CapstanAG™

SwathPRO™

Spray Application

For Air Tractor

Installation Guide

320700-007 Rev. J | Revised 01/2025 | ©2025 Capstan Ag Systems, Inc.

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Change Log

Revision	Date	Description
A	9/08/2021	Initial Release of the SwathPRO™ Installation Manual for Air Tractor aircraft
B	3/23/2022	Added Prerequisite modifications for Air Tractor AT-602 and AT-802 aircraft. Added bushing sleeve installation to the boom hanger installation procedure and update part number for kit Added Gateway hub mounting location for the AT-802/802A on the top of the luggage compartment Electrical main power revision. Changes to the breaker power harness connection.
C	10/20/2022	Fixed Part Number error in References Table Fixed System layout list. Added part numbers to description list. Changed part number for the pressure sensor. Added Ag-Nav Servo/Flow Control Valve Harness Removed the Alternate part for the Valve Assemblies. Fixed a typo on the Servo and Flowmeter port.
D	11/18/2022	Removed part number 320015-096. Added qty 2 to part number 320015-097. Added caution statement for hanger mounting hole locations Fixed shutoff kit schematic.
E	12/22/2022	Updated Figure 11 Updated rate controller text Added procedure for inputting number of nozzles into CapView.
F	3/03/2023	Correction to solder sleeve terminology Ring terminal part number and description correction
G	11/12/2024	Hardware part numbers revised to Mil Spec throughout Modification for SwathPRO section removed Revised AN Part Numbers and Torque Specifications table Revised Modification For SwathPRO text Revised Prepare for Installation and Setup text Resived Parts List- All Tables Revised Install Main Power Kit- All text and figures Revised Install the Pressure Sensor text Revised Boom Shutoff Kit Schematic, Parts List, text, and figures Revised Install the Servo/Flow Control Valve Harness to include Tabula (TracMap) Revised Install the Parts to the Center Boom text Revised Location Setup Procedure text Revised Figure 56

Revision	Date	Description
H	12/02/2024	Revised part number of Toggle Switch DPST in Main Power Kits to match main power kit schematic
J	01/13/2025	Added Shutoff Kit relay install instructions back in from Rev G. Fixed figure number callouts on shutoff kit section. Fixed step #4 and #7 in the Route and Install Main Power Toggle Switch Harnessing section to match the schematic. Fixed a part number typo for the Main power contactor on pages 55 and 62.

