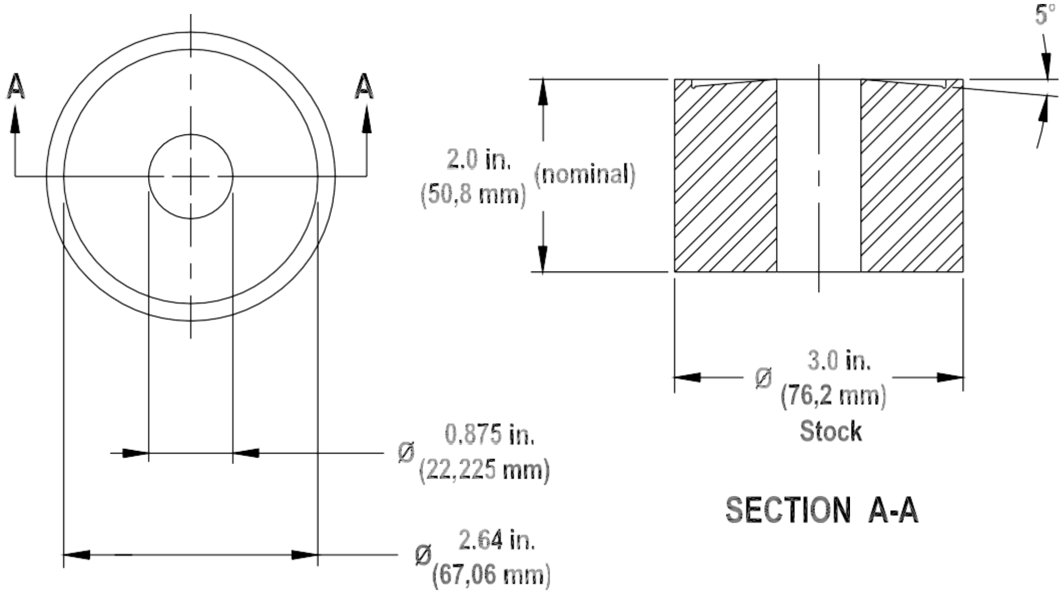


Figure 9004 - Dampener Plate Driver

C. Inner and Outer Race Bearing Drivers (Figure 9005, Figure 9006, Figure 9007 and Figure 9008)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0’. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is 01 tool steel hardened to Rc 55-60.

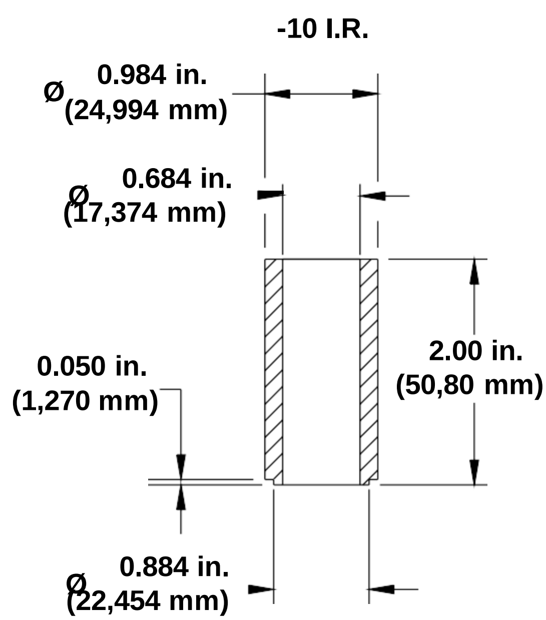


Figure 9005 - Inner Race Bearing Driver - 0.684 inch

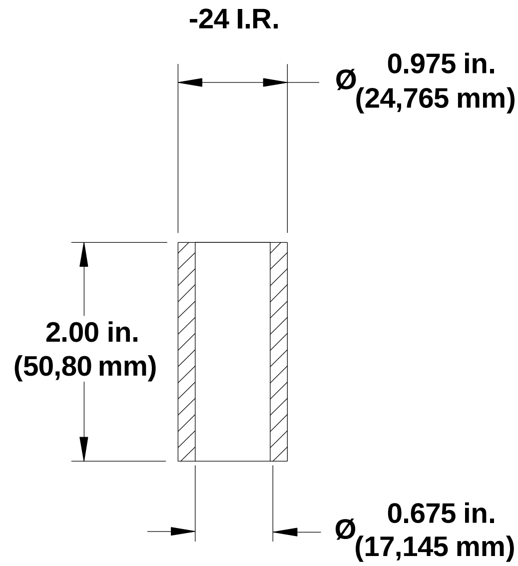


Figure 9006 - Inner Race Bearing Driver - 0.675 inch

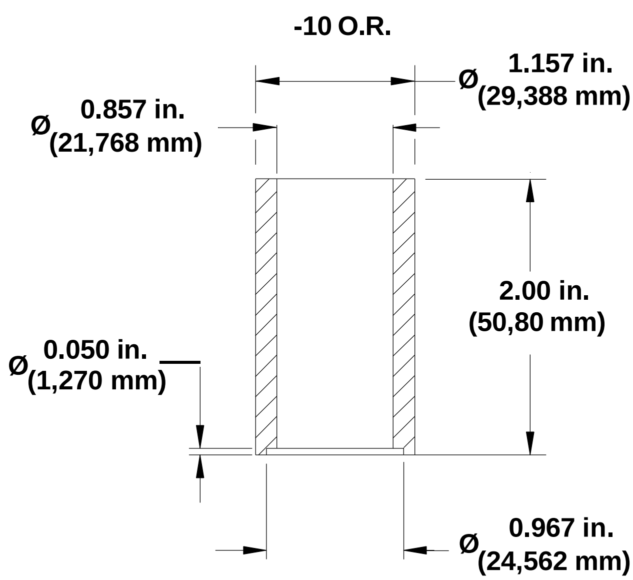


Figure 9007 - Outer Race Bearing Driver - ID

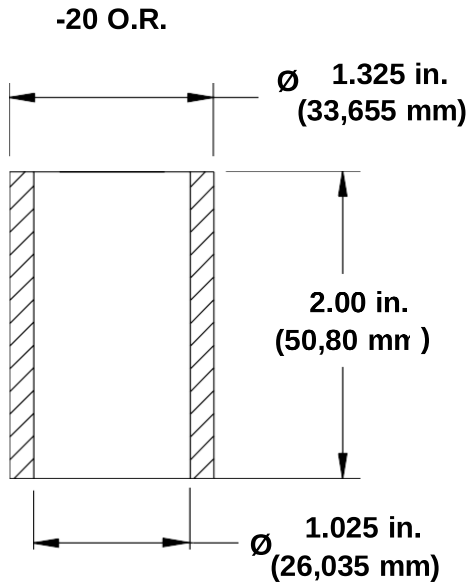


Figure 9008 - Outer Race Bearing Driver - OD

D. Drive End Bearing Support Fixture (Figure 9009)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0'. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is 01 tool steel.

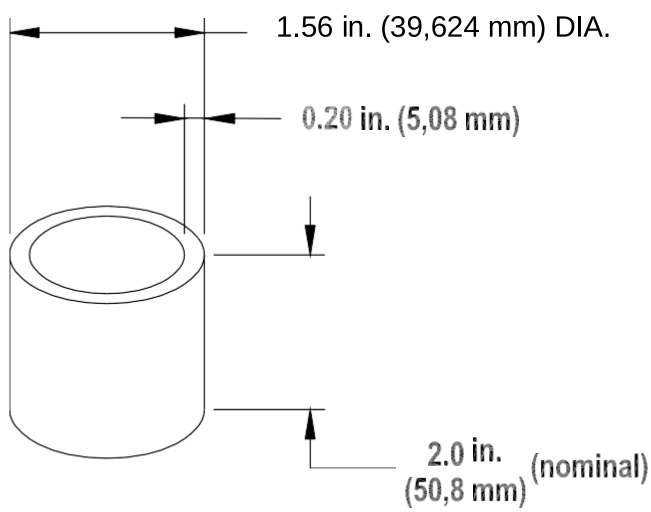


Figure 9009 - Drive End Bearing Support Fixture

E. Rotor and Stator Removal Fixture (Figure 9010)

Material: Hardwood

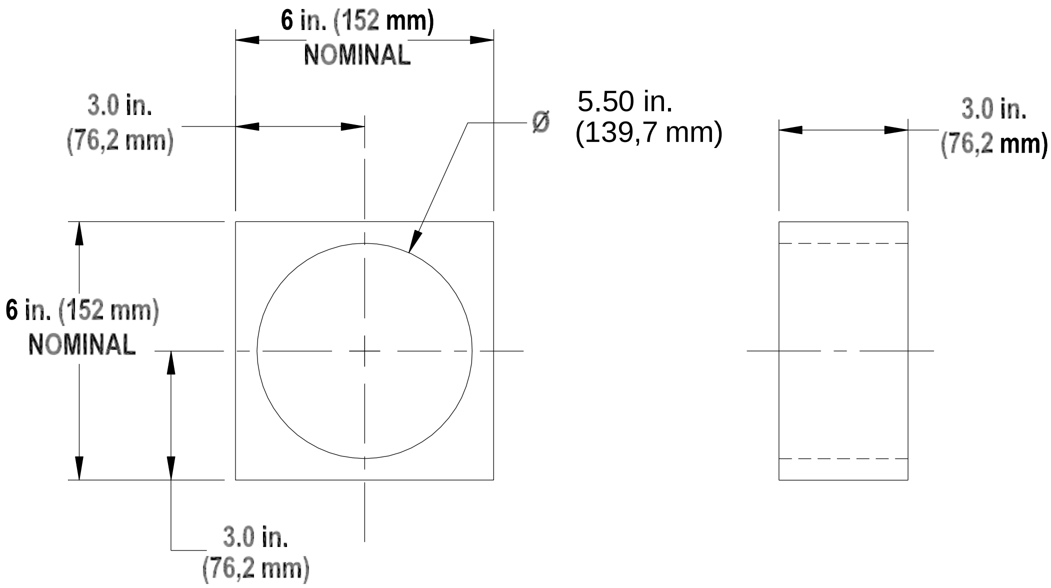


Figure 9010 - Rotor and Stator Removal Fixture

F. Arbor Press Base, Press Bullet, Insertion Bullet, Sleeve, and Sleeve Adapter (Figure 9011)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0'. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree.

Material:

Sheet 1 -	4140 steel
Sheet 2 -	Item 1 - 13/16 inch dia. X 3 5/8 inch 01 tool steel
Sheet 3 -	Item 1 - 13/16 inch dia. X 3 5/8 inch 01 tool steel
	Item 2 - 3/32 inch dia. X 3 1/2 inch 01 tool steel
Sheet 4 -	1 3/4 inch dia. X 2 1/4 inch 01 tool steel
Sheet 5 -	2 inch dia. X 2 7/8 inch 01 tool steel

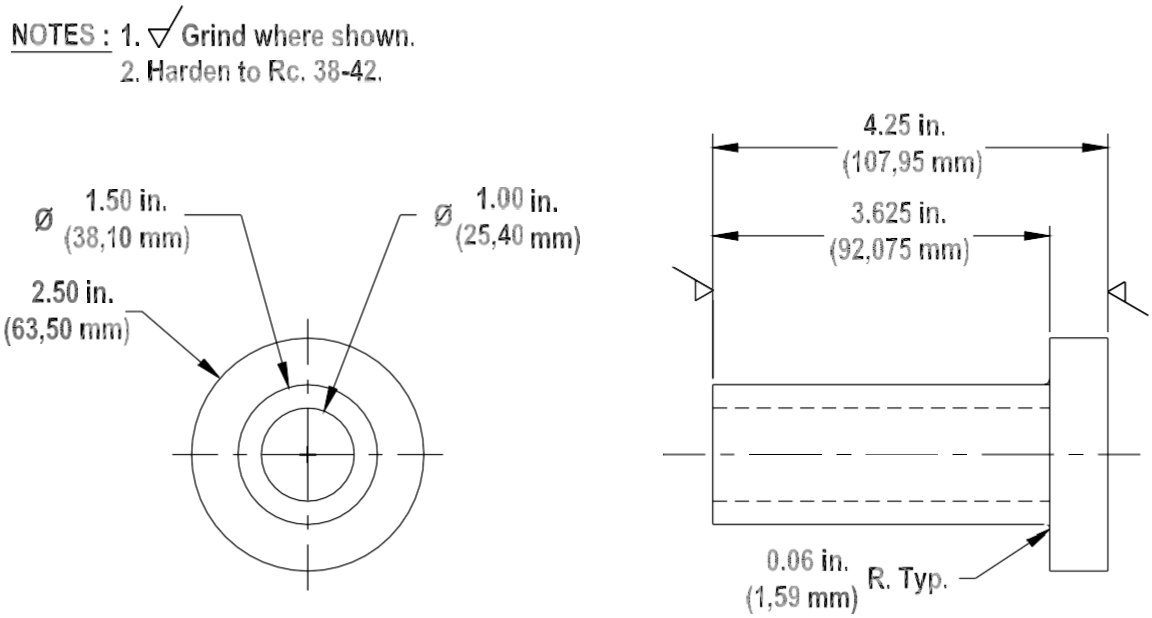


Figure 9011 - Arbor Press Base (Sheet 1 of 5)

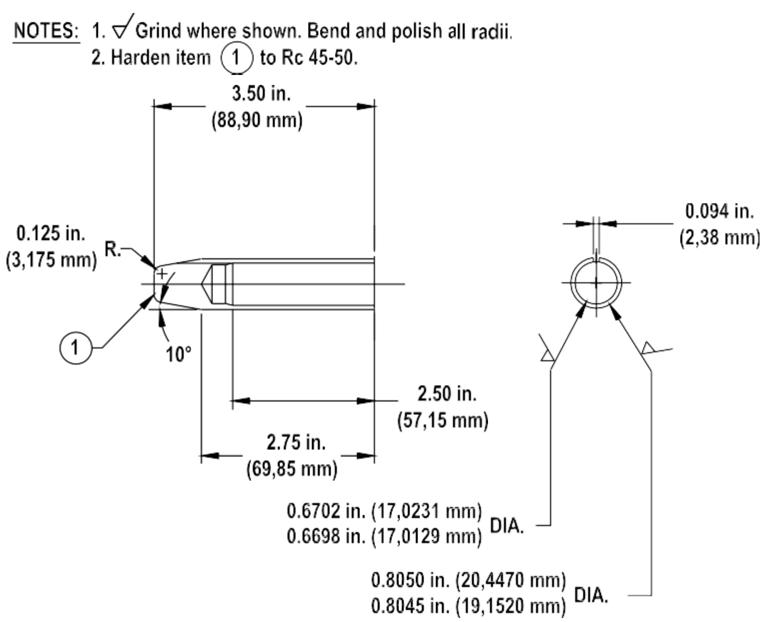


Figure 9011 - Arbor Press Bullet (Sheet 2 of 5)

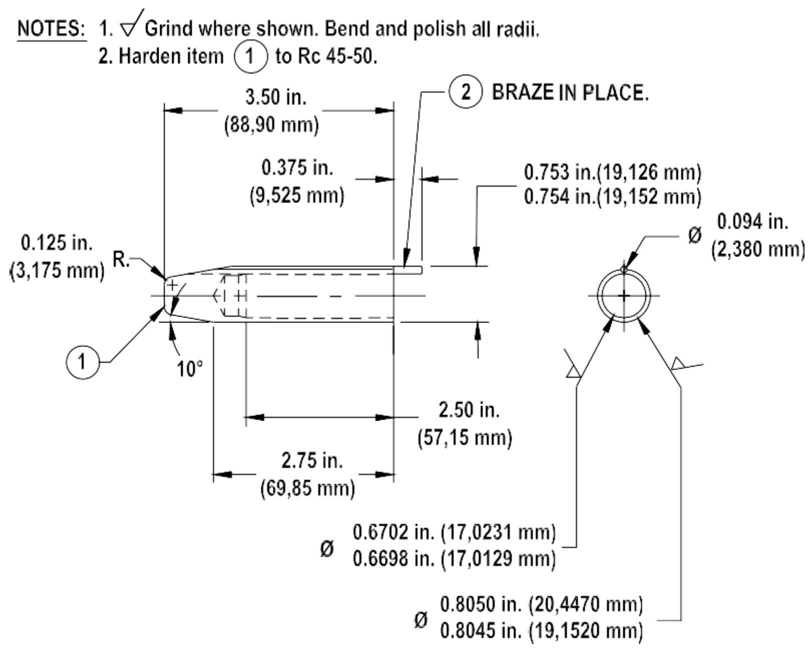


Figure 9011 - Arbor Insertion Bullet (Sheet 3 of 5)

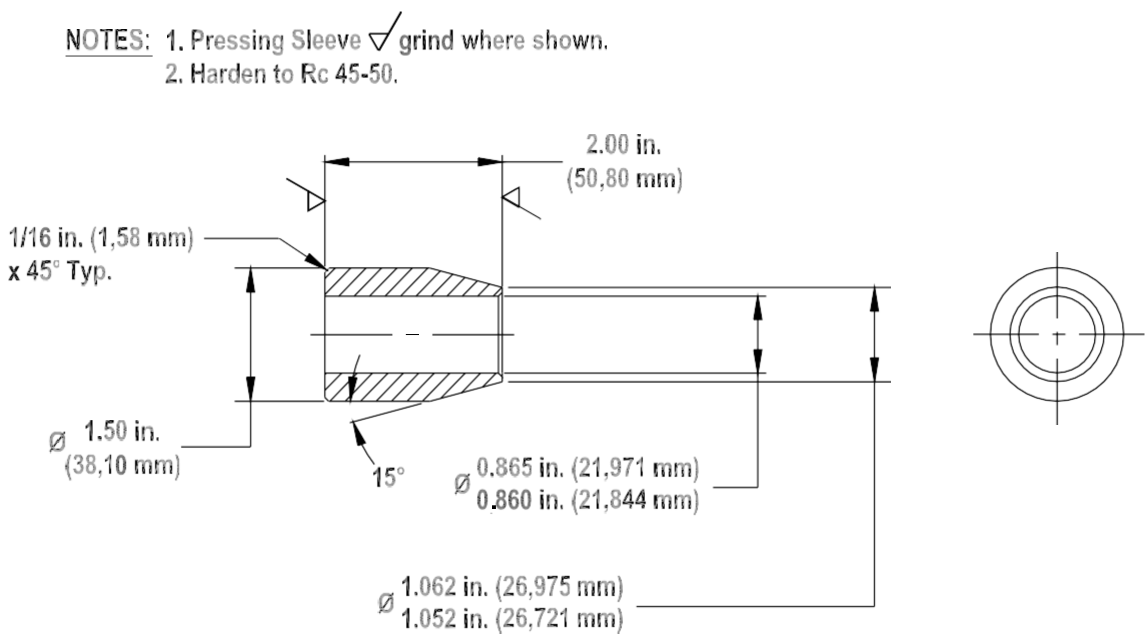


Figure 9011 - Arbor Press Sleeve (Sheet 4 of 5)

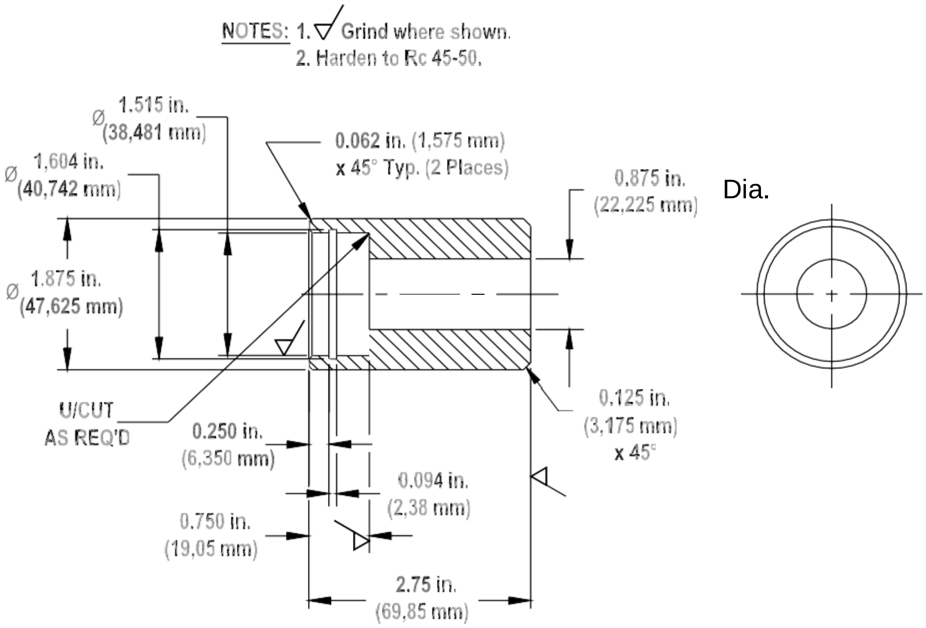
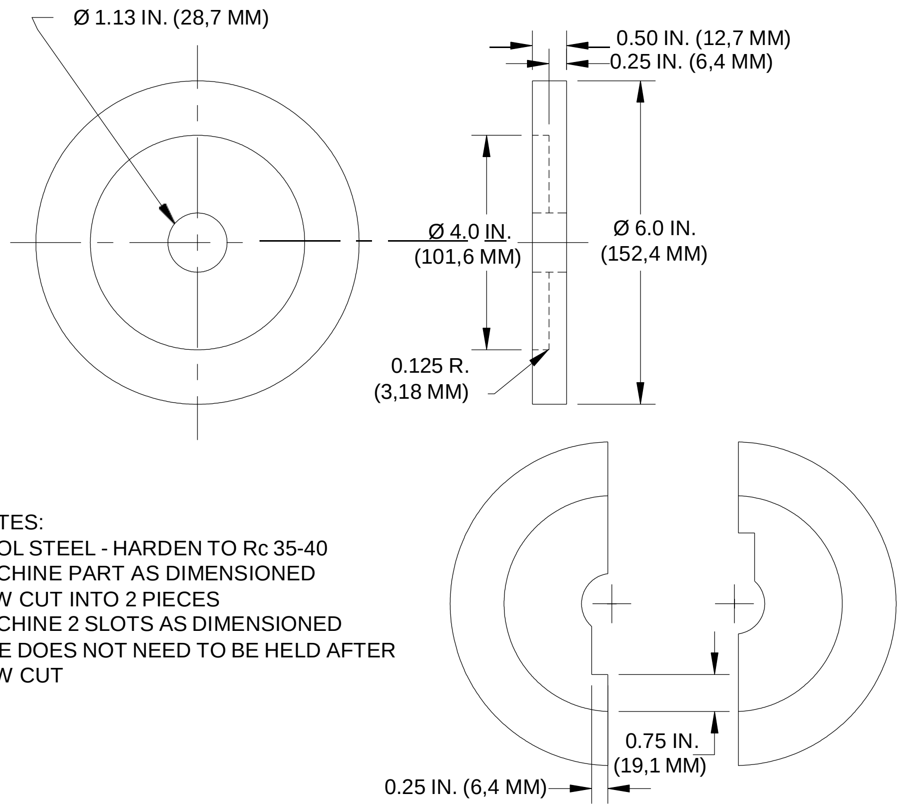


Figure 9011 - Arbor Press Adapter (Sheet 5 of 5)

G. Split Plate and Split Plate Support (Figure 9012 and Figure 9013)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0’. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is 01 tool steel.



