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INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

INLET BARRIER FILTER SYSTEM

for the

Leonardo S.p.A.

**Models A119 and AW119 MKII [including the AW119 G1000H
and AW119 IDU-680P (TH-119) variants]**

FAA STC No. SR02338CH



Donaldson[®]
FILTRATION SOLUTIONS
AEROSPACE & DEFENSE

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Chesterfield, MO 63005

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EFFECTIVITY

Effectivity for this ICA is for all Leonardo Models A119 and AW119 MKII [including the AW119 G1000H and AW119 IDU-680P (TH-119) variants] with the Donaldson Company, Inc. (DCI) Inlet Barrier Filter (IBF) System installed.

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INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

For the Donaldson Company Engine Inlet Barrier Filter System
Installed on the Leonardo S.p.A Models A119 and AW119 MKII [including the AW119 G1000H and AW119 IDU-680P (TH-119) variants]

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	SCOPE OF THIS MANUAL	1
1.2	USE OF THIS MANUAL	1
1.3	DEFINITIONS / TERMINOLOGY	1
1.4	ACRONYMS	3
1.5	WARNINGS, CAUTIONS, AND NOTES	3
1.6	UNITS OF MEASURE	3
1.7	REFERENCE PUBLICATIONS.....	4
1.8	LIST OF APPLICABLE PUBLICATIONS	4
1.9	DISTRIBUTION OF CHANGES	4
1.10	INDICATION OF CHANGES.....	4
1.11	SYSTEM DESCRIPTION AND OVERVIEW	4
2	AIRWORTHINESS LIMITATIONS	7
2.1	GENERAL	8
2.2	FILTER RETIREMENT LIFE	8
2.3	LIFE LIMITED COMPONENTS.....	8
3	INSPECTION REQUIREMENTS AND OVERHAUL	9
3.1	INSPECTION REQUIREMENTS	9
3.1.1	GENERAL REQUIREMENTS	9
3.1.2	FILTER ASSEMBLY INSPECTION.....	9
3.1.3	STRUCTURAL COMPONENT INSPECTIONS	10
3.1.4	SYSTEMS AND ELECTRICAL COMPONENT INSPECTIONS	10
3.2	OVERHAUL REQUIREMENTS	12
3.3	SPECIAL INSPECTIONS (CONDITIONAL INSPECTIONS)	12
3.3.1	HARD LANDING.....	13
3.3.2	LIGHTNING STRIKE	13
4	ACCESS PANELS	14
4.1	GENERAL DESCRIPTION	14
4.2	ACCESS FOR MAINTENANCE.....	14
4.2.1	ACCESS OF FMA AND DP SWITCH ASSEMBLIES	14
4.2.2	ACCESS OF BYPASS ACTUATOR ASSEMBLY	14
5	STORAGE	15
6	PLACARDS, DATA PLATES, AND MARKINGS.....	16
6.1	MARKING – PART NUMBER / PMA / SERIALIZATION	16
6.2	DATA PLATE – FILTER ASSEMBLY	16
6.3	PLACARDS / MARKINGS - COCKPIT	16
7	SERVICING	17
7.1	AUTHORIZED MATERIALS	17
7.2	FILTER SERVICE INTERVALS	17
7.2.1	GENERAL REQUIREMENTS	17
7.2.2	PREPARED FIELD OPERATIONS.....	18
7.2.3	SEVERE ENVIRONMENT OPERATIONS.....	18
7.3	FILTER ASSEMBLY SERVICING.....	19

7.3.1	FILTER PRE-CLEANING	19
7.3.2	FILTER CLEANING.....	19
7.3.3	FILTER DRYING	20
7.3.4	FILTER OILING	20
7.4	STRUCTURAL COMPONENT SERVICING.....	22
7.5	SYSTEMS AND ELECTRICAL SERVICING.....	22
7.6	AIRCRAFT WASHING	22
8	TROUBLESHOOTING AND MAINTENANCE	23
8.1	MAINTENANCE GENERAL.....	23
8.2	COMPONENTS - GENERAL DESCRIPTION.....	24
8.2.1	FILTER ASSY/FILTER SEAL	24
8.2.2	FILTER HOUSING ASSEMBLY (STRUCTURAL COMPONENTS)	24
8.2.3	SYSTEMS AND ELECTRICAL COMPONENTS.....	24
8.3	FILTER ASSY / FILTER SEAL	25
8.3.1	FILTER ASSY.....	25
8.3.2	FILTER SEAL	29
8.4	STRUCTURAL COMPONENTS	30
8.4.1	FILTER HOUSING ASSEMBLY.....	30
8.4.2	LOWER SIDE FILTER SUPPORTS.....	32
8.5	SYSTEMS AND ELECTRICAL COMPONENTS.....	34
8.5.1	CIRCUIT BREAKER.....	34
8.5.2	COCKPIT INDICATOR LIGHT	35
8.5.3	DIFFERENTIAL PRESSURE SWITCH.....	36
8.5.4	FILTER MAINTENANCE AID	39
8.5.5	ACTUATOR.....	42
8.5.6	WIRING, WIRING HARNESS, CONNECTORS, BACKSHELLS, CIRCUIT BREAKER.....	45
8.6	PROTECTIVE TREATMENT	46
8.7	TROUBLESHOOTING GUIDE.....	48
8.8	SPECIAL TOOLS / SPECIAL EQUIPMENT.....	49
8.9	CONSUMABLE MATERIALS, SUPPLIES, AND PROTECTIVE TREATMENT SPECIFICATIONS.....	49
APPENDIX A	I

TABLE OF FIGURES

Figure 1: IBF SYSTEM AND INSTALLATION	6
Figure 2: FILTER MAINTENANCE AID	11
Figure 3: FILTER MAINTENANCE AID	11
Figure 4: COMPONENT ACCESS	14
Figure 5: EXAMPLE OF FILTER ASSEMBLY DATA PLATE	16
Figure 6: IBF MARKINGS	16
Figure 7: OILING MEDIA	21
Figure 8: HAND SEAMER	27
Figure 9: FILTER MAINTENANCE AID ZONES	40
Figure 10: FILTER MAINTENANCE AID RESET	40
Figure 11 ACTUATOR ADJUSTMENT	44

TABLE OF FIGURES (APPENDIX A)

Figure A-1: IBF System	II
Figure A-2: Major Assemblies	III
Figure A-3: Side Filter Assembly	V
Figure A-4: Upper Filter Assembly	VI
Figure A-5: Actuator & Upper Filter/Bypass Door Instl (Superseded)	VII
Figure A-6: Actuator & Upper Filter/Bypass Door Instl (Current)	VIII
Figure A-7: DP Switch & Maintenance Indicator Installation	X
Figure A-8: Wire Harness Assembly Instl (Superseded)	XII
Figure A-9: Wire Harness Assembly Instl (Current)	XIII
Figure A-10: Side Filter Support Assembly	XV
Figure A-11: Electrical Schematic for IBF S/N 0068 and Below	XVI
Figure A-12: Electrical Schematic for IBF S/N 0069 and Above	XVII
Figure A-13: Electrical Schematic for IBF AW119 G1000H	XVIII
Figure A-14: Electrical Schematic for IBF AW119 Genesys IDU-680P	XIX
Figure A-15: Actuator Schematic	XX
Figure A-16: Wire Routing	XXI
Figure A-17: IBF Connector Location	XXII
Figure A-18: IBF Indicator/Switch and Circuit Breaker Location	XXIII
Figure A-19: IBF Indicator/Switch and Circuit Breaker Location for AW119 G1000H	XXIV
Figure A-20: IBF Indicator/Switch and Circuit Breaker Location for AW119 Genesys IDU-680	XXV
Figure A-21: Circuit Breaker Locator	XXVI
Figure A-22: Circuit Breaker Locator for AW119 G1000H	XXVII
Figure A-23: Circuit Breaker Locator for AW119 Genesys IDU-680P	XXVIII

TABLES

Table 3- 1 Inspection Intervals	12
Table 8- 1 Protective Treatment for Components	47
Table 8- 2 Troubleshooting Guide	48
Table 8- 3 Consumable Materials, Supplies and Protective Treatment Specifications	49

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1 INTRODUCTION

1.1 SCOPE OF THIS MANUAL

These Instructions for Continued Airworthiness (ICA) provide the information required to perform the maintenance and repair of the DCI Inlet Barrier Filter (IBF) system installation on the Leonardo S.p.A Models A119 and AW119 MKII [including the AW119 G1000H and AW119 IDU-680P (TH-119) variants]. This ICA should be used in conjunction with all pertinent Leonardo Model A119 and AW119 MKII manuals and all publications listed in the List of Applicable Publications (LOAP).

NOTE

Thoroughly review and become familiar with the Appendix A – Parts Figures section of this ICA before performing maintenance on the IBF system.

1.2 USE OF THIS MANUAL

The instructions that are given in this manual and those that have been changed by revisions, bulletins and/or alerts issued by Donaldson Company, Inc. (DCI), Leonardo S.p.A. or the Airworthiness Directives issued by the local Aviation Authority, shall be strictly followed.

1.3 DEFINITIONS / TERMINOLOGY

Actuator	An electromechanical actuator used to open/close the bypass door.
Air induction screen	Screen installed in the engine inlet on baseline configuration aircraft in lieu of the EAPS or the IBF, to prevent engine foreign object damage.
Air induction system	This represents the major kit components including the IBF filter assemblies, plenums, bypass door assembly, and associated wiring.
Brownout	A brownout condition is a zero visibility condition usually caused by hovering in a dusty environment.
Bypass	The bypass is an alternate air inlet used only when the main engine air inlet through the filter becomes clogged or blocked.
Bypass door	Door is located on the top of the IBF Filter housing assembly that, when opened by the actuator, allows unfiltered air from the environment around the aircraft to be drawn into the engine.
Cockpit Indicator/switch	Cockpit indicator/switch is a lighted push-button switch that is located in center console panel within easy reach of the pilot and labeled "IBF". The switch is used to energize the actuator by depressing the switch to open the bypass door and depressing it to close the bypass door. When the filter has enough dirt/debris that causes the differential pressure reach or exceed a preset limit, the FILTER segment of the indicator will illuminate and when the bypass is fully employed, the BYPASS segment of the indicator will illuminate.

Differential pressure	The difference between the ambient pressure and the pressure inside the plenum chamber, which is measured by the differential pressure switch and the filter maintenance aid.
Filter	Barrier type filter media made of multi-layers of cotton gauze saturated with specially formulated oil that forms a tack barrier that increases the capture efficiency of the filter.
Filter assembly	Filter media supported by pleated stainless steel screen on both sides and the filter assembly frame components around the perimeter of the filter media.
Filter downstream side	Clean side of the filter media (i.e. the side of the filter facing toward the engine)
Filter media	Multi-layered cotton gauze compressed between two layers of pleated stainless steel screen and saturated with specially formulated oil which allows the air to pass through with a very low drop in pressure but traps a high percentage of the dust/dirt particles.
Filter pleats	Stainless steel screen is used to form the pleats and hold the filter media in place
Filter upstream side	Dirty side of the filter media (i.e., the side of the filter facing the incoming air stream on which the dirt collects).
Inches of water	Unit of measure used for the differential pressure measured across the filter, as measured with a water manometer or similar apparatus.
Oiling	Process used to apply a uniform amount of oil on filter media.
On-condition	Indicates that servicing of the filter is based on a Filter Maintenance Aid (FMA) indication in the area marked in "RED", Power Assurance Check (PAC) results (where a failed PAC is the result of a dirty Filter Assembly), and/or any "FILTER" light indication on the cockpit light/switch indicator.
Plenum chamber	Area contained inside the IBF filter assembly.
Service cycle	Period starting when a filter is cleaned, oiled and placed into service and ending when the filter is removed for its next cleaning and oiling.

1.4 ACRONYMS

DCI	= Donaldson Company, Inc.
ATA	= Air Transport Association of America, Inc.
DP	= Differential Pressure
EAPS	= Engine Air Particle Separator
FAR	= Federal Aviation Regulation
FMA	= Filter Maintenance Aid
FMS	= Flight Manual Supplement
FOD	= Foreign Object Damage
IBF	= Inlet Barrier Filter
ICA	= Instructions for Continued Airworthiness
IP	= Installation Procedures
IPB	= Illustrated Parts Breakdown
LOAP	= List of Applicable Publications
ITT	= Interturbine Temperature
OAT	= Outside Air Temperature
PAC	= Power Assurance Check
RFM	= Rotorcraft Flight Manual
SAE	= Society of Automotive Engineers
TCDS	= Type Certificate Data Sheet
TIS	= Time In Service

1.5 WARNINGS, CAUTIONS, AND NOTES

Warning, cautions and notes are used throughout this manual to emphasize important and critical instructions.

WARNING

**AN OPERATING PROCEDURE, PRACTICE, ETC., WHICH, IF NOT CORRECTLY FOLLOWED,
COULD RESULT IN PERSONAL INJURY OR LOSS OF LIFE.**

CAUTION

**AN OPERATING PROCEDURE, PRACTICE, ETC., WHICH, IF NOT STRICTLY OBSERVED,
COULD RESULT IN DAMAGE TO OR DESTRUCTION OF
EQUIPMENT.**

NOTE

An operating procedure, condition, etc., which it is essential to highlight.
A note includes supplemental data about the procedure, the practice, the condition,
etc for the maintenance task.

1.6 UNITS OF MEASURE

U.S. Standard units of measure have been used in preparation of this manual. Typical units used in this manual include; inches of water measuring differential pressure, inch-pounds of torque, etc.

1.7 REFERENCE PUBLICATIONS

Reserved for future use.

1.8 LIST OF APPLICABLE PUBLICATIONS

LEONARDO S.p.A

Models A119 and AW119 MKII [including the AW119 G1000H and AW119 IDU-680P (TH-119) variants] Technical Publications

FAA

FAA Advisory Circular, AC 43.13-1B, Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair

FAA Advisory Circular, AC 27-1B, Certification of Normal Category Rotorcraft

NOTE

**Unless otherwise specified use standard torque values when tightening bolts.
(Refer to AC 43.13-1B, Chapter 7)**

1.9 DISTRIBUTION OF CHANGES

Changes shall be distributed by posting them on the DCI webpage www.donaldsonaerospace-defense.com. The ICA may also be found on <https://ShopDonaldson.com>. Each customer will be registered and provided access to the webpage via a personalized log-in/password established at the time of kit purchase.

NOTE

This webpage should be checked prior to the performance of any maintenance actions on the IBF system to confirm possession of the latest FAA approved revision. If access to the internet is not possible, contact DCI at (636) 300-5200 for assistance.

1.10 INDICATION OF CHANGES

All changes will be complete revisions with all pages marked with the latest revision letter. All changes since the last revision shall be marked with a black vertical bar in the left side of the page.

1.11 SYSTEM DESCRIPTION AND OVERVIEW

- a. The Leonardo IBF system is offered to operators which includes a filter housing assembly with three filter assemblies, a bypass door, and electrical hardware.
- b. The IBF system is located in the same location and in lieu of the OEM air induction screen or the Engine Air Particle Separator (EAPS). The IBF provides aircraft owner/operators a high performance engine air filtration option that significantly improve filtration efficiency over the EAPS. The IBF will increase the life of the engine through a dramatic reduction in erosion resulting from the substantial increase in filtration efficiency without degrading engine

performance. The DCI IBF system provides dust separation efficiencies exceeding 99% for Society of Automotive Engineers (SAE) AC Coarse and AC Fine dust as defined in specification SAE J726, Air Cleaner Test Code.

- c. The IBF system does not interfere with any of the commercial items installed in the Leonardo Models A119 and AW119 MKII [including the AW119 G1000H and AW119 IDU-680P (TH-119) variants] production aircraft. The IBF is a complete system in which safety, functionality and serviceability were major considerations in the design process. The major kit components include the frame assembly, filter assemblies, cockpit indicator/switch, and bypass system (which includes the bypass door, actuator, differential pressure switch, and filter maintenance aid). Located at the end of this chapter is an exploded view of the major kit components with the exception of the cockpit hardware. For a detailed illustration of all kit components, see the Appendix A - Parts Figures.
- d. The major components making up the bypass system include the bypass door, actuator, electrical wire harness, cockpit indicator/switch, and differential pressure switch. The cockpit indicator/switch energizes the actuator to open and close the bypass doors and the "FILTER" light alerts the pilot that the differential pressure has reached or exceeded its preset limit. In the bypass mode, when the bypass door is fully extended, the "BYPASS" light will illuminate.
- e. The IBF system provides a means of monitoring the condition of the filter both in-flight and on the ground, and a bypass capability should flow through the filter become restricted. In-flight, a differential pressure switch continuously measures the drop in pressure across the filter and triggers the cockpit indicator/switch cautioning the pilot any time the differential pressure across the filter reaches or exceeds a preset limit. At this point, the IBF is operating at approximately the same inlet differential pressure normally experienced with the EAPS installed. The electromechanically actuated bypass doors permits unfiltered air to enter the engine inlet plenum chamber should the filter media become obstructed and can be opened or closed as required. On the ground, a Filter Maintenance Aid, mounted on the front of the forward filter housing frame, displays the maximum differential pressure across the filter reached during the last flight. It is accessible only on the ground, providing the pilot or mechanic the ability to visually gauge the current condition of the filter. This gives the mechanic the ability to forecast the timing of the next service cycle. The Filter Maintenance Aid can be reset by depressing the yellow button marked "PUSH TO RESET" located on the end of the Filter Maintenance Aid (See Figures 2 & 3).
- f. The design of the bypass system allows the ground crew to cycle the bypass doors with power on the aircraft. The light/switch can be depressed to actuate the bypass doors open, and then depressed again to actuate it closed. Full functional verification of the bypass system including all electromechanical components and the filter maintenance aid is possible during routine maintenance (see Chapter 8).
- g. Removal of each filter assembly for servicing is easily achieved by removal of the forward and central aircraft cowlings, then loosening four bolts (side filters) and/or disconnecting the actuator and removing hinge rod (top filter).

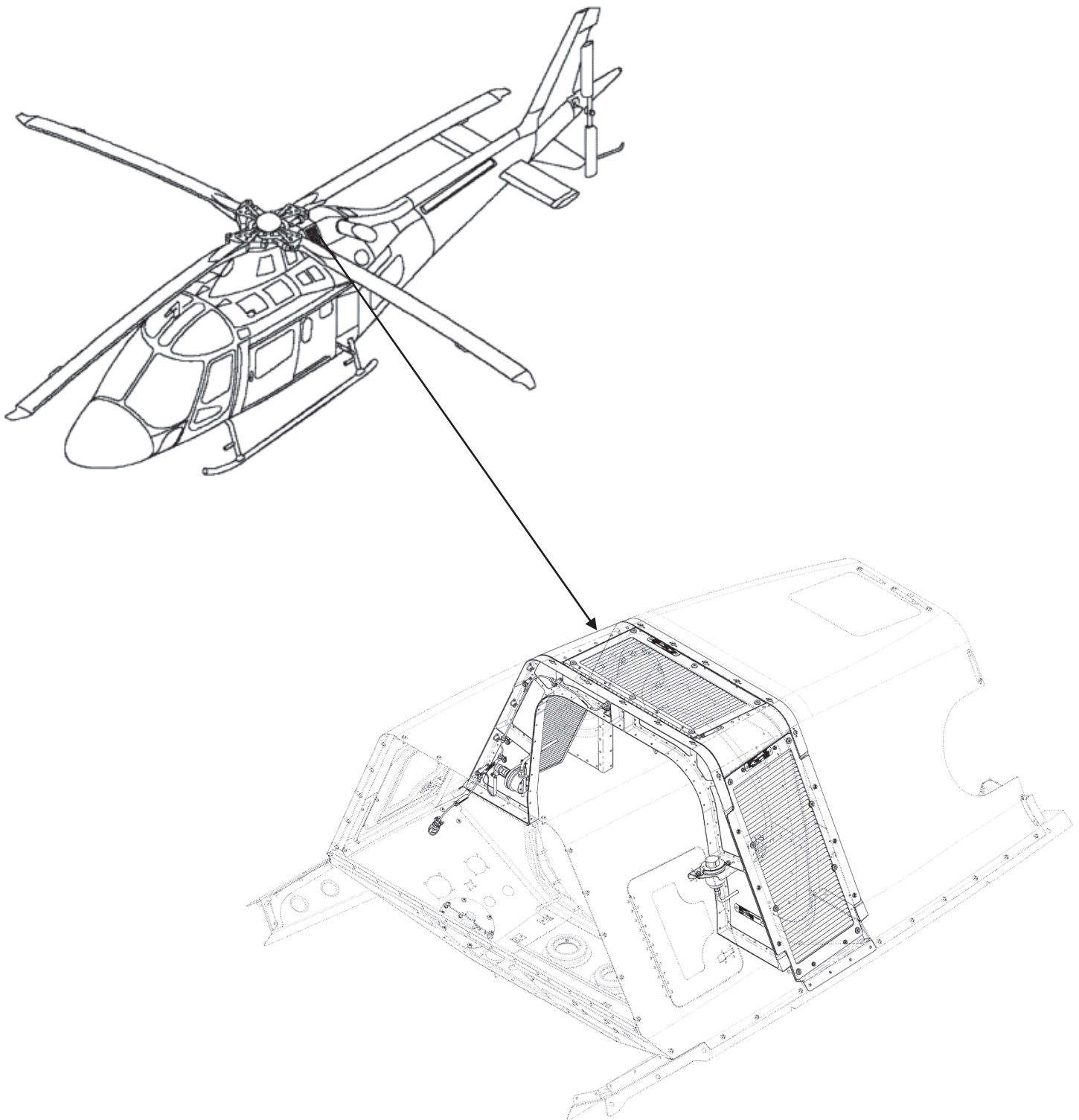


Figure 1: IBF SYSTEM AND INSTALLATION

2 AIRWORTHINESS LIMITATIONS

AIRWORTHINESS LIMITATIONS FAA APPROVAL BLOCK

The Airworthiness Limitations Section is FAA approved and specifies maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

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2.1 GENERAL

The Airworthiness Limitations for the DCI Inlet Barrier Filtration system (IBF) as installed on Leonardo S.p.A. Models A119 and AW119 MKII [including the AW119 G1000H and AW119 IDU-680P (TH-119) variants] are FAA approved. This STC does not impose any additional airworthiness limitations.

NOTE

The retirement life given or the failure to give a retirement life to a component does not constitute a warranty of any kind. The only warranty applicable to any component is the warranty included in the Purchase Agreement for the helicopter or the component.

2.2 FILTER RETIREMENT LIFE

After fifteen (15) cleaning and oiling cycles, the filters must be removed from service at the next servicing interval. The filter data tag is scribed after each cleaning and oiling cycle (see Section 6.2). When all numerals (1-15) on the data tag have been scribed out, the filters shall be removed from service at the next service interval. No further cleaning cycles are authorized.

2.3 LIFE LIMITED COMPONENTS

The only life limited component features are the number of cleanings of the filter assemblies. See Section 2.2.