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Contents

References ix

Acronym List xi

Section 1: Introduction 13

This Manual 14

Applicable Aircraft Models 14

Required and Special Tools 15

Section 2: Safety 17

Signal Words 18

Emergency Safety 18

Personal Protective Equipment 18

Pressurized Fluid Lines 18

Chemical Safety 18

Section 3: Installation 19

Prepare for Installation and Setup 20

Parts List 21

System Kits List 21

Fuselage Kit: 320150-001—Models: 802/602/502/402 22

Boom Hanger Kit: 320150-002—Models: 802/602/502/402 23

2” Flange Kit: 320150-004—Models: 802/602 23

1.5” Flange Kit: 320150-003—Models: 502/402 24

19’, 4” Spacing Boom Kit:320150-019-4—Models: 802/602 24

17’, 4” Spacing Boom Kit: 320150-017-4—Models:502/402 25

SwathPRO Shutoff Kit: 320124-008—Models: 802/602/502/402 25

Spare Parts: 320150-005—Models: 802/602/502/402 26

Main Power: 320124-020—Model: 802 26

Main Power: 320124-031—Models: 402/502/602 27

Ground Support Kit: 320150-011 27

Before Installation of the CapstanAG™ System 28

Remove the Factory Spray System 28

Install the Booms and Boom Hangers 29

Gateway Hub Mounting Location Options 41

Install the Gateway Hub On the Back of the Luggage Compartment 42

Install the Gateway Hub Inside the Luggage Compartment 43
Install the Gateway Hub Under the Cockpit 45
Install the Gateway Hub on the Top of the Luggage Compartment 46
Gateway Hub Identification 47
Install the Main Power Kit 48
Install the 60A Circuit Breaker 49
Install the 4Ga Power Cable (AT-402/502/602 only) 50
Install the 2Ga Power Cable (AT-802 only) 51
Install the Main Power Contactor 54
Install the Power Harness 55
Build and Install the Grounding Power Cable 55
Build and Install the Circuit Power Cable 56
Build and Install the Contactor Power Cable 57
Install the Main Power Relay 58
Install the SwathPRO Main Toggle Switch 59
Route and Install Main Power Toggle Switch Harnessing 60
Mount the Contactor 62
Install the Power Supply 63
Install the Pressure Sensor 64
Install the Gateway Boom Extension Harnesses 66
Boom Shut-off Kit Schematic 69
Install the Fan Brake Relay Signal Harness (Optional) 76
Install the Servo/Flow Control Valve Harness 77
Install the GPS Receiver 79
Install the CapView 80
Install the Maneuvering Speed Placard Decal 84
Install the Parts to the Center Boom 84
Install the Nozzle Tips 86
Post-install Checklist 86
Electrical Loads 86
Weight and Balance Information 87
Return to Service 87

Section 4: Setup 89

CapView Button Descriptions 90
System Setup 91
Factory Reset Procedure 92

 2025 Capstan Ag Systems, Inc.

Location Setup Procedure 93
Input Total Number of Valves 95
Upload a Profile and Set the Preset Buttons 96
System Dry Tests 97
Boom Dry Test 97
Key Fob Boom Dry Test 98
System Wet Test 99
Key Fob Boom Wet Test 99

Index 101

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References

This is a list of external documents for the SwathPRO™ system installation.

Table 1: Reference List

Title	Part Number	Description
Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for SwathPRO™	320700-001	System operation information
Instructions for Continued Airworthiness for the SwathPRO™ System (ICA)	320700-005	Maintenance information for the system
ProMaker User Guide	320700-002	Computer software manual to make profiles
Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair	AC 43.13-1B	Aircraft inspection and repair information

Table 2: AN Part Numbers and Torque Specifications

Part Number	Description	Torque Specification
AN960-416L	Washer, Mil-Spec, 1/4, Cad Plated	
AN960-516L	Washer, Mil-Spec, 5/16, Cad Plated	
AN365-524A	Nut, Hex, Nylok, 5/16-24, Cad Plated	100-140 in/lbs
AN364-632A	Nut, Stop, Hex, Thin, 6-32, Cad Plated	11-13 in/lbs
AN364-428A	Nut, Stop, Hex, Thin, 1/4-28, Cad Plated	30-40 in/lbs
AN5-7A	Bolt, Mil-Spec 5/16-24 x 31/32, Cad Plated	
AN3-5A	Bolt, Hex 10-32 x 21/32 Cad Plated	
AN365-1032A	Nut, Hex Elastic Stop, 10-32 Cad Plated	20-25 in/lbs
AN960-10	Washer, Flat, #10 Cad Plated	
AN3-4A	Bolt, Hex, 10-32 x 17/32, Cad Plated	
AN6-7A	Bolt, Hex 3/8-24 x 31/32 Cad Plated	
AN365-624A	Nut, Hex Elastic Stop, 3/8-24 Cad Plated	160-190 in/lbs
AN960-616L	Washer, Flat, 3/8 Cad Plated	
MS35206-219	Screw, 4-40 x ¾" Cad Plated	
AN364-440A	Nut, 4-40, thin, Cad Plated	3-4 in/lbs
AN960-4L	Washer, 4-40, Cad Plated	
MS35207-280	Screw, 1/4-28 x 5/8" Cad Plated	
MS35207-264	Machine screw, 10-32 x 5/8", Cad Plated	
MS35207-271	Screw, 10-32 x 2", Cad Plated	
MS21045L3	Nut, Self locking, 10-32, Cad Plated	20-25 in/lbs
MS35206-230	Screw, Pan Head Philips, 6-32 x 1/2, Cad Plated	
MS24693-S298	Screw, Mach, Flt Hd, 100 deg, 1/4-28 x 1, Cad Plated	
The published torque values do not include the rotational drag of the elastic stop nuts. Standard maintenance practice dictates that mechanics add this value to the specified torque. A random sample of new and used size -4, and -5 nuts shows that the torque required to turn the (1/4") nuts varied between 15-19 in/lbs. The torque required on the (5/16") nuts varied between 18-22 in/lbs. This value must be added to the torque value.		