NOTES:
TOOL STEEL - HARDEN TO Rc 35-40
MACHINE PART AS DIMENSIONED
SAW CUT INTO 2 PIECES
MACHINE 2 SLOTS AS DIMENSIONED
SIZE DOES NOT NEED TO BE HELD AFTER SAW CUT

Figure 9012 - Split Plate

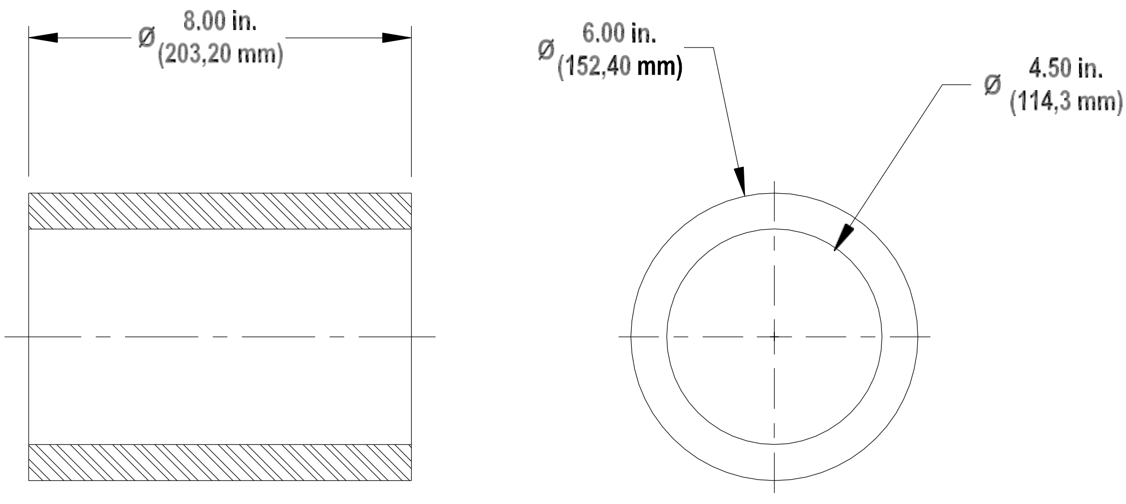


Figure 9013 - Split Plate Support

H. Rotor Assembly Support - Horizontal (Figure 9014)

Material: Hardwood

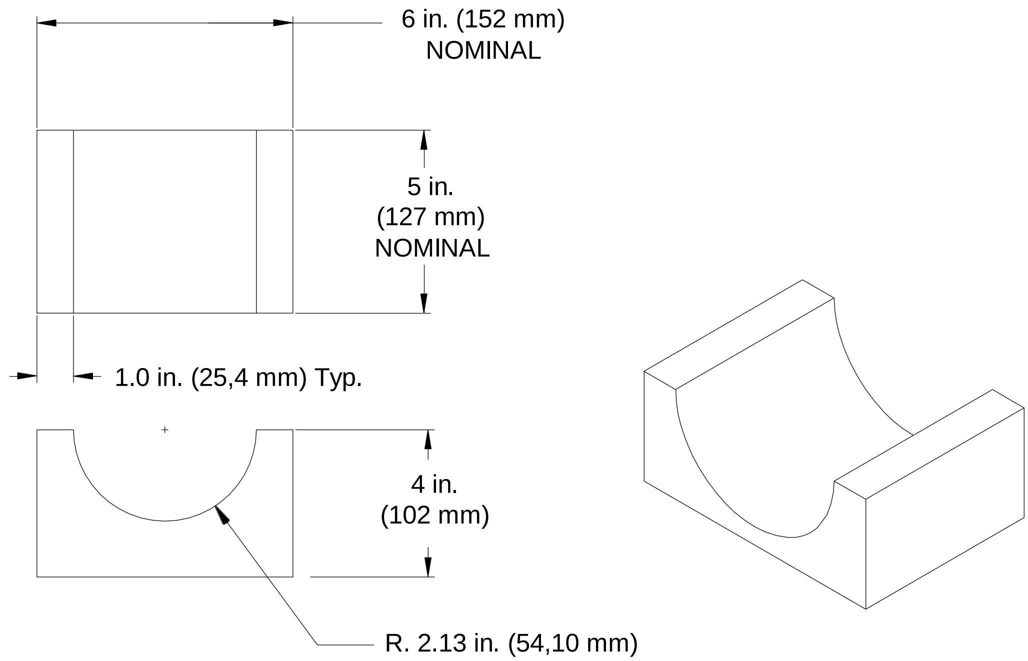


Figure 9014 - Rotor Assembly Support - Horizontal

I. Rotor Assembly Support - Vertical (Figure 9015)

Material: As Shown

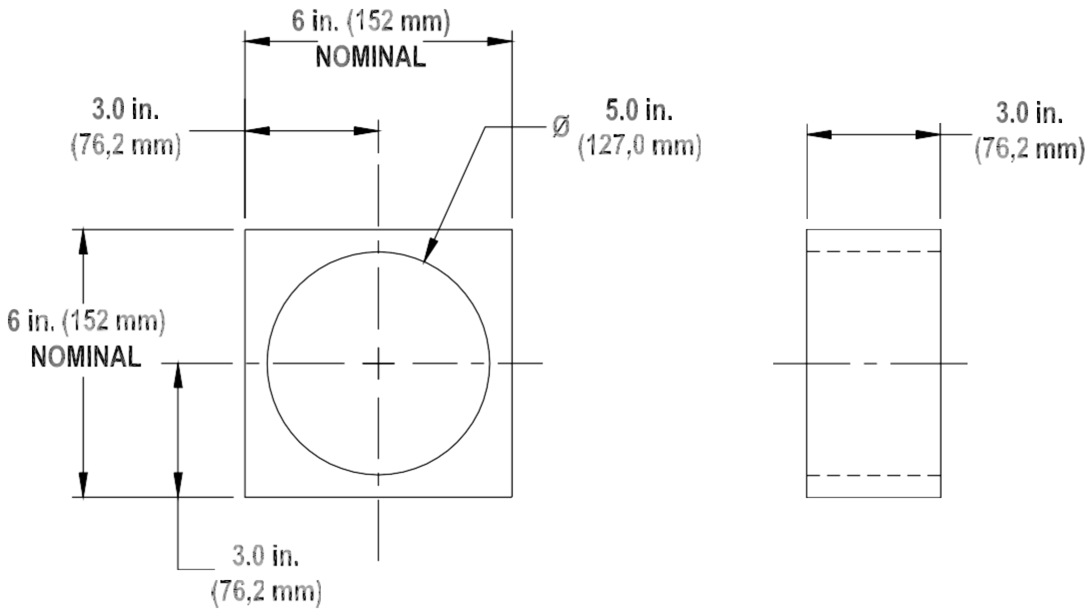


Figure 9015 - Rotor Assembly Support - Vertical

J. Stator and Housing Assembly Support - Horizontal (Figure 9016)

Material: Hardwood

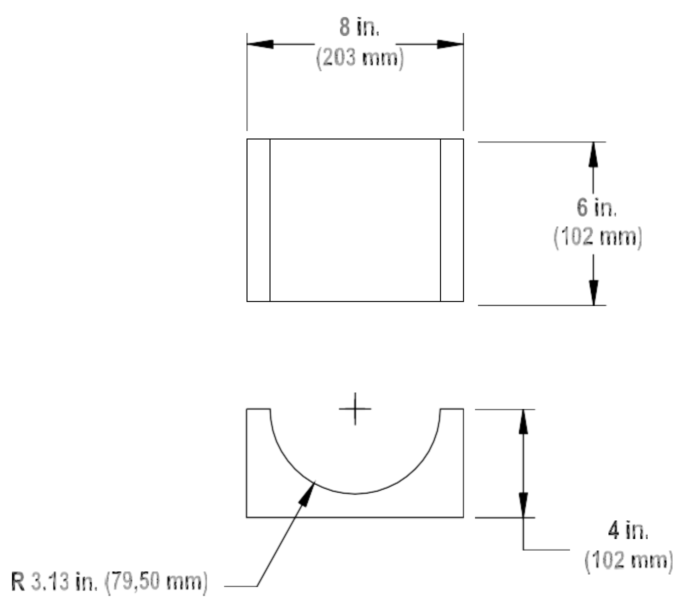


Figure 9016 - Stator and Housing Assembly Support - Horizontal

K. **Stator and Housing Assembly Support - Vertical (Figure 9017)**

Material: Hardwood

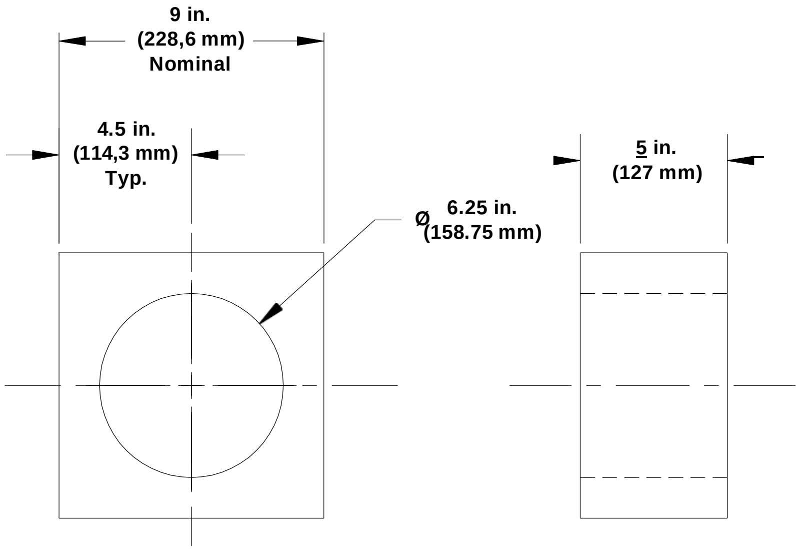
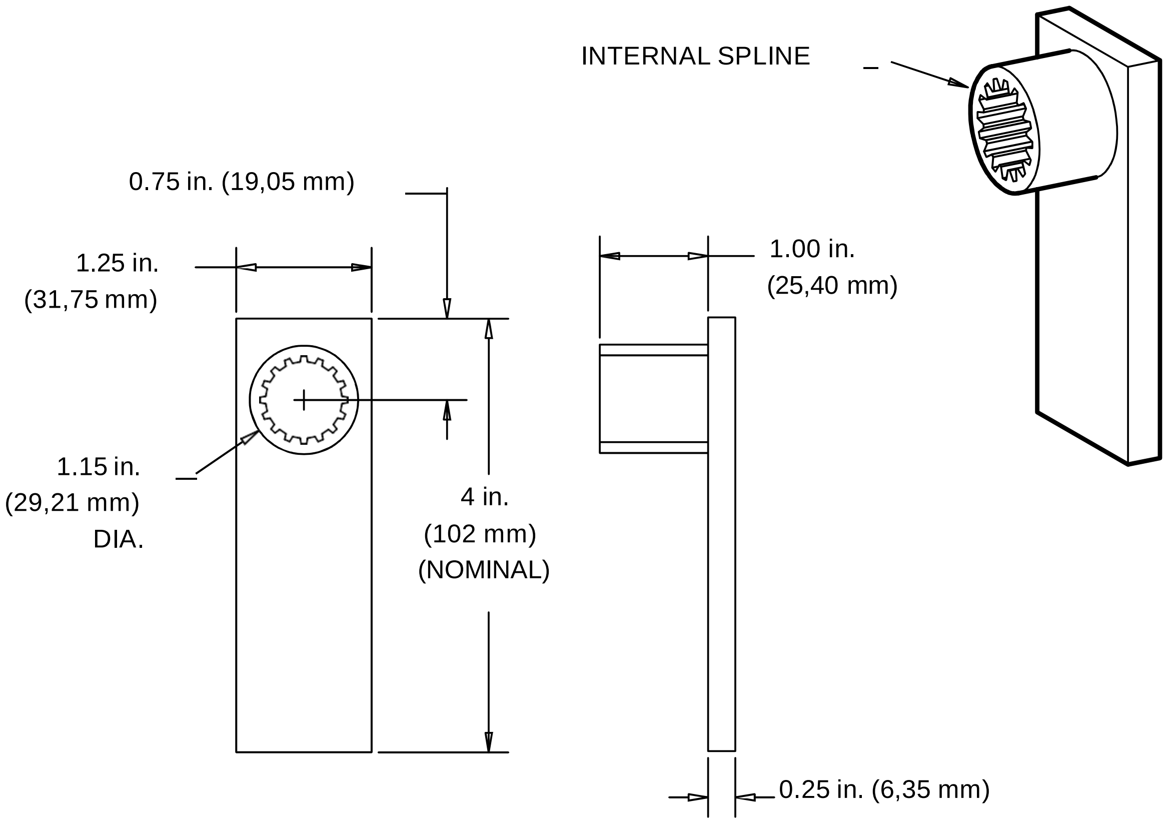


Figure 9017 - Stator and Housing Assembly Support - Vertical

L. Spline Wrench (Figure 9018)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0'. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is 1040 tool steel.



12 TOOTH SPLINE

Internal Involute Spline Data Fillet Root Side Fit	inch	mm
Number of Teeth	12	
Diametral Pitch	20/40	
Pressure Angle	30 DEG.	
Pitch Diameter	0.6000	15,240
Minor Diameter (min.)	0.5550	14,097
Major Diameter (min.)	0.6500	16,510
Chord Space (min.)	0.0730	1,853
Pin Diameter	0.0720	1,829
Between three .072 Pins (min.)	0.5095	12,941

Figure 9018 - Spline Wrench

M. Drive End Bearing Sensor Insertion Tool (Figure 9019)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0'. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is as noted on Sheets 2 and 3.

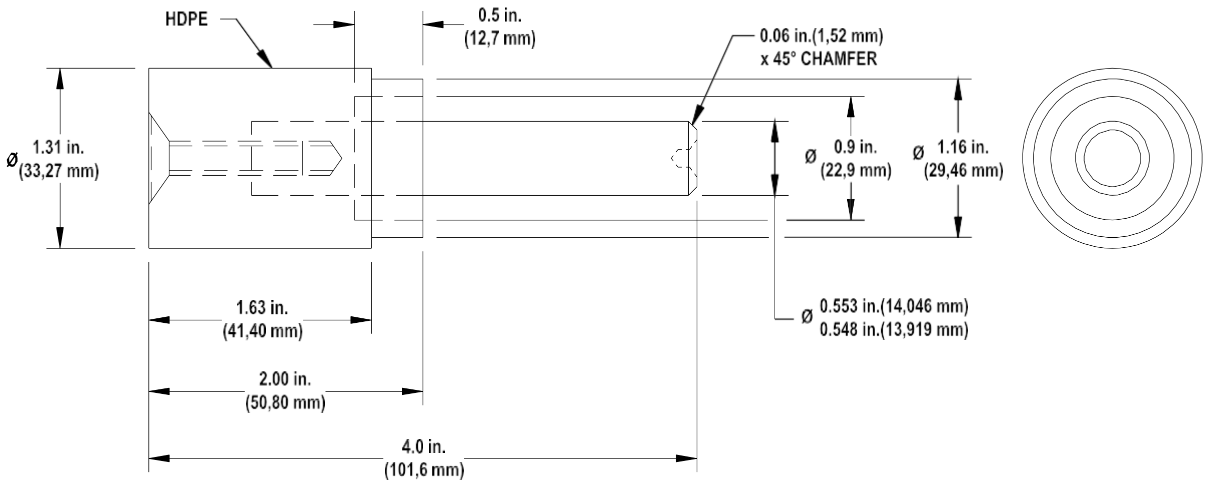
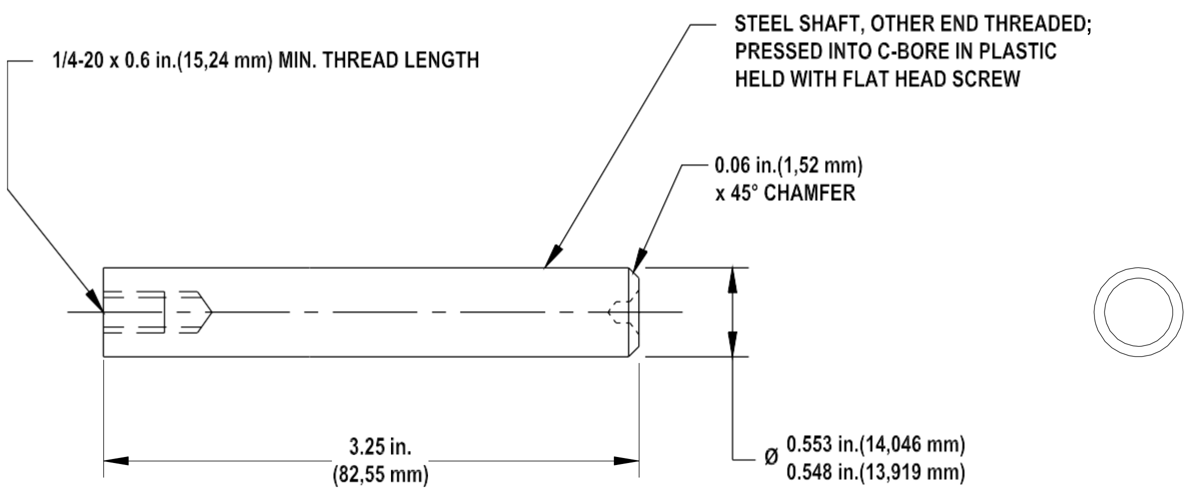


Figure 9019 - Drive End Bearing Sensor Insertion Tool (Sheet 1 of 3)



Material: 01 Tool Steel

Figure 9019 - Drive End Bearing Sensor Insertion Tool - Guide Rod (Sheet 2 of 3)

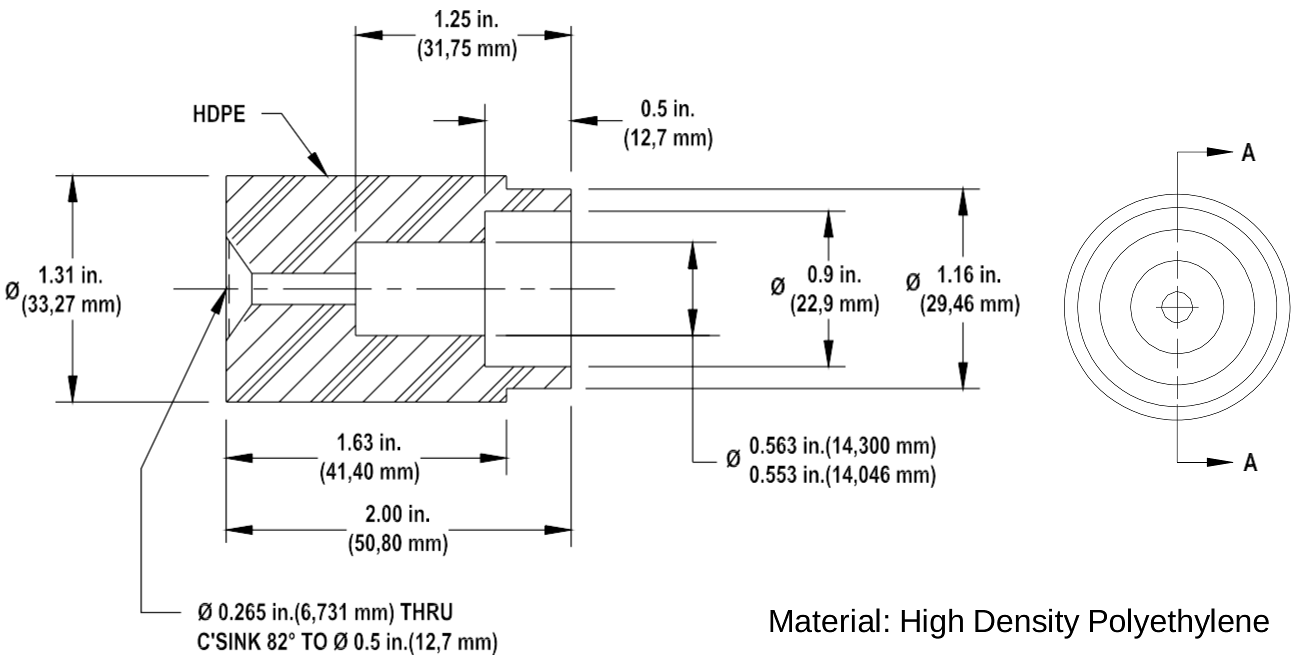


Figure 9019 - Drive End Bearing Sensor Insertion Tool - Pressing Handle (Sheet 3 of 3)

N. Anti-Drive End Bearing Sensor Insertion Tool (Figure 9020)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0'. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is High Density Polyethylene for Sheets 1 and 2. Sheet 3 is a standard roll pin (steel).