3 INSPECTION REQUIREMENTS AND OVERHAUL

3.1 INSPECTION REQUIREMENTS

3.1.1 GENERAL REQUIREMENTS

- a. Inspection of the IBF system consists of, in general terms, inspection of the filter assembly, inspection of the structural components, and inspection of electrical and system components. These assembly/component inspection intervals are based on hours after initial installation or on condition as required. The components of the system are divided, generally as a scope of work, into Filter Assembly/Seal, Structural Components, and Systems and Electrical components as is done throughout the manual.
- b. Refer to the Appendix A - Parts Figures for component illustrations that provide supplemental information relative to proper assembly configuration, orientation, and locations for all components to be inspected per Chapter 3 and Table 3-1. Refer to Appendix A, Figure A-2 for the primary components included in Kit No. 119000-101 and 119000-105.
- c. Table 3-1 gives a recommended inspection schedule for the components of the system. The Trouble-Shooting Guide, Table 8-1 found near the end of Chapter 8, also gives additional guidance when performing inspections and encountering trouble with the system. Chapter 8 also provides specific inspection guidance and removal/installation procedures for each component and is structured in the same three major groups as discussed above.

3.1.2 FILTER ASSEMBLY INSPECTION

- a. The following inspections pertain to the barrier filter assembly and associated components, which include the filter assembly (i.e. filter frame and filter media), and all associated seals/fasteners.
- b. ON-CONDITION UP TO TIS LIMIT: Any FMA indication in the "RED", "FILTER" light indication of the IBF cockpit indicator/switch light or failed PAC requires a conditional inspection in accordance with Table 3-1.
- c. VISUAL: All filter assembly components (including seals and fasteners) are to be visually inspected at every annual in accordance with Table 3-1 checking for the following: filter media for tears, punctures, uneven or damaged pleats; seals for tears/damage; frame components for corrosion, cracks, distortions near holes, and check for missing or damaged fasteners.

3.1.3 STRUCTURAL COMPONENT INSPECTIONS

VISUAL: All structural IBF components are to be inspected in accordance with Table 3-1 every 300 hours/annual. These components include the following: Fore and Aft Frames, Filter Frames, FMA Bracket, Lower Supports, and Actuator Supports.

3.1.4 SYSTEMS AND ELECTRICAL COMPONENT INSPECTIONS

- a. **VISUAL**: The systems and electrical components are to be visually inspected in accordance with Table 3-1 every 300 hours/annual. These components include the following: Wiring, Connectors, Backshells, Circuit Breaker, Cockpit Indicator/switch, Differential Pressure Switch, Filter Maintenance Aid, and Actuator.
- b. **FUNCTION CHECK**: Certain systems and electrical components are also to be function checked in accordance with Table 3-1 every annual inspection. These components include the following: Circuit Breaker, Cockpit Indicator/switch, Differential Pressure Switch, Filter Maintenance Aid, and Actuator.
- c. **FMA CHECK**: The FMA check is performed to ascertain the current condition of the filter or to gage the trend in accumulation of dirt. The FMA check is only a check of the indicator reading (See Figures 2 & 3). As such it is not considered an inspection of the FMA. The inspection Table 3-1 does not require a specific "inspection" interval of the FMA. The condition of the Filter Assembly and its accumulation of dirt will show up as an indication on the FMA. Thus, operational environment, more so than time in service, dictate how often the FMA should be checked in order to help determine the next Filter Assembly service requirement. It is an aid in scheduling the Filter Assembly servicing. At any time prior to an FMA indication in the "RED" (See Figure 2), a failed PAC, or a "FILTER" indication on the cockpit indicator/switch, when maintenance or flight personnel see a trend based on the FMA readings over time that would warrant servicing of the filter due to operational considerations, such as when the aircraft will be operated in a remote or off-site location without the ability to readily service the filter, the filter may be serviced, or replaced. See section 7.2 for a further description of the use of the FMA as it relates to the Filter Assembly service interval. See filter servicing Section 7.3.

NOTE

The Filter Maintenance Aid is designed to hold the highest differential pressure across the filter assembly reached during the last flight, and should be reset after servicing of the filter assembly by depressing the yellow button marked "PUSH TO RESET" located on the end of the filter maintenance aid (See Figure 2 & 3).

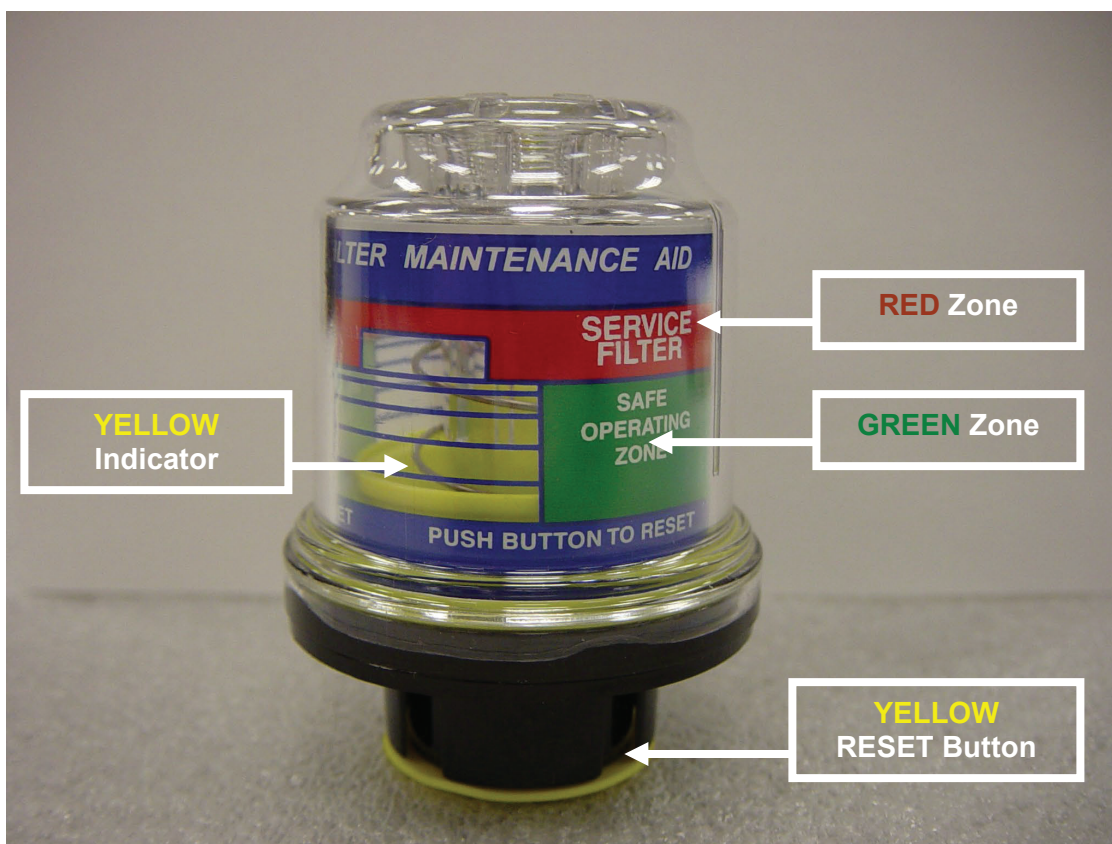


Figure 2: FILTER MAINTENANCE AID

“YELLOW Indicator” position relative to SAFE OPERATING ZONE (“GREEN Zone”) or SERVICE FILTER (“RED Zone”) markings defines current filter condition and pushing “YELLOW RESET Button” resets indicator.



Figure 3: FILTER MAINTENANCE AID

FMA unit is mounted to LH forward side of the Forward Frame Assembly and is accessed through the LH Engine Cowl Access Door (on the Forward Cowl).

Table 3- 1 Inspection Intervals

Components	Inspection Type	Inspection	Inspection Intervals			
			Scheduled		Time in Service	Notes
			300 Hrs.	Annual		
Filter Assembly as defined in sec. 3.1.2.	Conditional	1. On-Condition up to TIS Limit			300 hrs / 1 yr	2, 3, 4, 5,6
	Scheduled	2. Visual		X		1, 2, 4, 7
Structural Components as defined in sec. 3.1.3.	Scheduled	1. Visual	X	X		1, 2, 4, 6, 7
	Special	2. Visual				8
Systems and Electrical Components as defined in sec. 3.1.4.	Scheduled	1. Visual	X	X		1, 2, 4, 7
	Scheduled	2. Function Check		X		1, 2, 4, 5

Notes.

1. Refer to Chapter 8 for specific inspection requirements and functional check procedures.
2. Refer to Chapter 4 for access information.
3. FILTER light or failed PAC. This inspection is required any time a FILTER light indication or failed PAC is reported by the pilot.
4. Reference Appendix A - Parts Figures.
5. Reference Trouble-Shooting Guide, Table 8-2 of this manual.
6. Perform a visual inspection checking for deformation, buckling, corrosion, cracks, dents, tears, or other signs of damage and repair in accordance with the procedures in Chapter 8.
7. The maximum filter service interval between cleanings under any conditions is 300 flight hours or 1 year TIS, whichever comes first. Up to the TIS limit, the inspection of the Filter Assembly is "On-Condition" based on an FMA indication in the "RED", any "FILTER" light indication on the Cockpit Indicator/switch, and/or upon a failed PAC (where the failed PAC is the result of a dirty Filter Assembly).
8. For IBF Serial Number 0002 ONLY, perform a visual inspection checking for deformation, buckling, corrosion, cracks, dents, tears, or other signs of damage and repair in accordance with the procedures in Chapter 8 for every 25 hours up to the first 100 hours, then resume normal 300 hour inspection intervals.

3.2 OVERHAUL REQUIREMENTS

There are no overhaul intervals or requirements applicable to this product at this time.

3.3 SPECIAL INSPECTIONS (CONDITIONAL INSPECTIONS)

The following unscheduled special inspections/checks must be performed after encountering the following condition(s).

3.3.1 HARD LANDING

If a hard landing is suspected or has occurred, the following inspections/checks shall be complied with:

- a. Visually inspect filter assembly, lower supports, and filter housing structure for cracks, warping/distortion, and loose hardware. Refer to Sections 8.3 and 8.4 of this document for inspection guidance. If evidence of damage is found, contact DCI for disposition or replacement.
- b. Perform actuator function check to ensure the bypass door is not misaligned and that it operates and seals properly. Refer to Section 8.5 of this document for check/inspection guidance and troubleshooting procedures.

3.3.2 LIGHTNING STRIKE

If a lightning strike is suspected or has occurred, the following inspections/checks shall be complied with:

- a. Visually inspect all external surfaces of the filter assembly, lower supports, and filter housing structure for damage. Refer to Sections 8.3 and 8.4 of this document for inspection guidance. If evidence of damage is found, contact DCI for disposition or replacement.
- b. Perform function check of all systems and electrical components. Refer to Section 8.5 of this document for check/inspection guidance and troubleshooting procedures.

4 ACCESS PANELS

4.1 GENERAL DESCRIPTION

This chapter addresses how to access the IBF system installation for servicing or maintenance.

4.2 ACCESS FOR MAINTENANCE

4.2.1 ACCESS OF FMA AND DP SWITCH ASSEMBLIES

Access for maintenance of the FMA (filter maintenance aid) and the DP (differential pressure) switch and related components (see Figure 4), is accomplished by removing the forward aircraft cowl. See Chapter 8 for component removal/installation procedures, inspection, troubleshooting guide, adjustment/calibration/repair procedures.

4.2.2 ACCESS OF BYPASS ACTUATOR ASSEMBLY

Access for maintenance of the actuator assembly and related components (see Figure 4), is accomplished by opening the bypass door, removing either or both of the side filter assemblies and if required the top filter assembly. See Chapter 8 for component removal/installation procedures, inspection, troubleshooting guide, adjustment/calibration/repair procedures.

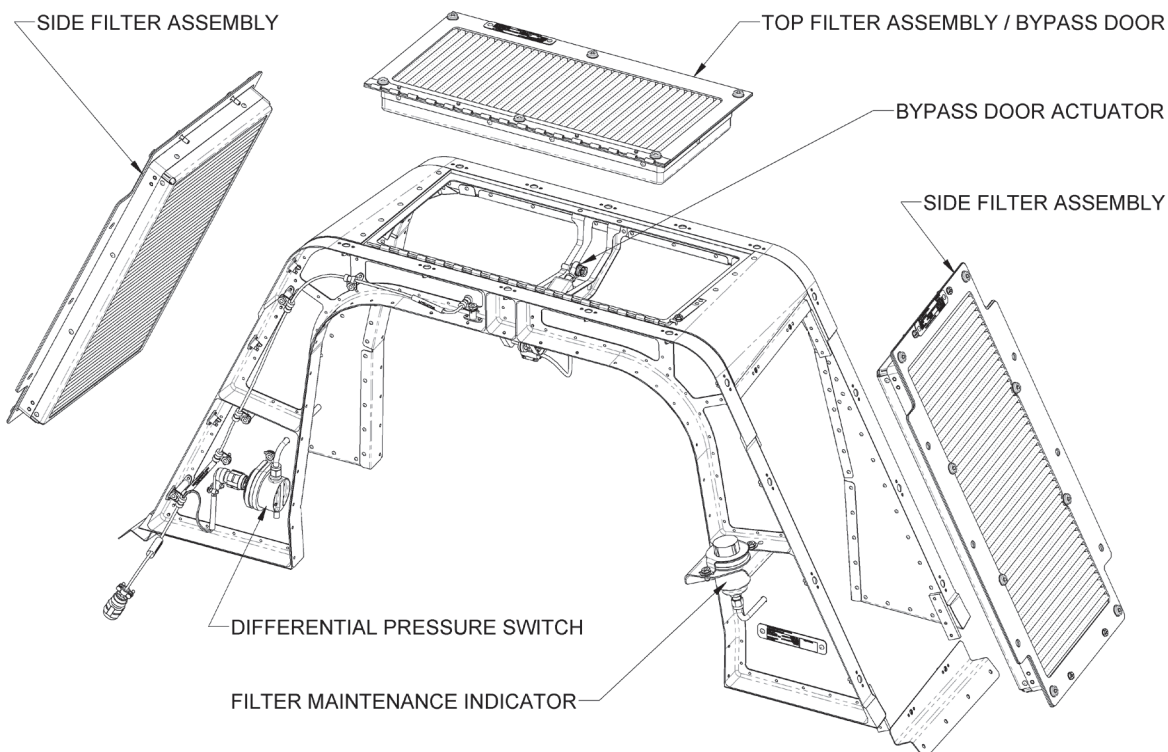


Figure 4: COMPONENT ACCESS

5 STORAGE

CAUTION

NEVER INSTALL A FILTER ASSEMBLY AND/OR OPERATE AN AIRCRAFT WITH A FILTER INSTALLED WHERE THE FILTER MEDIA HAS NOT BEEN PROPERLY OILED.

Long-term storage has no effect on filter assembly reliability if stored un-oiled (dry) in a cool, dry location to discourage possible fungus growth. After storage, the only maintenance to be performed on the filter before installation on the aircraft shall be oiling of the filter media. Refer to filter servicing Section 7.3.

6 PLACARDS, DATA PLATES, AND MARKINGS

6.1 MARKING – PART NUMBER / PMA / SERIALIZATION

The IBF system is marked on the forward frame assembly to contain the top level part number, the serial number of the system, and the FAA PMA markings.

6.2 DATA PLATE – FILTER ASSEMBLY

After the filter assembly has been serviced an “X” is marked through one of the unmarked boxes on the serviceability tag. When the last unmarked box is crossed through the filter assembly will have to be replaced at the next servicing. See Chapter 7 for servicing procedures.

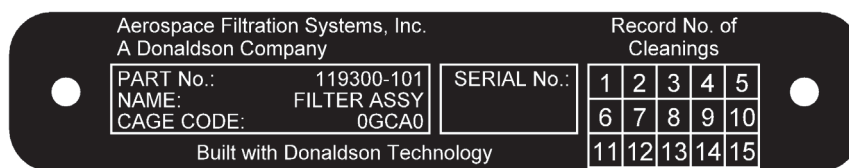
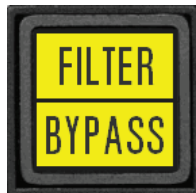


Figure 5: EXAMPLE OF FILTER ASSEMBLY DATA PLATE

6.3 PLACARDS / MARKINGS - COCKPIT

- a. The Cockpit Indicator/Switch is labeled as shown below and is located in the center console in an open space. See Figure 6(A) for markings.



(A)



(B)

Figure 6: IBF MARKINGS

- b. The IBF circuit breaker in the overhead console is marked “IBF”. See Figure 6(B) for markings.
- c. The area on the center console just below the indicator light maybe labeled as “IBF” if space is available.

7 SERVICING

7.1 AUTHORIZED MATERIALS

Service DCI Filter with only the following:

- a. Air Filter Oil
 - Squeeze bottle (11.2 oz) - DCI P/N 100100-112
 - 1 qt. bottle - DCI P/N 100100-320
 - 1 gal. container - DCI P/N 100101-000
 - 5 gal. container - DCI P/N 100105-000
- b. Air Filter Cleaner
 - 1 gallon container - DCI P/N 100201-000
 - 5 gallon container - DCI P/N 100205-000
 - 6.6 gallon container - ZOK Mfr. P/N ZOK 27 or Sky Geek P/N ZOK-27-6-6CON

Contact DCI for the products listed above.

NOTE

Refer to Chapter 8 for removal, inspection, repair and installation of filter assembly. Upon satisfactory inspection and any required maintenance of the filter assembly proceed with the rest of the servicing instructions for the filter assembly.

7.2 FILTER SERVICE INTERVALS

The filter service interval is based on the specific aircraft operating environment. The filter service intervals section is broken up in three parts: general requirements pertaining to all operations, specific recommendations for operations on prepared fields, and for operations in severe environments.

7.2.1 GENERAL REQUIREMENTS

NOTE

The maximum filter service interval between cleanings under any conditions is 300 flight hours or 1 year TIS, whichever comes first. Up to the TIS limit, the filter is considered an “on-condition” item.

NOTE

The FMA is an aid to help maintenance personnel and pilots to ascertain the condition of the filter at any point in time or to trend the accumulation of dirt on the Filter Assembly over a period of time.

- a. Up to the 300 hour/1 year TIS limit, the “on condition” requirement for servicing the Filter Assembly is based on a FMA indication, a “Filter” light indication on the Cockpit Indicator/switch, or upon a failed PAC (where the failed PAC is the result of a dirty Filter Assembly).

- b. Any “FILTER” indication, where the pressure sensor and indicating system are working properly, requires monitoring of instruments during operation to ensure aircraft/engine limits are not exceeded. Service the filter as soon as practical. See filter servicing Section 7.3.
- c. The gradual increase in differential pressure across the IBF filter assembly causes an increase in the interturbine temperature (ITT) required to produce a specified torque as measured during the PAC. A failed PAC due to an increase in differential pressure across the filter is cause for servicing of the filter assembly. See filter servicing Section 7.3.
- d. Any FMA indication in the area marked in “RED” it is recommended to service the filter as soon as practical. See filter servicing Section 7.3.
- e. At any time prior to a “FILTER” indication on the cockpit indicator/switch, an FMA indication in the “RED”, or a failed PAC, when maintenance or flight personnel see a trend on the FMA that would warrant servicing of the filter due to operational considerations, such as when the aircraft will be operating in a remote or off-site location without the ability to readily service the filter, the filter may be serviced, or replaced. See filter servicing Section 7.3.
- f. The maximum number of service cycles for the filter assembly (i.e., cleaning/oiling) is limited to 15 for each filter assembly. The filter assembly includes a data plate that must be scribed to track filter service cycles in accordance with Section 6.2.

7.2.2 PREPARED FIELD OPERATIONS

During typical operations in and out of prepared airfields and landing sites, the IBF filter assembly will not require frequent servicing. DCI recommends that the filter maintenance aid (FMA) be checked about every 25 aircraft operating hours following the first installation and operation of an IBF system on an aircraft. This should be done to gauge the rate of engine performance degradation due to changes in engine inlet differential pressure as the filters accumulate dirt in operations considered “prepared fields” operations. Once an interval of time in flight hours is determined that provided discrete changes in the FMA, this interval can be repeated as long as there is no change in the environmental operating conditions.

- a. This interval can be extended after sufficient flight data has been accumulated to establish a greater interval. Upon seeing increases in ITT and associated decreases in temperature margin/ available power, the inspection interval should again be shortened to about every 25 hours or less to enable scheduling of filter servicing without interruption of normal operations.
- b. Ensure all filter servicing requirements defined in Section 7.2.1 are followed. Refer to Section 7.3 for servicing of the filter assembly.

7.2.3 SEVERE ENVIRONMENT OPERATIONS

- a. When operating in an environment of high sand and dust levels, frequent servicing of the filter assembly may be required based on the time exposure and severity of the environment. Any operations in an environment that can result in “brownout” conditions should therefore be minimized or avoided to the maximum extent possible within the constraints of the operation. If extended time is accumulated operating in brownout conditions, monitoring of the FMA between shut down and startup will give an indication of the differential pressure

trend based on the severe environment being flown in. Once an interval of time in flight hours is determined that provided discrete changes in the FMA, this interval can be repeated as long as the initial readings remain typical of the current operations.

- b. Ensure all filter servicing requirements defined in Section 7.2.1 are followed. Refer to Section 7.3 for servicing of the filter assembly.

7.3 **FILTER ASSEMBLY SERVICING**

The filter assembly servicing section defines the procedures for pre-cleaning, cleaning, drying, and oiling the filter media in the filter assembly.

7.3.1 **FILTER PRE-CLEANING**

- a. Servicing of the filter assembly is determined by the inspection requirements found in Chapter 3.
- b. Prior to any cleaning operation gently brush the dirty side of the filter with a soft bristle brush similar to a soft paintbrush. Remove as much debris as practical from the filter before proceeding to the cleaning procedure.

7.3.2 **FILTER CLEANING**

CAUTION

DO NOT CLEAN DCI FILTER ASSEMBLIES WITH GASOLINE, SOLVENTS, PARTS CLEANERS, STRONG DETERGENTS, OR CAUSTIC CLEANING SOLUTIONS.

CAUTION

DO NOT STEAM CLEAN OR USE HIGH-PRESSURE WASHERS TO CLEAN THE DCI FILTER ASSEMBLY.

CAUTION

ANY OF THESE PROCESSES WILL DAMAGE FILTER MEDIA AND/OR THE FILTER FRAMES.

- a. Spray DCI Air Filter Cleaner (DCI or ZOK 27) liberally onto the entire filter media (both sides) until the filter media is thoroughly soaked. If procured in bulk, transfer a smaller quantity to a spray bottle. A spray bottle provides a more uniform distribution of the cleaning agent. In severe environmental conditions (high dirt/debris), the entire filter may be soaked in cleaner and repeated as necessary. Manufacturer's instructions for dilution of cleaner should be followed if using concentrate.
- b. Let the cleaner soak into the contaminants and filter media for 20 minutes.

- c. Rinse the filter with low-pressure water. Use water out of a faucet or hose (without nozzle). Rinse in the opposite the direction of airflow, i.e., from the clean side to the dirty side. Arrange the filter so the pleats are vertical and begin to rinse in a gradual side-to-side motion starting at the top and working downward. Adjust the pace to correspond with the cleanliness of the water runoff. As long as the runoff is filled with debris and oil, do not proceed downward.
- d. Upon completion, adjust the filter to clean from the dirty side to the clean side, pleats still vertical.
- e. Repeat the rinsing procedure once again, until there is no visible debris on the surface and the runoff water is relatively clean.
- f. When finished, flip the filter once again and repeat the rinse from clean side to dirty side.
- g. Finally, rotate the filter from top to bottom, and perform the final rinse until the runoff water is free of all debris and oil.
- h. If necessary, repeat cleaning procedure until filter is free from all contaminants.