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Acronym List

Table 3: Acronym List

Acronym	Description
DPST	Double Pole Single Throw
SPST	Single Pole Single Throw
VCM	Valve Control Module
SDS	Safety Data Sheet
PPE	Personal Protective Equipment
DTM	Deutsch Mini
DT	Deutsch
PWM	Pulse Width Modulation
LED	Light Emitting Diode
CAN	Controller Area Network
CB	Circuit Breaker
TP	Triple Pole

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Section 1: Introduction

Topics:

- This Manual
- Applicable Aircraft Models
- Modification for SwathPRO™
- Required and Special Tools

This Manual

Important: This document must be placed into the aircraft operator's Aircraft Maintenance Manual and incorporated into the aircraft's scheduled maintenance program.

For any case in which the instructions in this document and the Aircraft Maintenance Manual are in conflict, the most restrictive instructions take precedence.

This manual includes maintenance and re-installation information for the SwathPRO™ system you purchased.

Make sure that all personnel has read this manual other referenced manual(s) and thoroughly understand the safe and correct operation, maintenance, and re-installation procedures.

The right and left sides of the system are determined by facing the direction of forward travel of the aircraft on which the system is installed.

This manual contains important information on how to safely and correctly reinstall, operate, and maintain the SwathPRO™ system. These instructions help keep personnel safe, reduce downtime, and increase the reliability and life of the equipment, its components, and related systems.

Review the safety information in the manual(s) listed in the reference section of this manual. For more information, go to References.

Follow the instructions (in this manual) and in the other referenced manual(s) for each step to make sure that work conditions in and around the aircraft are safe.

It is important for all individuals working with chemicals to understand the potential risks, necessary safety precautions, and proper response in the event of accidental contact. Reference the specific chemical manuals for safety information.

Read, understand, and review the procedures in this manual and other referenced documents. Use the Safety Data Sheets (SDS) and the required Personal Protective Equipment (PPE) for hazardous chemicals.

If you do not understand the SwathPRO™ system after reading this manual and referenced documentation, please obtain the proper training before operating, servicing, or reinstalling the system. Proper training is important for your own safety, as well as your co-workers' safety, is maintained.

Applicable Aircraft Models

Refer to the STC AML for applicable aircraft models.

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Required and Special Tools

Table 4: Special Tools

Tool Description	Where Used
Adjustable Stands	Install the Booms and Boom Hangers
Clamps	Install the Booms and Boom Hangers
Drill	Install the Booms and Boom Hangers Install the Gateway Hub On the Back of the Luggage Compartment Install the Gateway Hub Inside the Luggage Compartment Boom Shut-off Kit
5 psi water line and camlock fitting on the end of the boom	Key Fob Boom Wet Test
Heat Gun	Boom Shut-off Kit Install the Fan Brake Relay Signal Harness (Optional)
Alodine	Install the Booms and Boom Hangers

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Section 2: Safety

Topics:

- Signal Words
- Emergency Safety
- Personal Protective Equipment
- Pressurized Fluid Lines
- Chemical Safety

Signal Words

DANGER: Indicates an imminent hazard which, if not avoided, will result in death or serious injury. This signal word is limited to the most extreme situations, typically for aircraft components that, for functional purposes, cannot be guarded.

WARNING: Indicates a potential hazard which, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION: Indicates a potential hazard which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT: This is used to draw attention to specific information that is necessary for the operation, setup, or service of the system.

Note: This is used for additional information that can help understand or operate the system.

Emergency Safety

Fire extinguishing systems must meet the applicable OSHA requirements, and all users of portable/ fixed fire suppression equipment must know the types, limitations, and proper uses of this equipment; including hazards involved with incipient stage firefighting.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.

Know the location of fire extinguishers and first aid kits and how to use them.

Examine the fire extinguisher and service the fire extinguisher regularly.

Follow the recommendations on the instructions plate.