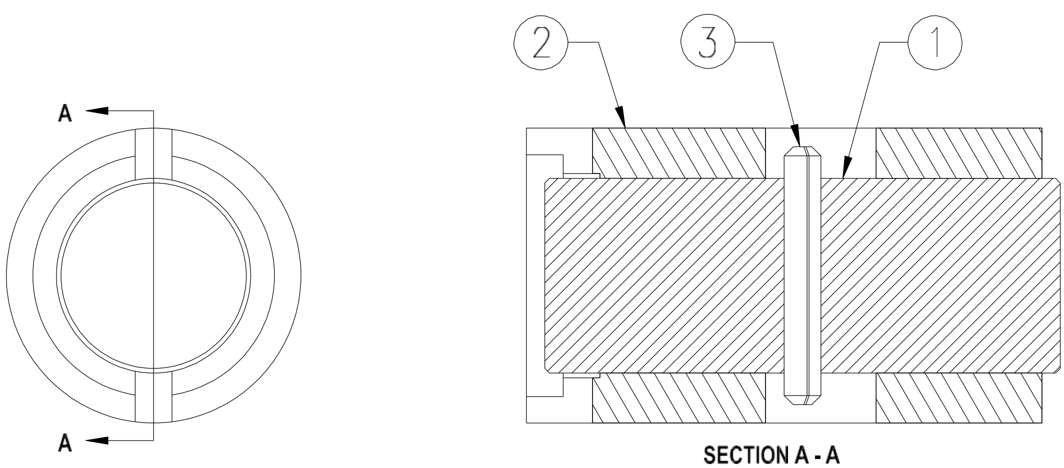


Figure 9020 - Anti-Drive End Bearing Sensor Insertion Tool (Sheet 1 of 3)

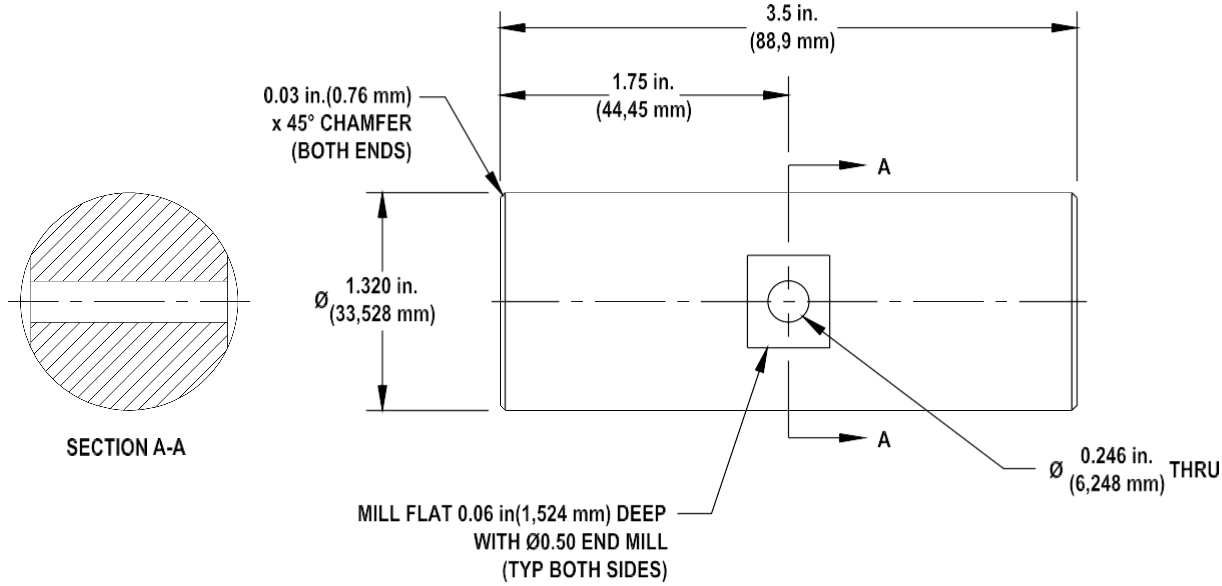


Figure 9020 - Anti-Drive End Bearing Sensor Insertion Tool (Sheet 2 of 3)

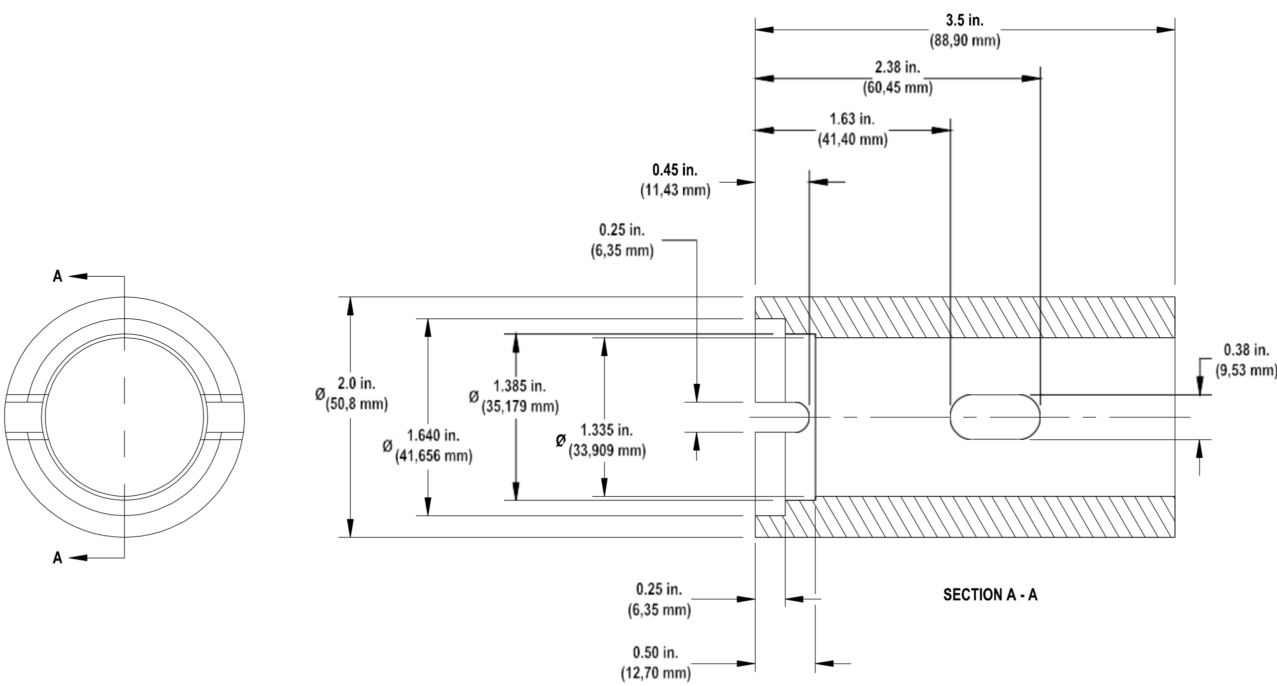


Figure 9020 - Anti-Drive End Bearing Sensor Insertion Tool - Fixture (Sheet 3 of 3)

O. Anti-Drive End Bearing Support Assembly Grinding Fixture (Figure 9021)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0'. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is 01 tool steel.

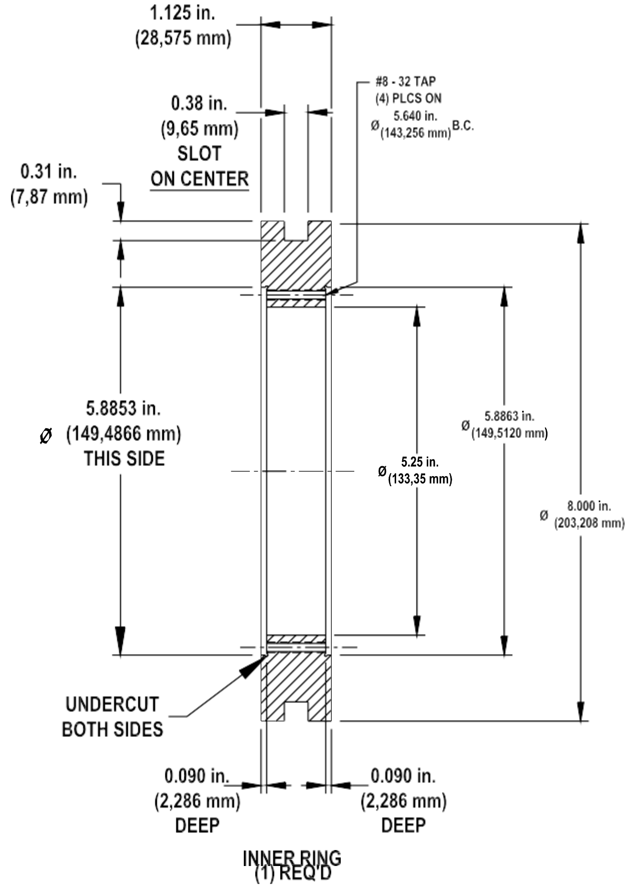


Figure 9021 - Anti-Drive End Bearing Support Assembly Grinding Fixture - Inner Ring (Sheet 1 of 3)

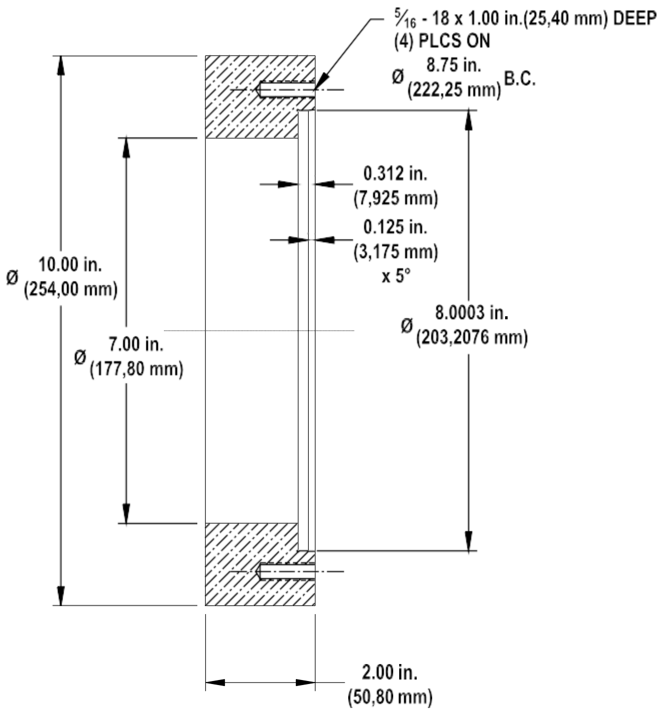


Figure 9021 - Anti-Drive End Bearing Support Assembly Grinding Fixture - Outer Ring
(Sheet 2 of 3)

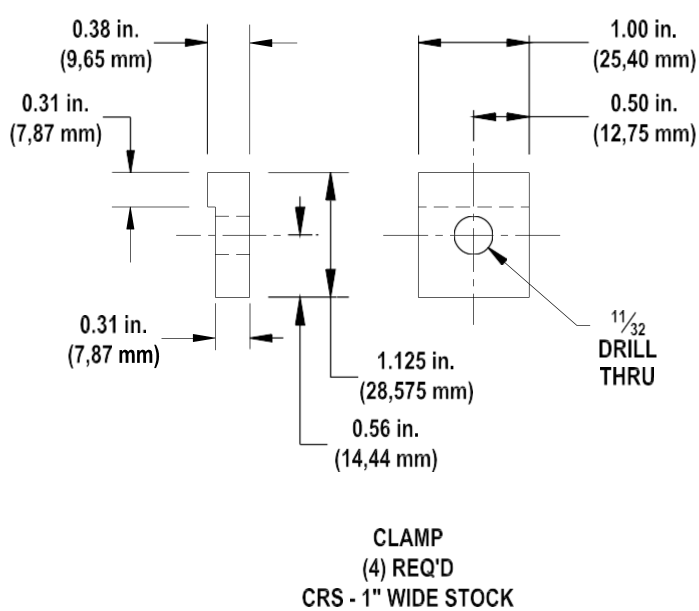


Figure 9021 - Anti-Drive End Bearing Support Assembly Grinding Fixture - Clamp
(Sheet 3 of 3)

P. Anti-Drive End Bearing Failure Sensor Fixture (Figure 9022)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0'. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is aluminum.

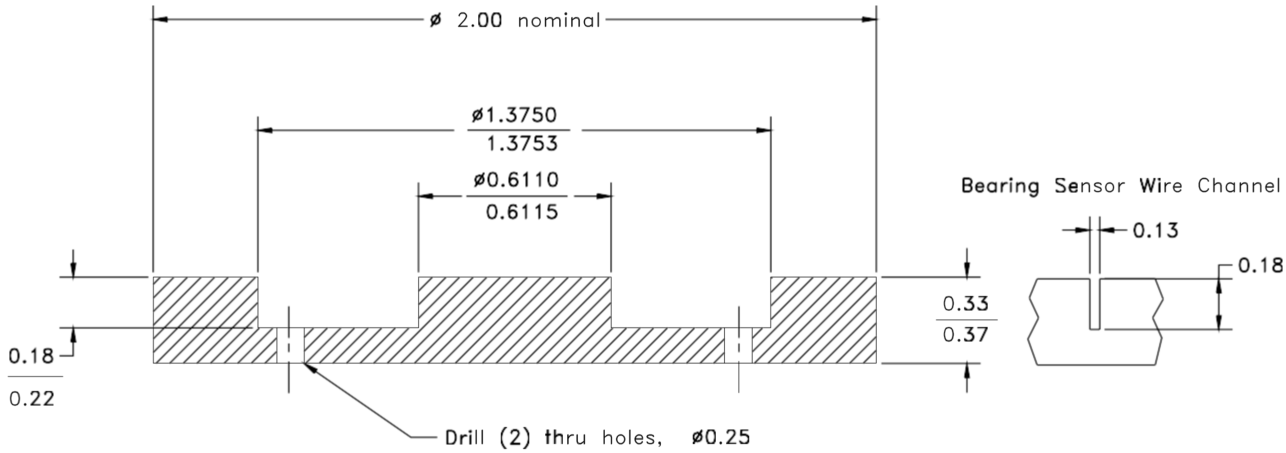


Figure 9022 - Anti-Drive End Bearing Failure Sensor Fixture

Q. Drive End Bearing Failure Sensor Fixture (Figure 9023)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0'. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree. Material is aluminum.

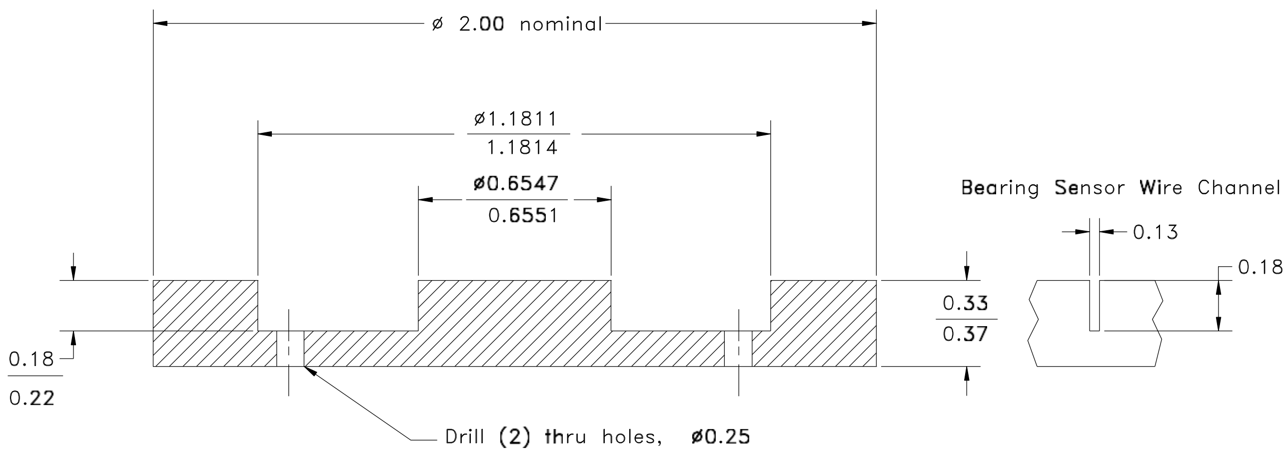


Figure 9023 - Drive End Bearing Failure Sensor Fixture

R. Drive End Bearing Liner Removal Fixture (Figure 9024)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0’. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree.