7.3.3 FILTER DRYING

CAUTION

DO NOT USE COMPRESSED AIR TO DRY THE FILTER ASSEMBLY. IT MAY DAMAGE THE FILTER MEDIA.

CAUTION

DO NOT USE HEAT FROM ANY SOURCE TO DRY THE DCI FILTER ASSEMBLY. HEAT MAY SHRINK THE FILTER MEDIA AND MAY DAMAGE THE CORING MATERIAL WITHIN THE FILTER FRAMES.

- a. After rinsing, shake off the excess water and let the Filter Assembly dry at room or outside air temperature (above freezing).
- b. Ensure dirt or debris does not enter or contact the Filter Assembly while drying.
- c. After the Filter Assembly dries, mark the service cycle on data plate in accordance with the Section 6.2.

7.3.4 FILTER OILING

CAUTION

NEVER PUT AN DCI FILTER ASSEMBLY IN SERVICE WITHOUT OILING IT.

CAUTION

USE ONLY DCI FILTER OIL OR AN DCI APPROVED SUBSTITUTE.

NOTE

A squeeze bottle capable of accurately measuring out the applicable fluid ounces that should be used when applying the oil to the filter as directed below.

- a. The filter will not function properly if other types of oil are used. DCI Air Filter Oil is a unique blend of mineral and organic oil base stocks and special polymers that form a very efficient "tack barrier." Red dye is added to show areas of oil application. Do not use transmission fluid, any kind of motor oil, or diesel fuel to oil the DCI filter. Do not use "WD-40," "LPS," or any other type of lightweight spray lubricants to oil the DCI filter. Any of those products will damage the filter or degrade its filtering ability. A squeeze bottle allows for the controlled application of a specific amount of oil to the filter (See Figure 7).
- b. Using a total of 4.6 fl. Oz. for the Upper Filter Assembly and 6.6 fl oz. for each Side Filter Assembly, apply approximately $\frac{1}{2}$ of the filter oil to the clean, dried Filter Assembly. Gently squeeze a small stream of oil along the entire length of each pleat peak, then flip the filter over and repeat this on the backside. Apply sparingly to ensure coverage of the entire filter.
- c. Let the Filter Assembly sit for 20 minutes as the oil "wicks" into the surrounding filter media. Apply any remaining filter oil to any areas that are still white and to complete the application of the appropriate amount of oil from the squeeze bottle.

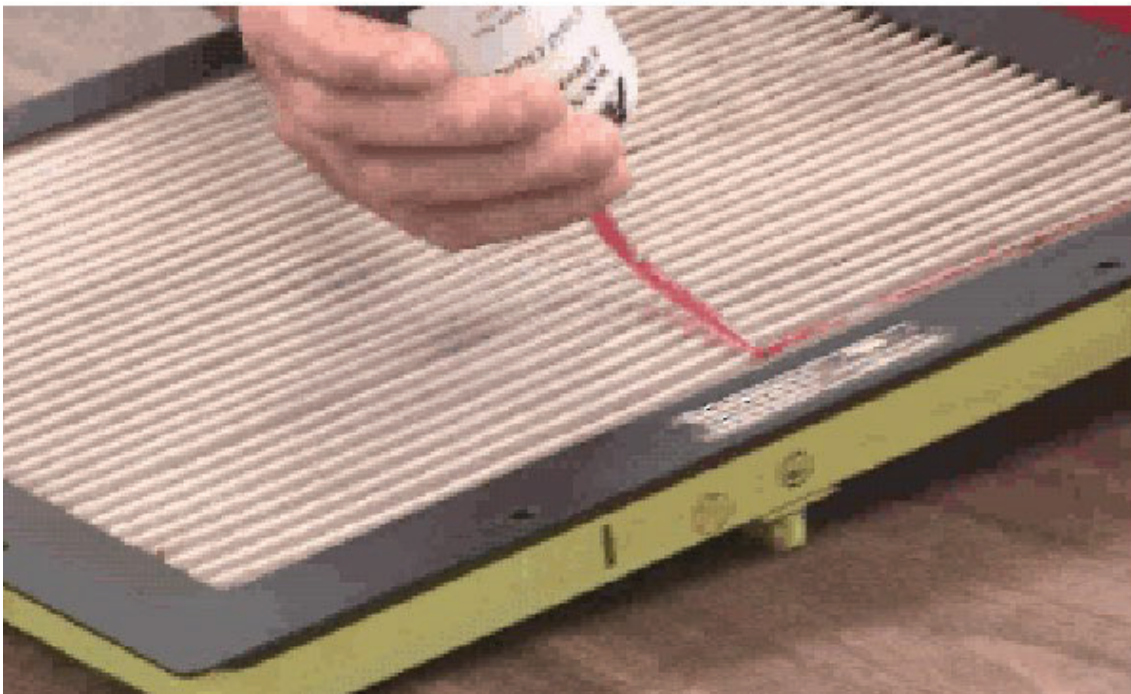


Figure 7: OILING MEDIA

7.4 STRUCTURAL COMPONENT SERVICING

There are no structural components requiring periodic servicing. See Chapter 6 for inspection requirements and Chapter 8 for maintenance requirements.

7.5 SYSTEMS AND ELECTRICAL SERVICING

There are no system and electrical components requiring periodic servicing. See Chapter 6 for inspection requirements and Chapter 8 for maintenance requirements.

NOTE

The Filter Maintenance Aid is designed to hold the highest differential pressure across the filter assembly reached during the last flight, and should be reset after servicing of the filter assembly by depressing the yellow button marked “PUSH TO RESET” located on the end of the filter maintenance aid (See Figure 8-3).

7.6 AIRCRAFT WASHING

During aircraft washing the IBF system, including the filter assemblies, should be protected or removed to avoid damaging the filter media with high pressure spray nozzles or to prevent solvents rinsing away the oil in the filter media.

8 TROUBLESHOOTING AND MAINTENANCE

8.1 MAINTENANCE GENERAL

CAUTION

THOROUGHLY REVIEW AND BECOME FAMILIAR WITH THE APPENDIX A - PARTS FIGURES BEFORE PERFORMING MAINTENANCE ON THE IBF SYSTEM.

NOTE

IT IS STRONGLY SUGGESTED, THAT FOR ANY MAINTENANCE OTHER THAN ROUTINE INSPECTIONS, TROUBLESHOOTING OR REMOVAL OF THE FILTER ASSEMBLIES FOR CLEANING, THAT THE COMPLETE IBF ASSEMBLY BE REMOVED BEFORE PERFORMING MAINTENANCE AND/OR REPAIRS.

Except where otherwise indicated, all torque values shall be in accordance with Chapter 7 of FAA Advisory Circular AC 43.13-1B.

- a. The components of the system are divided, generally as a scope of work, into Filter Housing Assembly (consisting of Forward, Aft, and Upper Frame Assemblies and Actuator Support Assembly), Filter Assembly, Lower Side Filter Supports, and Systems and Electrical components throughout the manual. Refer to Appendix A, Figures A-1 thru A-21. Table 3-1 gives a recommended inspection schedule for the components of the system. The troubleshooting guide in Table 8-2 provides additional guidance for performing inspections when encountering trouble with the system.
- b. The maintenance chapter is organized by removal, inspection, troubleshooting, adjustment, calibration and/or repair, and installation for the major components noted above, as applicable to the particular component. For some components a functional check is included. Not all components will require adjustment, or calibration, or have any approved functional check or repair procedures. Contact DCI for possible repairs when not listed in this manual. In some cases, defective components will require replacement.
- c. In general, visually inspect all structural components for oversized or elongated holes, deformation, cracks, corrosion, missing fasteners or components, fretting, galling, etc. Any component exhibiting these conditions requires repair or replacement.
- d. In general, visually inspect fasteners for damaged or missing threads, in both the bolt or screw and the nut or nut plate. If a self-locking fastener can be fully threaded by hand, replace the self-locking fastener.
- e. In general, visually inspect all electrical connections for security, corrosion, arcing, breakdown of insulation, and overheating. Repair or replace components exhibiting defects. Inspect and repair components per Leonardo technical manuals or AC 43.13-1B, Chapter 11.

8.2 COMPONENTS - GENERAL DESCRIPTION

8.2.1 FILTER ASSY/FILTER SEAL

(Refer to Appendix A, Figures A-1 thru A-4)

- a. Filter Assembly - The Filter Assembly is composed of the filter media (stainless steel mesh covering cotton gauze) bonded into the aluminum alloy filter frame assembly.
- b. Seal - The Seal is expanded foam with Dacron backing affixed to the Filter Assembly.

8.2.2 FILTER HOUSING ASSEMBLY (STRUCTURAL COMPONENTS)

(Refer to Appendix A, Figures A-1, A-2, A-5 and A-8)

- a. Upper Frame Assembly – This assembly is a stainless steel and aluminum structure where the bypass door and upper filter assembly are located. The Upper Frame Assy is mounted to the forward and aft frame assemblies and the side filter frames.
- b. Forward Frame Assembly – The Forward Frame Assy is made up from machined aluminum and stainless steel sheet. The upper frame assembly, side filter frames, actuator supports, differential pressure switch, and filter maintenance aid assembly are secured to this assembly.
- c. Aft Frame Assembly – The Aft Frame Assy is made up from machined aluminum and stainless steel sheet. The upper frame assembly, side filter frames, and actuator supports are secured to this assembly.
- d. Lower Side Filter Supports (RH & LH) – The Lower Side Filter Supports are made from aluminum plate and are connected to the side filter frames and attach to the aircraft.
- e. Actuator Support Assembly – The Actuator Support Assembly is made from machined aluminum and is riveted to the Forward and Aft Frame Assemblies.

8.2.3 SYSTEMS AND ELECTRICAL COMPONENTS

(Refer to Appendix A, Figures A-5, A-6, A-7, and A-9 thru A-21)

- a. Cockpit Indicator/Switch - The cockpit indicator/switch provides the lighting/switching function for the bypass door. The cockpit indicator light illuminates when the differential pressure between ambient and the plenum chamber has reached its preset limit. The construction details of the component do not warrant field maintenance. Repair or servicing of this component requires the component to be sent back to DCI for disposition.
- b. Differential Pressure Switch - The Differential Pressure Switch provides a signal to the Cockpit Indicator/Switch for annunciation of the "FILTER" light to signal the differential pressure across the Filter Assembly has reached a preset limit. The construction details of the component do not warrant field maintenance. Repair of this component requires the component to be sent back to DCI for disposition.

- c. Filter Maintenance Aid - The Filter Maintenance Aid provides an indication to maintenance personnel as to the trend of the differential pressure across the Filter Assembly. The construction details of the component do not warrant field maintenance. Repair of this component requires it to be sent back to DCI for disposition or replacement. The FMA is an aid to help maintenance personnel and pilots to ascertain the current condition or trend in accumulation of dirt on the Filter Assembly.
- d. Actuator - The Actuator provides mechanical actuation of the Bypass Door should the pilot depress the cockpit indicator/switch. The construction details of the component do not warrant field maintenance. Repair of this component requires the component to be sent back to DCI for disposition or replacement.
- e. Wiring, Connectors, Backshells, Circuit Breaker – The wiring utilizes wire per Military Specification Mil-W-22759/41. The gauge and marking identification is specified on the wiring diagram. The connectors, backshells, and circuit breaker are military specification components, or where applicable, vendor designed components. The construction details of these components (other than wiring) do not warrant field maintenance.

8.3 **FILTER ASSY / FILTER SEAL**

(Refer to Appendix A, Figures A-1 thru A-4)

8.3.1 **FILTER ASSY**

8.3.1.1 **REMOVAL – SIDE FILTER ASSY**

CAUTION

UPON REMOVAL OF ANY FILTER ASSEMBLY OR THE COMPLETE IBF SYSTEM, COVER THE ENGINE INLET (AS SOON AS THERE IS ACCESS TO THE INLET), TO PREVENT FOREIGN OBJECT DAMAGE (FOD).

- a. Remove the aircraft forward and central cowls.
- b. To remove side filters – Loosen the two (2) upper and two (2) lower captive bolts that retain each Side Filter Assembly to the Upper Frame Assembly and the Lower Side Filter Supports. (Refer to Appendix A, Figures A-2 and A-3)
- c. Use a plastic scraper to gently break any seal between the filter housing structure and the seal itself. The filter assembly must be carefully removed so as not to damage the filter seal.

8.3.1.2 **REMOVAL – UPPER FILTER ASSY**

- a. To remove upper filter – Open the Bypass door, cover engine inlet and remove the safety wire and bolt (with washers) that connects the filter assembly to the actuator. (Refer to Appendix A, Figures A-2, A-4 and A-5)

- b. Loosen the captive bolt on the upper LH side of the filter housing until the hinge rod can be removed.
- c. Remove the hinge rod.
- d. The upper filter assembly may now be removed.
- e. Inspect the filter seals. Refer to "Filter Seal" procedures.

8.3.1.3 INSPECTION – FILTER ASSY

NOTE

After servicing of the Filter Assembly or at any time the Filter Assembly is inspected, the pleats may require straightening or crimping. If you cannot see the bottom of the pleat, the airflow will be restricted and/or the pleats will adhere to one another when dirt loaded. Any restriction to the flow through the pleats will result in increased differential pressure and reduction in dirt loading capacity. In order to ensure ideal flow characteristics through the filter media, the pleats must be straightened or crimped with a hand seamer.

- a. Visually inspect the pleats on both sides of the filter. If you cannot see the bottom of the pleat, when sighting the length, or depth of the pleat, straightening of the pleat is required. Refer to "Adjustment" for pleat straightening procedures.
- b. If this inspection is in response to a FILTER light indication or failed PAC, perform troubleshooting per Table 8-2. If troubleshooting indicates a dirty filter, service filter per Section 7.3.
- c. Inspect the filter assembly frame for cracks, gouges, distortion or deformation, corrosion, loose or missing fasteners, and missing or deteriorated protective coating. Refer to "Repair" for criteria / disposition.
- d. Inspect the filter seal. Refer to "Filter Seal" procedures.

8.3.1.4 ADJUSTMENT - FILTER

CAUTION

HAND SEAMER MUST BE LIMITED TO A MAXIMUM JAW DEPTH OF 1 1/4 INCH. A DEEPER JAW DEPTH CAN RESULT IN DEFORMATION OR DAMAGE TO THE ADJOINING PLEATS.

CAUTION

DO NOT OVER CRIMP AND CRUSH PLEAT; CARE MUST BE TAKEN TO SQUEEZE THE PLEATS WITHOUT DAMAGING THE PLEATED SCREEN. THE RADIUS AT THE TOP OF THE PLEAT SHOULD REMAIN INTACT, NOT CREASED.

- a. If you cannot see the bottom of a pleat, use a hand seamer (See Special Tools/Special Equipment, Section 8.9.a.) to crimp the pleat and to straighten the pleat. Sight down the length and depth of the pleat to confirm the pleat is straightened (See Figure 8).
- b. Once one side is crimped, flip the filter over and crimp the other side as required following the guidance above. Use caution not to crush the pleats when straightening them. Use care to maintain the original radius, as much as possible, at the top of the pleat.



Figure 8: HAND SEAMER

8.3.1.5 CALIBRATION

Not applicable.

8.3.1.6 REPAIR - FILTER MEDIA, GENERAL

WARNING

ADHESIVE VAPORS (MAY BE CONTAINED IN SEALING MATERIAL AMS 3276 OR MIL-S-8802), MAY CAUSE IRRITATION OF EYES, NOSE, AND RESPIRATORY SYSTEM. EYE AND SKIN CONTACT WITH MATERIAL MAY CAUSE IRRITATION. IF INGESTED, MAY CAUSE GASTRIC DISTRESS. FLUSH EYES WITH WATER FOR 15 MINUTES. WASH SKIN WITH SOAP AND WATER. IF INHALED, MOVE TO FRESH AIR. IN ALL CASES GET IMMEDIATE MEDICAL ATTENTION. WORK IN A WELL-VENTILATED AREA. WEAR GLOVES AND SAFETY GLASSES.

NOTE

Repair filter media damage after cleaning but prior to oiling of filters.

8.3.1.7 REPAIR - FILTER MEDIA, SMALL RUPTURES, TEARS, or HOLES

- a. In the event of damage to the filter media, ruptures in the filter media may be repaired. Small ruptures defined as smaller than .500 inch diameter or length can be sealed shut without degradation of performance to the filter assembly. Each filter assembly may have up to 3 small ruptures that may be repaired, but no repair may be within 1" of an adjacent repair.
- b. Prior to performing any of these repairs, the filter material must be cleaned of contamination and oil. Refer to Chapter 7 for cleaning of the filter assembly. Perform the repair to a cleaned and dry filter assembly. Each time the entire filter assembly is cleaned, repaired, and oiled, a mark shall be scribed on the filter assembly data plate in accordance with Section 6.2 indicating a cleaning cycle was performed.
- c. Trim ruptures, tears, or holes in the filter media up to .500 inches in length or diameter to remove loose material (wire or cotton gauze).
- d. Seal the affected area using two-part sealant, AMS 3276 or MIL-S-8802. Allow the sealant to bleed into the filter material and cure. Follow manufacturer's directions for proper mixing, application, and curing of the two-part sealant.
- e. Proceed with oiling the filter. Refer to Chapter 7.

8.3.1.8 REPAIR - FILTER MEDIA, LARGE RUPTURES, TEARS, or HOLES

Larger ruptures exceeding .500 inch in size are not repairable in the field. Contact DCI for disposition and possible repair procedures, or discard the filter assembly.

8.3.1.9 REPAIR – FILTER ASSY, OTHER DAMAGE

- a. The repair procedures defined above are for damage resulting in ruptures, tears, or holes in the filter media. The following is for field repairable damage to the filter assembly frame. Field repairable damage to the filter assembly frame is limited to blending of scratches and gouges, and / or the re-application of protective coatings. See Table 8-1 for application of protective coatings.
- b. Any damage to the filter frames such as cracking requires the filter assembly to be returned to DCI for evaluation and disposition or replacement. Any damage to the filter frames such as warping or distortion (to the extent that a good seal of the filter frame, when installed and/or torqued, do not permit the filter assembly to sit flush against the forward, aft, and/or the upper frame assembly) requires the filter assembly be returned to DCI for evaluation and disposition, or be replaced.

8.3.1.10 INSTALLATION

- a. SIDE FILTER – Locate and install the filter into the side of the filter housing. (Refer to Appendix A, Figures A-2 and A-3)
- b. Tighten the two (2) upper and two (2) lower captive bolts that retain each Side Filter Assembly to the Upper Frame Assembly and the Lower Side Filter Supports.
- c. Install the aircraft forward and central cowls.
- d. UPPER FILTER – Locate the filter and align the filter hinge and the hinge on the filter housing. (Refer to Appendix A, Figures A-2, A-4 and A-5)
- e. Install the hinge rod (insert until the retainer will capture the hinge rod)
- f. Tighten the captive bolt to retain the hinge rod.
- g. Connect the actuator to the filter (re-using the bolt and washers) and safety wire the bolt.

8.3.2 FILTER SEAL

8.3.2.1 REMOVAL

- a. Gain access to the filter seal by removing the filter assembly(s). Refer to Section 8.3.1.1.
- b. Carefully remove the seal by peeling it away from the filter assembly(s) (See Appendix A, Figures A-3 and A-4, Item 2). Use a plastic scraper or other suitable tool that is softer than aluminum to peel the seal from the filter assembly(s). Discard the removed seal.

8.3.2.2 INSPECTION

Inspect the filter seal for any tears, nicks, gouges, missing pieces or a permanent set or flattening of the seal. If the seal exhibits any of these conditions, repair or replace the seal.

8.3.2.3 REPAIR

WARNING

ADHESIVE VAPORS (IN SEALANT SUCH AS RTV 736) MAY CAUSE IRRITATION OF EYES, NOSE, AND RESPIRATORY SYSTEM. EYE AND SKIN CONTACT WITH MATERIAL MAY CAUSE IRRITATION. IF INGESTED, MAY CAUSE GASTRIC DISTRESS. FLUSH EYES WITH WATER FOR 15 MINUTES. WASH SKIN WITH SOAP AND WATER. IF INHALED, MOVE TO FRESH AIR. IN ALL CASES GET IMMEDIATE MEDICAL ATTENTION. WORK IN A WELL-VENTILATED AREA. WEAR GLOVES AND SAFETY GLASSES.

- a. Small tears, nicks, or gouges in the seal may be repaired using RTV 736 Sealant. Use a wooden tongue depressor, cotton swab, or similar tool to dab a small amount of sealant on the damage to repair tears, nicks, or gouges in the seal. Smooth over sealant to create a smooth flush repair similar to the original seal cross section. Allow to dry before re-installing filter. If the repair does not allow the filter assembly(s) from sealing to the forward, aft, and/or upper frame assembly replace the seal.
- b. If the Seal exhibits extensive tears, deep nicks or gouges, or missing pieces that would prevent the filter from properly sealing, replace the seal.

8.3.2.4 INSTALLATION

- a. Gain access to the filter seal. Refer to filter assembly removal and filter seal removal.
- b. To install the seal, apply RTV 736 sealant to the foam side of the seal. Locate and apply the seal to the clean dry surface on the filter frame and press in place.

8.4 STRUCTURAL COMPONENTS

NOTE:

THE IBF SYSTEM SHOULD BE REMOVED FROM THE AIRCRAFT PRIOR TO ANY MAINTENANCE OR REPAIR OF THE STRUCTURAL COMPONENTS.

8.4.1 FILTER HOUSING ASSEMBLY

(Refer to Appendix A, Figures A-1, A-2, A-3 and A-13)

8.4.1.1 REMOVAL OF FILTER HOUSING ASSEMBLY

- a. Remove aircraft upper cowls (specifically the forward and central cowls).
- b. Disconnect electrical Bypass System Connector from RH engine deck (Refer to Appendix A, Figure A-13).
- c. Loosen the two (2) LH lower filter assembly captive bolts from Lower Side Filter Support (repeat on RH side).
- d. Remove the two (2) fasteners from the Aft LH lower frame assembly that attach the filter housing assembly to the engine deck (repeat on RH side).
- e. Remove the three (3) fasteners from the Forward LH lower frame assembly that attach the filter housing assembly to the engine deck (repeat on RH side).
- f. Remove Filter Housing Assembly from aircraft.

8.4.1.2 INSPECTION

- a. The Filter Housing Assembly interfaces with the engine deck of the aircraft. See Appendix A, Figures A-1 and A-2. At these locations inspect for chafing or fretting, elongation of fastener holes, damage to nut plates and fasteners, corrosion, cracking, and deformation.
- b. Inspection for the above conditions and any other conditions that may be applicable are defined in the Leonardo Helicopter technical manuals.
- c. Inspections of the major components that make up the Filter Housing Assembly (Upper Frame, Forward Frame, Aft Frame, and Actuator Support Assemblies) are to be inspected at this time for the following:
- d. Cracking. Visually inspect the assemblies for cracking using a 10x magnification glass at the corners, radiuses, and transitions in part thickness. Inspect suspect areas carefully using the 10x magnification. No cracks are allowed in the assemblies. If cracks are found, Filter Housing Assembly must be replaced.
- e. Warping or distortion. Visually inspect the assemblies for warping or distortion. Any warping or distortion that keeps the Upper or Side Filter Assemblies from creating a seal to the frame Assemblies requires disposition instructions from DCI or replacement.
- f. Protective Coatings. Visually inspect the assemblies for missing, damaged, or "scratched through" protective coatings. Re-apply protective coatings per Table 8-1 of this chapter.
- g. Corrosion. Visually inspect the assemblies for corrosion in accordance with AC 43.13-1, Chapter 6 and Table 8-1.
- h. Missing, damaged or loose associated components. Visually inspect the assemblies for missing damaged or loose components.