Very small fires can be put out (extinguished) with a fire extinguisher. Use an appropriate method to extinguish a fire (water for paper fires, and chemical extinguishers for electrical or chemical fires).

Personal Protective Equipment

Wear close-fitting clothing and the correct personal protective equipment (PPE) for the job. Refer to the specific chemical manufacturer documentation or other information for correct PPE.

Pressurized Fluid Lines

Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can accidentally burst when too much heat is present.

Chemical Safety

Chemicals used in agricultural applications can be harmful to your health and/or the environment if not used correctly. Always follow all label directions for effective, safe, and legal use of agricultural chemicals.

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Section 3: Installation

Topics:

- Prepare for Installation and Setup
- Parts List
- Before Installation of the CapstanAG™ System
- Install the Booms and Boom Hangers
- Gateway Hub Mounting Location Options
- Install the Main Power Kit
- Install the Pressure Sensor
- Install the Gateway Boom Extension Harnesses
- Boom Shut-off Kit Schematic
- Install the Servo/Flow Control Valve Harness
- Install the GPS Receiver
- Install the CapView
- Install the Maneuvering Speed Placard Decal
- Install the Parts to the Center Boom
- Install the Nozzle Tips
- Post-install Checklist
- Electrical Loads
- Weight and Balance Information
- Return to Service

Prepare for Installation and Setup

CAUTION: Before installation or service to the system, read and understand the aircraft installation and maintenance manuals. Chemical residue may be present on/in the equipment. Use the correct personal protective equipment.

Important: Before installation, make sure that all parts are included in the shipping boxes. Make sure that the parts match the list of parts for your aircraft that is included in the shipping boxes.

Important: Do not attach the harnesses to the aircraft or components with cable ties until the dry test of the system is complete.

Check the system layout and parts list in this manual.

Support harnesses and wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11. Make sure that the harnesses and wiring does not interfere with flight control cables or other moving parts.

Refer to Table 2: AN Part Numbers and Torque Specifications for all required torque specifications.

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Parts List

System Kits List

Description	Qty	802 Part Number	602 Part Number	502 Part Number	402 Part Number
Boom Hanger, Left	3	320100-802-L (Qty of 1) 320101-802-L (Qty of 2)	320100-502/602-L		320100-402-L
Boom Hanger, Right	3	320100-802-R (Qty of 1) 320101-802-R (Qty of 2)	320100-502/602-R		320100-402-R
Kit, Boom Hanger, Bushing, and Sleeve		320150-007 (Qty of 6)	320150-007 (Qty of 2)	N/A	
Decal, Maneuvering Speed, SwathPRO	1	320015-030	N/A		
Adapter, Pipe, 1/4 - 1/8	6	N/A	716008-330	N/A	
Kit, Fuselage, SwathPRO	1	320150-001			
Kit, Boom Hanger, SwathPRO	1	320150-002			
Kit, Flange	1	320150-004		320150-003	
Kit, Boom	1	320150-019-4		320150-017-4	
Kit, Shutoff, SwathPRO	1	320124-008			
Kit, Spare Parts, SwathPRO	1	320150-005			
Kit, Main Power, AT-802		320124-020	N/A		
Kit, Main Power, AT-402 thru AT-602		N/A	320124-031		
Servo Harness (By Brand)	1	Insero — 320124-015			
	1	Satloc — 320124-014			
	1	Ag-Nav — 320124-025			
	1	Tabula (TracMap) — 320124-032			