Material:

Detail 1 -	4 1/2 inch dia. X 1/2 inch long cold rolled steel
Detail 2 -	4 1/2 inch dia. X 2 1/8 inch long cold rolled steel
Detail 3 -	2 inch dia. X 2 inch long 01 tool steel (harden to Rc 55-58)
Detail 4 -	1 1/2 inch dia. X 2 1/8 inch long 01 tool steel (harden to Rc 55-58)
Detail 5 -	Spring to suit
Detail 6 -	1/4 20 X 3/4 inch long flat head screws

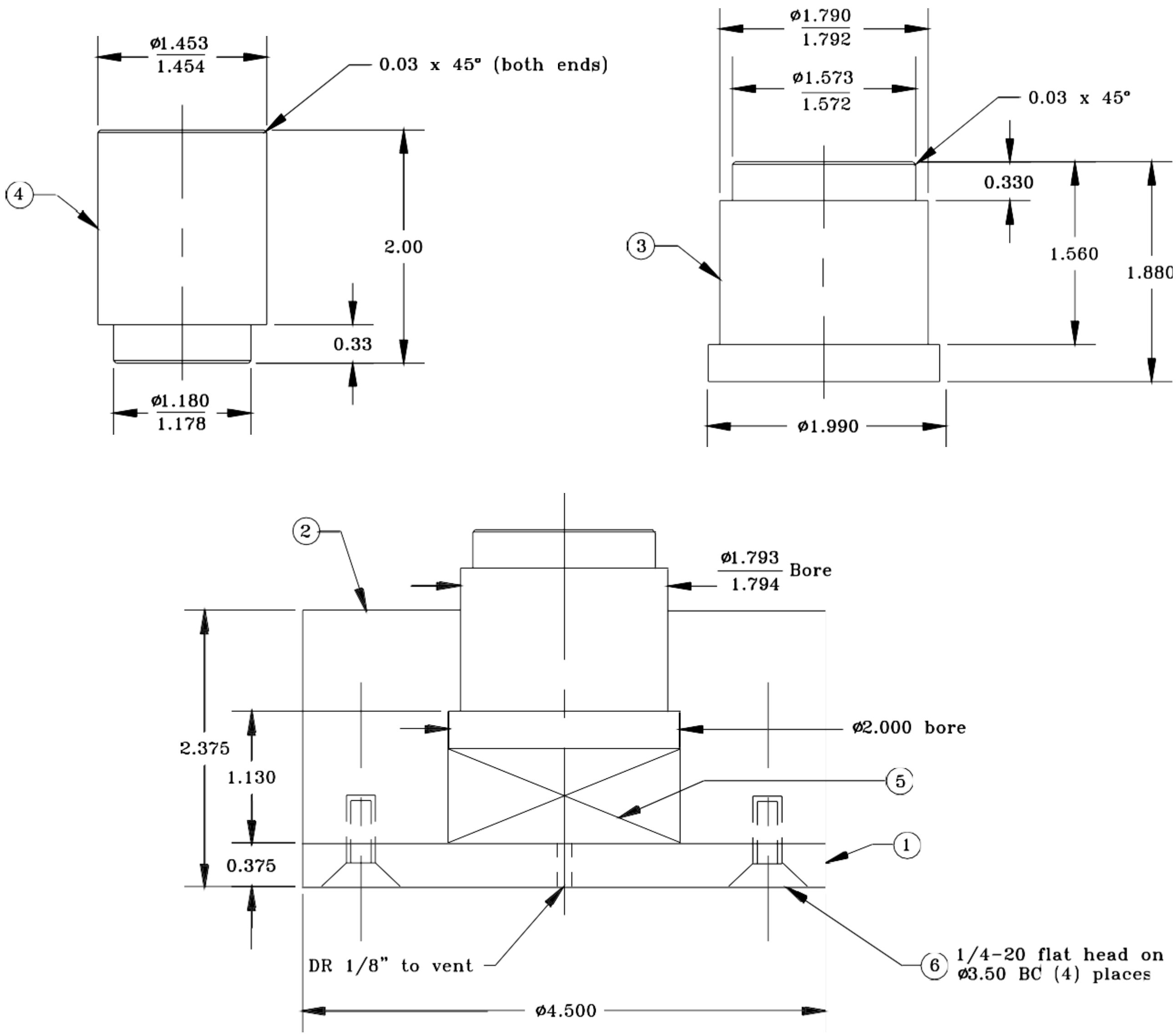


Figure 9024 - Drive End Bearing Liner Removal Fixture

S. Drive End Bearing Liner Installation Fixture (Figure 9025)

Unless otherwise specified, dimensions are in inches. Tolerances on decimals, 0.XX ± 0.01 (0,25 mm), 0.XXX ± 0.005 (0,127 mm). Angles ± 2°0’. Machined ends to be parallel within 0.001 inch (0,025 mm) and square with sidewalls ± 0.05 degree.

Material:

Detail 1 -	1 inch X 8 inch X 1/8 inch cold rolled steel
Detail 2 -	6 inch dia. X 1 5/8 inch long 01 tool steel (harden to Rc 58-60)
Detail 3 -	1/2 inch dia. X 4 1/2 inch long hard drill blank
Detail 4 -	1 inch dia. X 1 1/4 inch long 01 tool steel
Detail 5 -	1 1/2 inch dia. X 2 3/16 inch long 01 tool steel (harden to Rc 58-60)
Detail 6 -	0.2 inch dia. X 0.5 inch long hard pin
Detail 7 -	1 5/8 inch X 2 1/8 inch long 01 tool steel (harden to Rc 58-60)
Detail 8 -	1/4 inch square X 2 inch long 01 tool steel (harden to Rc 58-60)
Detail 9 -	Light to medium spring to suit

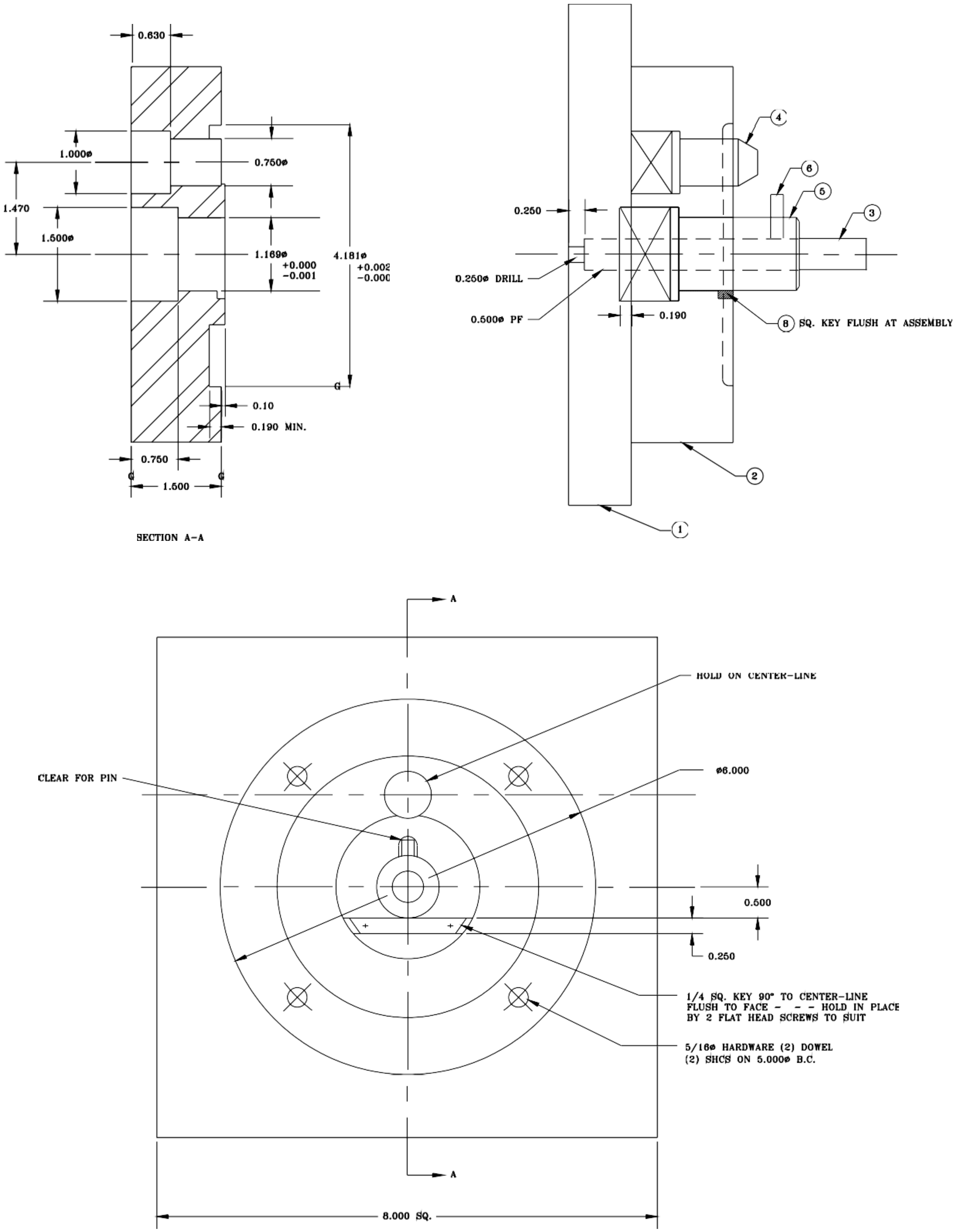
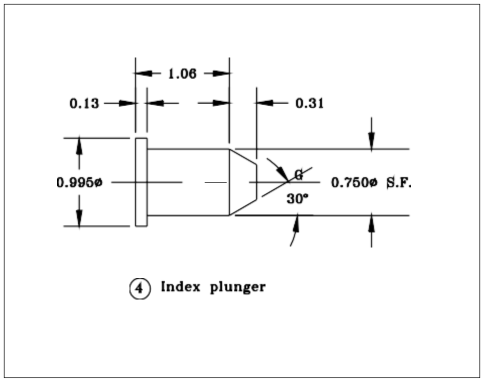
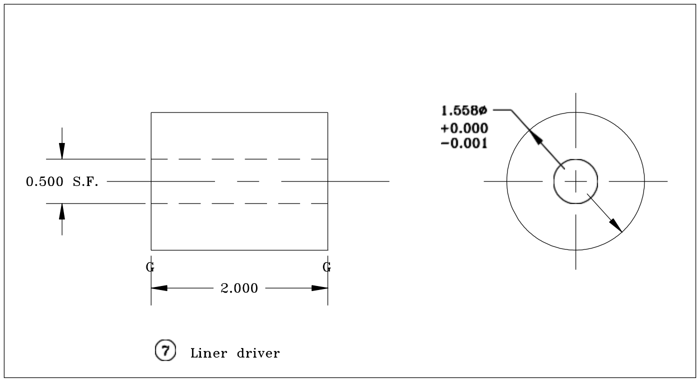


Figure 9025 - Drive End Bearing Liner Installation Fixture (Sheet 1 of 2)





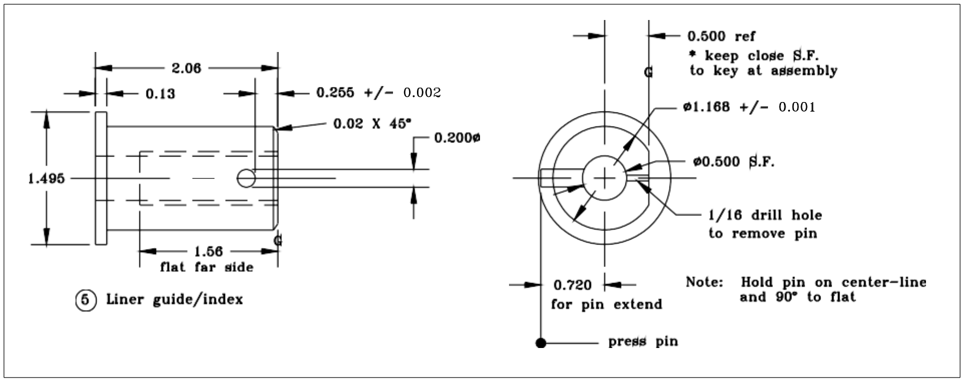


Figure 9025 - Drive End Bearing Liner Installation Fixture (Sheet 2 of 2)

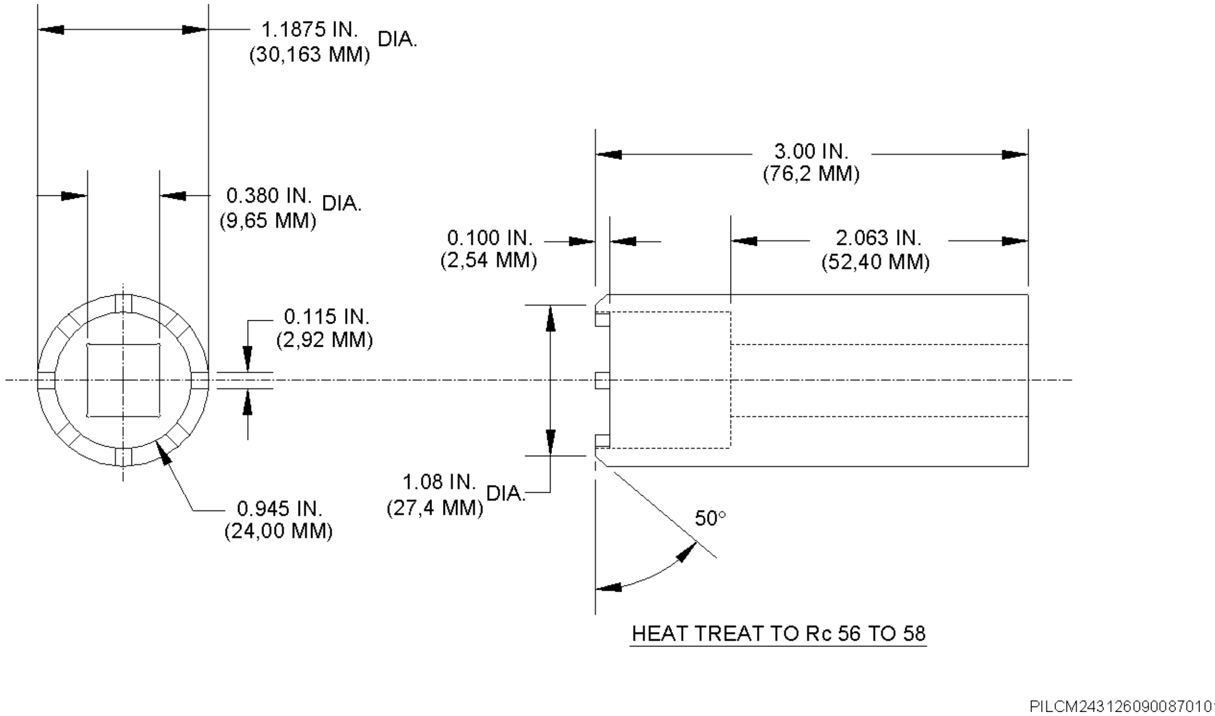


Figure 9026 - Spanner Tool

T. Strain Relief Tool. See Figure 9027

Materials: Main shaft - hex. steel bar
Ends - drill rod

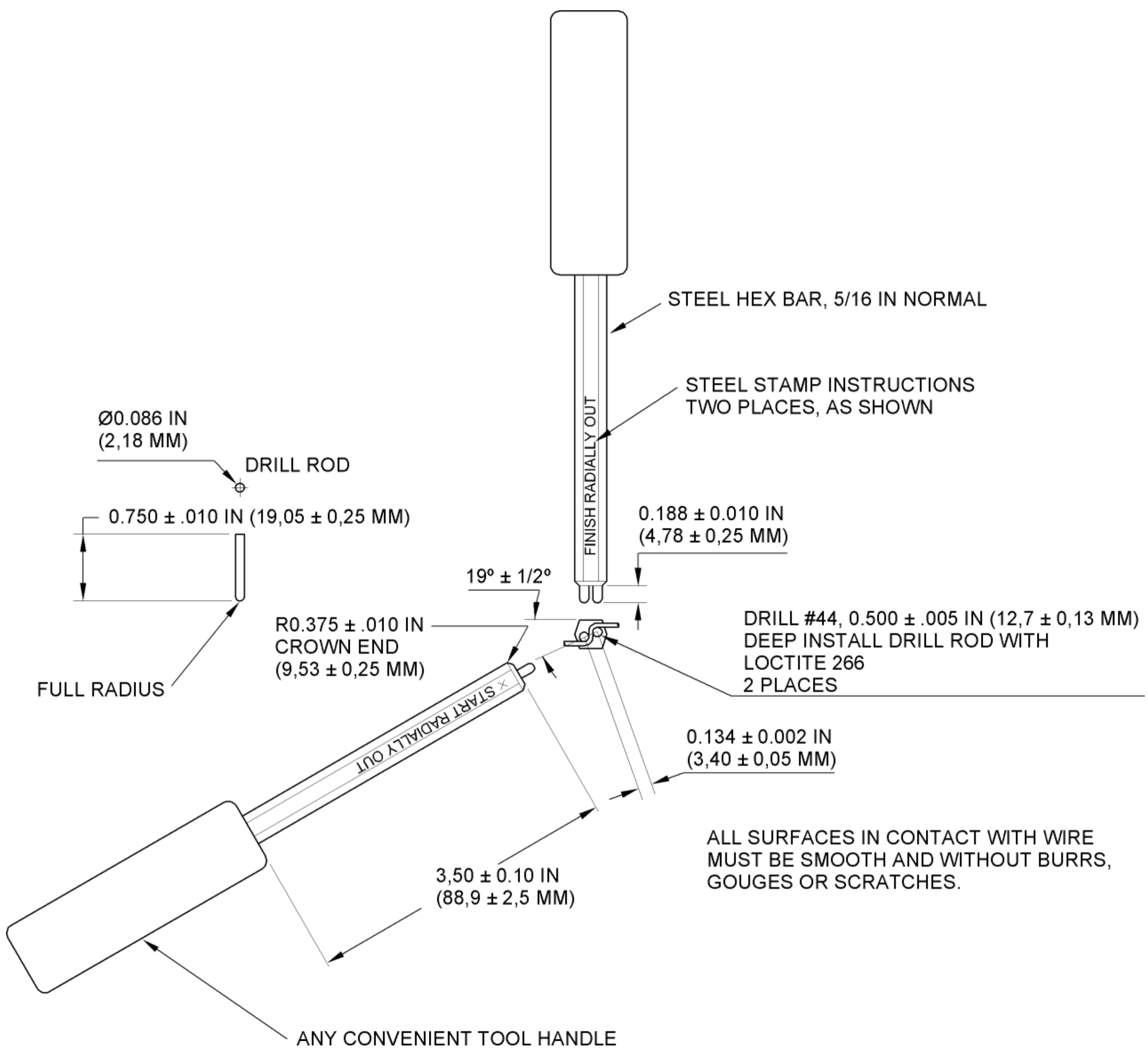


Figure 9027 - Strain Relief Tool

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SPECIAL PROCEDURES

1. Introduction

This section provides information for special maintenance procedures such as surge testing and field modifications that are not normally covered elsewhere in this manual.

2. Procedure to Convert 30086-010 to 30086-011

The following procedure must be performed when converting a model 30086-010 DC Generator to a model 30086-011 DC Generator. Additionally, the drive end bearing support, drive end and anti-drive end bearing failure sensors, printed wiring board assembly and identification plate must be replaced. Added items include a connector retainer, insulation sleeving and tying cord. Route the wiring and tie as described in the ASSEMBLY section.

A. Procedure

Machine the drive end of the rotor assembly shaft according to Figure 11001.

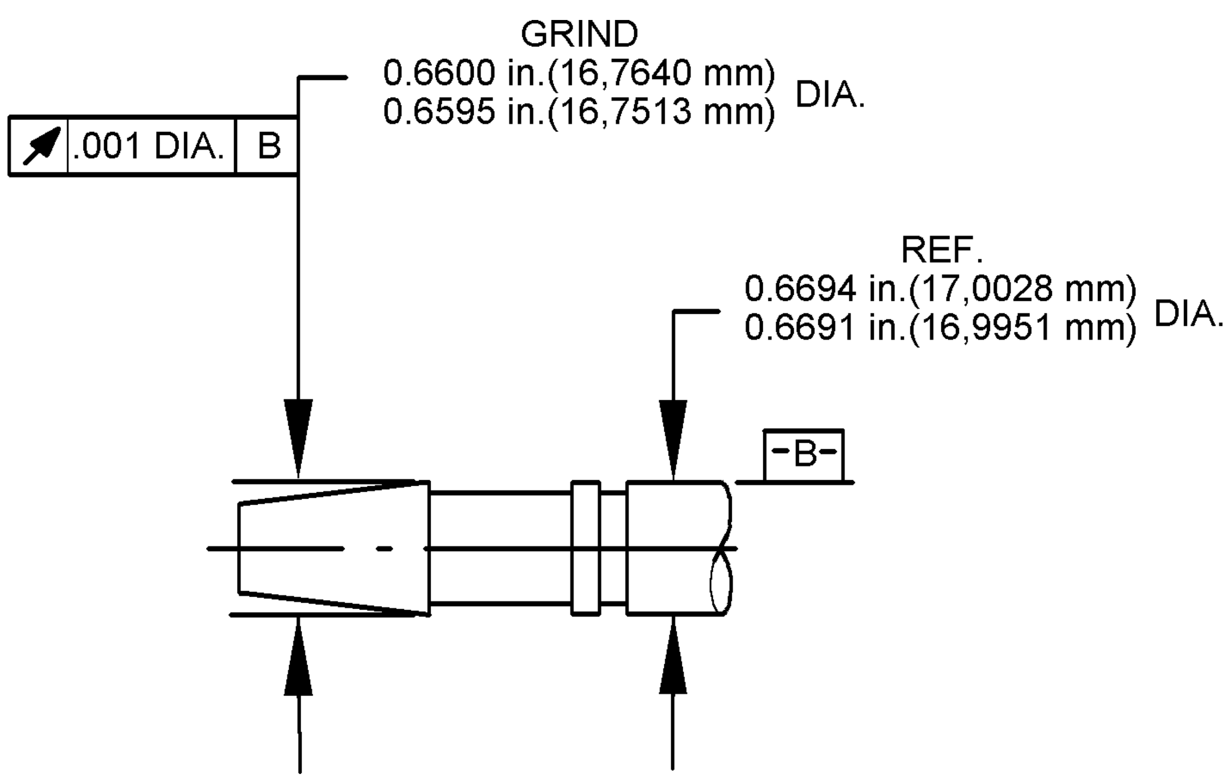

Figure 11001 - Machining the Rotor Assembly Shaft

3. Special Bearing Sensor Removal Procedure

The following procedure provides removal instructions for the drive end and anti-drive end bearing failure sensors for visual inspection, test or replacement. The bearing failure sensors can be removed from the bearing liners without removing major components.