8.4.1.3 TROUBLESHOOTING/ADJUSTMENT/CALIBRATION

Not applicable. Contact DCI for disposition of defective component or replace.

8.4.1.4 REPAIR

- a. Cracks. No cracks are allowed in any part of the Filter Housing Assembly. Cracks are not repairable. If cracks exist, the Filter Housing Assembly must be replaced.
- b. Warping or distortion. Visually inspect the Filter Housing Assembly for warping or distortion. Any warping or distortion that keeps the Upper or Side Filter Assemblies from creating a seal to the frames requires disposition instructions from DCI or replacement.
- c. Protective Coatings. Re-apply protective coatings per Table 8-1 of this chapter.
- d. Corrosion. Treat corrosion in accordance with AC 43.13-1, Chapter 6 and Table 8-1.
- e. Missing, damaged or loose associated components. Replace missing or damaged components. Secure loose components.

8.4.1.5 INSTALLATION

- a. Place the Filter Housing Assembly on the engine deck of the aircraft.
- b. Install the two (2) fasteners into the Aft Side of the LH Lower Frame Assembly that attach the filter housing assembly to the engine deck (repeat on RH side).
- c. Install the three (3) fasteners into the Forward Side of the LH Lower Frame Assembly that attach the filter housing assembly to the engine deck (repeat on RH side).
- d. Install the two (2) LH lower filter assembly fasteners (repeat on RH side).
- e. Connect Bypass System electrical disconnect located on the RH engine deck.
- f. Install aircraft upper cowls that were removed.

8.4.2 LOWER SIDE FILTER SUPPORTS

(Refer to Appendix A, Figures A-1, A-2 and A-8)

8.4.2.1 REMOVAL

- a. Remove the Filter Housing Assembly (Refer to Section 8.4.1.1).
- b. Remove the hardware attaching the LH (119707-101) & RH (119708-101) Lower Side Filter Supports from the aircraft (if hardware is serviceable, retain for use on installation).

8.4.2.2 INSPECTION

- a. Cracking. Visually inspect the Lower Side Filter Supports and related parts for cracking using 10x magnification glass at the corners, radiuses, and transitions in part thickness. Inspect suspect areas carefully using the 10x magnification. No cracks are allowed in the Lower Side Filter Supports. If cracks are found, Lower Side Filter Supports must be replaced.
- b. Warping or distortion. Visually inspect the Lower Side Filter Supports for warping or distortion. Any warping or distortion that keeps the IBF System from being installed and secured properly requires disposition instructions from DCI or replacement of the Lower Side Filter Supports.
- c. Protective Coatings. Visually inspect the Lower Side Filter Supports for missing, damaged, or “scratched through” protective coatings. Re-apply protective coatings per Table 8-1 of this chapter.
- d. Corrosion. Visually inspect the Lower Side Filter Supports and related parts for corrosion in accordance with AC 43.13-1, Chapter 6, and Table 8-1.
- e. Missing, damaged or loose associated components. Visually inspect for missing, damaged, or loose components.

8.4.2.3 TROUBLESHOOTING/ADJUSTMENT/CALIBRATION

Not applicable. Contact DCI for disposition of defective component or replace.

8.4.2.4 REPAIR

- a. Cracks. No cracks are allowed in the Lower Side Filter Supports. Cracks are not repairable. If cracks exist, Lower Side Filter Supports must be replaced.
- b. Warping or distortion. Visually inspect the Lower Side Filter Supports for warping or distortion. Any warping or distortion that keeps the IBF System from being installed and secured properly requires disposition instructions from DCI or replacement of the Lower Side Filter Supports.
- c. Protective Coatings. Visually inspect the Lower Side Filter Supports for missing, damaged, or “scratched through” protective coatings. Re-apply protective coatings per Table 8-1 of this chapter.
- d. Corrosion. Treat corrosion in accordance with AC 43.13-1, Chapter 6 and Table 8-1.
- e. Missing, damaged or loose associated components. Replace missing or damaged components. Secure loose components.

8.4.2.5 INSTALLATION

- a. Locate the LH (119707-101) Lower Side Filter Support on the LH side of the aircraft and install attaching hardware.
- b. Locate the RH (119708-101) Lower Side Filter Support on the RH side of the aircraft and install attaching hardware.
- c. The Filter Housing Assembly may now be re-installed (Refer to Section 8.4.1.5).

8.5 SYSTEMS AND ELECTRICAL COMPONENTS

8.5.1 CIRCUIT BREAKER

8.5.1.1 REMOVAL

- a. Gain access to the back of the overhead circuit breaker panel.
- b. Remove terminal connectors at back of circuit breaker.
- c. Remove nut from circuit breaker face.
- d. Remove circuit breaker from panel.
- e. Tag and secure wiring.

8.5.1.2 INSPECTION

- a. Inspect circuit breaker for proper functioning. Refer to Table 8-2 for troubleshooting.
- b. Inspect circuit breaker for security, damage, overheating, or corrosion. If component is suspect, replace defective component or contact DCI for disposition.

8.5.1.3 TROUBLESHOOTING

See Table 8-2 for troubleshooting guide.

8.5.1.4 ADJUSTMENT / CALIBRATION / REPAIR

Not applicable. Contact DCI for disposition of defective component or replace.

8.5.1.5 INSTALLATION

- a. Place circuit breaker into panel opening in correct orientation.
- b. Secure circuit breaker to circuit breaker panel with nut.
- c. Secure terminal connectors at rear of circuit breaker.

8.5.2 COCKPIT INDICATOR LIGHT

(Refer to Appendix A, Figures A-9 thru A-12)

8.5.2.1 REMOVAL

- a. Gain access to the back of the instrument panel.
- b. Remove Quik-Connect plug at back of Indicator/Switch.
- c. Remove mounting sleeve from back of Indicator/Switch.
- d. Slide Indicator/Switch out of panel.
- e. Tag and secure wiring.

8.5.2.2 INSPECTION

- a. Inspect Cockpit Indicator/Switch for proper functioning. Refer to Section 8.5.2.5 and to Table 8-2 for troubleshooting.
- b. Inspect Cockpit Indicator/Switch for security, damage, overheating, corrosion, or distortion. Replace defective component or contact DCI for disposition.

8.5.2.3 TROUBLESHOOTING

See Table 8-2 for troubleshooting guide.

8.5.2.4 ADJUSTMENT / CALIBRATION / REPAIR

Not applicable. Contact DCI for disposition of defective component or replace.

8.5.2.5 FUNCTION CHECK

CAUTION

THIS PROCEDURE INTRODUCES THE POSSIBILITY OF ENGINE FOD.

- a. Verify the Bypass Door is closed and aircraft electric power is ON.
- b. Perform Differential Pressure Switch function check (Ref 8.5.3.5).
- c. Verify Cockpit Indicator/Switch "FILTER" amber light illuminates.
- d. Depress Cockpit Indicator/Switch to open the Bypass Door.
- e. Verify the Bypass Door is open and "BYPASS" light illuminates.
- f. Depress Cockpit Indicator/Switch to close the Bypass Door.
- g. Verify the Bypass Door is closed and "BYPASS" light extinguishes and if no longer needed, that aircraft electric power is OFF.

8.5.2.6 INSTALLATION

- a. Slide Cockpit Indicator/Switch into panel opening.
- b. Secure Indicator/Switch to panel with mounting sleeve.
- c. Attach Quik-Connect plug at rear of Cockpit Indicator/Switch.
- d. Perform Cockpit Indicator/Switch Function Check.

8.5.3 DIFFERENTIAL PRESSURE SWITCH

(Refer to Appendix A, Figures A-2, A-6 and A-9)

8.5.3.1 REMOVAL

- a. Remove aircraft forward cowling to access the Differential Pressure Switch.
- b. Remove hoses, fittings, and attaching hardware from the Differential Pressure Switch.
- c. Disconnect and secure connector.
- d. Loosen clamp and remove Differential Pressure Switch.

8.5.3.2 INSPECTION

- a. Inspect for general serviceability, damage, corrosion, and missing components. Inspect the attaching hardware for security.
- b. Inspect the Tube Assembly for debris and ensure that the tube is clear and unobstructed.

8.5.3.3 TROUBLESHOOTING

See Table 8-2 for troubleshooting guidance.

8.5.3.4 ADJUSTMENT / CALIBRATION / REPAIR

The construction details of the component do not warrant field maintenance. Repair of this component requires the component to be sent back to DCI for disposition.

8.5.3.5 FUNCTION CHECK

CAUTION

THIS PROCEDURE INTRODUCES THE POSSIBILITY OF ENGINE FOD.

CAUTION

**IMPROPER USE OF THE ALTIMETER TEST SET COULD RESULT IN
DAMAGE TO THE SWITCH CALIBRATION.**

CAUTION

**IMPROPER USE OF THE ALTIMETER TEST SET COULD RESULT IN DAMAGE
TO THE SWITCH.**

CAUTION

**TESTING TO AN ALTITUDE OF GREATER THAN 1880 FEET ABOVE FIELD
ELEVATION WILL DAMAGE THE DIFFERENTIAL PRESSURE SWITCH.**

- a. Gain access to the inside of the IBF Filter Assembly by removing the RH Side Filter Assembly.

- b. Connect a Barfield (or equivalent) altimeter test set vacuum system to the plenum tube assembly, by slipping a piece of 3/16 inch ID vinyl tubing over the end of the tube assembly. Ensure that the fit between the tubing and tube assembly is tight, i.e., no leakage.
- c. Ensuring that aircraft electrical power is ON, operate the test set to an indicated altitude of 560 feet above the field elevation and gradually increase altitude. The differential pressure switch should actuate and send a signal to the Cockpit Indicator/Switch illuminating the light before the indicated altitude exceeds 680 feet.
- d. If the Cockpit Indicator/Switch does not illuminate, pull IBF circuit breaker. Run the altimeter test set up to 680 feet above the field elevation, check for continuity across the terminals of the Differential Pressure Switch. If continuity is present, the Differential Pressure Switch function is acceptable, and the rest of the circuit is suspect. Upon completion of testing, ensure that aircraft electrical power is OFF. Refer to Table 8-2.
- e. This will functionally check both the differential pressure switch and the Cockpit Indicator/Switch.

8.5.3.6 INSTALLATION

- a. Place Differential Pressure Switch in position and tighten clamp (Refer to Appendix A, Figures A-2, A-6 and A-9).
- b. Attach hoses, fittings, and attaching hardware.
- c. Connect and secure connector (See Appendix A, Figures A-2 and A-9).
- d. Perform Function Check of Differential Pressure Switch and Indicator/Switch (Refer to Sections 8.5.2.5 and 8.5.3.5).

8.5.4 FILTER MAINTENANCE AID

(Refer to Appendix A, Figures A-2 and A-7)

8.5.4.1 REMOVAL

- a. Remove the aircraft forward cowling to access the Filter Maintenance Aid.
- b. Disconnect Tube Assembly from Filter Maintenance Aid (Appendix A, Figure 7).
- c. Remove hardware and FMA Retaining Ring from Filter Maintenance Aid Mount.
- d. Remove Filter Maintenance Aid.

8.5.4.2 INSPECTION

- a. Inspect the Filter Maintenance Aid and associated mounting for discoloration affecting readability, cracks, deformation, missing or damaged components, and serviceability.
- b. Inspect the Filter Maintenance Aid Tube Assembly for debris and ensure that the tube is clear and unobstructed.
- c. Inspect the associated components, such as the Mount Assembly and hardware for missing components, cracks, distortion or deformation, scratches or gouges, or missing protective coatings. If Filter Maintenance Aid Bracket assembly is cracked or nut-plates (MS21059L3) are unserviceable, drill out the attaching rivets that secure the component and obtain new bracket (119501-201) and re-attach using same type rivets (MS20470AD4 for bracket) or (MS1097AD3 for nut-plates).

8.5.4.3 TROUBLESHOOTING

See Troubleshooting Guide, Table 8-2.

8.5.4.4 ADJUSTMENT / CALIBRATION / REPAIR

The construction details of the component do not warrant field maintenance. Repair of this component requires the component to be sent back to DCI for disposition, or to be replaced.

8.5.4.5 ADJUSTMENT

The Filter Maintenance Aid is designed to hold the highest differential pressure across the filter assembly reached during the last flight, and can be reset by depressing the yellow button marked "PUSH TO RESET" located on the end of the filter maintenance aid (See Figure 9 and Figure 10).

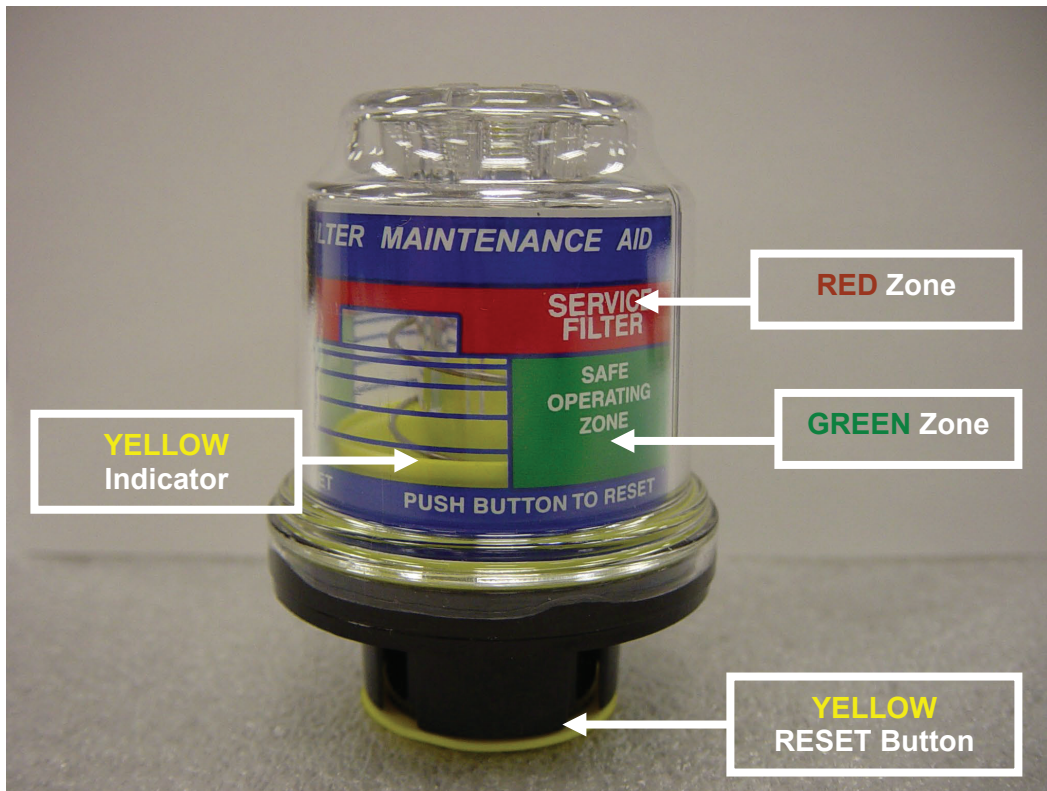


Figure 9: FILTER MAINTENANCE AID ZONES
(ABOVE) “YELLOW Indicator” position relative to SAFE OPERATING ZONE (“GREEN Zone”) or SERVICE FILTER (“RED Zone”) markings defines current filter condition, and pushing “YELLOW RESET Button” resets indicator. (See Figure 10, Below)



Figure 10: FILTER MAINTENANCE AID RESET

FMA unit is mounted on the Left Hand front of the Forward Filter Housing Frame and is accessed through LH access door on air induction cowling.

8.5.4.6 REPAIR

- a. The construction details of the component do not warrant field maintenance. Repair of this component requires the component to be sent back to DCI for disposition, or to be replaced.
- b. If the Filter Maintenance Aid fails the function check, disconnect the tube assembly (Appendix A, Figure A-7) from the Filter Maintenance Aid, and inspect for damage or blockage of the tube assembly. Inspect the opening on the Filter Maintenance Aid for obstructions. Remove obstructions as required. Reattach tube assembly and perform function check (Refer to Section 8.5.4.7). If it fails function check, replace FMA.
- c. Replace damaged sheet metal components of the Mount Assembly and missing or damaged hardware.

8.5.4.7 FUNCTION CHECK

CAUTION

THIS PROCEDURE INTRODUCES THE POSSIBILITY OF ENGINE FOD.

CAUTION

IMPROPER USE OF THE ALTIMETER TEST SET COULD RESULT IN DAMAGE TO THE FILTER MAINTENANCE AID.

CAUTION

IMPROPER USE OF THE ALTIMETER TEST SET SUCH AS PULLING AN ALTITUDE OF GREATER THAN 1880 FEET ABOVE FIELD ELEVATION WILL DAMAGE THE FILTER MAINTENANCE AID.

- a. Gain access to the inside of the IBF Filter Assembly by removing the RH Side Filter Assembly (Refer to Section 4.2.1)
- b. Connect the Barfield (or equivalent) altimeter test set vacuum system to the plenum tube assembly (Appendix A, Figure A-7, Item 7), by slipping a piece of 3/16 inch ID vinyl tubing over the end of the tube assembly. Ensure that the fit between the tubing and tube assembly is tight, i.e., no leakage.
- c. Reset the Filter Maintenance Aid by depressing the yellow button marked "PUSH TO RESET" located on the end of the filter maintenance aid (See Figure 10).

- d. The maintenance aid should indicate in the red zone within the following range:

Test Elevation (ft)	0	2000	4000	6000	8000	10000
Altimeter Test Set (ft above test station elevation)	830 ±80	880 ±90	930 ±90	990 ±100	1060 ±110	1130 ±110

8.5.4.8 INSTALLATION

- Position the Filter Maintenance Aid into the Mount Assembly (Appendix A, Figure 7).
- Install hardware and connect Tube Assembly.
- Perform Function Check of Filter Maintenance Aid (Refer to Section 8.5.4.7).

8.5.5 ACTUATOR

(Refer to Appendix A, Figures A-2, A-3 and A-5)

8.5.5.1 REMOVAL

- Gain access to the area by removing either of the Side Filter Assemblies (Refer to Section 8.3.1.1).
- Place cover over engine inlet.
- Depress the Cockpit Indicator/Switch to open Bypass door.
- Remove Aircraft electrical power.
- Disconnect and secure circular connector at Actuator.
- Remove safety wire from the two (2) bolts securing the Actuator.
- Remove the two (2) bolts and associated washers and spacers securing the Actuator.
- Remove Actuator.

8.5.5.2 INSPECTION

- Inspect Actuator for cracks, damage, corrosion, and serviceability.
- Inspect the Circular Connector for damage, security, corrosion and serviceability.
- Inspect the Actuator Supports and the Upper Filter Actuator Support for cracks, damage, corrosion, security, and serviceability.

8.5.5.3 TROUBLESHOOTING

- a. Refer to Table 8-2 for troubleshooting guidance.
- b. Perform Function Check. If Function Check indicates a discrepancy with the Actuator replace the actuator.

8.5.5.4 ADJUSTMENT

The Actuator is adjusted properly by DCI prior to shipment. The Seal on the Top Filter Assembly should be uniformly and slightly compressed against the Upper Frame Assembly with no visible gaps. Use care not to damage the seal when checking for gaps/compression of the Seal. In the event adjustments are required in the field, perform the following steps:

- a. Clear the area of the Bypass Door of any tools, hardware, or other obstructions
- b. Ensure aircraft power is ON and depress the Cockpit Indicator/Switch to open Bypass door.
- c. Remove the safety wire and bolt that connects Actuator Rod to the Top Filter Assembly and loosen the Jam Nut on the end of the Actuator Rod (Refer to Figure 11).

CAUTION

TO PREVENT INTERNAL DAMAGE TO THE ACTUATOR, HOLD THE ROD END WHILE LOOSENING, TIGHTENING, OR APPLYING TORQUE TO THE JAMB NUT.

- d. Adjust as necessary by extending or retracting the Actuator Rod End by turning the end of the Actuator Rod.
- e. Re-connect the Actuator Rod to the Top Filter Assembly and close the Bypass door and check seal. Repeat adjustments as necessary until a uniform complete seal has been formed around the Top Filter Assembly and the contacting surface of the Upper Frame Assembly (approximately 50% of its non-compressed cross-section). Repeat adjustment as necessary to obtain proper seal.
- f. After final adjustments are made, tighten the Jam Nut and torque (25 to 30 inch-pounds).
- g. Tighten the bolt that connects the Actuator Rod to the Top Filter Assembly and safety wire bolt.
- h. Perform Function Check (Refer to Section 8.5.5.7)

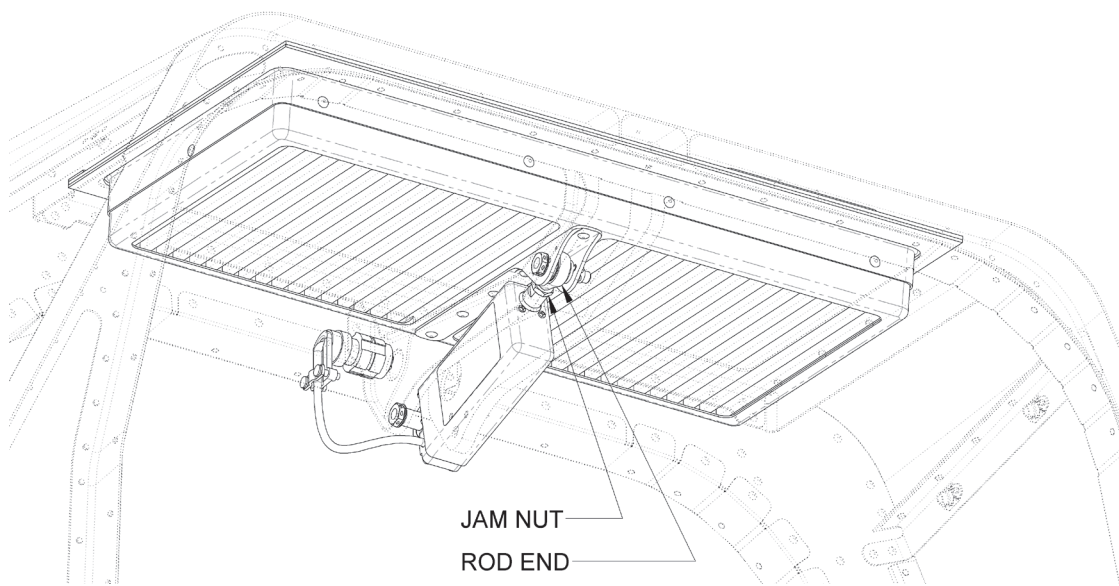


Figure 11 ACTUATOR ADJUSTMENT

8.5.5.5 CALIBRATION

Not applicable.

8.5.5.6 REPAIR

- a. Repair of the actuator is limited to removal of minor surface corrosion from the actuator shaft using fine sandpaper or crocus cloth (Table 8-3).
- b. Damage to the actuator, such as cracking of the attachment lug, distortion, warping, or failure to actuate requires disposition by DCI or replacement.

