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INSTRUCTION AND SERVICE MANUAL

DISCHARGERS AND RETAINERS

DAYTON-GRANGER, INC.
3299 SW 9TH Ave
Ft. Lauderdale, FL 33315
(954) 463-3451
sales@daytongranger.com

DG's Quality Management System is registered to ISO 9001:2015 + AS9100D

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REVISION PAGE

ECO	REVISION	DATE	BY	REMARKS
5522	A	6/27/91		Revised and updated.
9237	B	9-30-01		Reformatted document Updated Table II, Added Table III Added discharger photos Added Paragraph 3.4.3.9, 3.5.2.9 Updated Paragraph 4.2, 5.2.1, 5.2.2, 5.2.3, 5.3.3
9420	C	3-11-02		Updated Paragraph 5.3.4 and Table III
14851	D	12/11/2015	KH	Updated Sections 2.3, 2.5, 3.4.2, 3.4.3.5, 5.3.3 & Table I
14917	E	03/07/2016	KH	Updated *NOTE in Section 5.3.4
15083	F	08/30/2016	KH	Updated Table 1, Resistance for Carbo-Wick/Nylo-Wick Dischargers.
16024	G	07/15/2019	RN	Changed 16286-94 to 16286 in 2 places in Table II Changed 16296-97 to 16286 in 2 places in Table II
16810	H	04/28/2023	AT	Updated Section 3.5, including Para's 3.5.1 and 3.5.2 Added Para 3.5.3 Changed from Para 3.5.2.6 to 3.6, renumbered accordingly Updated Table of Contents Updated Figures Table

1.0 INTRODUCTION

Three major types of breakdown (ionization of the surrounding air) can occur when an aircraft is charged by precipitation:

- Corona Discharge
- Streamering
- Sparking/Arcing

Dischargers dissipate static electric charge by reduction of the voltage level required to initiate corona discharge (intensity reduction).

Dayton-Granger's dischargers are small, rod-like devices that are attached to the tips and trailing edges of the wings and empennage of the aircraft to dissipate static electric charge that accumulates on aircraft during flight.

The various types of dischargers manufactured by Dayton-Granger, along with their associated retainers, are shown in Table II.

2.0 TYPES OF STATIC DISCHARGERS

2.1 Carbowick/Nylowick - These dischargers were among the first invented and patented by Dayton-Granger. They consist of carbon impregnated fibers enveloped in a flexible sleeving. While these wicks offer fair noise reduction, their main disadvantage is a very short life, due to the windstream action whipping the particles out of the cotton. Dischargers of this type require regular trimming at the ends when the tip changes from black to gray. These dischargers are still utilized by the government due to their low initial cost factor. They are not suited for jet aircraft or high performance twin engine aircraft. They are more suitable for aircraft traveling below 300 mph.

2.2 Micropoint - Micropoint static dischargers offer a controlled path to bleed off accumulated charge and attenuate the resultant broadband radio frequency noise by approximately 40 db, as compared to discharge from aircraft without static wicks.

The Micropoint discharger obtains its unique noise quieting ability from a newly developed, micro-miniature, anti-magnetic, stainless steel, four-micron diameter wire. The smaller the discharger point, the higher the electrostatic field stress will be at the discharge point, resulting in corona onset at a lower potential. The Micropoint dischargers utilize approximately 4,000 four-micron diameter wires in each discharger tip assembly. Ion erosion is thereby evenly distributed over the 4,000 discharger points, which provides long service and maintains the original excellent noise quieting characteristics throughout the discharger life.

2.3 Null-Plus – Null-Plus dischargers are carbon point static dischargers designed for all types of aircraft traveling over 200 knots. This discharger model is the most effective device available for providing optimum noise quieting at the VLF frequencies. Null-Plus dischargers weigh less and are aerodynamically designed to lessen drag.

They are recommended for aircraft with speed up to 600 mph.

2.4 Nullfield - Nullfield static dischargers dissipate static electric charge in the following three ways:

1. By reduction of the voltage level required to initiate corona discharge (intensity reduction).

2. By causing the discharge to take place at right angles to antenna fields (orthogonal coupling).

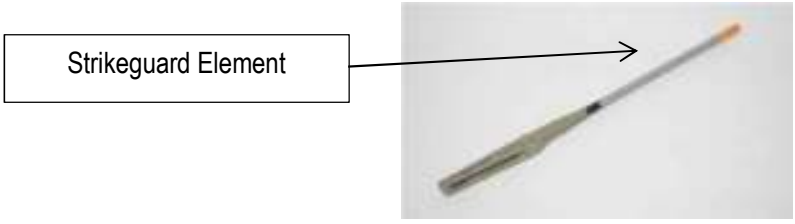
3. By creating regions of practically zero RF field strength (nullfield) and causing the discharge to take place in these regions (reciprocal field decoupling).