A. Removal Procedure for Drive End and Anti-drive End Bearing Failure Sensors from the 30086-011 DC Generator

(1) Remove the drive shaft assembly from the generator as given in the DISASSEMBLY section of this CMM to access the bearing failure sensors.

(2) Remove the connector cover from the generator housing to access the printed wiring connection board and bearing failure sensor leads as given in the CMM.

(3) Remove the drive end bearing failure sensor from the generator as follows:

(a) Remove tie cord or self-locking straps as necessary to free the wire leads within the generator and allow sensor movement.

(b) Remove the retaining ring (10001-140) from the drive end bearing support.

(c) Remove the round machine key (10001-145) with a magnet.

(d) Carefully remove the drive end bearing failure sensor (10001-150) from the drive end bearing support (10001-175) by applying light pressure to the back side of the sensor. Lightly work the sensor out of the bore.

NOTE: A cotton swab can be used to apply a light lubricant on the inside diameter of the bearing liner at the outside edge of the bearing failure sensor to assist in the removal.

(e) Wipe the oil from the bearing liners and bearing failure sensors with a clean, lint free cloth.

NOTE: The drive end bearing failure sensor is installed in accordance with the procedures in the ASSEMBLY section of this manual.

(4) Remove the anti-drive end bearing failure sensor from the generator as follows:

(a) Remove tie cord or self-locking straps as necessary to free the wire leads within the generator to allow sensor movement.

(b) Remove the retaining ring (10001-155) from the anti-drive end bearing support.

(c) Remove the round machine key (10001-165) with a magnet.

(d) Carefully remove the anti-drive end bearing failure sensor (10001-170) from the anti-drive end bearing support (10004-75) by applying light pressure to the back side of the sensor. Lightly work the sensor out of the bore.

<u>NOTE:</u> A cotton swab can be used to apply a light lubricant on the inside diameter of the bearing liner at the outside edge of the bearing failure sensor to assist in the removal.

(e) Wipe the oil from the bearing liners and bearing failure sensors with a clean, lint free cloth.

<u>NOTE:</u> The anti-drive end bearing failure sensors is installed in accordance with the procedures in the ASSEMBLY section of this manual.

4. Surge Comparison Test

A. Introduction

This section provides a special maintenance procedure for surge testing that is not normally covered elsewhere in this manual. Surge comparison tests are limited to:

- Stator Surge Test, 6-Phase Main Stator
- Rotor Surge Test, 2 Wire Main Field Rotor
- Rotor Surge Test, Exciter Rotor

The surge comparison test is not a requirement of the acceptance test, but must be performed to ensure generator integrity. The surge comparison test checks turn insulation in the windings for turn-to-turn or phase-to-phase shorts. Surges are produced by a simple capacitor discharge circuit. The surge comparison test measures inductance and compares inductance of multiple phases. Since a turn-to-turn or phase-to-phase short changes inductance, a shorted winding will produce a higher frequency wave form.

- Surge comparison testing does not detect grounded windings, so the hi pot test must still be performed for this check.
- Surge comparison testing does not detect resistance differences in windings and therefore cannot detect wrong size wire gauges, resistive solder joints, or open circuits among parallel conductors. Resistance values must still be checked to detect the differences.
- Surge comparison testing should be performed when a winding is disassembled to the extent the winding can be isolated from the rest of the circuits. This is to avoid damage that might occur to other components.

B. Equipment Requirements

(1) Surge Tester (analog, model ST103A or similar) capable of displaying two decaying sinusoidal waveforms simultaneously for each winding being tested, and displaying 500 V per division is recommended.

(2) Surge Tester (digital, model D6000 or similar) capable of storing and displaying two decaying sinusoidal waveforms simultaneously for each winding being tested, and displaying 500 V per division is recommended.

(3) Equipment supplied by the following source meets these requirements:

WARNING: YOU MUST OBEY THE TOOL/EQUIPMENT MANUFACTURERS WARNINGS AND CAUTIONS SHOWN ON PACKAGING, CONTAINERS AND/OR INSTRUCTION LEAFLETS. IF YOU DO NOT, YOU CAN CAUSE DEATH OR INJURY TO PERSONS AND DAMAGE TO EQUIPMENT OR PROPERTY.

Description/Specification	Source
Analog: Baker Model ST103A or Digital: Baker Model D6000 or Equivalent	Baker Instrument Company P.O. Box 587 Ft. Collins, CO 80522-0587 USA Ph: 1 (907) 282-1200 or 1 (800) 752-8272 www.bakerinst.com
	DAE-A Precision Company 595-8 Pajang-Dong, Jangan-Gu Suwon-City, Kyonggido, Korea Ph: 0 331 252-6242 Fax: 0 331 257-4718 www.koreafine.co.kr

Table 11001 - Surge Test Equipment

(a) Properly calibrated instruments for all measurements and must have an error no greater than 1% of full scale, and as specifically defined in a detail requirement.

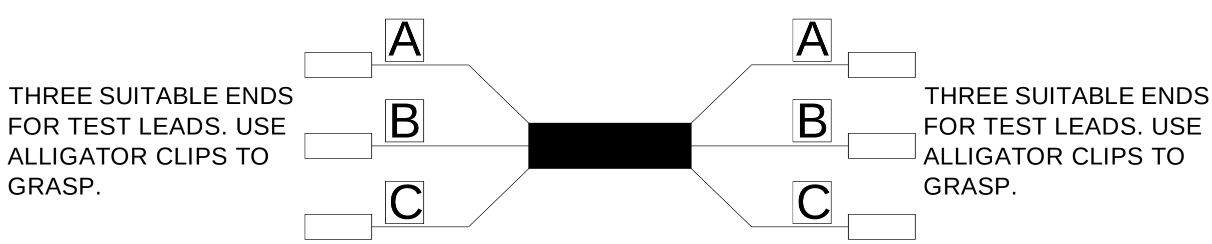

Figure 11002 - Test Wire Harness Fabrication

(b) To fabricate the wire harness, refer to Figure 11002.

C. General

(1) Surge testing can be performed on the main stator with the main stator still installed in the stator-housing.

(2) Disassemble the generator per instructions in the DISASSEMBLY section of the CMM until the leads T1 through T3 and T11 through T13 can be accessed (See Figure 11003).

D. Stator Surge Test, Main 6-Phase Stator

NOTE: The rotor assembly should be removed from the generator during the main stator surge test. The rotor assembly can cause an inconsistent waveform between each phase.

NOTE: The anti-drive end end bell should be removed and test leads should be disconnected from the diodes.

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING SURGE TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

(1) Perform the surge comparison test on the 6-phase main stator as follows:

(a) Connect the three (red) surge tester phase leads to the three lead wires T1, T2, and T3. All test leads are circled in Figure 11003.

(b) Connect black lead to secure housing location.

(c) Equipment Requirements:

1 Refer to Paragraph 4.B. and choose the desired equipment.

(d) Test Setup:

1 Surge tester switch settings:

a FUNCTION: SURGE

b VOLTS/DIV: 500

c TEST LEAD SELECT: 1-2

d OUTPUT CONTROL: Minimum

e All others: Mid Scale

(e) Press and hold TEST button to energize tester.

1 LEADS ENERGIZED (or equivalent) light will illuminate.

(f) Adjust OUTPUT CONTROL from 780 to 820 VDC.

(g) Adjust tester display controls (Focus, Intensity, Horizontal and Vertical Position, and Sweep) as necessary to view the two waveforms.

1 Check to see that both decaying sinusoidal sinewaves cross-over ‘0’ together and are almost identical in amplitude and frequency. See Figure 11004 and Figure 11005.

(h) Return OUTPUT CONTROL to 0 VDC.

(i) Release TEST button.

(j) Change TEST LEAD SELECT switch to 2-3 and repeat test.

(k) Change TEST LEAD SELECT switch to 1-3 and repeat test.

(l) After all three leads have been tested, turn OFF power to the surge tester and remove the test wire harness.

(m) Repeat Paragraph 4.D.(1)(a) thru Paragraph 4.D.(1)(l) for the other three lead wires T11, T12, and T13.

NOTE: It is not necessary to surge test T4, T5, T6 and T14, T15, T16 leads because they use the same main stator windings as T1, T2, T3 and T11, T12, T13.

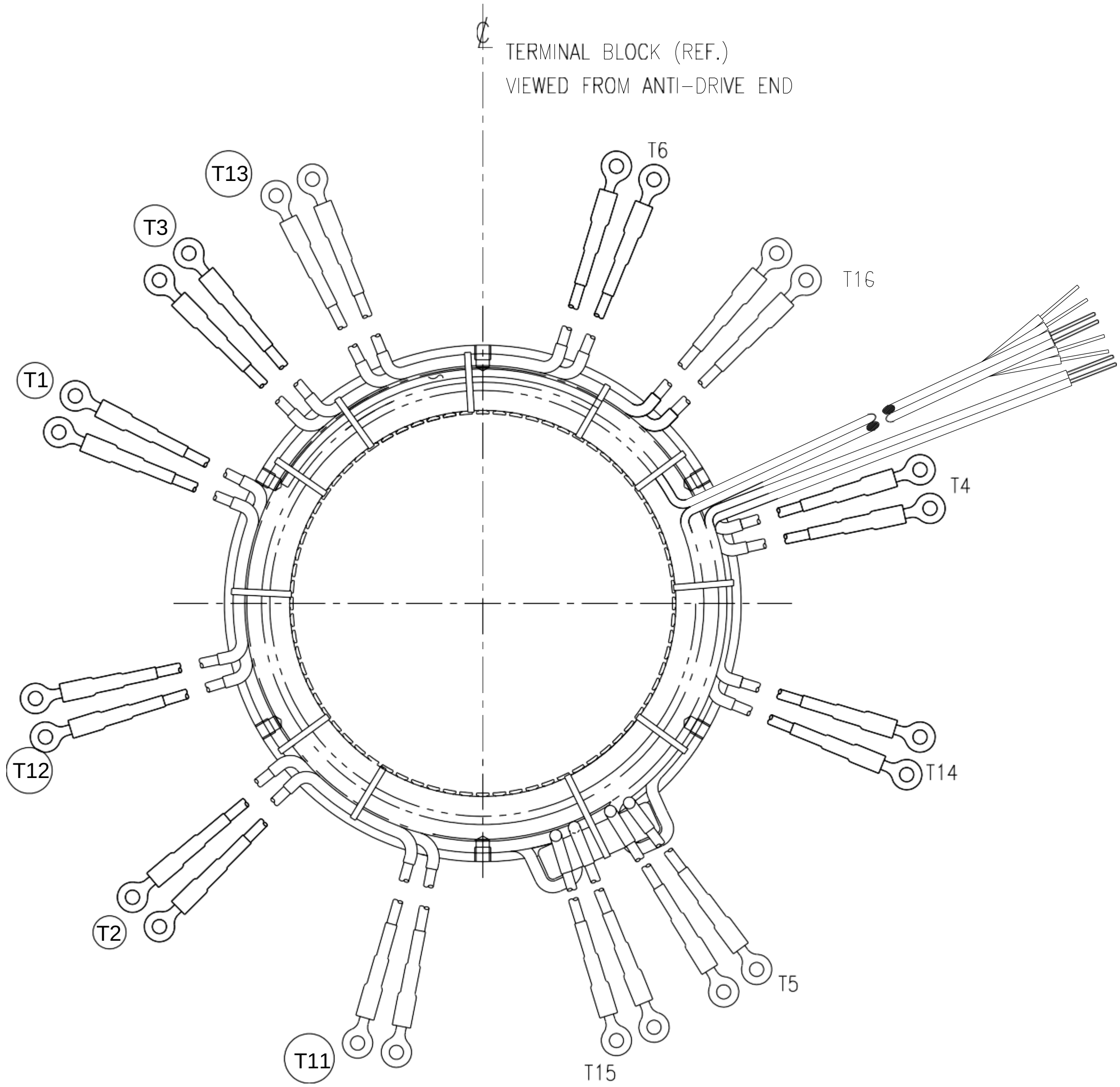

Figure 11003 - Test Lead Connections

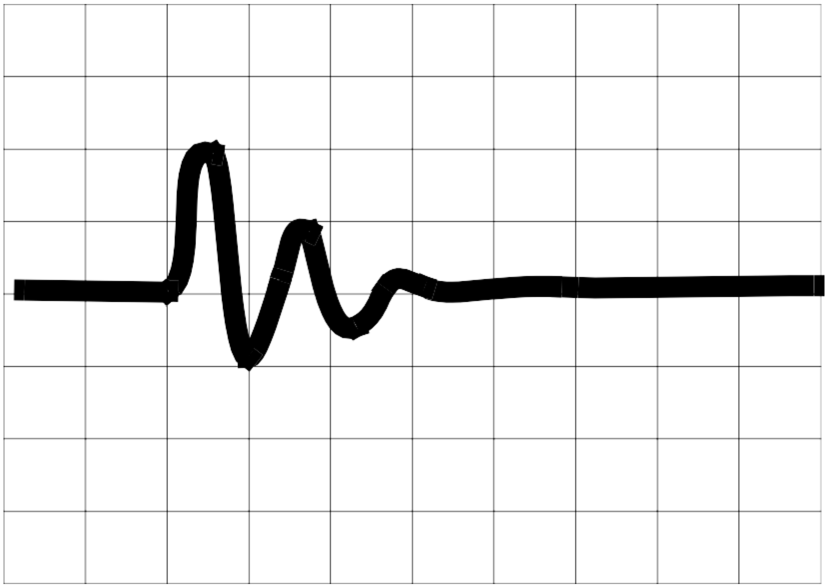

Figure 11004 - Acceptable Sinewave

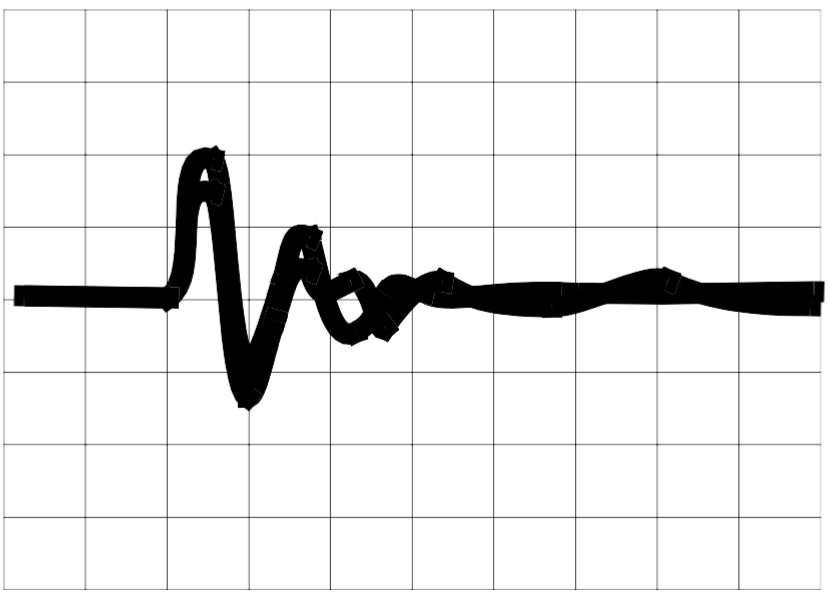

Figure 11005 - Unacceptable Sinewave

E. Rotor Surge Test, Main Field Rotor

NOTE: To disassemble the generator refer to instructions in the DISASSEMBLY section of the 30086 Series II CMM until the main rotor leads S1 and S2 can be accessed. See Figure 11006.

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING SURGE TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

CAUTION: THE MAIN FIELD COIL MUST BE ISOLATED FROM THE ELECTRICAL COMPONENTS.

(1) Disconnect the S1 and S2 leads wires from the electrical circuit.

(2) Perform the surge comparison test on the two wire main field rotor as follows:

(a) Equipment requirements:

1 Refer to Paragraph 4.B. and choose the desired equipment.

(b) Test setup:

1 Surge tester switch settings:

a FUNCTION: SURGE

b VOLTS/DIV: 500

c TEST LEAD SELECT: Analog 1-3 or Digital 1

d OUTPUT CONTROL: Minimum

e All others: Mid Scale

(c) Acceptance tests:

CAUTION: DO NOT PUT THE TEST COMPONENTS ON A CONDUCTIVE SURFACE.

(d) Analog tester:

NOTE: A master (comparison) main field rotor must be used for comparison of the rotor being tested.

1 Test connections:

a Connect surge tester #2 common lead to one lead wire each from two units. See Figure 11007.

b Connect other two tester leads (1 and 3) to remaining two leads from units.

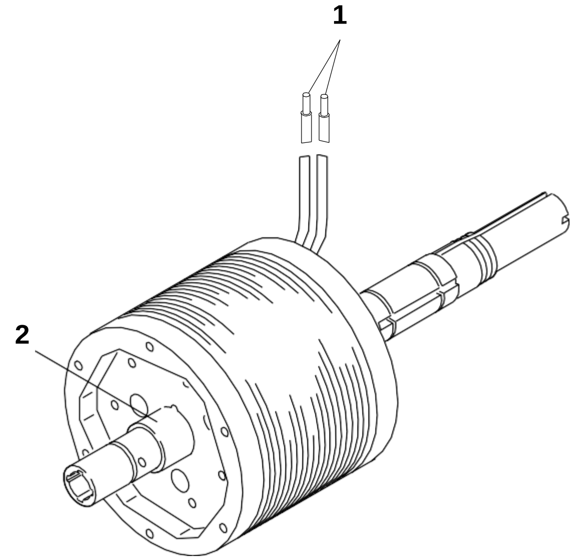

Figure 11006 - Main Field Rotor Assembly Test Connections

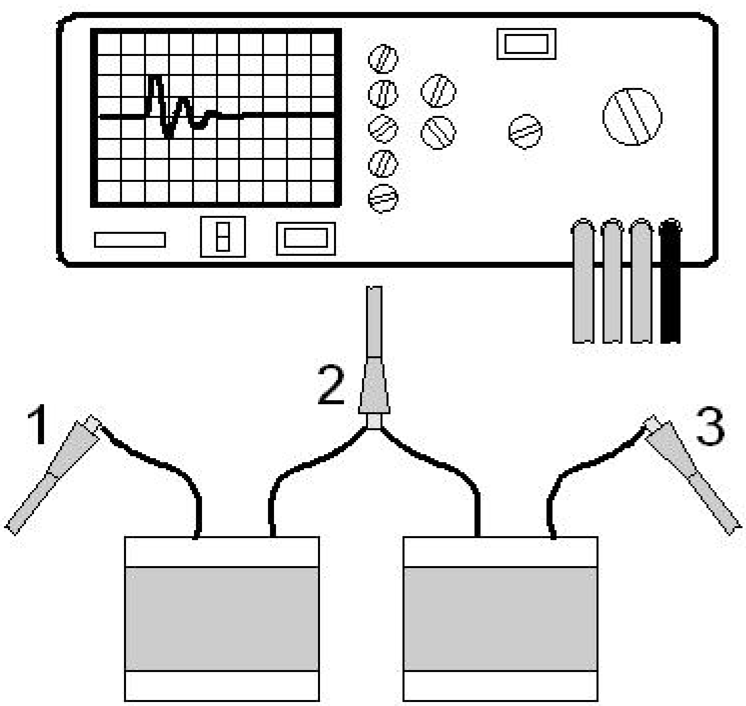

Figure 11007 - Single Phase Hookup for Analog Tester

(e) Test procedure:

<u>a</u> Press and hold TEST button to energize tester.

a LEADS ENERGIZED (or equivalent) light will illuminate.

b Adjust OUTPUT CONTROL from 980 to 1020 VDC.

c Adjust tester display controls (Focus, Intensity, Horizontal and Vertical Position, and Sweep) as necessary to view the two waveforms.

a Check and see that both decaying sinusoidal sinewaves cross-over ‘0’ together and are almost identical in amplitude and frequency. See Figure 11004 and Figure 11005.

d Return OUTPUT CONTROL to 0 VDC.

e Turn OFF power to the surge tester.

f Remove the test wire harness.