8.5.5.7 FUNCTION CHECK

- a. Clear the area of the Bypass Door of any tools, hardware, or other obstructions.
- b. Ensure that aircraft power is ON, and then depress the Cockpit Indicator/Switch to signal the Actuator to close the bypass door.
- c. Inspect the Filter Assembly Seal compression (the seal should be in contact with the perimeter of the filter and surrounding framework with no visible gaps, the seal should be slightly compressed).
- d. Depress the Cockpit Indicator/Switch to signal the Actuator to open the bypass door.
- e. Depress the Cockpit Indicator/Switch to return the Bypass Door to the closed position and aircraft power may now be removed if desired.

8.5.5.8 INSTALLATION

CAUTION

THIS PROCEDURE INTRODUCES THE POSSIBILITY OF ENGINE FOD.

- a. With the Actuator extended, locate Actuator and install two (2) bolts to secure the Actuator to the Actuator Supports and the Upper Filter Actuator Support.
- b. Safety Wire the bolts.
- c. Connect and secure circular connector at Actuator.
- d. Apply Aircraft electrical power.
- e. Depress the Cockpit Indicator/Switch to close the Bypass door and perform functional check per Section 8.5.5.7.
- f. Upon completion of Bypass Door Function Check remove cover over engine inlet.
- g. Replace the Side Filter Assembly that was removed to gain access to the Actuator. Ensure that aircraft power is OFF.

8.5.6 WIRING, WIRING HARNESS, CONNECTORS, BACKSHELLS, CIRCUIT BREAKER

(Refer to Appendix A, Figures A-9 thru A-21)

8.5.6.1 REMOVAL

- a. Prepare aircraft for work performed on the electrical system by disconnecting the battery.
- b. Remove hardware, clamps, spiral wrap from component, as applicable. Tag interfacing components for later installation. Remove affected components.

8.5.6.2 INSPECTION

The IBF wiring, wiring harness and associated components is constructed of standard aircraft wire and connectors. Standard aircraft maintenance procedures should be used for inspections and repair of the harness and connectors. Routine aircraft maintenance should include visual inspection for evidence of chafing, damage, corrosion and ensuring the circuit breaker and all pins, connectors, and backshells are secure. Inspect wiring, wiring harness and associated components per AC 43.13-1, Chapter 11.

8.5.6.3 TROUBLESHOOTING

- a. See Table 8-2 for troubleshooting guidance.
- b. See Appendix A, Figures A-9 thru A-21 for wiring diagram, wire marking and identification, routing, and installation information.

8.5.6.4 ADJUSTMENT / CALIBRATION

Not applicable.

8.5.6.5 REPAIR

Standard aircraft maintenance procedures should be used for repair of the wiring, wire harness and associated components. See Appendix A, Figures A-9 thru A-21 for wiring diagram, wire marking and identification, routing, and installation information. Perform repairs to affected components per AC 43.13-1, Chapter 11.

8.5.6.6 INSTALLATION

- a. Prepare aircraft for work performed on the electrical system by disconnecting the battery.
- b. Install affected component using appropriate hardware. Connect wiring per wiring diagram. Install clamps, spiral wrap and heat shrink as applicable to affected components per AC 43.13-1, Chapter 11.

8.6 PROTECTIVE TREATMENT

- a. The assemblies and structural components of the IBF system are composed primarily of aluminum alloy materials, 304 Stainless Steel. All components, except for standard hardware components and fasteners, and vendor components, are coated with an epoxy primer. Scratched or damaged aluminum components should be touched up with a small paint brush dipped in epoxy primer. Prepare epoxy primer per manufacturer's instructions.
- b. Aircraft finishes scratched or damaged should be recoated with the finish specified in the aircraft maintenance records and maintenance manual.
- c. For the systems and electrical components, there are no protective treatments specified. Contact DCI for disposition of damaged components or replace the damaged component.

Table 8- 1 Protective Treatment for Components

Component	Material	Limits of Damage	Protective Treatment
Filter Assembly(s)	Alum. Alloy	Scratches, pitting, gouges must be less than 20% of part thickness. See note 1.	Re-apply Epoxy Primer Ref Table 8-3
Upper Filter Frame Assembly	Alum. Alloy	Scratches, pitting, gouges must be less than 10% of part thickness. See note 1.	Re-apply Epoxy Primer Ref Table 8-3
Forward Frame Assembly	Alum. Alloy	Scratches, pitting, gouges must be less than 10% of part thickness. See note 1.	Re-apply Epoxy Primer Ref Table 8-3
Aft Frame Assembly	Alum. Alloy	Scratches, pitting, gouges must be less than 10% of part thickness. See note 1.	Re-apply Epoxy Primer Ref Table 8-3
Filter Maint. Aid Bracket	Alum. Alloy Sheet Stk.	Inspect for Serviceability	Chemical conversion coating. Ref Table 8-3 Re-apply Epoxy Primer Ref Table 8-3
Lower Side Filter Supports	Alum. Alloy Sheet Stk.	Scratches, pitting, gouges must be less than 10% of part thickness. See note 1.	Chemical conversion coating. Ref Table 8-3 Re-apply Epoxy Primer Ref Table 8-3

Notes:

1. Contact DCI for disposition instructions for components with more severe discrepancies or replace.

8.7 TROUBLESHOOTING GUIDE

The following table defines the probable cause, remedy, and ICA reference to the applicable procedure for correcting the trouble listed in the table. Multiple failures are not addressed in this table such as a failed actuator and failed wiring existing at the same time.

Table 8- 2 Troubleshooting Guide

ITEM	TROUBLE	PROBABLE CAUSE	REMEDY	ICA REF
1	FILTER light fails to illuminate	Faulty connector Faulty circuit Faulty cockpit ind/switch Faulty delta P switch	Check connectors to aircraft power, cockpit indicator/switch, and actuator. Check circuit continuity and repair circuit. Verify using circuit tester; replace cockpit indicator/switch. Replace differential pressure switch.	Para. 8-5.5. Para. 8-5.5. Para. 8-5.1. Para. 8-5.2.
2	FILTER light is dim	Failed LED(s) in indicator	Verify using circuit tester; replace cockpit indicator/switch.	Para. 8-5.1.
3	FILTER light stays illuminated	Bypass obstructed Faulty delta P switch	Clear bypass path. Replace differential pressure switch.	Para. 8-5.2.
4	BYPASS light fails to illuminate	Faulty connector Faulty circuit Faulty cockpit ind/switch Faulty delta P switch	Check connectors to aircraft power, cockpit indicator/switch, and actuator. Check circuit continuity and repair circuit. Verify using circuit tester; replace cockpit indicator/switch. Replace differential pressure switch.	Para. 8-5.5. Para. 8-5.5. Para. 8-5.1. Para. 8-5.2.
5	BYPASS light is dim	Failed LED(s) in indicator	Verify using circuit tester; replace cockpit indicator/switch.	Para. 8-5.1.
6	BYPASS light stays illuminated	Bypass obstructed Faulty delta P switch	Clear bypass path. Replace differential pressure switch.	Para. 8-5.2.
7	Bypass doors fail to close	Faulty connector Faulty circuit Faulty cockpit ind/switch	Check connectors to aircraft power, cockpit indicator/switch, and actuator. Check circuit continuity and repair circuit. Check switch continuity; replace cockpit indicator/switch.	Para. 8-5.5. Para. 8-5.5. Para. 8-5.1.
8	Bypass doors fail to open	Faulty connector Faulty circuit Faulty cockpit ind/switch Faulty actuator	Check connectors to aircraft power, cockpit indicator/switch, and actuator. Check circuit continuity and repair circuit. Check switch continuity; replace cockpit indicator/switch. Replace actuator.	Para. 8-5.5. Para. 8-5.5. Para. 8-5.1 Para. 8-5.4.
9	FILTER light illuminates	Obstructed inlet Dirty filter	Clear engine inlet. Verify by checking FMA & inspect filter; service filter.	Para. 7-3.
10	Engine fails PAC	Obstructed inlet Dirty filter	Clear engine inlet. Verify PAC results, check FMA, & inspect filter; service filter. NOTE: If engine still fails PAC - check engine.	Para. 7-3.

8.8 SPECIAL TOOLS / SPECIAL EQUIPMENT

NOTE

Standard Aircraft Mechanic Tools are not listed.

- a. Hand Seamer – 1 1/4 inch maximum jaw depth. Hand seamers are available through many commercial aircraft supply stores and also through commercial heating and air conditioning supply stores. Recommend the following: Malco Tools “Hand Seamer with Forged Steel Jaw”, Catalog # S2, S3 and S6. The S3 model is also available through Wicks Aircraft Supply, Part Number TP44-0, “Offset Hand Seamer”.
- b. Barfield or Equivalent Manufacturer Altimeter Test Set

8.9 CONSUMABLE MATERIALS, SUPPLIES, AND PROTECTIVE TREATMENT SPECIFICATIONS

Table 8- 3 Consumable Materials, Supplies and Protective Treatment Specifications

Item	Description	Spec / Part No.
Consumables		
1	Sealant	AMS 3276
2	Sealant	Mil-S-8802
3	Sealant	RTV 736
4	Sandpaper 400-600 grit	Commercial avail.
5	Crocus Cloth	Commercial avail.
Supplies		
6	Air Filter Oil	Squeeze bottle 4.6 oz.– 100100-046
6.1	Air Filter Oil	Squeeze bottle 6.6 oz.– 100100-066
6.2	Air Filter Oil	Gallon Container - P/N 100101-000
7	Air Filter Cleaner	Gallon Container - P/N 100201-000
7.1	Air Filter Cleaner	6.6 gallon container - ZOK Mfr. P/N ZOK 27 or Sky Geek P/N ZOK-27-6-6CON
Protective Treatment Specs		
8	Epoxy Primer.	Mil-PRF-23337
9	Chemical Conversion Coating	Mil-C-5541 (One commercial trade name, “Alodine”)
10	Aircraft Finish	See Aircraft Records for appropriate Finish / Top Coat.

APPENDIX A

PARTS FIGURES

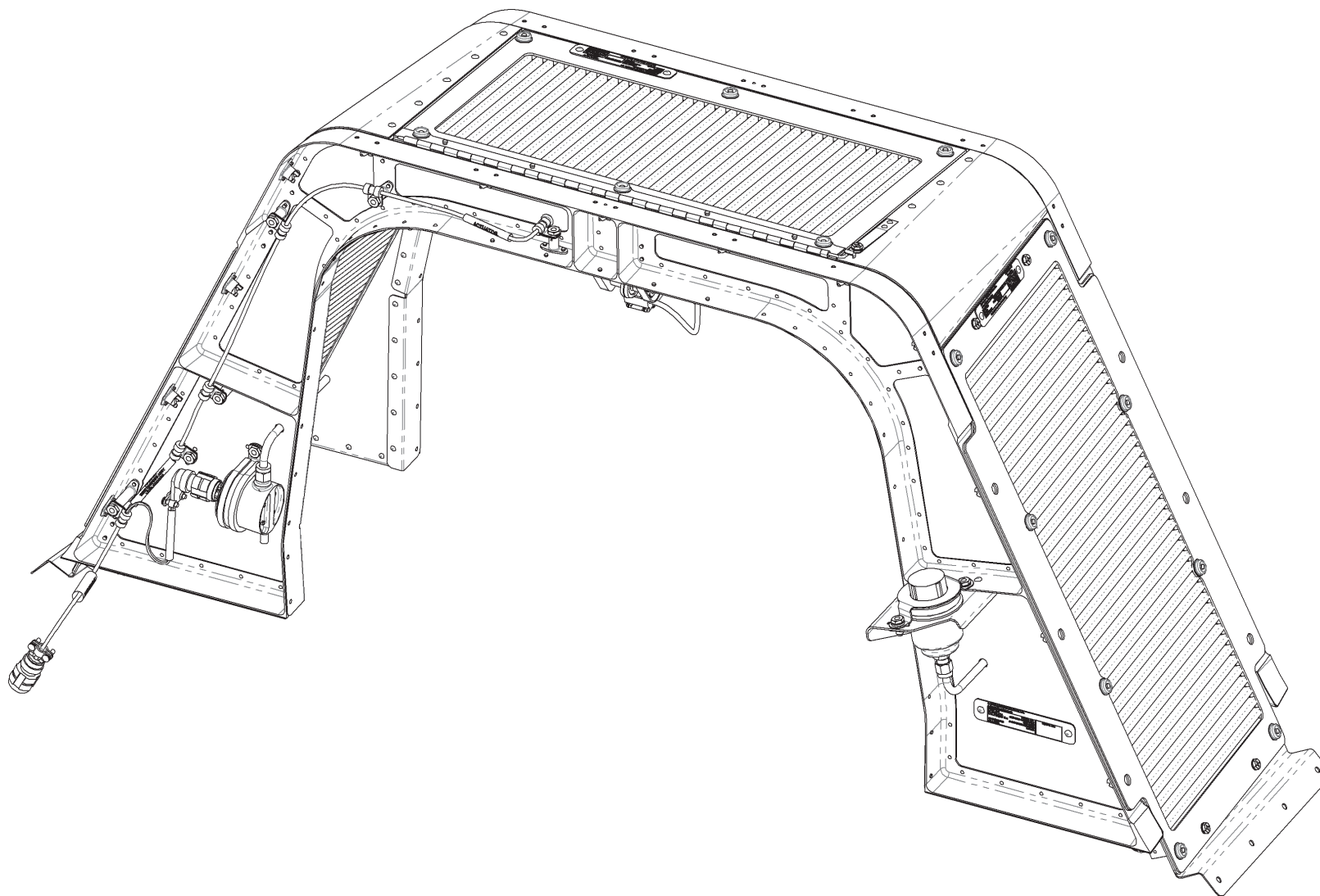


Figure A-1: IBF System

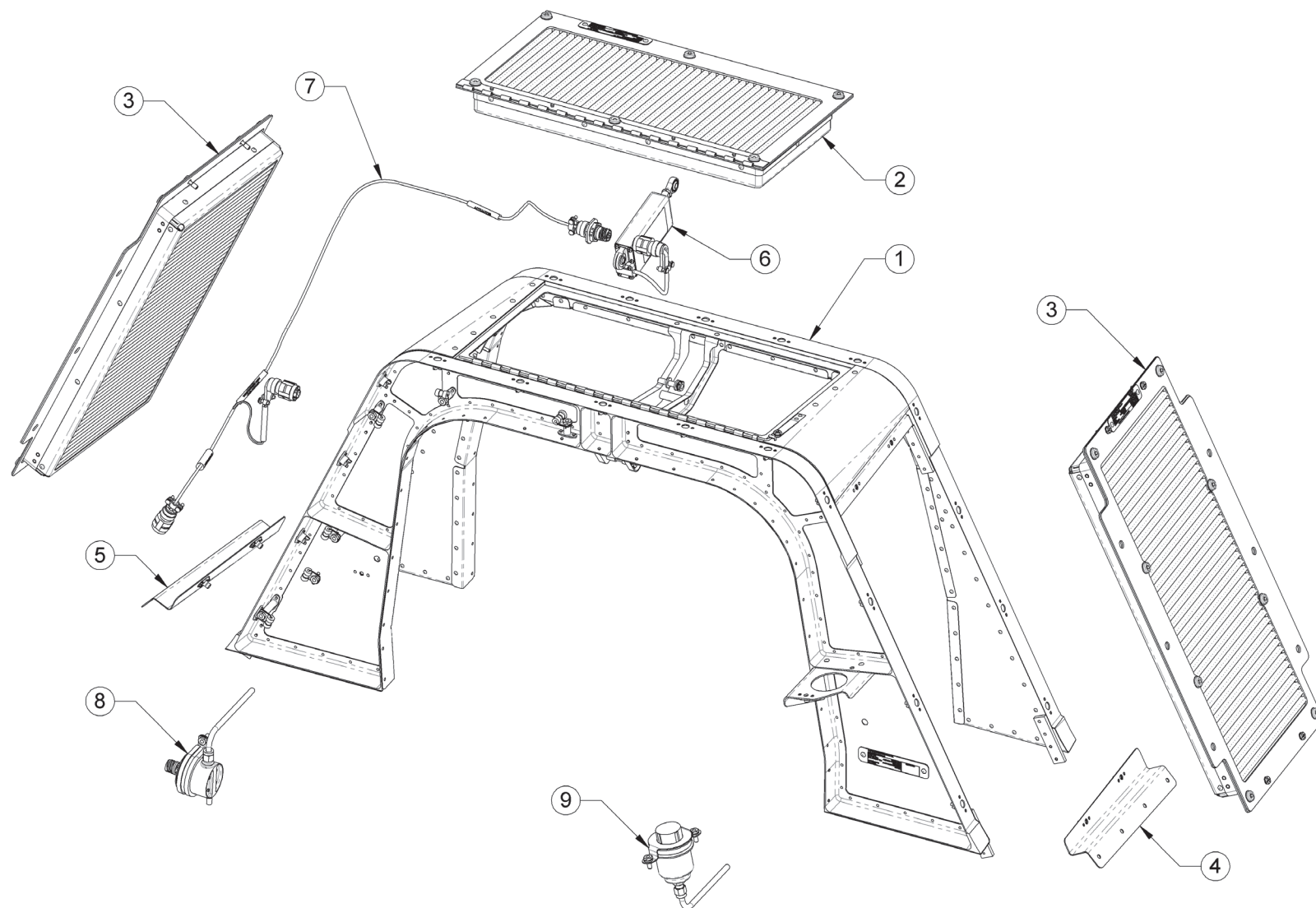


Figure A-2: Major Assemblies

INDEX NUMBER	PART NUMBER	ITEM NAME	UNIT PER ASSY	A V A I L
		Figure A-2: Inlet Barrier Filter System Kit		
	119000-101 119000-105	Kit - IBF System, A119		P
1	119150-105 (current) 119150-101 (superseded)	Structural Assembly	1	P
2	119300-101	Filter Assembly - Upper	2	P
3	119350-101	Filter Assembly - Side	1	P
4	119707-101	Support Assembly, Side Filter - Lower	1	P
5	119707-102	Support Assembly, Side Filter - Lower	1	P
6	106113-203	Actuator	1	P
7	119400-101	Wire Harness Assembly	1	P
8	100409-101	Differential Pressure Switch	1	P
9	104441-201	Maintenance Indicator	1	P
		AVAIL CODE DEFINITION P Procurable NP Non Procurable SP Normal stock/procurable See introduction on availability codes for additional information.		

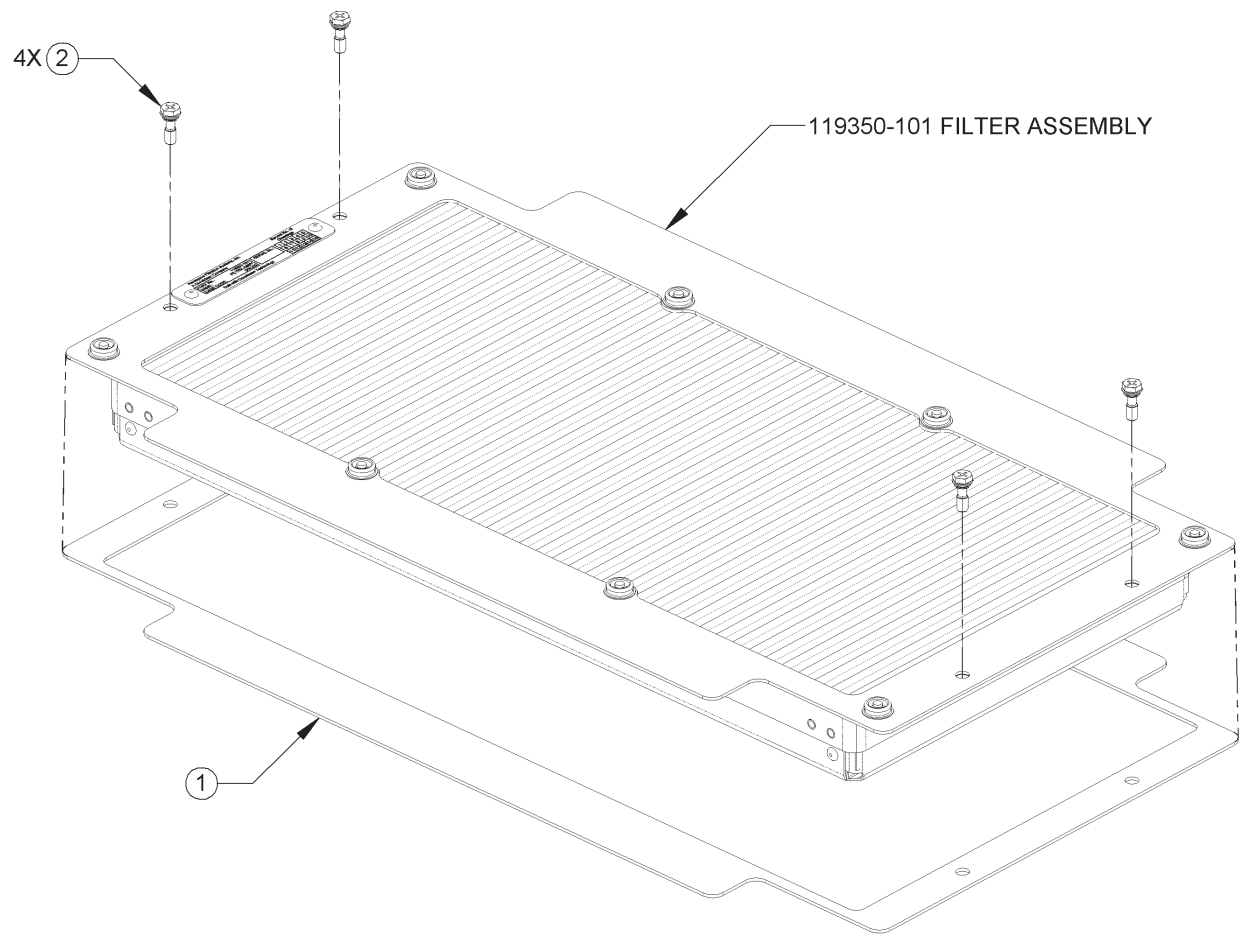


Figure A-3: Side Filter Assembly

INDEX NUMBER	PART NUMBER	ITEM NAME	UNIT PER ASSY	A V A I L
		Figure A-3: Side Filter Assembly		
	119350-101	Filter Assembly - Side		P
1	119354-201	Seal, Filter, Side	1	P
2	WES7900-10-A-10	Captive Bolt	4	P