   Ortho decoupled or nullfield discharger consists of a high impedance rod with tungsten pins protruding through the rod in a plane that will provide a high degree of decoupling between the static discharger radiation and the antennas. The sharp points of the discharger, projecting at right angles to the body of the discharger, further concentrate the static field so that the discharge occurs from these points. The discharge is caused to occur in a region where the antenna field is nearly zero and with little coupling to the antenna.

All resistive type dischargers provide some intensity reduction. However, only Dayton-Granger's nullfield dischargers provide both orthogonal and reciprocal field decoupling for added reduction of noise in the aircraft's radio equipment.

The functioning parts of a nullfield discharger are the discharger points or pin and a high resistance element connecting, electrically, the discharge points with the aircraft structure. A molded nylon rod is used to position the points and to support the internal resistive element. With Models 612D-2A (16320), 613D-1A (16325), 620D-1Z (16330), and 611-1008HE (16315), the resistive element gives these units their characteristic black color. With models 610D-1B (16305) and 611D-B (16310), the resistive element is formed as a core down the center of the rod which is not visible. These dischargers are bright yellow in color. All are equipped with protective pin guards to minimize possible injury to personnel.

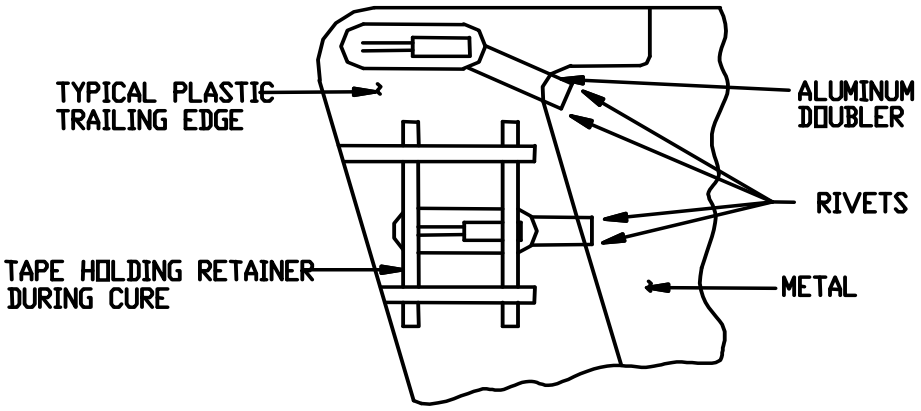
2.5 Null-Strike - Null-Strike static dischargers feature exclusive lightning protection capability. They consist of “Strikeguard”, finely deposited aluminum particles epoxied on the surface of the discharger with an extremely strong adhesive. The Strikeguard element is used as a means of diverting lightning strike in order to minimize damage to the airframe.



3.0 INSTALLATION INSTRUCTIONS – RETAINERS

3.1 **General** - This section describes the installation of Dayton-Granger discharger retainers. The information contained in this section may also be used as guidance in installing other types of discharger retainers. The two recommended methods of installation in order of preference are riveting and adhesive bonding.