(f) Digital tester:

1 Test connections:

a Connect surge tester #1 lead to a lead wire.

b Connect surge tester ground to the other lead wire.

(g) Test procedure:

1 To display stored master display:

a Press RECALL button.

b Highlight RECORD 1 and push SELECT button.

c Highlight LEAD 1 and push SELECT button.

2 Press and hold TEST button to energize tester.

3 LEADS ENERGIZED (or equivalent) light will illuminate.

4 Adjust OUTPUT CONTROL from 980 to 1020 VDC.

5 Adjust tester display controls (Focus, Intensity, Horizontal and Vertical Position, and Sweep) as necessary to view the two waveforms.

a Check and see that both decaying sinusoidal sinewaves cross-over ‘0’ together and are almost identical in amplitude and frequency. See Figure 11004 and Figure 11005.

6 Return OUTPUT CONTROL to 0 VDC.

7 Turn OFF power to the surge tester.

8 Remove the test wires.

F. Rotor Surge Test, Exciter Rotor

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING SURGE TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

(1) Disassemble the exciter rotor from the rotor assembly and disconnect leads T7, T8, T9, T10.

(2) Perform the surge comparison test on the exciter rotor as follows:

(a) Test setup:

1 Surge tester switch settings:

a	FUNCTION:	SURGE
b	VOLTS/DIV:	500
c	TEST LEAD SELECT:	1-2
d	OUTPUT CONTROL:	Minimum
e	All other controls:	Mid Scale

(b) Test connections:

CAUTION: DO NOT PUT THE TEST COMPONENTS ON A CONDUCTIVE SURFACE.

1 Connect the three (red) surge tester phase leads to the three lead wires T7, T8 and T9 (white). See Figure 11008.

NOTE: Do not test lead wire T10 (black), this is a neutral lead.

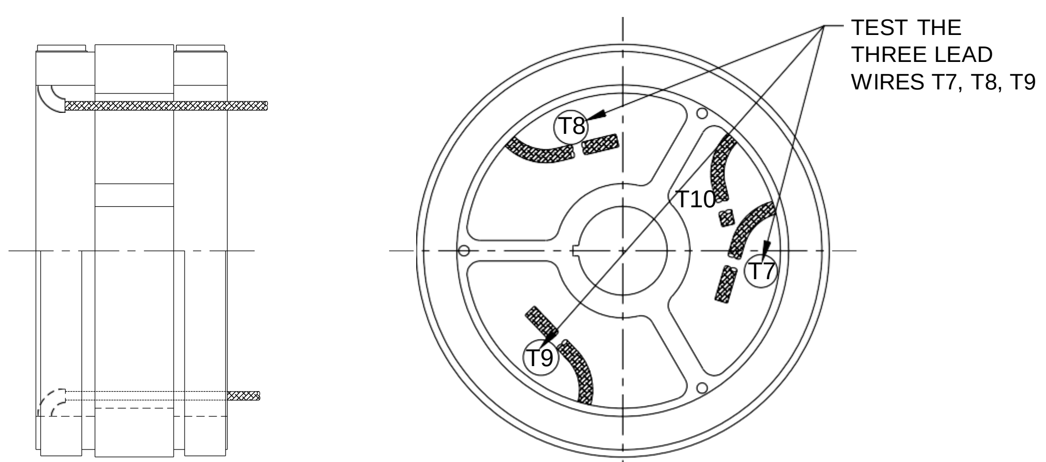

Figure 11008 - Exciter Rotor Test Lead Connections

WARNING: FAILURE TO USE NECESSARY SAFETY PRECAUTIONS WHEN HANDLING HIGH VOLTAGE ELECTRICAL EQUIPMENT DURING SURGE TESTING CAN CAUSE SERIOUS INJURY OR DEATH TO THE OPERATOR.

(c) Test procedure:

a Analog unit:

a Press and hold TEST button to energize tester.

b LEADS ENERGIZED (or equivalent) light will illuminate.

c Adjust OUTPUT CONTROL from 480 to 520 VDC.

d Adjust tester display controls (Focus, Intensity, Horizontal and Vertical Position, and Sweep) as necessary to view the two waveforms.

e Check and see that both decaying sinusoidal sinewaves cross-over ‘0’ together and are almost identical in amplitude and frequency. See Figure 11004 and Figure 11005.

f Return OUTPUT CONTROL to 0 VDC.

g Repeat the test twice using TEST LEAD SELECT switch to 2-3, then TEST LEAD SELECT switch to 1-3.

h Turn OFF power to the surge tester.

i Remove the test wire harness.

b Digital Unit

a Press and hold TEST button to energize tester.

b LEADS ENERGIZED (or equivalent) light will illuminate.

c Adjust OUTPUT CONTROL to from 480 to 520 VDC.

d Adjust tester display controls (Focus, Intensity, Horizontal and Vertical Position, and Sweep) as necessary to view the waveforms.

e Release TEST button.

f To store the display, press STORE button.

G. Diode Rectifier Check When Mounted to the Heatsinks.

(1) Do the following tests if you the generator has a unacceptable waveform found in Figure 1003. This diode rectifier test is for testing diodes mounted in the generator.

(2) The waveform in Figure 1003 is an example of a bad diode in the generator.

(3) Use a power supply that is capable of 10 V DC at 3.0 ± 10% A with a meters that display the output voltage and current. External meters can be used if the power supply does not have meters to display the output voltage and current.

WARNING: BEFORE YOU USE THE HIGH VOLTAGE TESTER, MAKE SURE THAT THE POWER SWITCH IS IN THE OFF POSITION. MAKE SURE THAT NO PERSON TOUCHES THE EQUIPMENT OR PROBES. THIS WILL PREVENT DEATH OR INJURY FROM ELECTRIC SHOCK.

(a) Diode Forward Voltage Test:

a Connect the DC power supply minus (-) to the diode cathode and the supply positive (+) to diode anode.

b Limit the power supply current to the 3.0 ± 10% A.

c Monitoring the voltage across the diode and current in series, increase the voltage until a supply current of 3.0 ± 10% A is displayed.

d A good diode will have a forward voltage reading of 0.60 to 1.15 V DC on the voltmeter with a reading of 3.0 ± 10% A shown on the ammeter (in circuit).

(b) Diode Reverse Voltage test:

1 Limit the power supply 3.0 ± 10% Amps.

2 Connect the DC power supply plus (+) to the diode cathode and the power supply minus (-) to the diode anode.

3 Monitoring the voltage across the diode and current in series increase the voltage to 10 ± 1% V DC.

4 A good diode will have a reverse voltage reading of 10.0 ± 10% V DC with a reverse current of equal to or less than 200 mA (in circuit).

(c) If this test does not find a bad diode and you have an unacceptable waveform, then remove each diode from the heatsink and check IAW Paragraph 8.Z. of the CHECK section.

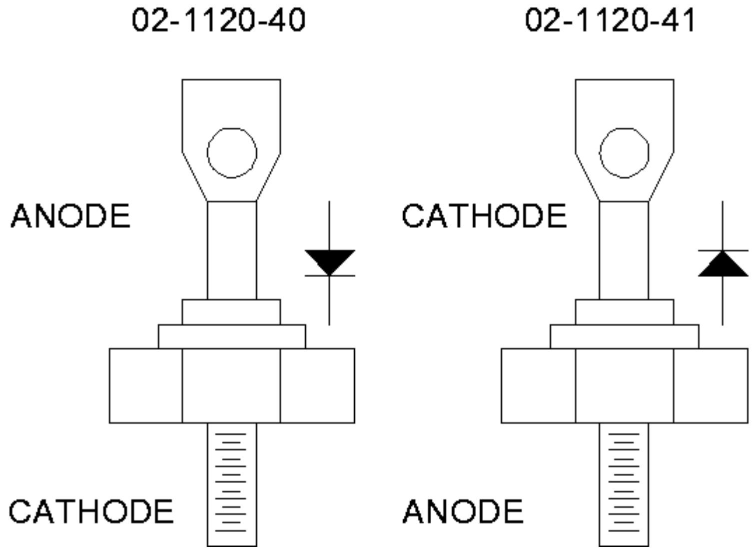

Figure 11009 - Rectifier Diodes

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REMOVAL

1. Introduction

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INSTALLATION

1. Introduction

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SERVICING

1. Introduction

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STORAGE

1. Storage

Materials recommended for packaging rotating machines containing lubricated bearings for storage or shipment are listed below in Table 15001.

Description	Specification	Quantity
Tag	Commercially available	1 (Domestic) 2 (International)
Grease	MIL-PRF-81322	AR
Protective paper	MIL-B-121A Grade A Type II	AR
Chemically neutral protective paper	Commercially available	AR
Polyethylene (plastic) wrap	Commercially available	AR
Packing material - shock absorbing foam rubber, styrofoam, bubble wrap or expanded foam (Safran Power's preferred method) - three (3) inch thick minimum - surrounding machine on all sides	Commercially available	AR
Tape - waterproof, pressure sensitive	Commercially available	AR
Small plastic bag	Commercially available	AR
O-ring (for drive shaft on applicable models)	Check Illustrated Parts List for current p/n	1 ea.
Desiccant	MIL-D-3464 Type I and II	1 ea.
Original shipping container - or equivalent alternate: domestic class, double-wall, corrugated cardboard. Box must be large enough to totally enclose bagged machine and allow for a 3 inch thick layer of cushioning material to surround it on all sides	PPP-B-636 or suitable equivalent	1 ea.
Box - WC5 overseas shipping container, sized to completely enclose domestic class packaging - for overseas shipment only	PPP-B-636 or suitable equivalent	1 ea.

Table 15001 - Packaging Materials

A. General Information

CAUTION: IF MACHINE STORAGE TIME HAS EXCEEDED 24 MONTHS WITH NO USE, IT IS RECOMMENDED THAT THE BALL BEARINGS BE REPLACED. IT MUST THEN BE RE-TESTED ACCORDING TO THE TESTING AND FAULT ISOLATION SECTION BEFORE BEING PUT INTO SERVICE.

CAUTION: ONCE THE GENERATOR IS PUT INTO SERVICE WITHIN THE 24 MONTHS STORAGE PERIOD, THE GENERATOR CAN REMAIN IN SERVICE FOR UP TO 60 MONTHS BEFORE THE BEARINGS NEED TO BE REPLACED.

(1) Unit is to have successfully completed tests specified in TESTING AND FAULT ISOLATION section of this manual before preparing unit for shipment or storage.

(2) Verify that any lockwire used is in place.

(3) Record following information on tag(s):

- Model Number
- Serial Number
- Modification (MOD) Status
- Test Date (PASSED)
- Packing date

(4) Select packaging materials as described in Table 15001.

B. Documentation

Include all applicable documentation with unit:

- Testing Records
- Repair Reports
- Final Inspection/Check Records
- Packing List and Certificate of Conformance

C. Domestic Packaging

Recommended packaging procedure for generators is:

(1) If machine includes drive shaft with O-ring/oil sealing provision, place O-ring into small plastic bag, include instructions to lubricate and install the O-ring on drive end of shaft prior to installation on aircraft, seal bag, and attach it to the machine.

(2) Apply lubricating grease to drive spline according to MIL-PRF-81322 and wrap it in protective paper according to MIL-B-121A, Grade A, Type II.

(3) Put unit and desiccant into a waterproof and vapor-proof heat-seal bag and partially heat-seal it while forcing as much air as possible from bag.

(4) Insert vacuum tube into bag to draw remaining air out of bag.

(5) Withdraw vacuum tube quickly and complete heat-sealing of bag.

(6) Use machine's original shipping container if possible. Put bagged machine into box surrounded with a minimum of three (3) inch thick shock absorbing, cushioning material on all six sides.

(7) Securely and completely seal all flapped openings of box with tape.

(8) Tape tag to exterior of box. Make sure all information is visible.

D. Overseas Shipment on Surface Vessels

(1) Package the machine as given in the DOMESTIC PACKAGING paragraph in this section.

(2) Put domestically packaged generator into WC5 shipping container.

(3) Securely and completely seal all flapped-openings of shipping container with tape.

(4) Tape tag to exterior of shipping container. Make sure all information is visible.

2. Receiving Inspection

The drive shaft is not rigid in the radial direction at the drive end of the generator and is free to move within the rotor shaft as shown in Figure 15001. The drive shaft is connected to the rotating component within the generator at the anti-drive end of the unit. It is possible for the drive shaft to be off center and orbit (looks like it is bent) when rotated. The drive shaft is centered during routine maintenance but can shift during normal ground handling. Do NOT reject the generator because the drive shaft appears bent when rotated. The drive shaft will align when the generator is installed on the Q.A.D. mounting adapter and piloted by the mounting surface.

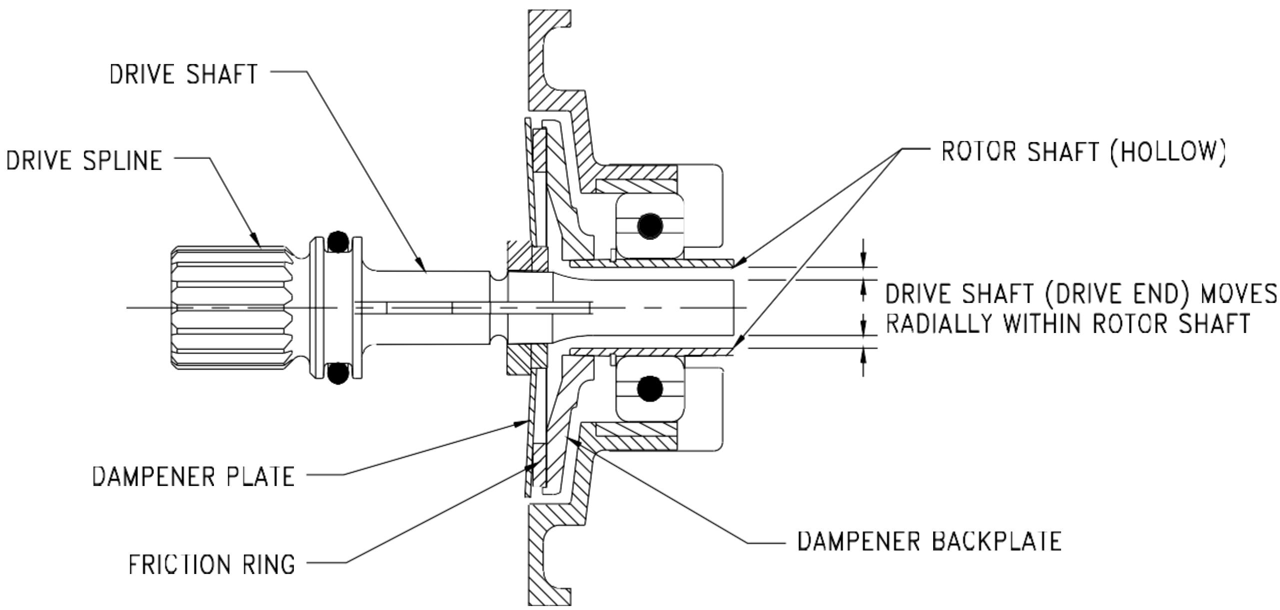

Figure 15001 - Typical Dampener Assembly

REWORK

1. Introduction

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ILLUSTRATED PARTS LIST

1. Introduction

This section provides a listing of assemblies and detail parts for the 30086 Series II of DC Generators. All parts are listed, except for parts which lose their identities by being permanently fastened to other parts or are part of an assembly not subject to disassembly. Each list is arranged in disassembly sequence, except that attaching parts are listed immediately after the parts they attach, under the heading of (ATTACHING PARTS).

All replacement parts are manufactured or source-controlled by Safran Power with the exceptions listed in Paragraph 2.B.

WARNING: ANY USE OF PARTS, MATERIALS OR PROCEDURES NOT AUTHORIZED BY SAFRAN POWER FOR MAINTENANCE OR RESTORATION OF UNIT(S) CAN AFFECT CONTINUED AIRWORTHINESS OR INVALIDATE CERTIFICATION.

To order authorized parts contact your Safran Power Equipment Service Center.

2. Arrangement of Parts List

A. Figure and Item Number

The figure number indicates the figure where the part is illustrated. Each item number corresponds to a part illustrated in the applicable figure. Several item numbers may have a letter following a number (e.g. 10 A). This indicates that the part has the same function and location as the base number (e.g. 10), but can be different in form and material. An item number that is preceded by a dash (e.g. -30) is not illustrated in the applicable figure.

B. Part Number Column

The part numbers listed in this column are the only authorized parts for replacement and restoration of the generator. Part numbers in this IPL consists mainly of Safran Power part numbers, and does include Military Standard (MS), Army Navy (AN), National Aerospace Standard (NAS) and industry standard (ANSI, ASME, ISO, etc.) part numbers unless a Commercial and Government Entity (CAGE) code appears in the Nomenclature column. Refer to Paragraph 3. for details.

C. Nomenclature Column

The proper name and type of each part is provided in this column. The description of each item is indented by columns to indicate the relationship to the next higher assembly. The number of indentures and bullets depicts the relationship of the item to the associated next higher assembly as follows:

(1) The description of each item is indented by columns to indicate the relationship to the next higher assembly (NHA). Each listed item is placed in the NOMENCLATURE column one indenture (one dot) to the right of the assembly to which it belongs. Items at equal indentures are all components of a single assembly or subassembly. The number of indentures and bullets depicts the relationship of the item to the associated next higher assembly as follows:

1 2 3 4 5
Assembly, level 1, no bullets
  Detail Parts for Assembly, level 2, 1 bullet
    Sub-Assembly, level 3, 2 bullets
      Attaching Parts for Sub-Assembly, level 4, 3 bullets
        Detail Parts for Sub-Assembly, level 5, 4 bullets

The interchangeability relationship between parts is identified in the NOMENCLATURE column of the parts list. A list of the terms used to show interchangeability and their definition is as follows:

Term	Parts List Abbreviation	Definition
Alternate	ALT:	One of the two part numbers may be used. If the part number in the Nomenclature Column is NOT specified as ‘ALT’, it may not be used as an alternate. The information is for reference only or as a way to help identify the part.
Modification	MOD	Modification (MOD) status details information about effectivity of parts in regard to upgrades and modifications. Alpha variants (A through Y) (but I, O, Q, S, X, and Z) are assigned to existing model numbers when necessary.
Order separately		Part is not furnished as part of the generator.
Superseded	SUPSD BY	Part number listed is obsolete and must be replaced by the new part listed at the next repair. A superseded part is not to be installed or reinstalled.
Supersedes	SUPSDS	Part number listed must replace the obsolete part number at the next repair.
Replaced BY	REPLD BY	Part number listed is discontinued and should be replaced by the new part number. Original part may be for use until current stock is depleted and then must be replaced by the new part listed.
Replaces	REPLS	Part listed replaces and is interchangeable with the item number shown in the notation.

D. Effect Code

Each generator model is assigned a unique effectivity code (A through Z, I and O are not used). Subsequent items within the parts list pertaining to Figure 10001 will refer to the effectivity codes that correspond to a particular model. In subsequent figures, the effectivity code is redefined for each major subassembly and remains independent of all other main assembly and subassemblies defined in other figures within this section. In cases where a part is used on all assemblies, the effect code is left blank.

E. Units Per Assembly

This column indicates the quantity of parts used at the location shown. For bulk items, the abbreviation AR is used to indicate the part quantity is used on an “as required” basis. The abbreviation RF indicates that the item is listed for “reference” only. The abbreviation NP indicates non-procurable and refers to items which are not procurable and may not be ordered.

3. Vendors

A. Manufacturer's Code

In the case of an item supplied by a vendor and not listed under the prime manufacturer's part number, a vendor CAGE code is prefixed by the capital letter V appearing in the nomenclature column. This CAGE code number designates the original manufacturer of non-Safran Power components, and is in accordance with Cataloging Hand Books H4-1, H4-2, and H4-3. CAGE codes are listed in the NOMENCLATURE column, except for the government codes below, which are not listed:

V80205	National Aircraft Standard (prefix NAS)
V81349	Military Specifications (prefix M)
V88044	Army/Navy Standard (prefix AN)
V96906	Military Standard (prefix MS)

The Customer Support division in your region is to be contacted for parts dispatch.