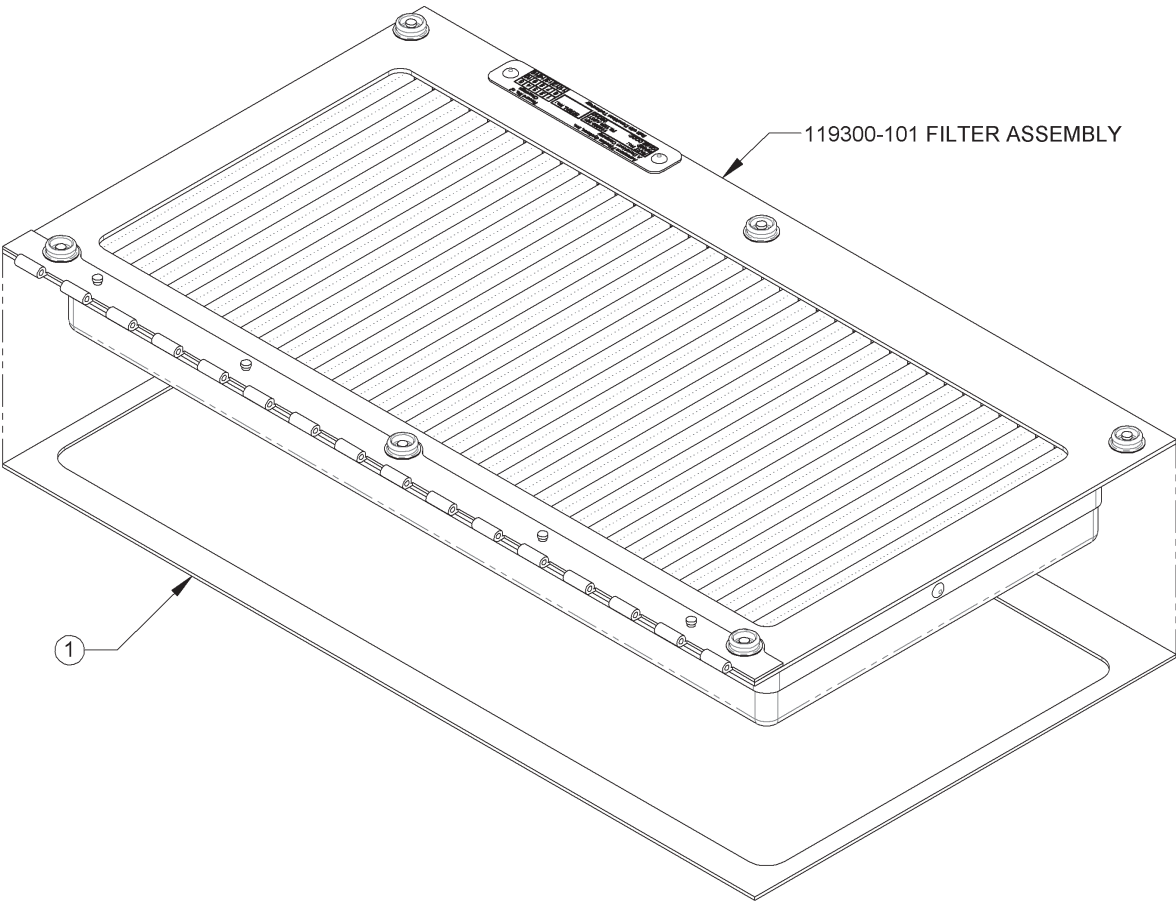


Figure A-4: Upper Filter Assembly

INDEX NUMBER	PART NUMBER	ITEM NAME	UNIT PER ASSY	A V A I L
		Figure A-4: Upper Filter Assembly		
	119300-101	Filter Assembly - Upper		P
1	119302-201	Seal, Filter, Upper	1	P

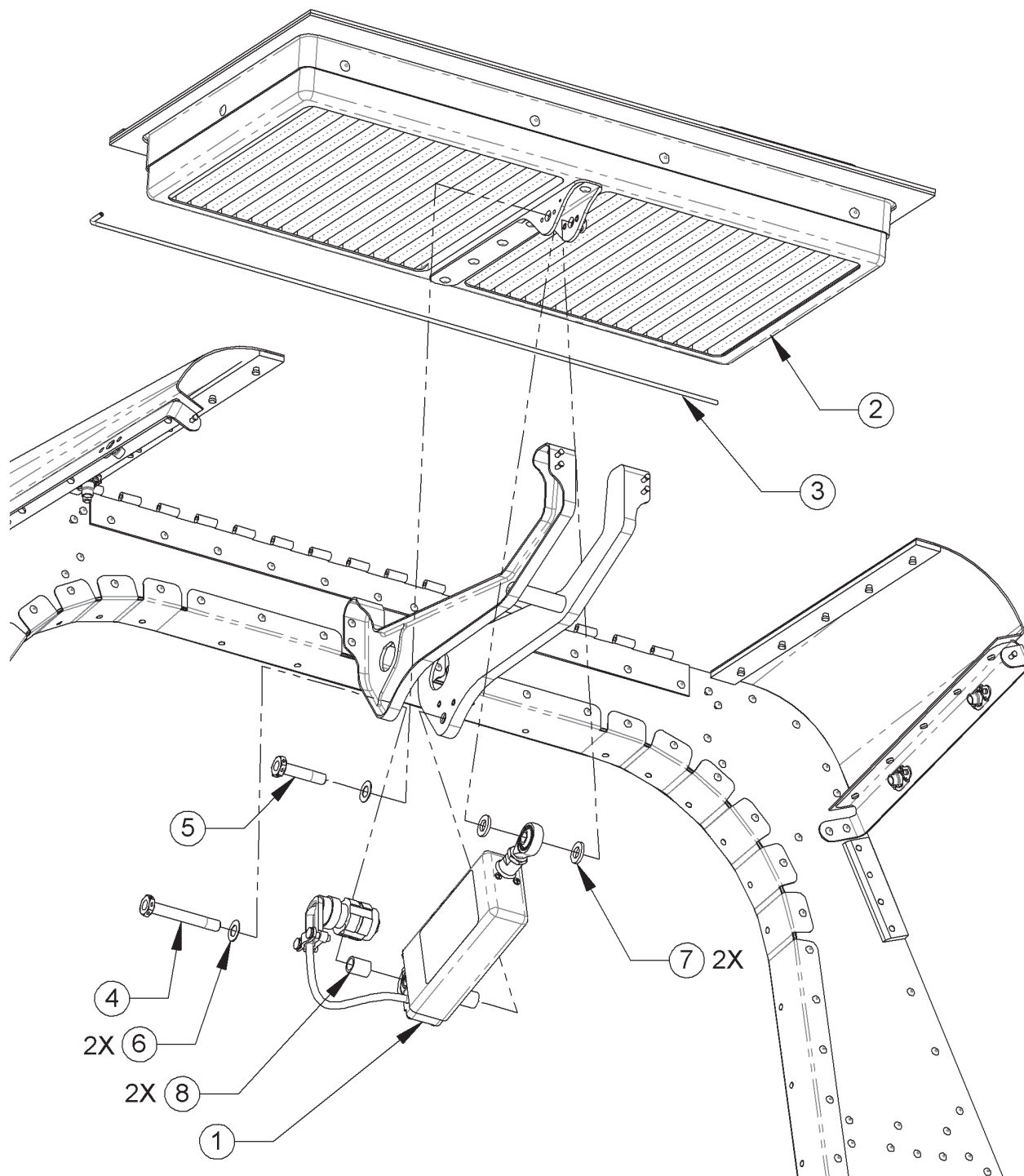


Figure A-5: Actuator & Upper Filter/Bypass Door Instl (Superseded)
(Aft Frame Assembly not shown for clarity)

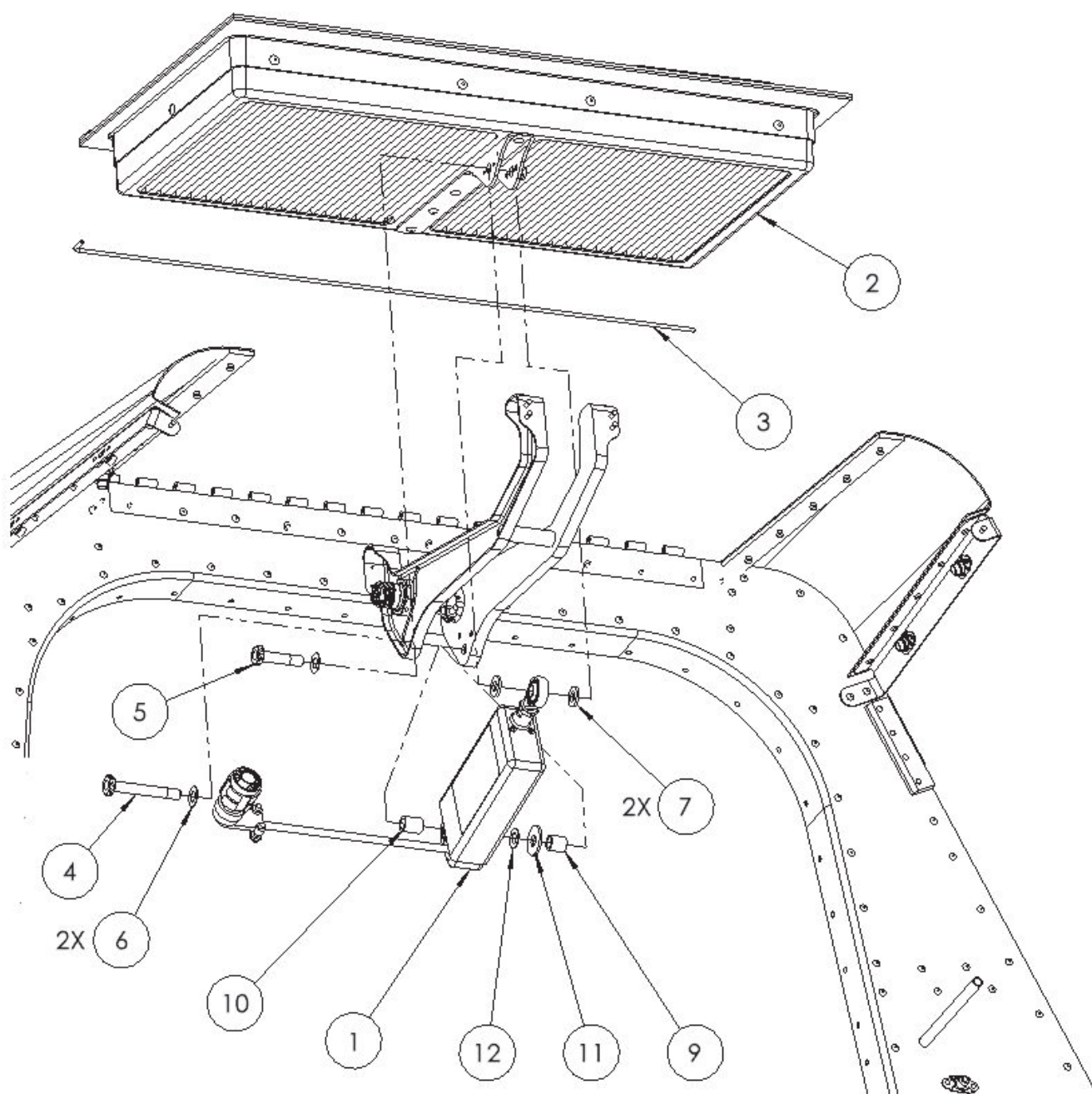


Figure A-6: Actuator & Upper Filter/Bypass Door Instl (Current)
(Aft Frame Assembly not shown for clarity)

INDEX NUMBER	PART NUMBER	ITEM NAME	UNIT PER ASSY	A V A I L
		Figure A-5 & A-6: Actuator & Upper Filter/Bypass Door Instl		
1	106113-203	Actuator	1	P
2	119300-101	Filter Assembly - UPR	1	P
3	119705-201	Hinge Pin	1	P
4	NAS6204-23H	Bolt	1	SP
5	NAS6204-12H	Bolt	1	SP
6	NAS1149D0416J	Washer	2	SP
7	NAS1149D0463J	Washer	2	SP
8	NAS43DD4-29FC (Superseded)	Spacer	2	SP
9	NAS43DD4-25FC (Current)	Spacer	1	SP
10	NAS43DD4-30FC (Current)	Spacer	1	SP
11	MS27183-52 (Current)	Washer	1	SP
12	NAS1149C0416R (Current)	Washer	1	SP

119150-105 STRUCTURAL ASSEMBLY
119150-101 (Superseded)

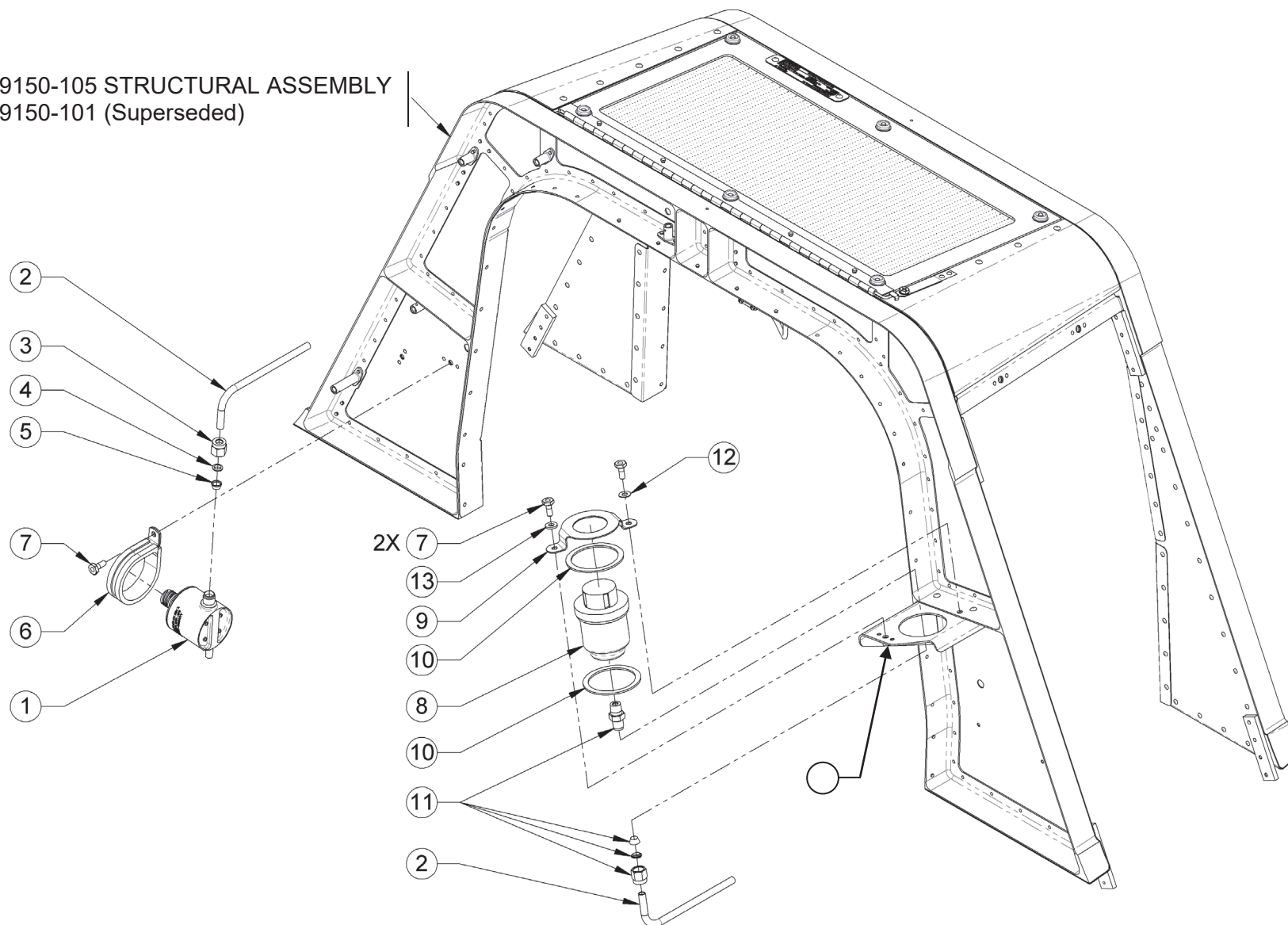


Figure A-7: DP Switch & Maintenance Indicator Installation

INDEX NUMBER	PART NUMBER	ITEM NAME	UNIT PER ASSY	A V A I L
		Figure A-7: DP Switch & Maintenance Indicator Inst		
1	100409-101	Differential Pressure Switch	1	P
2	119505-201	Tube	2	P
3	A-402-1	Nut	1	P
4	A-404-1	Back Ferrule	1	P
5	A-403-1	Front Ferrule	1	P
6	MS21919-WDG28	Clamp	1	SP
7	NAS6203-3	Bolt	3	SP
8	104441-201	Maintenance Indicator	1	P
9	119502-201	Retainer	1	P
10	100444-201	Cushion	2	P
11	A-400-1-2	Adapter	1	P
12	NAS1149D0316J	Washer	1	SP
13	NAS1149D0363J	Washer	1	SP
14	119501-201	Bracket, Maintenance Indicator	1	P

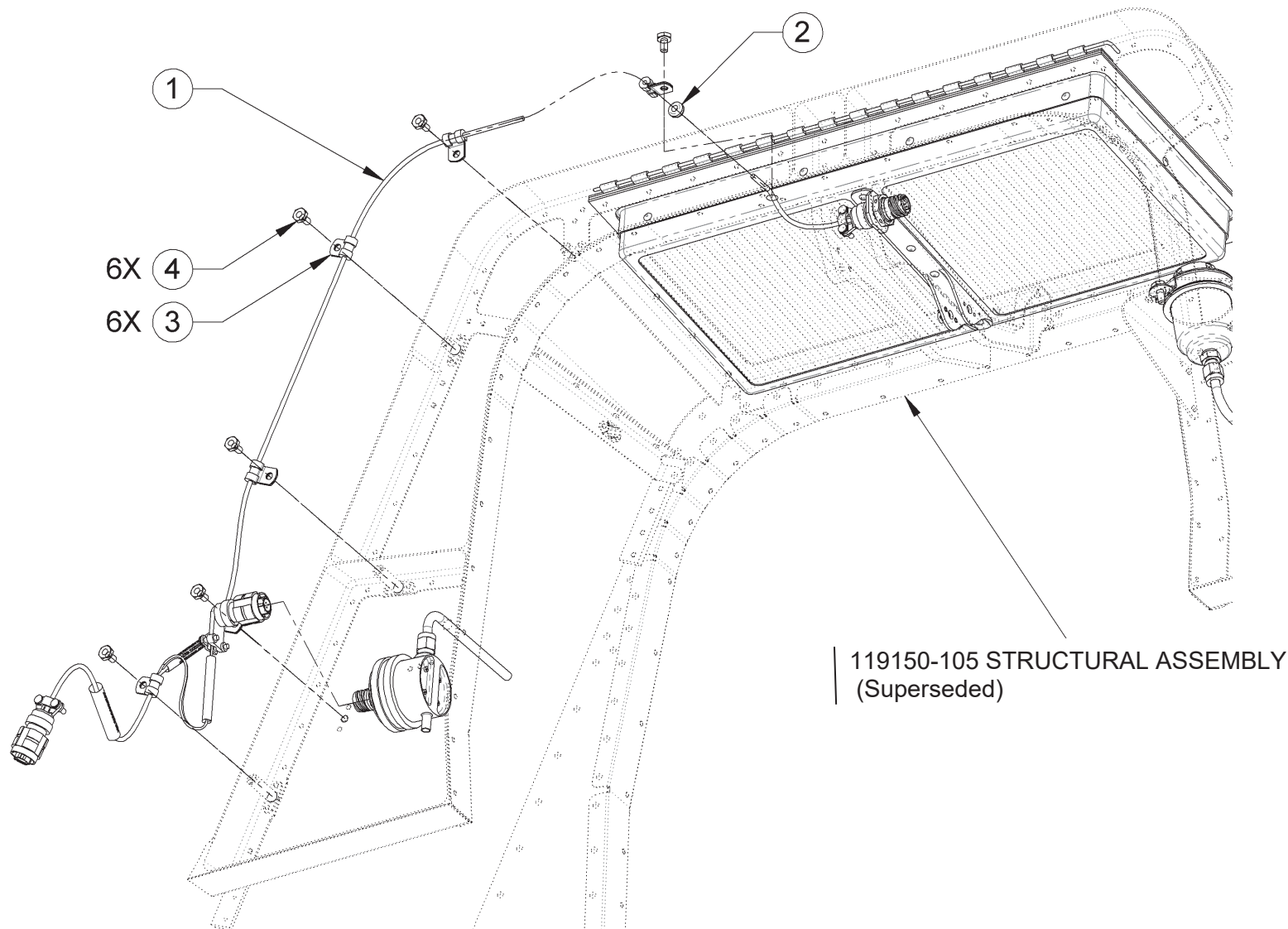


Figure A-8: Wire Harness Assembly Instl (Superseded)

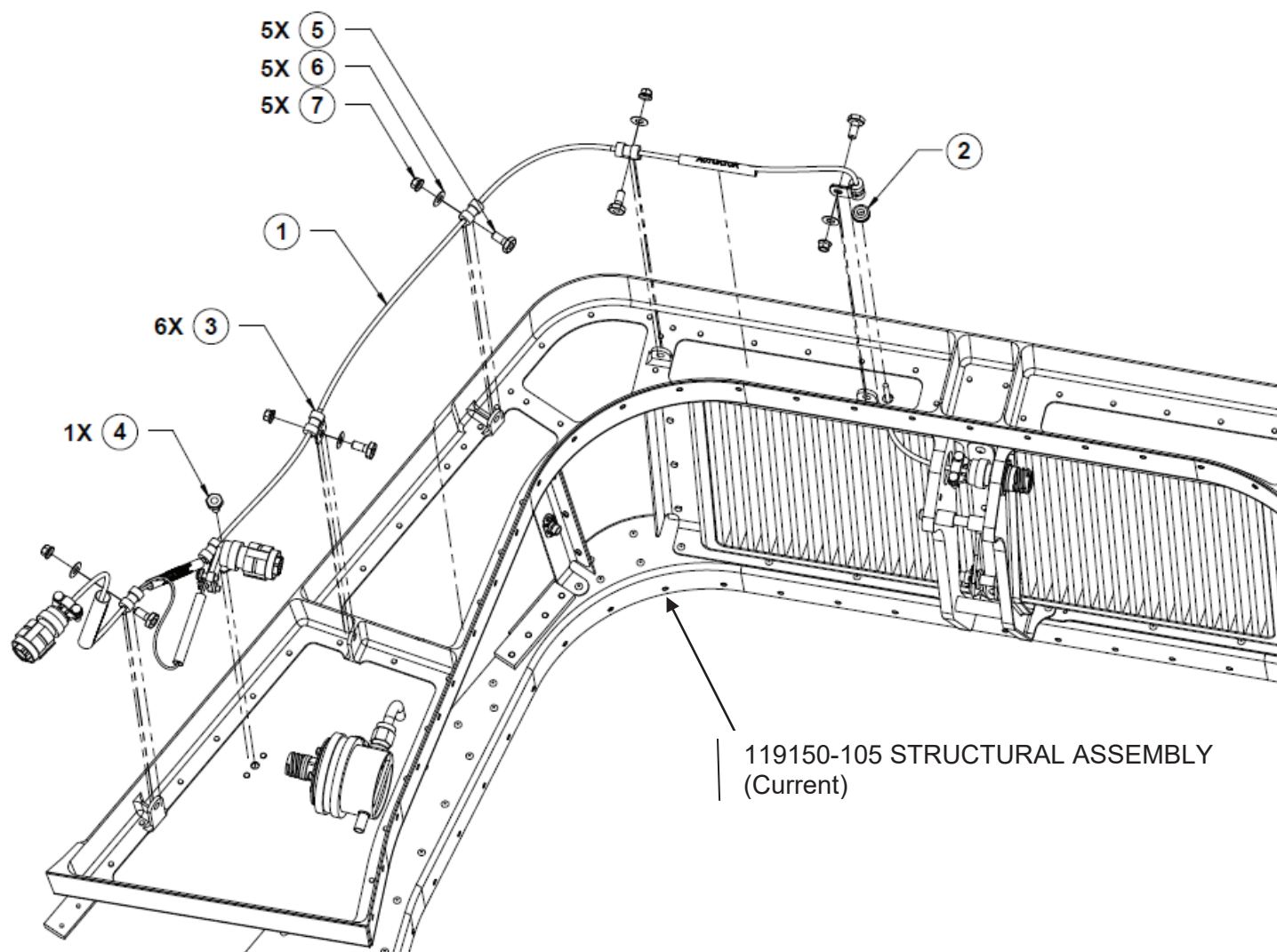


Figure A-9: Wire Harness Assembly Instl (Current)