FIGURE 1



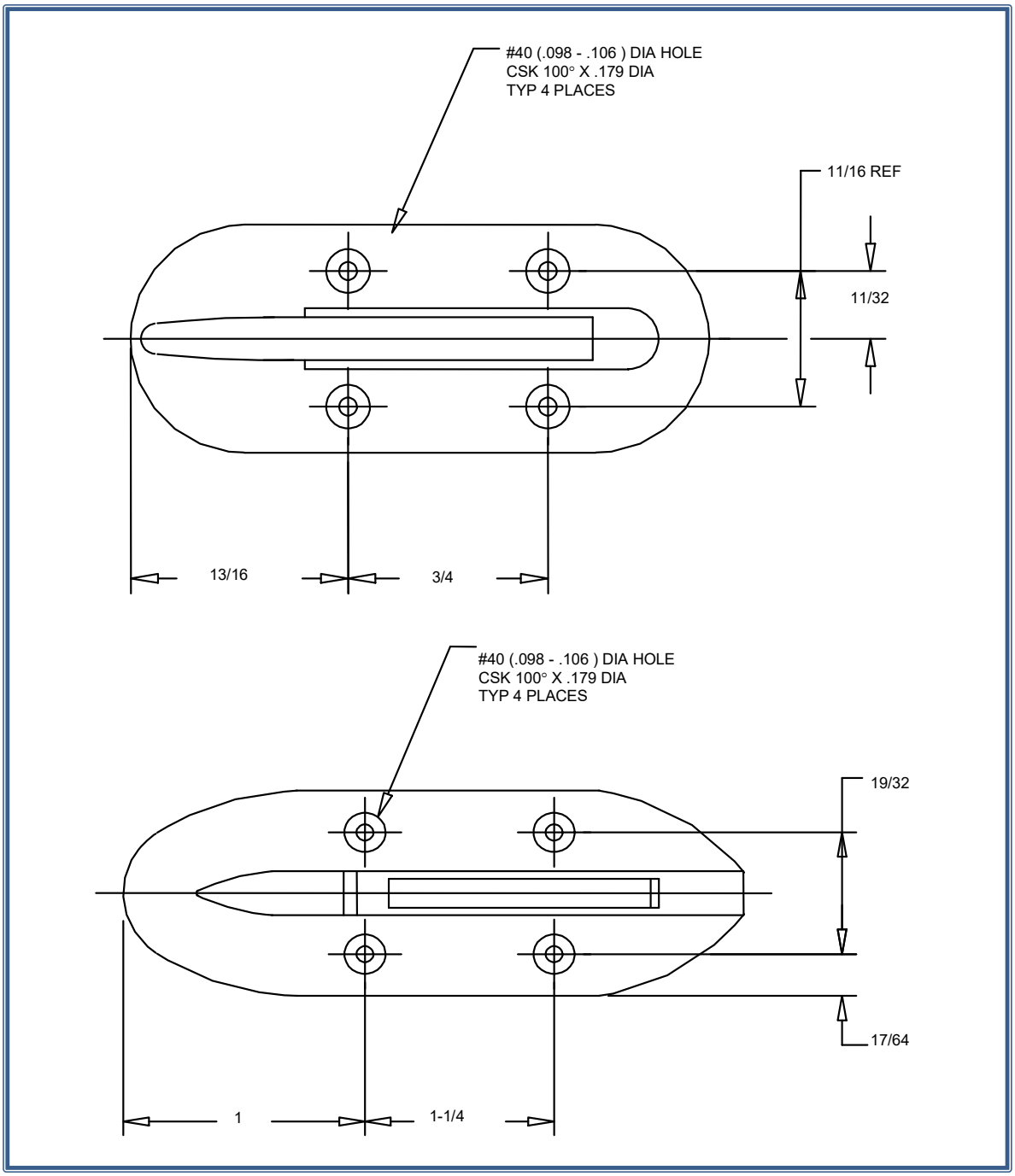
A conductive path to the metal airframe is always required across a plastic surface, and is normally made with an aluminum doubler at least one inch wide and 0.010 inch thick (See Figure 1).

3.2 **Required Time** - The initial installation of Dayton-Granger discharger retainers should be scheduled when the aircraft will be available for at least 24 hours. Installation may be scheduled for less elapsed time as experience is gained.

3.3 **Required Facilities** - It is highly desirable to have the aircraft inside a hangar, particularly if work is to be done at night. Otherwise, any moisture on aircraft surfaces will severely hamper the adhesive bonding process.

Aircraft Stands - It is highly desirable that stands be available at all the aircraft extremities. Since a number of operations using different materials and equipment are required at each discharger location, the job can be done more rapidly if it is possible to reach all the discharger locations at any one extremity without the necessity of moving stands. If wing, elevator, or rudder tip sections can be easily removed from the aircraft, it may be efficient to do so in order to apply the appropriate discharger retainers.

FIGURE 2



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3.4 Riveting

3.4.1 General - All models of the retainers may be riveted to the aircraft. Suggested rivet hole patterns are shown in Figure 2. Some installations may require the use of doubler plates under the aircraft skin for adequate stiffness.

The flanges of the 611R-series may be slightly bent or formed for an exact fit to the aircraft skin curvature. A number of different radii are available in the 611R-4A through 611R-16A series to fit most applications. It may be necessary to select the nearest smaller radius from the series then gently form-to-fit using a wood block and soft hammer. Do all forming operations before drilling the rivet holes.