Vendor Code	Manufacturer’s Name and Address

NOTE: Spec 200/2000, automated ordering users, refers to the EXCLUSIVE DISTRIBUTORS section in the front of this manual when ordering parts identified with V19527, Safran Power.

3CPE0	Safran Power USA 8380 Darrow Road Twinsburg, Ohio, 44070 USA

B. Notes in the Nomenclature Column

(1) The 30086-010, -011 DC Generators are not supplied with a QAD Mounting Kit. QAD Mounting Kit P/N 30081-520 or 30081-521 must be ordered separately. Also, all model 30086-010 generators must be converted to model 30086-011 IAW SB 30086-010-24-03.

(2) The 30081-2021 drive end bearing support supersedes the 30081-2020 drive end bearing support. Re-identification of the DC Generator is not required to reflect this modification. At first repair or restoration of the DC Generator, the drive end bearing support must be examined to determine which bearing liner is installed in the drive end bearing support. It is mandatory that the soft bearing liner (P/N 30081-2030) be replaced with the hard bearing liner (P/N 30081-2031).

(a) Indications:

1 The “soft” bearing liner, P/N 30081-2030, is part of the 30081-2020 drive end bearing support. Look for the part marking, 30081-2020, on the drive end bearing support. If the part marking is not visible, visually examine the coating on the non-machined surfaces of the bearing liner. The “soft” bearing liner is cadmium plated. The “soft” bearing liner, P/N 30081-2030, must be pressed out of the drive end bearing support and replaced with the “hard” bearing liner, P/N 30081-2031, and the drive end bearing support must be re-identified to reflect the accomplishment of this modification (see REPAIR section).

2 The “hard” bearing liner, P/N 30081-2031, is part of the 30081-2021 drive end bearing support. Look for the part marking, 30081-2021, on the drive end bearing support. If the part marking is not visible, visually examine the coating on the non-machined surfaces of the bearing liner. The “hard” bearing liner has a black oxide coating. The black oxide coating is visible on the non-machined surfaces of the “hard” bearing liner. Replacement of the bearing liner is not required if it is determined that the “hard” bearing liner is part of the drive end bearing support unless the bearing liner is damaged. The “hard” bearing liner, P/N 30081-2031, is not repairable by Safran Power SPD 1000 (see REPAIR section).

(3) Models 30086-011 can have variations of conformal coating used to coat the printed wiring board. The units are identified as Mod C or Mod D. Modifications C and D are approved when done IAW SB 30086-011-24-03.

(a) All 30086-011 Mod B units must have SB 30086-011-24-03 applied to modify the unit to Mod C.

(b) All 30086-011 units with printed wiring board P/N 30086-350A must have Mod D applied per SB 30086-011-24-03.

1 Only models with printed wiring board P/N 30086-350A can be converted to Mod D.

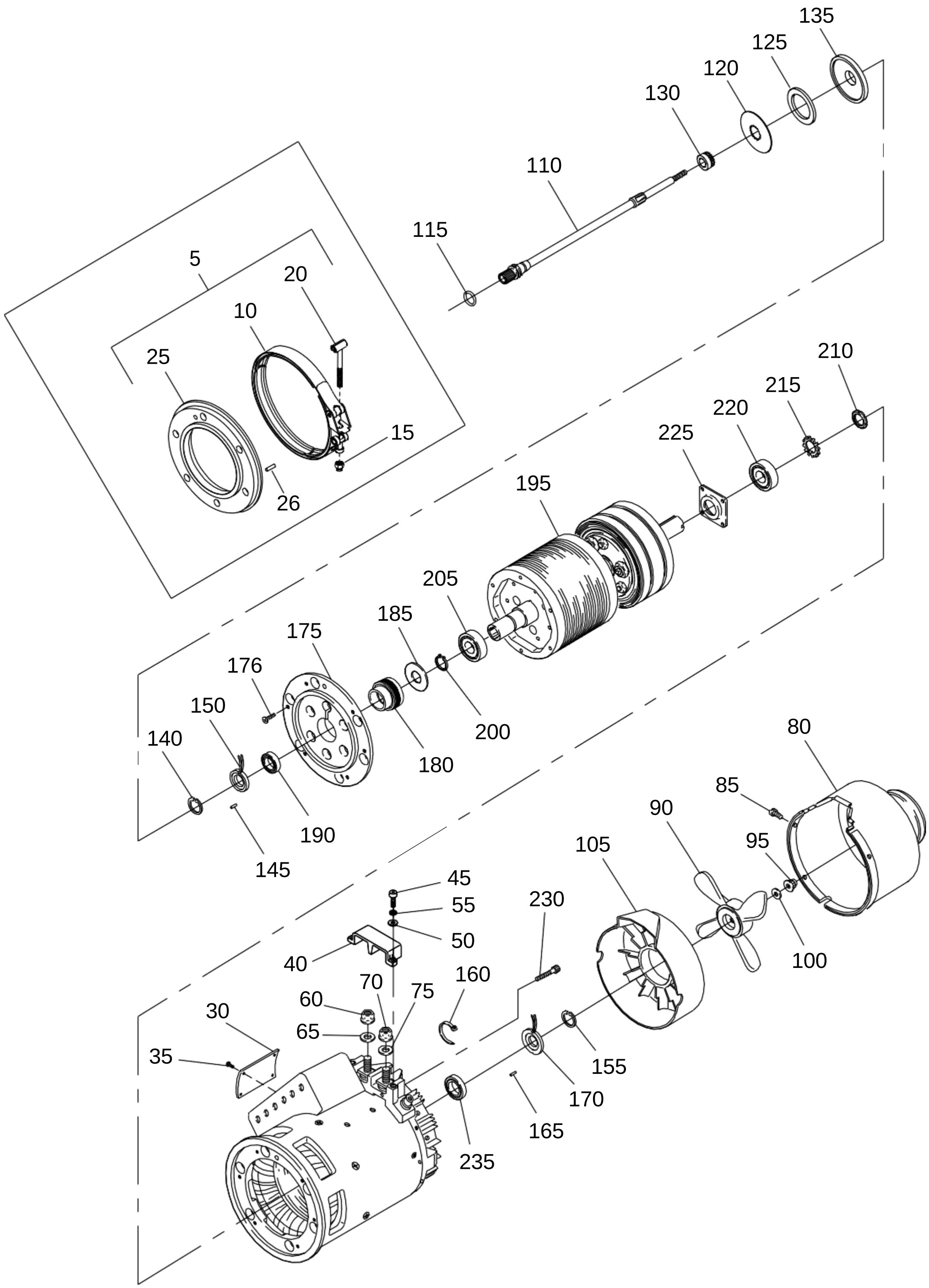

Figure 10001 - DC Generator Model 30086-010/ -011 (Sheet 1 of 2)

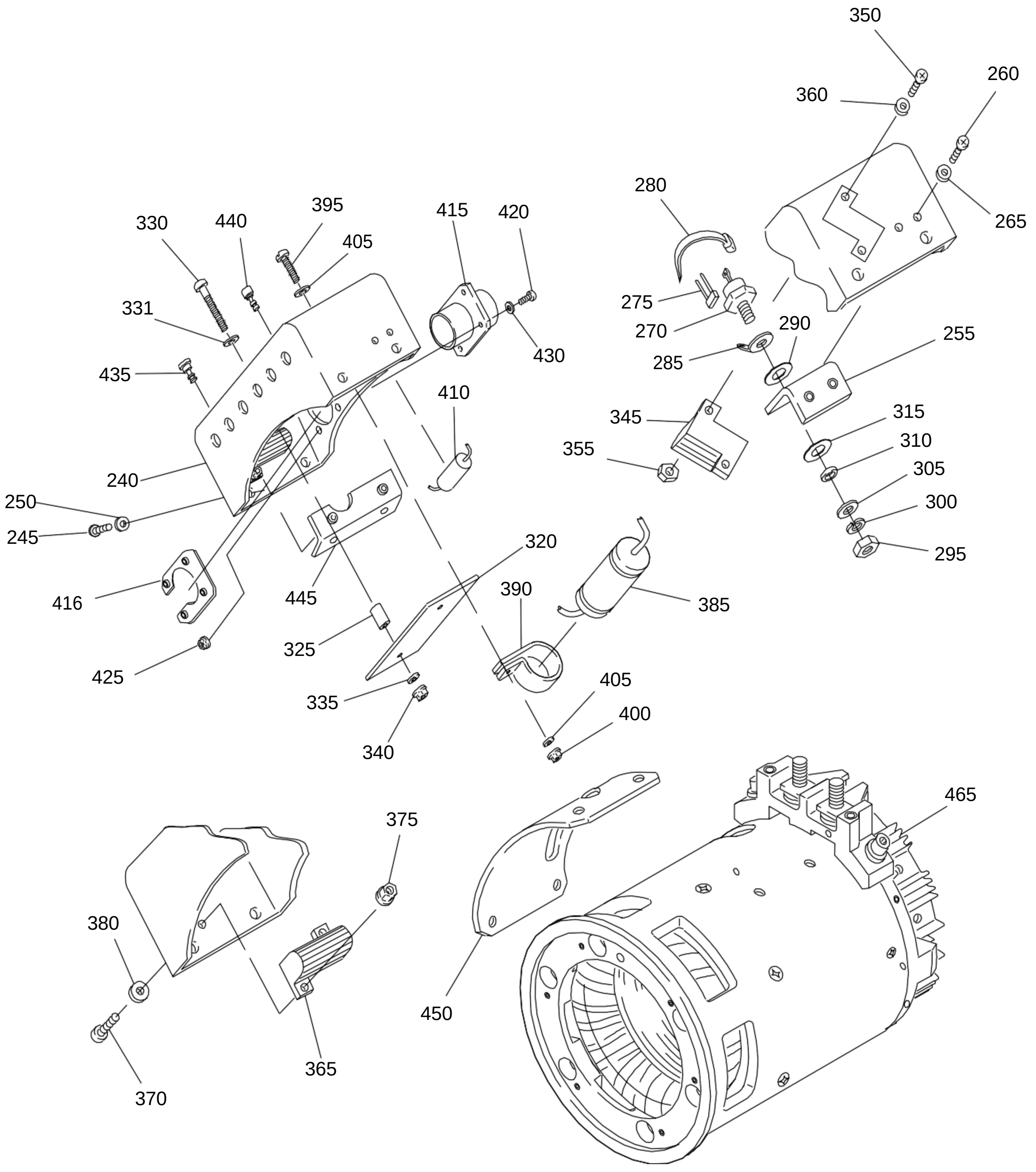

Figure 10001 - DC Generator Model 30086-010/ -011 (Sheet 2 of 2)

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10001-				
	30086-010	DC GENERATOR . . . . (See Note 3.B.(1))	A	RF
	30086-011	DC GENERATOR . . . . SB 30086-010-24-03 (See Note 3.B.(1))	B	RF
5	30081-520	• KIT, QAD, Mounting . . . . REPLD BY 30081-521		1
	30081-521	• KIT, QAD, Mounting . . . . REPLS 30081-520		1
10	23072-1125	• • CLAMP, V-band . . . . (ALT: 23072-1325) (Used only on 30081-520)		1
	23072-1325	• • CLAMP, V-band . . . . (ALT: 23072-1125) (Used only on 30081-520)		1
-10A	23072-1110	• • CLAMP, V-band . . . . (Used only on 30081-521)		1
		(ATTACHING PARTS)		
15	MS21045-4	• • • NUT, Self-locking, Hex . . . . (Used on 23072-1125 and 23072-1110 Clamp)		1
	MS21045-L4	• • • NUT, Self, locking, Hex . . . . (Used on 23072-1325 Clamp)		1
20	23032-2802	• • • T-BOLT. . . . . (Used on 23072-1125 and 23072-1110 Clamp)		1
	23032-2803	• • • T-BOLT . . . . (Used on 23072-1325 Clamp)		1
		------------ * ------------		
25	30081-1045	• • ADAPTER, Mounting.		1
26	02-4412-08	• • • PIN, Guide		1
30	06-0028-03	• PLATE, ID (Replacement).	A	1
	06-0031-02	• PLATE, ID (Replacement).	B	1
		(ATTACHING PARTS)		
35	MS21318-13	• SCREW, Drive.		4
		------------ * ------------		
40	30527-1611	• COVER, Terminal Block		1
		(ATTACHING PARTS)		

- ITEM NOT ILLUSTRATED

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10001-				
45	NAS601-7P	• SCREW, Pan Head.		2
50	NAS620-6L	• WASHER, Flat		2
55	MS35338-41	• WASHER, Lock.		2
		------------ * ------------		
60	MS21042-6	• NUT, Self-locking.		1
65	M12133/2-380	• WASHER, Belleville		1
70	MS21042-5	• NUT, Self-locking.		1
75	M12133/2-317	• WASHER, Belleville		1
80	30086-2100	• INLET, Air		1
		(ATTACHING PARTS)		
85	MS35265-42	• SCREW, Fillister Head		4
		------------ * ------------		
90	30081-2050	• ASSEMBLY, Fan		1
		(ATTACHING PARTS)		
95	02-4107-01	• NUT, Self-locking, Double Hex	A	1
	02-4107-01	• NUT, Self-locking, Double Hex . . . . REPLD BY MS21042-4	B	1
	MS21042-4	• NUT, Self-locking, Double Hex . . . . REPLS 02-4107-01	B	1
100	AN960-416	• WASHER, Flat		1
		------------ * ------------		
105	30076-2275	• DEFLECTOR, Air . . . . ALT: 30076-2276 SB 30086-010-24-02		1
110	02-6100-14	• SHAFT, Drive		1
115	M83248/1-113	• O-RING		1
120	23032-1910	• PLATE, Dampener		1
125	02-5600-13	• RING, Friction		1
130	23032-1900	• HUB, Dampener . . . . (ALT: 23032-1905)		1
	23032-1905	• HUB, Dampener . . . . (ALT: 23032-1900)		1
135	30076-2460	• BACKPLATE, Dampener		1
140	MS16631-4118	• RING, Retaining . . . . (ALT: MS16631-1118)		1
	MS16631-1118	• RING, Retaining . . . . (ALT: MS16631-4118)		1

- ITEM NOT ILLUSTRATED

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10001-				
145	02-4390-20	• KEY, Machine, Round . . . . (Dia. 0.094/0.092 in. (2.39/2.34 mm))	A	1
	02-4390-20	• KEY, Machine, Round . . . . (Dia. 0.094/0.092 in. (2.39/2.34 mm)) SUPSD BY 02-4390-29	B	1
	02-4390-29	• KEY, Machine, Round . . . . (Dia. 0.091/0.089 in. 2.31/2.26 mm)) SUPSDS 02-4390-20	B	1
150	30081-2300	• SENSOR, Bearing Failure, Drive End. . SB 30086-010-24-03	A	1
	30086-330	• SENSOR, Bearing Failure, Drive End. . REPLD BY 30086-331	B	1
	30086-331	• SENSOR, Bearing Failure, Drive End REPLS 30086-330 .... MOD A SB 30086-011-24-01	B	1
155	MS16631-4137	• RING, Retaining . . . . (ALT: MS16631-1137)		1
	MS16631-1137	• RING, Retaining . . . . (ALT: MS16631-4137)		1
160	MS3367-4-9	• STRAP, Self-locking		1
165	02-4390-20	• KEY, Machine, Round . . . . (Dia. 0.094/0.092 in. (2.39/2.34 mm))	A	1
	02-4390-20	• KEY, Machine, Round . . . . (Dia. 0.094/0.092 in. (2.39/2.34 mm)) SUPSD BY 02-4390-29	B	1
	02-4390-29	• KEY, Machine, Round . . . . (Dia. 0.091/0.089 in. (2.31/2.26 mm)) SUPSDS 02-4390-20	B	1
170	30081-2200	• SENSOR, Bearing Failure, Anti-Drive End . . . . SB 30086-010-24-03	A	1
	30086-340	• SENSOR, Bearing Failure, Anti-Drive End . . . . REPLD BY 30086-341	B	1
	30086-341	• SENSOR, Bearing Failure, Anti-Drive End .... MOD A REPLS 30086-340 SB 30086-011-24-01	B	1
175	30081-2020	• BEARING SUPPORT, Drive End . . . . . See Note 3.B.(2) SUPSD BY 30081-2021 SB 30086-010-24-03	A	RF

- ITEM NOT ILLUSTRATED

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10001-				
	30081-2021	• BEARING SUPPORT, Drive End . . . . . See Note 3.B.(2) SUPSDS 30081-2020 SB 30086-010-24-01	A	1
	30081-2021	• BEARING SUPPORT, Drive End	B	1
		(ATTACHING PARTS)		
176	MS24693-S49	• SCREW, Flat Head		6
		------------ * ------------		
180	30081-2030	• • LINER, Bearing . . . . Used with 30081-2021 only SUPSD BY 30081-2031 SB 30086-010-24-03	A	RF
	30081-2031	• • LINER, Bearing . . . . See Note 3.B.(2) SUPSDS 30081-2030 SB 30086-010-24-01	A	1
	30081-2031	• • LINER, Bearing . . . . See Note 3.B.(2)	B	1
185	02-4231-04	• WASHER, Spring Wave		1
190	03-6009-10	• BEARING, Drive End Auxiliary . . . . SB 30086-010-24-03	A	1
	03-6009-26	• BEARING, Drive End Auxiliary	B	1
195	30086-310	• ASSEMBLY, Rotor. . . . . (See Figure 10002 for details)		1
200	MS16624-1066	• RING, External Retaining		1
205	03-6009-24	• BEARING, Drive End, Main. . . . . SB 30086-010-24-03		1
210	MS172239	• NUT, Spanner, Bearing Retaining		1
215	MS172204	• WASHER, Key, Bearing Retaining		1
220	03-6009-24	• BEARING, Anti-drive End, Main . . . . . . SB 30086-010-24-03		1
225	30081-1320	• RETAINER, Bearing		1
		(ATTACHING PARTS)		
230	MS16997-36	• SCREW, Cap, Socket Head		4
		------------ * ------------		
235	03-6009-20	• BEARING, Anti-drive End Auxiliary . . . . SB 30086-010-24-03		1
240	30076-3182	• COVER, Filter and Connector Mounting		1

- ITEM NOT ILLUSTRATED

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10001-				
		(ATTACHING PARTS)		
245	05-346371	• SCREW, Binding Head		4
250	AN960-6L	• WASHER, Flat		4
		------------ * ------------		
255	30076-3231	• BRACKET, Diode Mounting		1
		(ATTACHING PARTS)		
260	MS35206-215	• SCREW, Pan Head. . . . . REPLD BY MS35206-214		2
	MS35206-214	• SCREW, Pan Head. . . . . REPLS MS35206-215		2
265	NAS620-4L	• WASHER, Flat		2
		------------ * ------------		
270	03-0064-28	• DIODE (D1).		1
275	03-0056-37	• CAPACITOR, Fixed, Ceramic (C3) . . . . REPLD BY 03-0156-410		1
	03-0156-410	• CAPACITOR, Fixed, Ceramic (C3) . . . . REPLS 03-0056-37		1
280	MS3367-4-9	• STRAP, Self-locking		1
285	05-652509	• TERMINAL, Lug		1
		(ATTACHING PARTS)		
290	02-2083-05	• INSULATOR		1
295	MS35650-302	• NUT, Plain, Hex.		1
300	MS35333-39	• WASHER, Lock. REPLD BY MS35338-43	A	1
	MS35333-43	• WASHER, Lock. REPLS MS35333-39	A	1
	MS35338-43	• WASHER, Lock.	B	1
305	02-4200-30	• WASHER, Flat . . . . REPLD BY AN960-10	A	1
	AN960-10	• WASHER, Flat . . . . REPLS 02-4200-30	A	1
	AN960-10	• WASHER, Flat	B	1
310	05-631208	• BUSHING		1
315	02-2083-05	• INSULATOR		1
		------------ * ------------		