INDEX NUMBER	PART NUMBER	ITEM NAME	UNIT PER ASSY	A V A I L
		Figure A-8 & A-9: Wire Harness Assembly Instl		
1	119400-101	Wire Harness Assembly	1	P
2	MS35489-4	Grommet	1	SP
3	MS21919-WDG2	Clamp	6	SP
4	NAS6203-1 (Superseded)	Bolt	6	SP
4	NAS6203-1 (Current)	Bolt	1	SP
5	NAS6203-2 (Current)	Bolt	5	SP
6	NAS1149D0316J (Current)	Washer	5	SP
7	MS21043-3 (Current)	Nut	5	SP

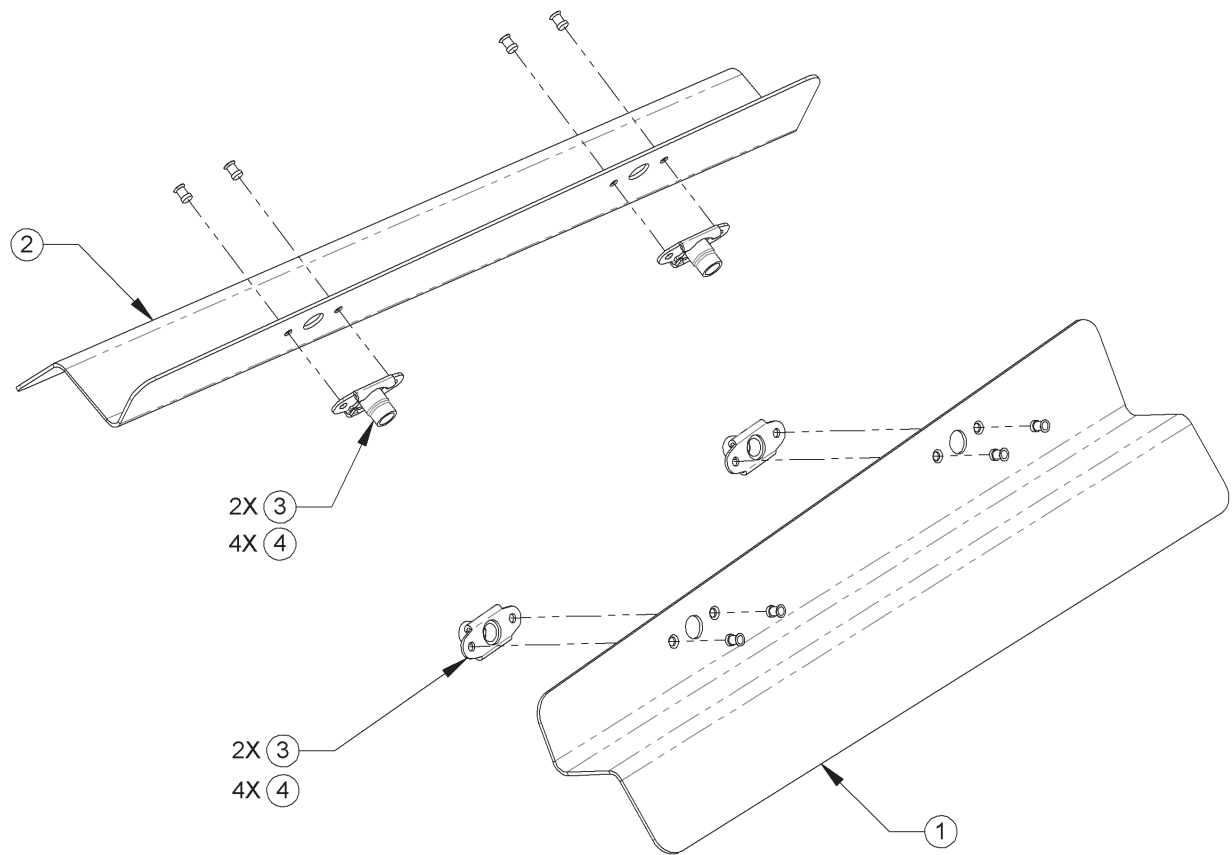


Figure A-10: Side Filter Support Assembly

INDEX NUMBER	PART NUMBER	ITEM NAME	UNIT PER ASSY	A V A I L
	119707-101 119707-102	Figure A-10: Side Filter Support Assembly		
1	119701-201	Support, Side Filter, Lower	1	NP
2	119701-202	Support, Side Filter, Lower	1	NP
3	NAS1870-3-3	Platenut	4	SP
4	NAS1097AD3-3-5	Rivet	8	SP





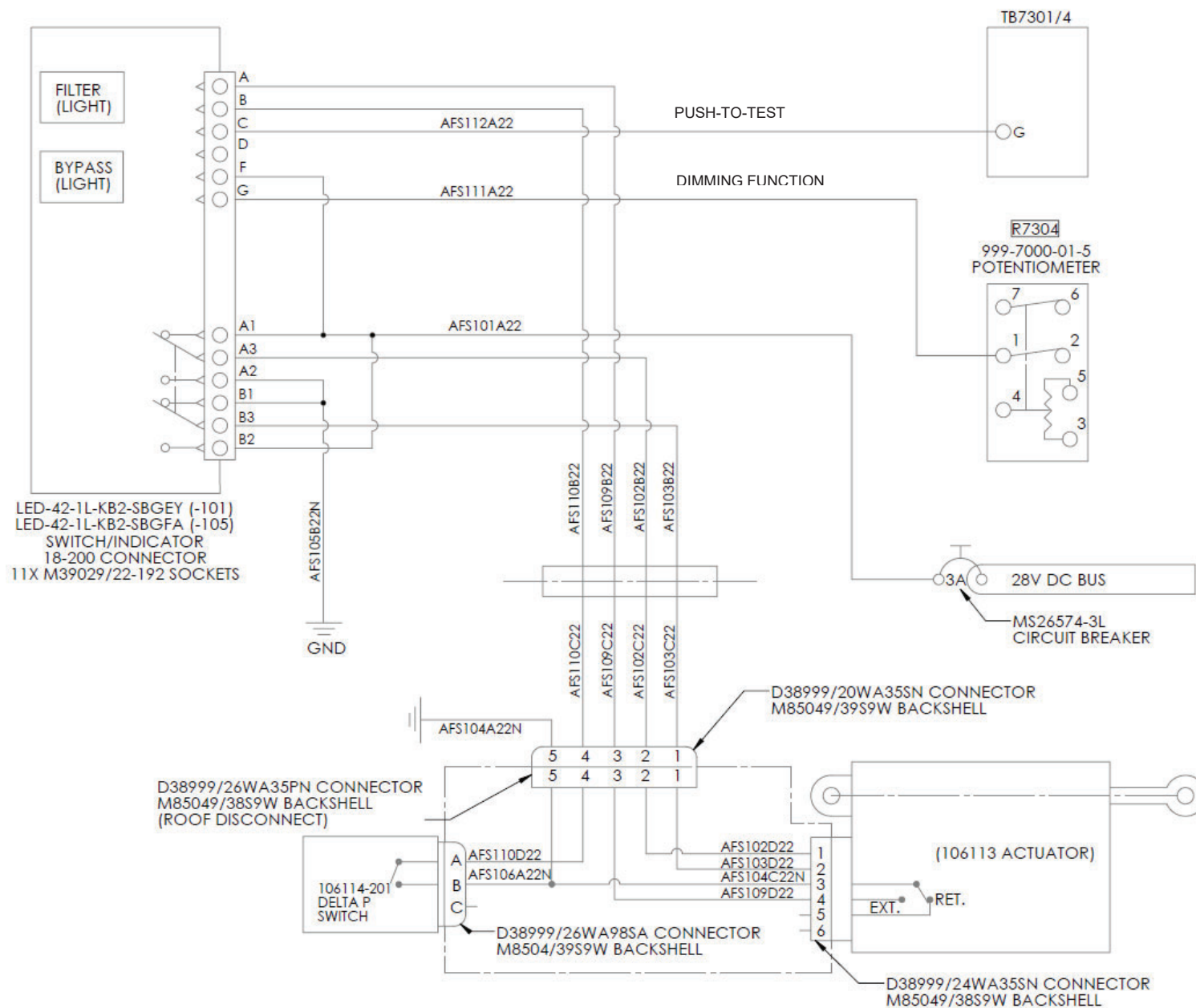


Figure A-13: Electrical Schematic for IBF AW119 G1000H

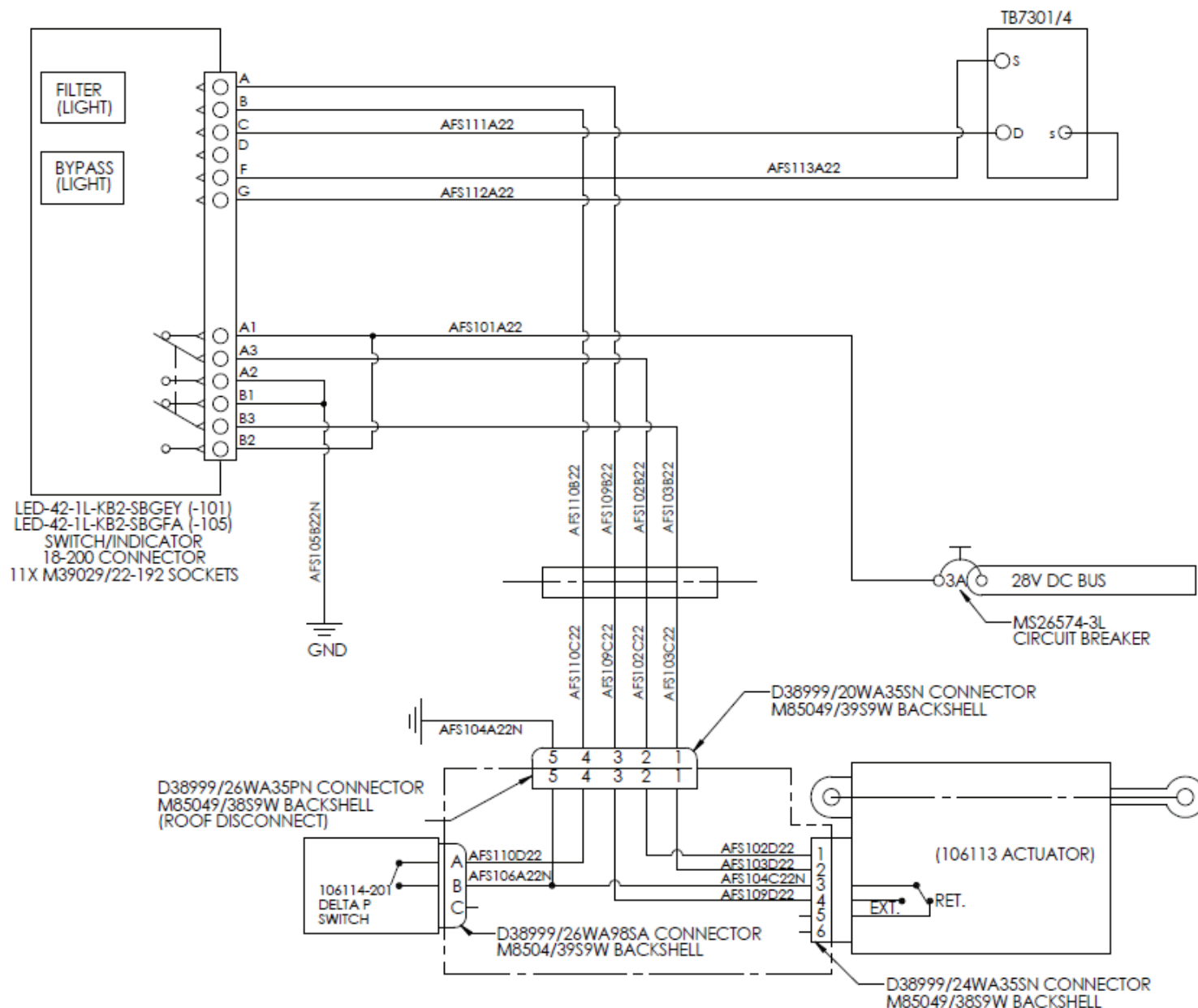
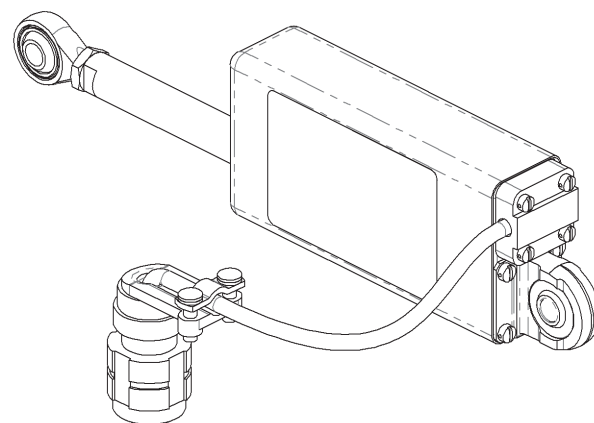
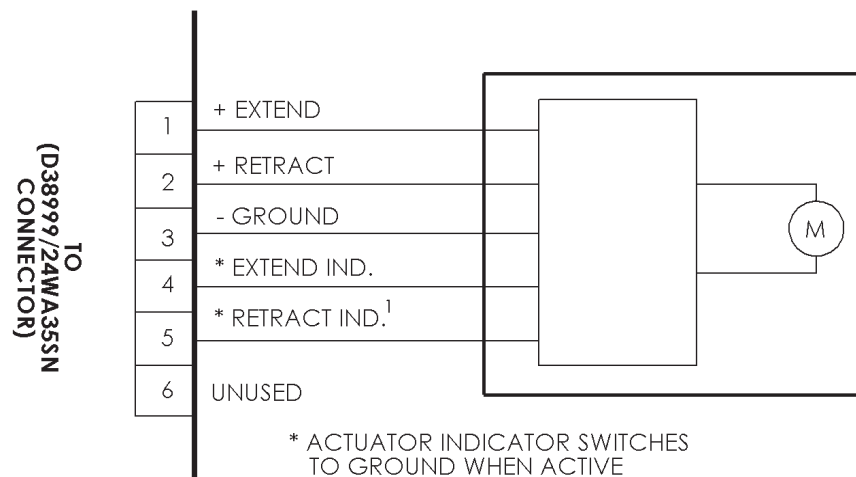
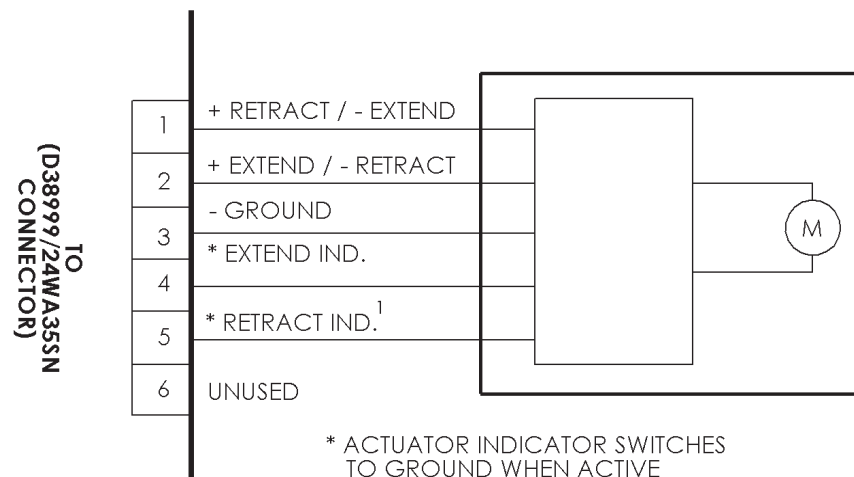


Figure A-14: Electrical Schematic for IBF AW119 Genesys IDU-680P



NOTES:

1. NOT USED IN THIS INSTALLATION

Figure A-15: Actuator Schematic

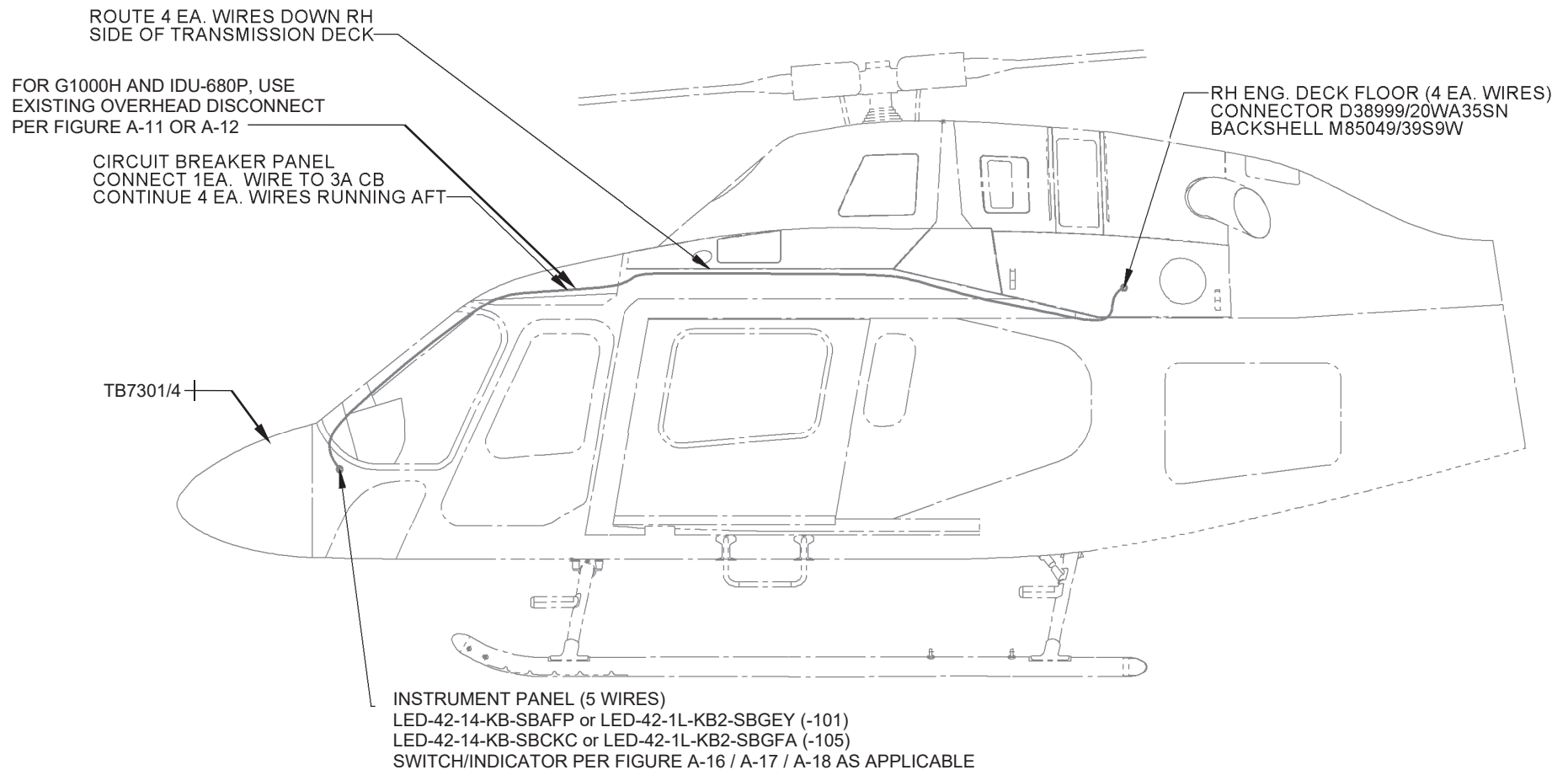
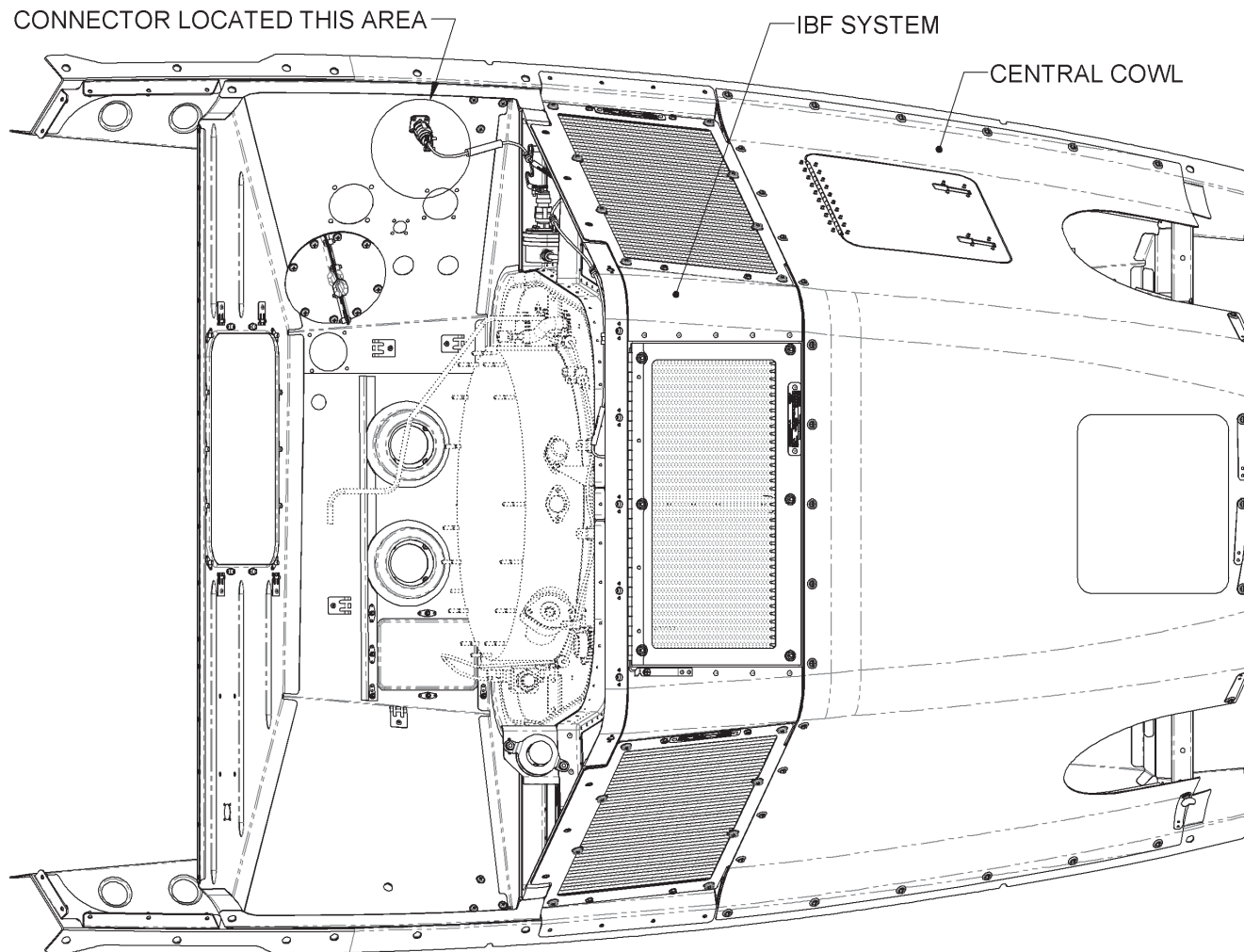