3.4.2 **Material Required**

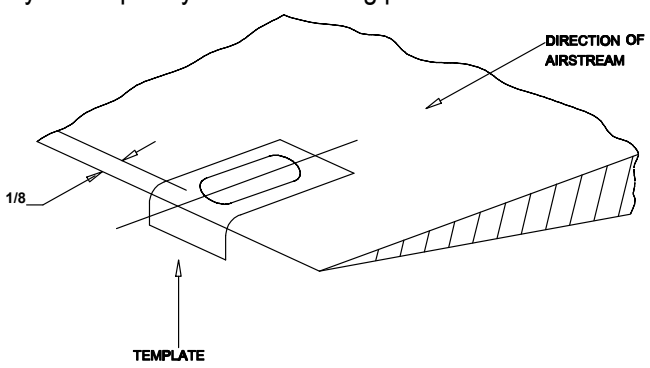
A. Selected static dischargers to be installed
B. Selected discharger retainers to be installed
C. Flexible non-conductive epoxy kit, P/N 15348 (one kit per 7 retainers required).
D. Clean-up towel
E. Sandpaper 400 - 600 grit
F. Edge sealant compound RTV 3140 or equivalent
G. Select type of rivet to be used:
   A: Blind rivet: Cherry rivet CR-756-3-4 or equivalent
   B. Solid rivet: NASM20426AD3 or NAS1097AD3 minimum size
H. Tools: For blind rivets Rivet tool pulling head H803C or equivalent
   For solid rivets, bucking bars are required.
I. Electric drill and #40 drill bit (.098 in., 2.49 mm)

3.4.3 **Riveting Procedure Method A**

3.4.3.1 Select the location where the discharger retainers are to be mounted and, with a pencil, scribe the outline of the base on the surface. (Retainer sanding templates, P/N 16268 and P/N 16269, can be used for this purpose). See Figure 3.

3.4.3.2 Tape the retainer sanding template, or equivalent, in place. Sand the aircraft surface through the retainer sanding template until the aircraft surface is smooth and all paint glaze has been removed. It is not necessary to completely remove existing paint.

FIGURE 3



3.4.3.3 After all aircraft retainer areas have been sanded, position the respective discharger retainer over the sanded area and drill the required holes through the retainer and aircraft structure. Clean all burrs, sanding grit and all other debris from the retainer and aircraft bond area. Keep the retainer in close proximity to the mating contact surface to avoid mixing of the retainers after drilling.

3.4.3.4 Mix flexible non-conductive epoxy kit, P/N 15348, and butter the sanded area on the aircraft, as well as the bottom of the mating discharger retainer. Immediately place the retainer over the sanded area and draw down the four rivets.

3.4.3.5 After the rivets have been installed, wipe all excess epoxy from the discharger retainer and surrounding surface. Leave a small amount of epoxy around the circumference of the retainer to help seal the interface against water penetration.

3.4.3.6 After approximately 6 hours at room temperature, or when the epoxy has hardened, apply and edge sealant compound RTV 3140, or equivalent, around the circumference of the retainer and rivet heads to further seal the interface against water penetration.

3.4.3.7 Measure the DC resistance of the interface. This resistance should be less than 0.1 ohms on new bonds.*

*If this resistance is exceeded, there is a possibility of moderate to heavy structural burning in the area of the retainer. One half (0.5) ohm is a realistic maximum value of bonding resistance under which most lightning strikes will not cause skin damage. The higher the resistance, the greater is the possibility of skin burning due to lightning.

3.4.3.8 Install the respective static discharger on the respective discharger retainer.

3.4.3.9 Measure the resistance of the discharger with a 500V megohmmeter.

Resistance tolerance:	Tip Discharger	6 – 120 Megohms
	Trailing Discharger	6 – 200 Megohms

3.5 Adhesive Bonding Method B

When riveting cannot be utilized because of thin aircraft skin honeycomb or composite surfaces, it is recommended that a pure aluminum gasket technique be utilized. The technique utilizes an aluminum gasket with upward and downward protrusions which makes electrical contact with the aircraft surface and discharger retainer. The retainer and the gasket are epoxied in place with the use of a flexible non-conductive epoxy, PN 15348.

3.5.1 Material Required

A. Selected static dischargers to be installed
B. Selected discharger retainers to be installed

C. Flexible non-conductive epoxy kit, PN 15348 as necessary, (one kit per 7 retainers required)
D Conductive epoxy kit, PN 16307, as necessary, (one kit per 7 retainers required)
E. Clean-up towel
F. Sandpaper 400 - 600 grit (without aluminum oxide)
G. Pure aluminum gaskets (trailing P/N 16181, tip P/N 16243)
H. Grease-free solvent
I. Heat clamp or "C" clamp
J. Trailing retainer sanding template, P/N 16268
and tip retainer sanding template, P/N 16269
K. Torque tool, P/N 16284, or equivalent

3.5.2 **Adhesive Bonding Procedure For Metallic Surfaces**

This procedure outlines the pure aluminum gasket attachment technique. However, it also applies if the conductive epoxy technique is utilized. If the conductive epoxy technique is used, the aluminum gasket is not required and conductive epoxy, P/N 16307, should be substituted for non-conductive epoxy, P/N 15348.