- ITEM NOT ILLUSTRATED

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10001-				
320	30076-375	• ASSEMBLY, Printed Wiring Board (See Figure 10003) . . . . SB 30086-010-24-03	A	1
	30086-350	• ASSEMBLY, Printed Wiring Board (See Figure 10003) ....MOD C See Note 3.B.(3) SB 30086-011-24-03	B	1
	30086-350A	• ASSEMBLY, Printed Wiring Board (See Figure 10003) ....MOD D See Note 3.B.(3) SB 30086-011-24-03	B	1
325	02-4271-35	• SPACER, Sleeve.		2
		(ATTACHING PARTS)		
330	MS35206-233	• SCREW, Pan Head.		2
331	AN960-6L	• WASHER, Flat		2
335	NAS620-6L	• WASHER, Flat		2
340	MS21042-06	• NUT, Self-locking.		2
		------------ * ------------		
345	RER70F2R00R	• RESISTOR (R5)		1
		(ATTACHING PARTS)		
350	MS35206-215	• SCREW, Pan Head.		2
355	MS21042-04	• NUT, Self-locking.		2
360	NAS620-4L	• WASHER, Flat		2
		------------ * ------------		
365	02-1065-10	• RESISTOR, Preload (R6)		1
		(ATTACHING PARTS)		
370	MS35206-215	• SCREW, Pan Head.		2
375	MS21042-04	• NUT, Self-locking.		2
380	NAS620-4L	• WASHER, Flat		2
		------------ * ------------		
385	02-0106-07	• CAPACITOR, Filter (C1)		1
		(ATTACHING PARTS)		
390	MS9353-15	• CLAMP, Loop		1
395	05-346375	• SCREW, Binding Head		1
400	MS21042-06	• NUT, Self-locking.		1
405	AN960-6	• WASHER, Flat		2
		------------ * ------------		

- ITEM NOT ILLUSTRATED

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10001-				
410	02-0117-08	• CAPACITOR (C2)		1
415	38999/20FD97PN	• CONNECTOR, Receptacle(J1). . . . . . . Safran Power P/N 01-200788		1
		(ATTACHING PARTS)		
416	02-4480-07	• RETAINER, Connector	B	1
-417	10-251415-205	• • PIN, Connector . . . . ALT: M39029/58-363		5
-418	10-251415-165	• • PIN, Connector . . . . ALT: M39029/58-364		3
420	MS35206-214	• SCREW, Pan Head.		4
425	MS21042-04	• NUT, Self-locking. . . . . SB 30086-010-24-03	A	4
430	NAS620-4L	• WASHER, Flat . . . . SB 30086-010-24-03	A	4
		------------ * ------------		
435	05-653903	• POST, Terminal.		3
440	05-660001	• LUG, Terminal		1
445	30086-1150	• BRACKET, Filter and Connector Mounting Cover		2
450	30076-3191	• GASKET, Cover		1
		(ATTACHING PARTS)		
-455	05-346371	• SCREW, Binding Head		4
-460	AN960-6L	• WASHER, Flat		4
		------------ * ------------		
465	30086-300	• ASSEMBLY, Stator and Housing. . . . . . (See Figure 10004)	A	1
	30086-300	• ASSEMBLY, Stator and Housing. . . . . . (See Figure 10004) REPLD BY 30086-302	B	1
	30086-302	• ASSEMBLY, Stator and Housing. . . . . . (See Figure 10004) REPLS 30086-300	B	1

- ITEM NOT ILLUSTRATED

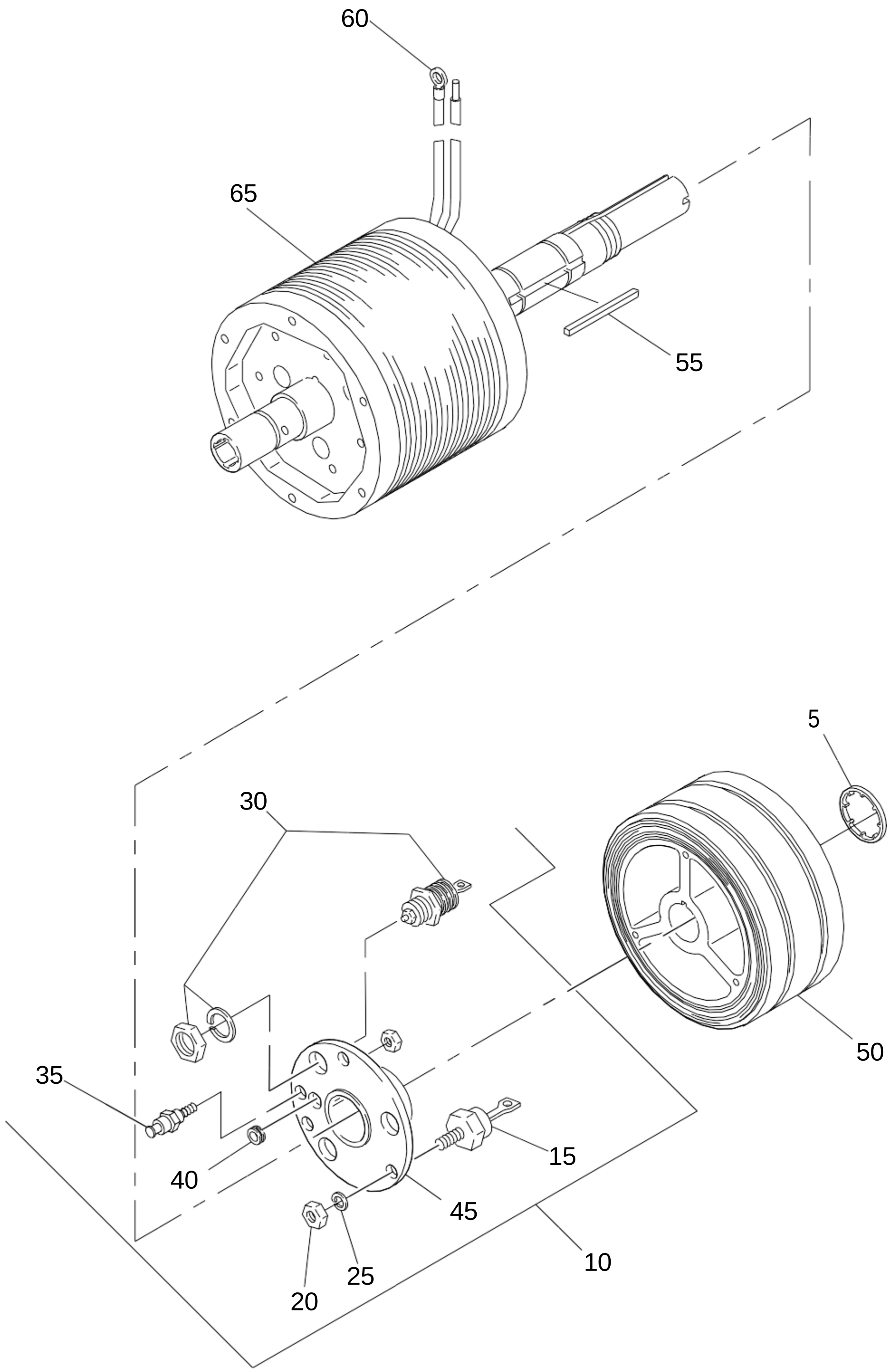

Figure 10002 - Rotor Assembly

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10002-				
	30086-310	ROTOR ASSEMBLY.		RF
5	31216-1520	• RING, Retaining		1
10	31216-1483	• ASSEMBLY, Diode and Resistor.		1
15	02-1120-44	• • DIODE		3
		(ATTACHING PARTS)		
20	MS35650-3252	• • NUT, Plain Hex		3
25	MS35338-44	• • WASHER, Lock		3
		------------ * ------------		
30	02-0506-10	• • RESISTOR		3
35	AA59126/029H01	• • POST, Terminal . . . . ALT: MIL-T-55155/2A		1
40	NAS557-3C	• • GROMMET		1
45	31216-1466	• • MOUNTING BRACKET, Diode and Resistor		1
50	30086-1040	• ASSEMBLY, Exciter Rotor.		1
55	MS20066-35	• KEY, Machine, Square		1
60	05-652016	• LUG, Terminal		1
65	30086-320	• ASSEMBLY, Main Field Rotor and Shaft		1

- ITEM NOT ILLUSTRATED

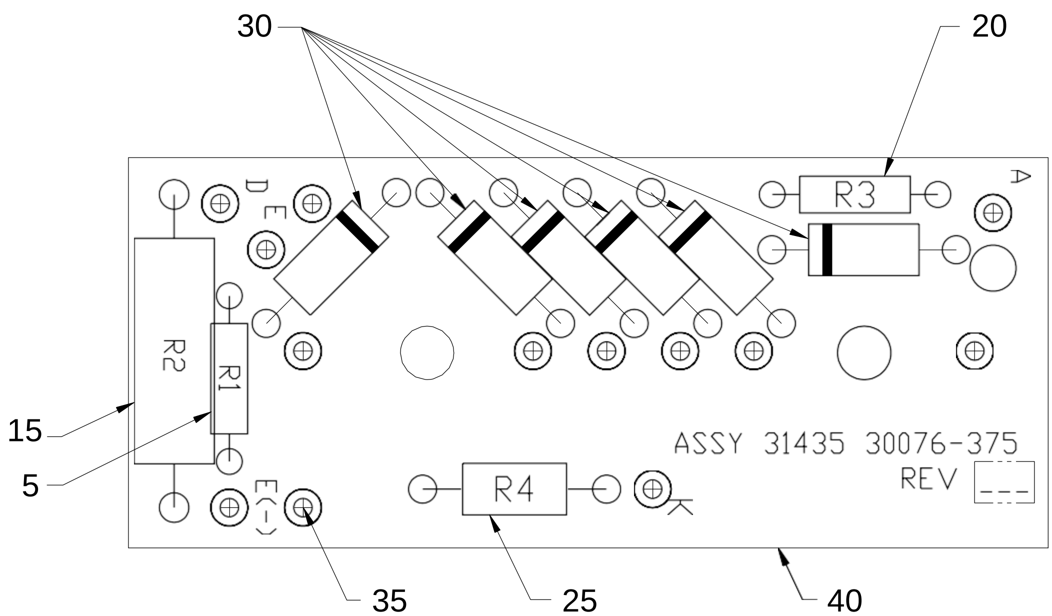

Figure 10003 - Signal Diode Board Model 30076-375 (Sheet 1 of 2)

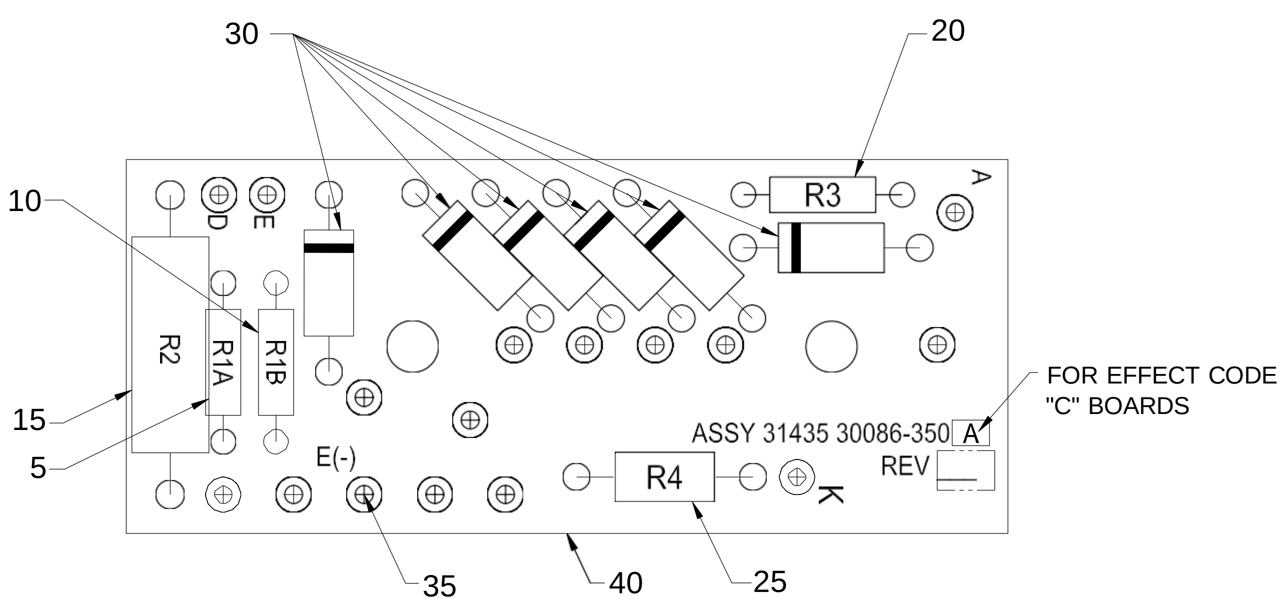

Figure 10003 - Signal Diode Board Model 30086-350/-350A (Sheet 2 of 2)

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10003-				
	30076-375	ASSEMBLY, Printed Wiring Board	A	RF
	30086-350	ASSEMBLY, Printed Wiring Board	B	RF
	30086-350A	ASSEMBLY, Printed Wiring Board	C	RF
5	RNC55K1002FS	• RESISTOR (R1)	A	1
	RNC55H8251FS	• RESISTOR (R1A)	B, C	1
10	RNC55H1003FS	• RESISTOR (R1B)	B, C	1
15	RWR89S10R0FS	• RESISTOR (R2)		1
20	RWR81S1001FS	• RESISTOR (R3)		1
25	RNC55K1002FS	• RESISTOR (R4)		1
30	02-1031-08	• DIODE.		6
35	02-2386-01	• TERMINAL	A	13
	02-2386-01	• TERMINAL	B, C	15
40	30076-1315	• BOARD, WIRE, PRINTED	A	1
	30086-1300	• BOARD, WIRE, PRINTED	B, C	1

- ITEM NOT ILLUSTRATED

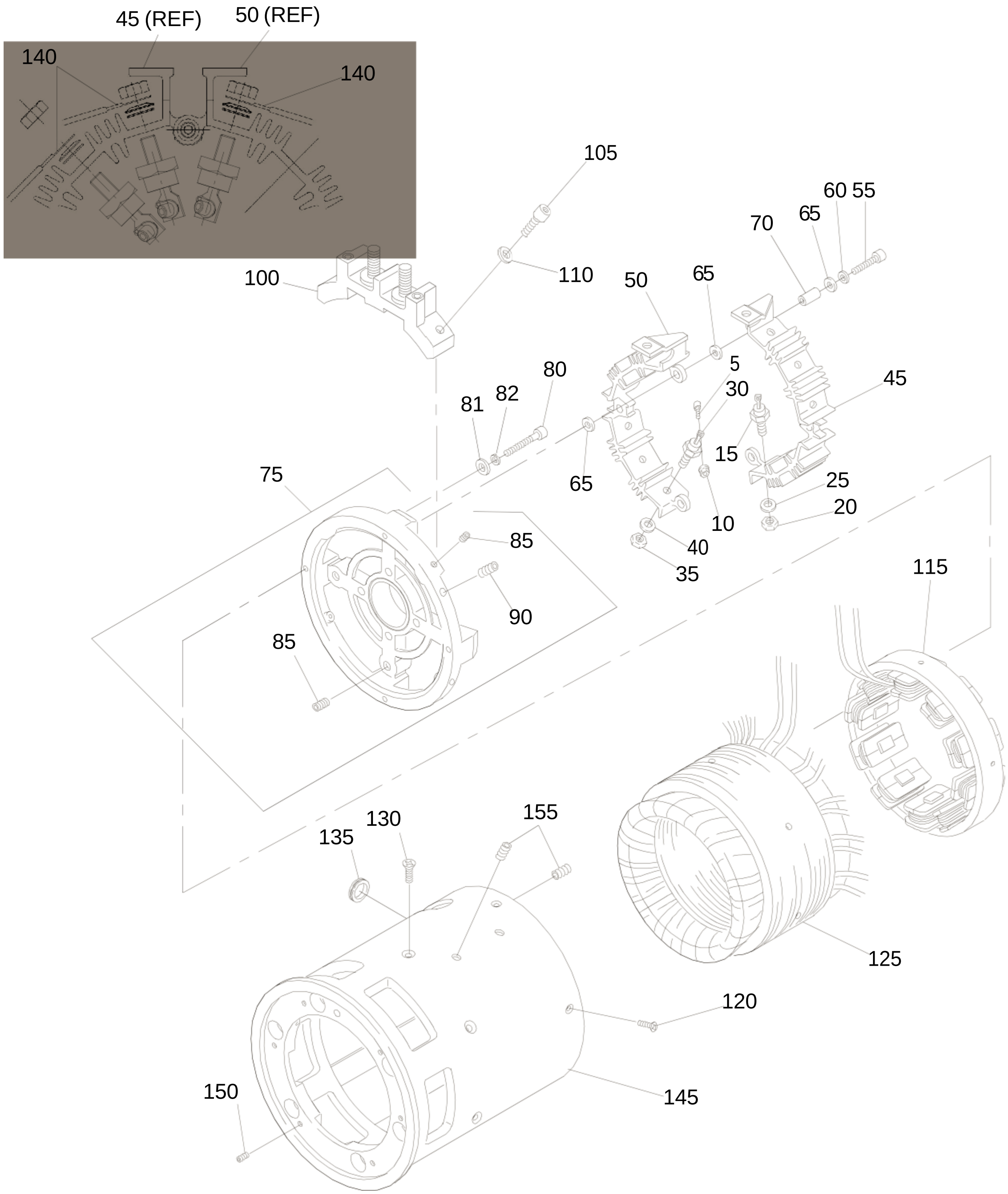

Figure 10004 - Stator and Housing Assembly

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10004-				
	30086-300	STATOR AND HOUSING ASSEMBLY	A	RF
	30086-302	STATOR AND HOUSING ASSEMBLY	B	RF
5	MS16995-17	• SCREW, Cap, Socket Head		12
10	MS21042-06	• NUT, Self-locking.		12
15	02-1120-41	• RECTIFIER, Left-hand		6
		(ATTACHING PARTS)		
20	MS35650-3252	• NUT, Plain, Hex.		6
25	M12133/1-4P	• WASHER, Belleville		6
		------------ * ------------		
30	02-1120-40	• RECTIFIER, Right-hand		6
		(ATTACHING PARTS)		
35	MS35650-3252	• NUT, Plain, Hex.		6
40	M12133/1-4P	• WASHER, Belleville		6
		------------ * ------------		
45	30081-1071	• HEATSINK, Left-hand		1
50	30081-1081	• HEATSINK, Right-hand.		1
		(ATTACHING PARTS)		
55	MS16997-35	• SCREW, Cap, Socket Head		4
60	AN960-8	• WASHER, Flat		4
65	02-4210-07	• WASHER, Insulating		10
70	02-2001-26	• SLEEVE, Insulating.		4
		------------ * ------------		
75	30081-2080	• BEARING SUPPORT, Anti-drive End . .	A	1
	30081-2081	• BEARING SUPPORT, Anti-drive End . .	B	1
		(ATTACHING PARTS)		
80	MS16997-37	• SCREW, Cap, Socket Head		4
81	05-370047	• WASHER, Flat		4
82	MS35338-42	• WASHER, Lock.		4
		------------ * ------------		
85	MS21209C0815	• • INSERT, Screw Thread		8
90	MS21209F1-15	• • INSERT, Screw Thread		2
-95	Not Procurable	• • LINER, Bearing		NP

- ITEM NOT ILLUSTRATED

FIGURE AND ITEM	PART NUMBER	NOMENCLATURE 1 2 3 4 5	EFFECT CODE	UNITS PER ASSY
10004-				
100	30076-2181	• BLOCK, Terminal . . . . REPLD BY 30076-2182		RF
	30076-2182	• BLOCK, Terminal . . . . REPLS 30076-2181		1
		(ATTACHING PARTS)		
105	MS16998-29	• SCREW, Cap, Socket Head		2
110	AN960-10L	• WASHER, Flat		2
		------------ * ------------		
115	30086-1090	• STATOR, Exciter		1
		(ATTACHING PARTS)		
120	NAS514P632-8P	• SCREW, Flat Head		5
		------------ * ------------		
125	30086-1140	• STATOR, Main (Order NHA)		1
		(ATTACHING PARTS)		
130	MS24693-S49	• SCREW, Flat Head		6
		------------ * ------------		
135	NAS557-10C	• GROMMET, Split . . . . REPLD BY MS35489-71	A	RF
	MS35489-71	• GROMMET, Split . . . . REPLS NAS557-10C	A	1
	MS35489-71	• GROMMET, Split	B	1
140	05-652017	• LUG, Terminal		3
145	30086-1100	• HOUSING, Generator (Order NHA) . . .		1
		(ATTACHING PARTS)		
150	MS21209C0820	• • INSERT, Screw Thread		10
155	MS21209C0620	• • INSERT, Screw Thread		4
		------------ * ------------		

- ITEM NOT ILLUSTRATED

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