Figure A-16: Wire Routing



ENGINE DECK ELECTRICAL CONNECTOR LOCATION
VIEW LKG DOWN
(Fwd Cowl not shown for clarity)

Figure A-17: IBF Connector Location

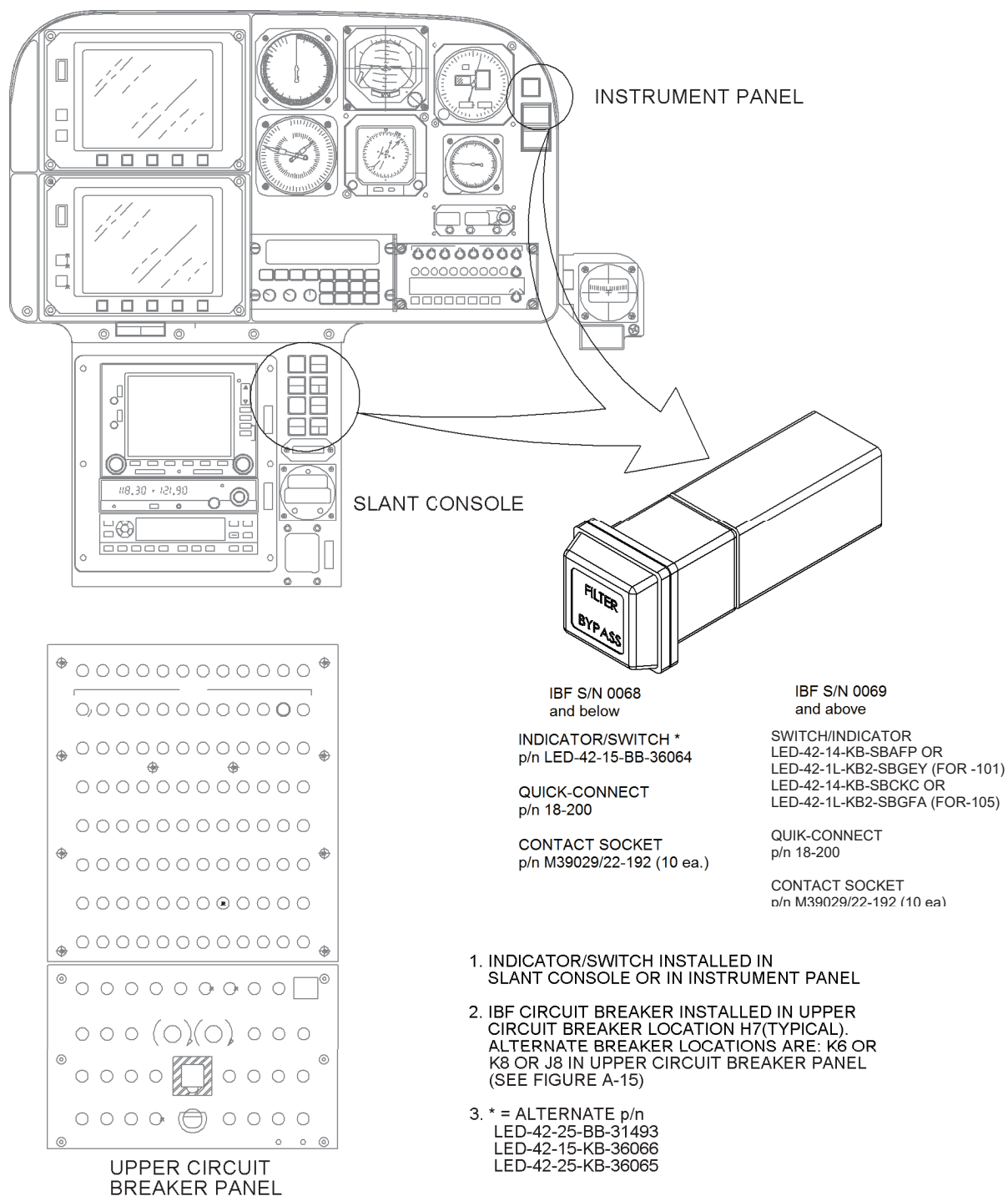


Figure A-18: IBF Indicator/Switch and Circuit Breaker Location

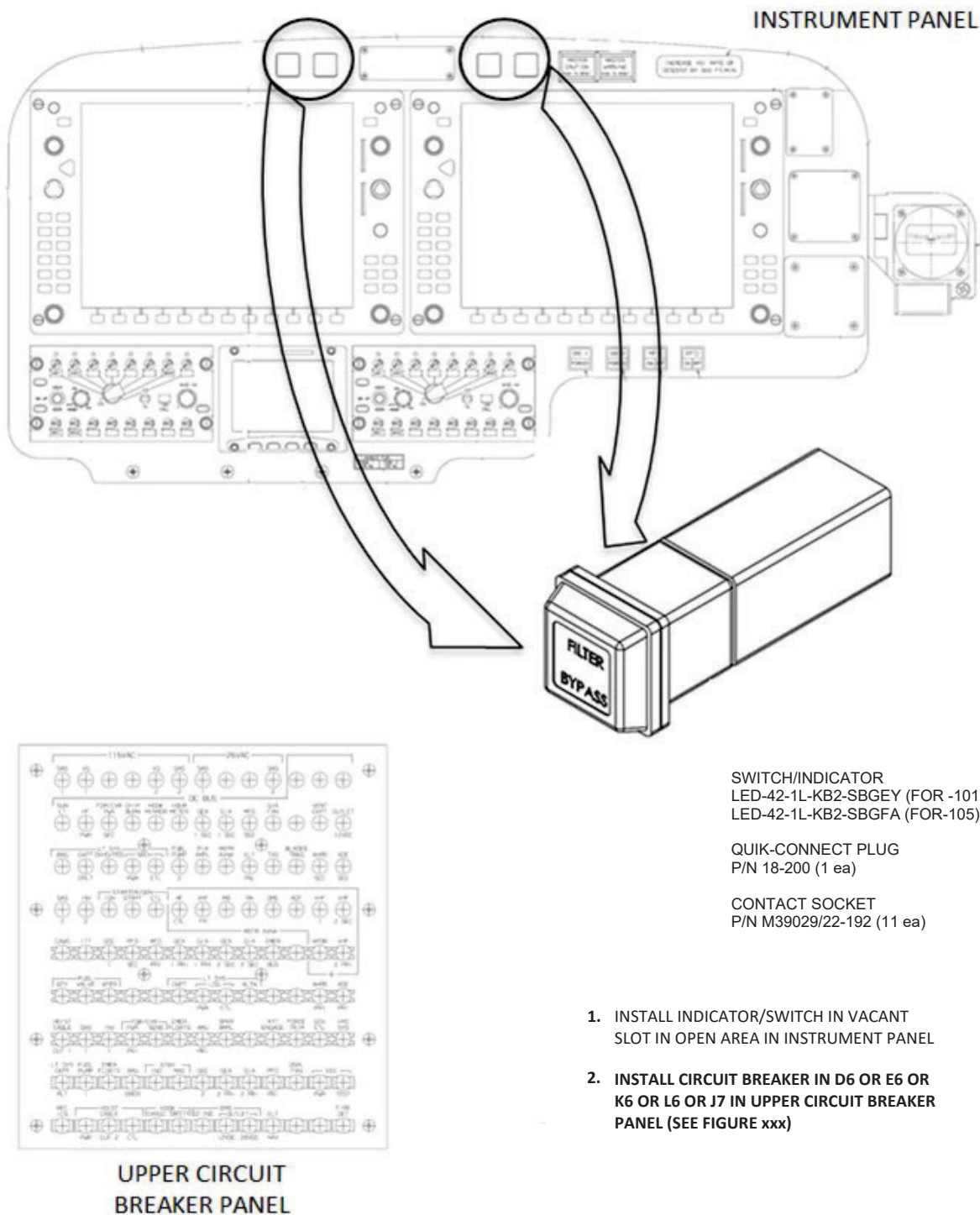


Figure A-19: IBF Indicator/Switch and Circuit Breaker Location for AW119 G1000H

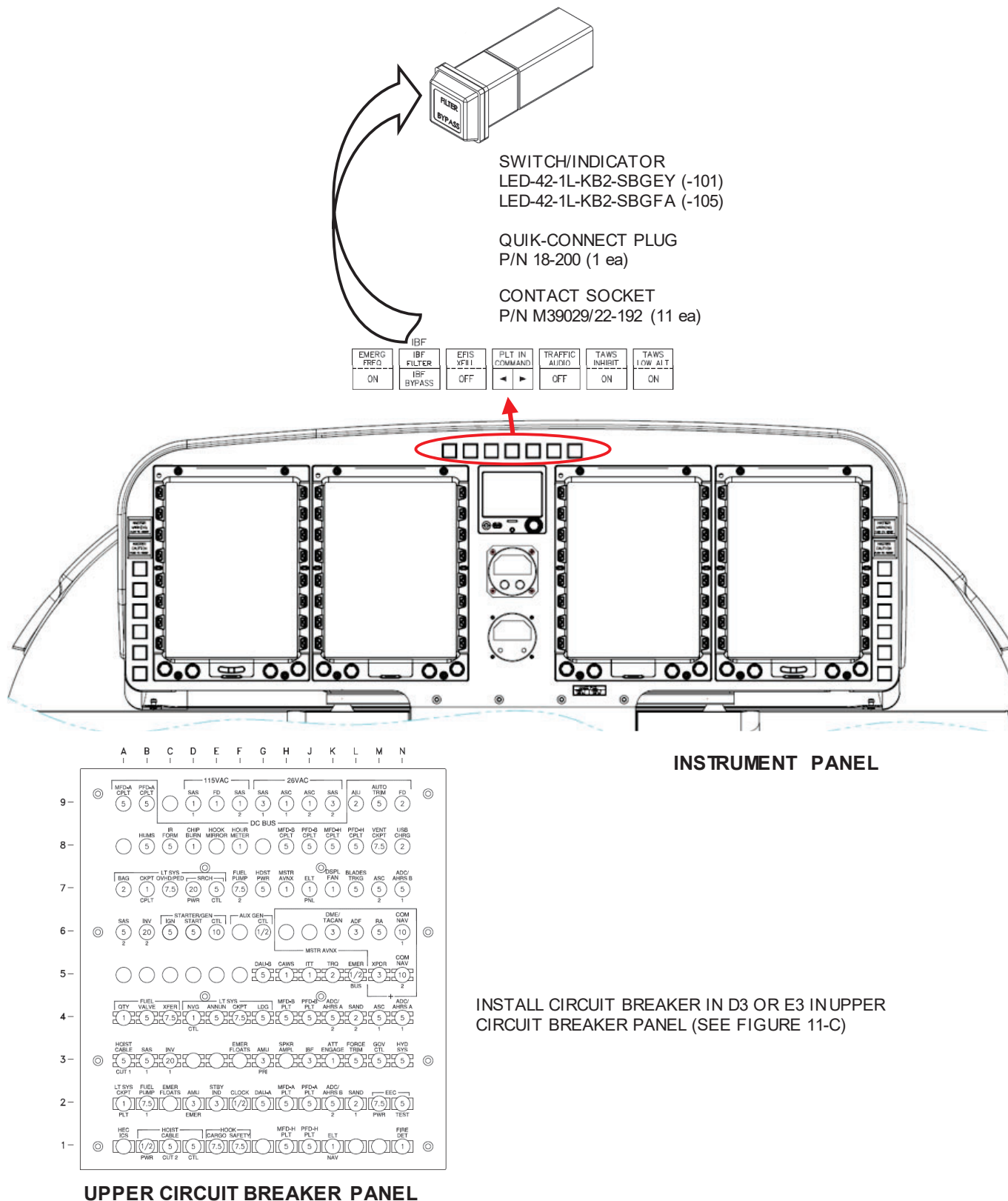


Figure A-20: IBF Indicator/Switch and Circuit Breaker Location for AW119 Genesys IDU-680

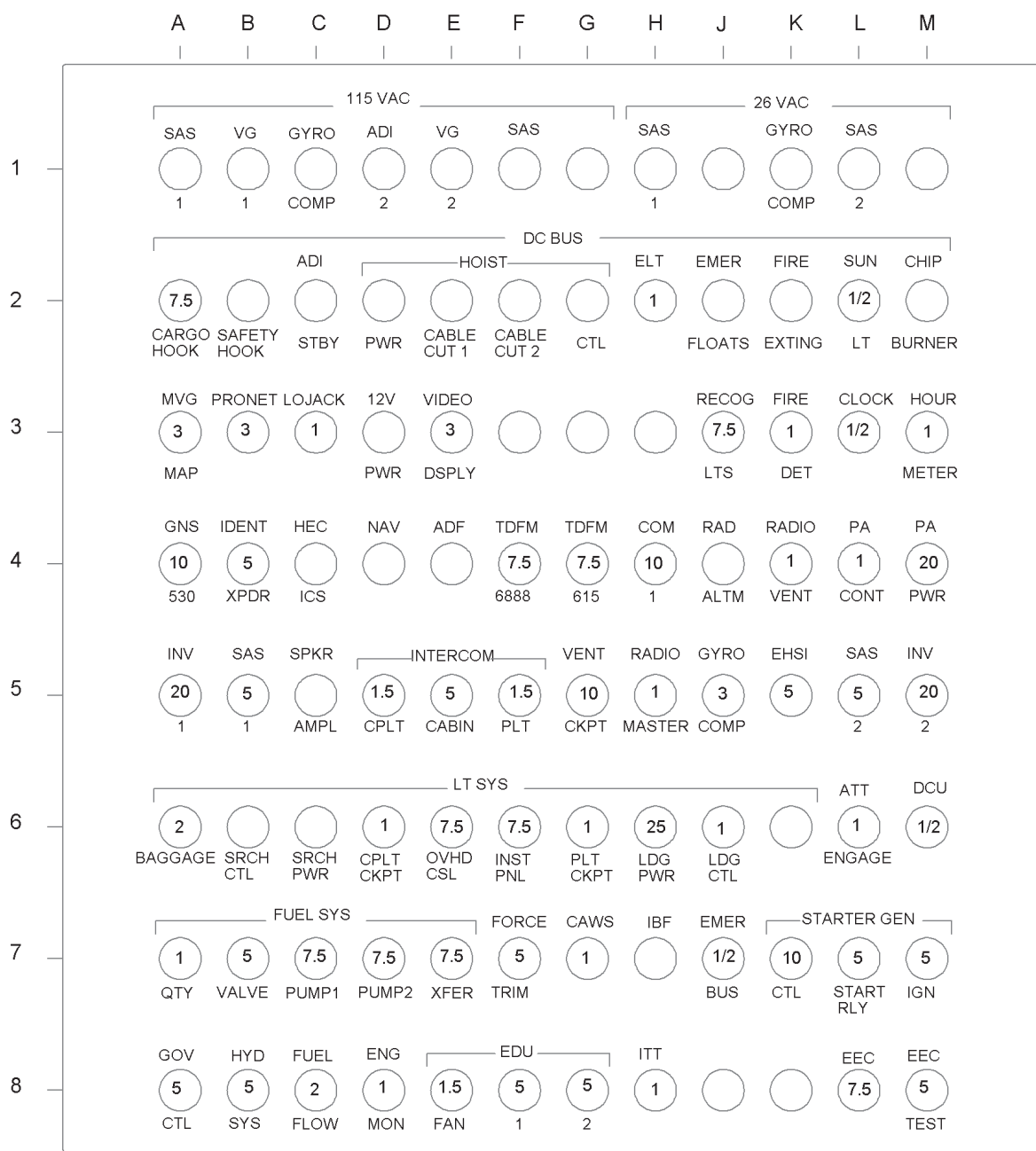


Figure A-21: Circuit Breaker Locator

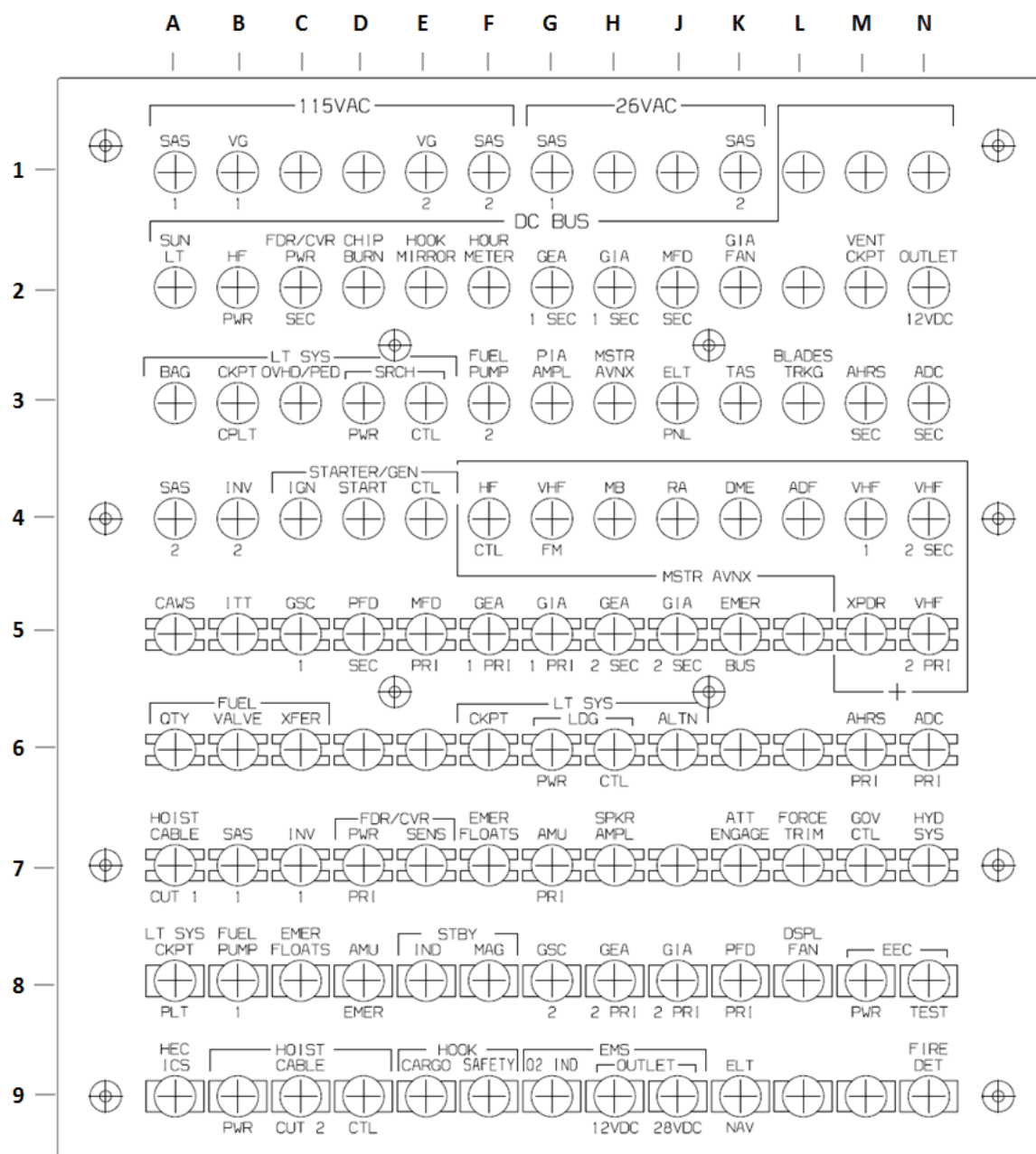


Figure A-22: Circuit Breaker Locator for AW119 G1000H

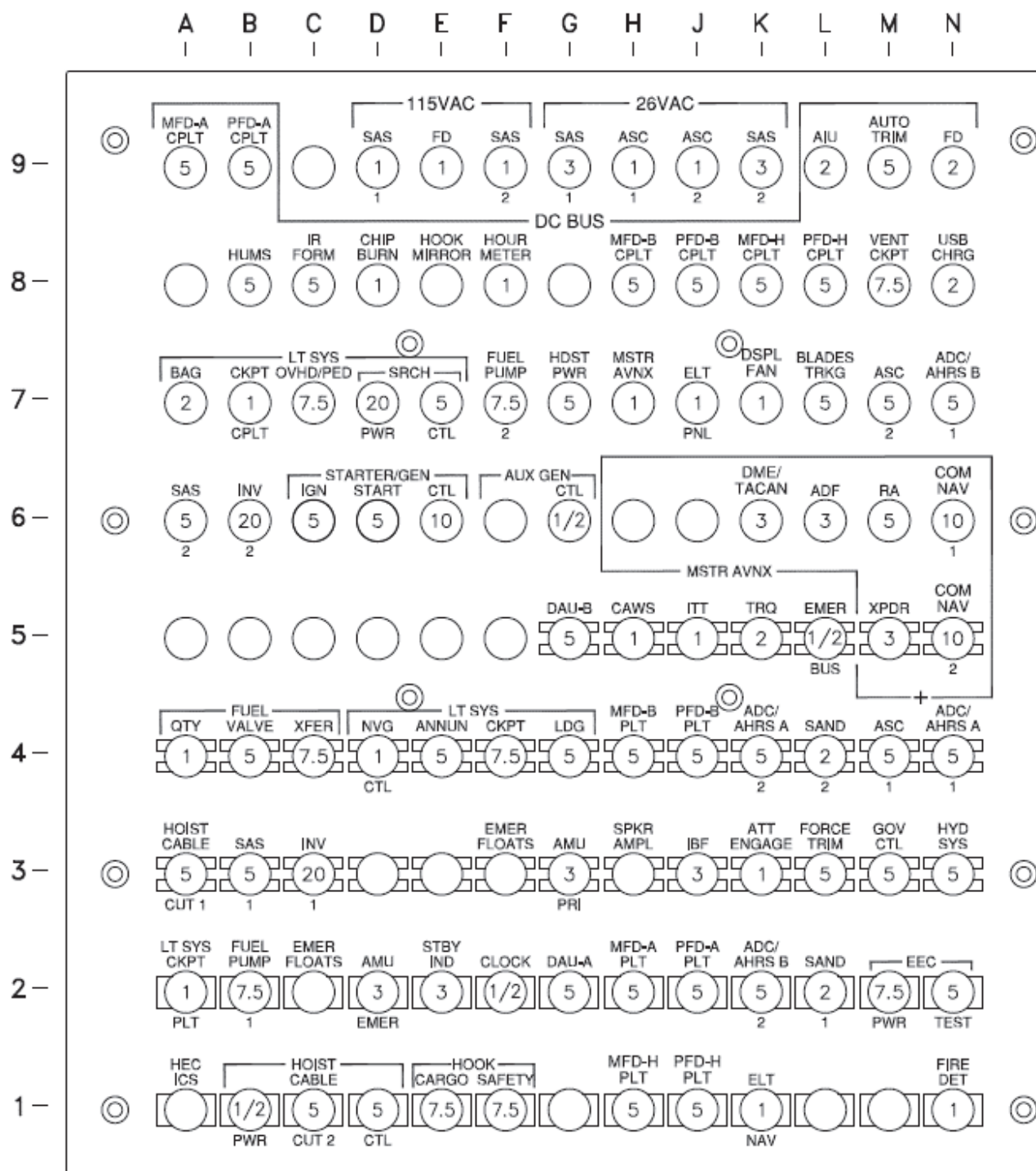


Figure A-23: Circuit Breaker Locator for AW119 Genesys IDU-680P