3.5.2.1 Select the location where the discharger retainers are to be mounted and with a pencil scribe the outline of the base on the surface. (Retainer sanding templates, P/N 16268 and P/N 16269, can be used for this purpose).

3.5.2.2 Tape the retainer sanding template or equivalent in place. Apply a solvent or stripper to remove all paint within the various bond areas.

3.5.2.3 Sand all aircraft bonding surfaces and the bottoms of all retainers with the 400 to 600 grit sandpaper. Make sure all oxide has been removed and wiped clean with a paper towel.

3.5.2.4 Mix thoroughly the flexible non-conductive epoxy, P/N 15348. Apply a small amount of the mixed epoxy to the bonding area on the aircraft and bottom of the retainer. Place gasket onto adhesive area of aircraft, and retainer on top of gasket (the gasket should now be sandwiched between the aircraft skin and the retainer). Clamp down firmly on retainer assuring that good metal to metal contact has been made. The heat clamp or "C" clamp should be used to clamp the retainer in position until the epoxy cures.

3.5.2.5 Remove excess epoxy but be sure that there is a fillet of epoxy around the entire edge of mounting base to avoid entry of moisture. With the use of the "C" clamp, the adhesive will set-up in four to six hours at room temperature, but full cure will take 24 hours.

NOTE: The heat clamp provides a convenient way of clamping the retainer to the aircraft and also accelerates the cure. If it is used, the adhesive will set-up in 15 minutes with full cure being obtained in 1 hour with the temperature set at 150^{o}F.

3.5.3 **Adhesive Bonding for Composite Surfaces with Embedded Metallic Mesh**

This procedure outlines the conductive epoxy attachment technique. Conductive epoxy, PN 16307, should be used for this method.

3.5.3.1 Select the location where the discharger retainers are to be mounted and with a pencil scribe the outline of the base on the surface (Retainer sanding templates, PN 16268 and PN 16269, can be used for this purpose).

3.5.3.2 Tape the retainer sanding template or equivalent in place. Apply solvent or stripper to remove all paint within the various bond areas.

3.5.3.3 Sand the area with 400 to 600 grit sandpaper to expose the metallic mesh surface.

3.5.3.4 Verify that the metallic mesh is fully exposed by measuring the DC resistance across the metallic mesh surface.

3.5.3.5 Mix thoroughly the conductive epoxy, PN 16307. Apply a small amount of the mixed epoxy to the bonding area on the aircraft and bottom of the retainer. Clamp down firmly on the retainer assuring that even pressure is applied for good retainer to mesh contact has been made. The heat clamp or "C" clamp should be used to clamp the retainer in position until the epoxy cures.

3.5.3.6 Remove excess epoxy around mounting base. Seal the edges around the retainer base with MIL-S-81733 sealant to avoid entry of moisture and prevent corrosion.

3.6 Post Bonding Inspection

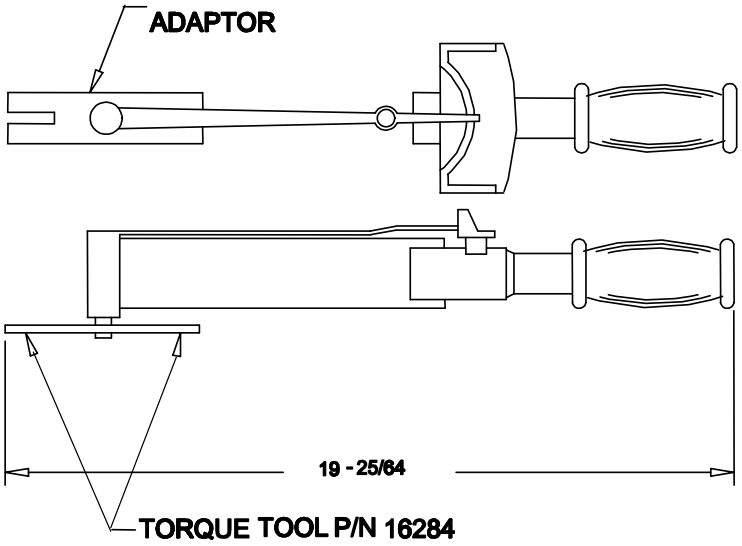
A. Inspect all discharger retainers thoroughly. Remove and re-install retainer if there is any evidence of cracks in adhesive fillet between retainer and aircraft surface.

B. Using torque tool, P/N 16284, (Figure 4) check all mounting bases to following values as read on the torque tool scale. (Be sure adhesive is fully cured and is completely cool before torqueing).

Model 610R-9A (Trailing) 250 ± 25 inch pounds
Model 611R-series (Airfoil tips) 200 ± 25 inch pounds

3.6.1 After the bond has been checked, clean the sides of the retainer and adjacent aircraft surface with solvent. Apply a thin ribbon of sealant (RTV 3140 or equivalent) to serve as a fillet between retainer and the aircraft surface. Be sure that sealant covers all bond lines between adhesive and adjacent metal surfaces.

Figure 4



3.6.2 When sealant is fully cured, install the discharger on the retainer. Be sure that the discharger is properly seated and that the set screw is firmly securing the discharger. Use 1/16" Allen Wrench on nullfield dischargers.

3.6.3 Measure the resistance of this discharger with a 500V megohmmeter.

Resistance tolerance:	Tip Discharger	6 – 120 megohms
Trailing	Discharger	6 – 200 megohms

4.0 DISCHARGER RETAINER REMOVAL

4.1 The discharger retainer can be removed from the aircraft by removing the rivets, if installed, the adhesive fillet at any point, and getting a crack started with a sharp tool. Once the crack has started, the retainer can be peeled or torqued off quite easily. Other means that will not damage the airframe are, of course, also acceptable.

4.2 A residue of adhesive may then remain on the aircraft surface. This can be buffed off by mechanical means, if desired. Residue can also be softened before final mechanical removal by means of a chemical stripper.

5.0 INSPECTION PROCEDURES

5.1 General

Inspection period should be arranged to coincide with regular routine maintenance of the aircraft. Most airlines have established airframe service periods that will provide convenient intervals for the inspection and servicing of dischargers. The following inspection procedures are recommended:

A. Terminal: Visually inspect prior to flight.
B. Periodic: 400 - 800 flight hours (2 - 4 months).
C. Heavy: 2400 - 3000 flight hours (9 - 15 months).

5.2 Terminal Inspection

5.2.1 Note from ground that discharger installation is complete, (Refer to Discharger Installation Drawing) or write up the installation of missing discharger as a "hold item". (Replace if on "Minimum Equipment List").

5.2.2 Replace any broken or damaged discharger assemblies.

5.2.3 Sufficient electrostatic discharge capability is built into the installation so that an aircraft may be dispatched with up to 10% of its inboard dischargers missing without serious degradation in performance. However, the trailing dischargers in the outboard #1 and #2 position on each wing, vertical and horizontal stabilizer, must be intact. Limitations on missing dischargers may be specified for some operation by regulatory agencies.

5.3 Periodic Inspection

5.3.1 Check to determine that all dischargers are secure on mounting bases.

5.3.2 Replace broken or missing dischargers.

5.3.3 Perform close inspection of all dischargers as follows:

A. Replace dischargers with broken metal pins. Broken plastic guards do not affect discharger performance. However, dischargers with broken pin guards may be replaced if considered to be a safety hazard.

B. Replace dischargers having blunted or bent metal pins.

C. Check for lightning damage, as evidenced by a pale discoloration and roughening of the dischargers, pitting, or etching at the pin or shank of the trailing dischargers. Replace as necessary. This damage is most apt to occur to the trailing dischargers near the tips of the wings and tail surfaces (extremities of the structure). A lightning struck discharger may be continued in service if it meets the resistance tolerances stated herein and if the pins are sharp.

NOTE: If a lightning-damaged discharger is discovered, inspect carefully for other lightning damage in the vicinity and at the opposite extremity of the aircraft.

D. For discharger retainers that depend on a bonding strap across insulating surfaces, carefully inspect for any evidence of cracking or burning of the bond. If damage is noted, make ohmmeter check and repair as necessary to achieve individual bond resistance of not more than 0.5 ohms to the metallic airframe. **DO NOT USE** a high current test set, as the heat generated by continuous high current flow may be damaging to the adhesive bonding employed.

E. Dischargers with "Strikeguard" Lightning Protection:
Check for lightning damage, such as evidence of discoloration, pitting, or erosion of the strikeguard diverter element. Inspect the aluminum particles for any evidence of cracking or burning.

Note 1: Dischargers with Strikeguard damage section of more than (.125-inches)in any direction should be replaced.

Note: 2. Dischargers with Strikeguard damage of less than .125-inches need not be replace.

5.3.4 **Heavy Inspection**

A. Perform periodic inspection items (1), (2), and (3).

B. Measure resistance of all dischargers with a megohmmeter of the 500 volt type, and replace out-of-tolerance dischargers according to the following schedule in Table 1.

C. Measure resistance of the adhesive bonds with a low resistance test set of a type which will not exceed 1.0 ampere current (low ohm multimeters, Kelvin bridges, etc., are satisfactory). Replace retainers indicating excessive bonding resistance, according to the following schedule:

Retainer Location	Maximum Resistance
Outboard two trailing retainers on each wing and tail extremity	0.5 ohms*
Retainers requiring special bonding straps. Per bond.	0.5 ohms*
All tip retainers and the inboard trailing retainers	0.5 ohms

*NOTE: The new bonds should measure less than 0.1 ohms and should be reworked if they are higher. A properly made new bond should measure well under 0.1 ohms.

TABLE I
FIELD TEST PROCEDURES
DAYTON-GRANGER DISCHARGERS

To obtain accurate resistance readings when testing dischargers, the following instructions apply:

Required Test Equipment: Megohmmeter capable of a 500 volt test voltage (Reference: MIL-D-1929D).

1. **NULLFIELD DISCHARGERS**
   Measure resistance between metal base and needle point. Attach alligator clips to needle point to insure a positive contact.

Resistance tolerance:	Tip Dischargers	6 - 120 megohms
	Trailing Dischargers	6 - 200 megohms

2. **MICROPOINT DISCHARGERS**
   Measure resistance between metal base and micron wire at tip. Attach alligator clip to micron wire to insure a positive contact.

Resistance tolerance:	Tip Dischargers	6 - 120 megohms
	Trailing Dischargers	6 - 200 megohms

3. **CARBO-WICK/NYLO-WICK DISCHARGERS**
   Measure resistance between metal base and tip.
   NOTE: If tip has turned to a grayish white color, then a new 1 inch length of wick should be exposed. Cut and remove old washed out portion of wick. Replace wick after it has been trimmed back under 6 inches.

   Attach alligator clip to exposed tip to insure a positive contact.
   Resistance tolerance: .5 – 300 megohms

4. **NULLSTRIKE DISCHARGERS**
   Measure resistance between metal base and carbon point. Insure contact is with immediate carbon point and not the black heat shrink tubing! Attach alligator clip with a wet sponge or fine steel wool in clip jaws to carbon point.

Resistance tolerance:	Tip Dischargers	6 - 120 megohms
	Trailing Dischargers	6 - 200 megohms

5. **MINIWICK/FLEXWICK DISCHARGERS**
   Measure resistance between metal base and tip. Attach alligator clip with a wet sponge or fine steel wool in clip jaws to red tip.
   Resistance tolerance: .5 - 500 megohms

TABLE II
STATIC DISCHARGER/RETAINER
REFERENCE GUIDE AND MOUNTING METHOD

Part Number	Description	Applicable Retainer	Mounting Method Method A = Riveting Procedure Method B = Adhesive Procedure
12764	Carbowick ASA-3A	Self-Contained	A
14078	Carbowick ASA-3B	Self-Contained	A
14480	Nylowick ASA-3C	Self-Contained	A
14842	Miniwick	Self-Contained	A
15330	Micropoint	15335, 15401, 15593, 15560, SP 15448, SO 16195	A
15340	Micropoint	15347	A
15344	Carbon Tip	611R Series 16286, 16296	A or B
15449	Micropoint (15330)	Self-Contained, 15448	A
16081	Micropoint	D/G 540095 Chelton 2-23, 2-26	
16125	Micropoint	D/G 540095 Chelton 2-21	A
16125-1	Null Plus (Anti-Magnetic)	D/G 540095 Chelton 2-21	
16165	Micropoint	ASA Mount Self-Contained	A
16175	Nullfield Trailing	D/G 540095 Chelton 2-23	A or B
16276	Micropoint		A
16280	Trailing (Concorde)		
16305	Nullfield Trailing (610D-1B)	610R Series Retainer 16335 SP (16700, 16760, 16820, 16900)	A or B
16310	Nulllfield Tip 611D-1B	611R Series Retainer 16286, 16296	A or B
16315	High Performance (Supersonic)	611R Series Retainer 16155, 16286, 16287, 16288, 16290, 16293	A or B
16320	Nullfield Trailing	Self-Contained ASA Mounting	A
16325	Nullfield Tip	Self-Contained ASA Mounting	A
16330	Supersonic Trailing 620D-1A	16340	A or B
16450	Composite Trailing 610D	16261 Special Retainer for Composite Surface	B
16451	Omega Trailing Composite	Special Base Required	B

TABLE II (Continued)
STATIC DISCHARGER/RETAINER
REFERENCE GUIDE AND MOUNTING METHOD

Part Number	Description	Applicable Retainer	Mounting Method Method A = Riveting Procedure Method B = Adhesive Procedure
16606	Micropoint Trailing	15401, 15488, 15660-1 16195	A
16630	Micropoint	Self-Contained Rivnut Mount	A
16785	Null Strike Carbon (510D-2A)	16335 SP (16700, 16760, 16820, 16900)	A or B
16840	Trailing (Special)		
16920	Null Strike Carbon (Trailing) (Lightning Diverter)	15401, 15660 SP (15448, 16195, 16360) 15347	A or B
16920-1	Null Plus Carbon Tip	15401, 15660 SP (15448, 16195, 16360) 15347	A or B
16930	Carbon Null Plus Tip	15347, 17705 Screw type	A
16930-1	Carbon Null Strike Tip	15347, 17705 Screw type	A
17224	Micropoint Trailing	D/G 740041, Chelton 2-26	A
17750	Supersonic Trailing	16340	A or B
17770	Null Plus Trailing	D/G 540095, Chelton 2-23	A or B
17805	Null Plus Tip	D/G 540095	A or B
21000	Supersonic Null Plus	740038	A or B
740001	Carbon Null Plus Tip	611R Series Retainer	
740007	Carbon Null Plus Tip	16286, 16293, 16290, 16292, 16288, 16289, 16287, 16291, 16297, 16296, 16155, 16348, 16420	A or B
740013	Micropoint	D/G 540095, Chelton 2-23	
740019-1	Carbon Null Plus Trailing	15401, 15660-1, 15448, 16195 Screw Retainer	A or B
740026-1	Supersonic Trailing	16340	A or B
740031	Null Plus Trailing	15401, 15660-1, 15448, 16195	A
740040	Null Plus Trailing	#10-32 UNF-2A	N/A
740042	Null Plus (ASA) Trailing	Self-Contained	A
SW10-96	Trailing	N/A	A

TABLE III
STATIC DISCHARGER RESISTANCE

Discharger Part Number	Type	Resistance (Megohm)	Length (Inches)	Weight (Ounces)
16305 (610D-1B)	Nullfield Trailing	6–200	10-11/32	0.93
16310 (610D-1B)	Nullfield Trailing	6–120	3-1/2	0.15
16320 (612D-2A)	Nullfield Tip	6-200	10-9/32	0.78
16325 (613D-1A)	Nullfield Tip	6-120	7-15/32	0.53
16175	Nullfield Trailing	6-200	9-1/2	0.91
16450	Nullfield Trailing	6-200	10-11/32	0.81
16315	Nullfield Tip	6-120	3-21/32	0.18
16330	Nullfield Trailing	6-200	9.2	0.63
740013	Micropoint Trailing	6-200	8	0.15
15330	Micropoint Trailing	6-200	7-5/8	0.31
16630	Micropoint Trailing	6-200	8-3/4	0.17
16165	Micropoint Trailing	6-200	9	0.37
16081	Micropoint Trailing	6-200	7-1/4	0.15
16606	Micropoint Trailing	6-200	7-5/8	0.15
17224	Micropoint Trailing	6-200	6-3/4	.11
15340	Micropoint Tip	6-120	4-1/8	0.18
16125	Micropoint Tip	6-120	5-3/4	0.13
17272	Micropoint Tip	6 – 120	3-/78	0.20
740001	Null Plus Trailing	6-200	8-7/8	0.58
16785	Null Plus Trailing	6-200	8-7/8	0.58
16920-1	Null Plus Trailing	6-200	6-1/8	0.27
16920	Null Strike Trailing	6-200	6-1/8	0.27
17770	Null Plus Trailing	6-200	7-7/8	0.15
17750	Supersonic Trailing	6-200	6-15/16	0.53
740019-1	Null Plus Trailing	6-200	6-1/8	0.27
740019	Null Strike Trailing	6-200	6-1/8	0.27
740026-1	Supersonic Trailing	6-200	5.23	0.43
740031	Null Plus Trailing	6-200	7-3/4	0.20
740040	Null Plus Trailing	6-200	8-7/16	0.47
740042	Null Plus Trailing	6-200	9-1/2	0.40
21000	Supersonic Trailing	6-200	6.9	0.43
740007	Null Plus Tip	6-120	4-3/4	0.25
15344	Null Strike Tip	6-120	4-3/4	0.25
16930	Null Strike Tip	6-120	4-19/32	0.21
16930-1	Null Plus Tip	6-120	4-19/32	0.21
16125-1	Null Plus Tip	6-120	5-3/4	0.13
17805	Null Plus Tip	6-120	5-3/4	0.13
16935	Null Plus Tip	6-120	4-19/32	0.21
14480	Nylo-Wick Trailing	1-300	13-1/2	0.65
14078	Carbo-Wick Trailing	1-300	13-1/2	0.61
12764	Carbo-Wick Trailing	1-300	13-1/2	0.49
SW10-96	Trailing	.5	7.37	0.39
740037	Trailing	6 – 200	8-1/8	0.60