Fuselage Kit: 320150-001—Models: 802/602/502/402

Part Number	Description	Qty
116301-015	Pressure Sensor, 100 PSI	1
118603-113	Ram Mount Ball, 1"	2
118603-114	Ram Arm, Medium, B Size	1
120100-010	Kit, Cable Ties	1
320100-031	Bracket, Boom Extension, Gateway	2
320100-032	U-Bolt, 1/4-20 x 1", 304 SS, 425 Lb Cap	2
320124-009	Harness, Pressure Sensor Extension	1
320124-347	Harness, Boom Control Extension	2
320124-352	Harness, Capview	1
320200-100	Assembly, Gateway Hub, SwathPRO	1
320200-300	Display, Capview, SwathPRO	1
320700-001	Manual, Pilot's Operating Handbook for SwathPRO	1
320700-007	Manual, Install Guide, SwathPRO	1
320700-005	Manual, Instructions for Continued Airworthiness for SwathPRO	1
706530-260	Dust Cap, Receptical, 24 Shell	2
706530-348	Dust Plug, 6 Pin	4
706530-349	Dust Plug, 8 Pin	1
706530-356	Dust Plug, 12 Pin	2
716008-329	Tee Street, 1/4" NPT	1
320124-231	Harness, Boom, Center, 4 Space, Right	1
320124-232	Harness, Boom, Center, 4 Space, Left	1
320015-108	Valve Assy, Center, SwathPRO	6
AN3-5A	Bolt, Hex 10-32 x 21/32 Cad Plated	4
AN960-10	Washer, Flat, #10 Cad Plated	4
AN365-1032A	Nut, Hex Elastic Stop, 10-32 Cad Plated	4
320015-015	Decal, Page, Fuselage Decals	1
AN6-7A	Bolt, Hex 3/8-24 x 31/32 Cad Plated	6
AN365-624A	Nut, Hex 3/8-24 Stop, Cad Plated	6
AN960-616L	Washer, Flat, 3/8, Cad Plated	12
320015-018	Mount, Gateway	2
716023-112	Pop Rivet, 1/8" Aluminum (Cherrymax)	6
320015-020	Assembly, GPS, Hub 5Hz, Aerial	1
320124-355	Harness, Adapter, GPS - Hub	1

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Boom Hanger Kit: 320150-002—Models: 802/602/502/402

Part Number	Description	Qty
320100-008	Boom Hanger Tab, Front Mnt, Bottom Right	6
320100-009	Boom Hanger Tab, Front Mnt, Top Left	6
320100-010	Boom Hanger Tab, Front Mnt, Bottom Left	6
MS35207-280	Screw, 1/4-28 x 5/8" Cad Plated	12
AN5-7A	Bolt, Mil-Spec 5/16-24 x 31/32 Cad Plated	6
MS24693-S298	Screw, Mach, Flt Hd, 100 deg, 1/4-28 x 1, Cad Plated	24
MS35206-230	Screw, Pan Head Philips, 6-32 x 1/2 Cad Plated	6
AN364-428A	Nut, Stop, Hex, Thin, 1/4-28 Cad Plated	36
AN364-632A	Nut, Stop, Hex, Thin, 6-32 Cad Plated	6
AN365-524A	Nut, Hex, Nylok, 5/16-24, Cad Plated	6
AN960-516L	Washer, Mil-Spec, 5/16, Cad Plated	12
320100-014	Centering Plate, Plastic	6
AN960-416L	Washer, Mil-Spec, 1/4, Cad Plated	24
320150-006	Kit, Bracket, Conventional boom	1

2” Flange Kit: 320150-004—Models: 802/602

Part Number	Description	Qty
2084T25	Hose Coupling, 2"	2
FC220	Flange Clamp, 2" Full Port	4
TKM220MPTSS	Flange Adapter, 2" Full Port, 2" MPT, SS	2
M221G	Flange Gasket, 2" Full Port, Banjo	4
GFGLP150CAP	Cap, Cam Lock 1.5"	2
320015-014	220 Flange 1" NPT 150A Camlock	2
Note: The flange kit comes installed on the boom assembly. Individual part numbers may not be called out specifically in the installation guide.		

1.5” Flange Kit: 320150-003—Models: 502/402

Part Number	Description	Qty
2084T24	Hose Coupling, 1.5"	2
FC220	Flange Clamp, 2" Full Port	4
TKM220150MPTSS	Flange Adapter, 2" Full Port, 1.5" MPT, SS	2
M221G	Flange Gasket, 2" Full Port, Banjo	4
716008-330	Adapter, Pipe, 1/4 - 1/8	6
GFGLP150CAP	Cap, Cam Lock 1.5"	2
320015-014	220 Flange 1" NPT 150A Camlock	2
Note: All parts in the flange kit come pre-installed on the boom assembly with the exception of adapter pipes (P/N 716008-330). Individual part numbers may not be called out specifically in the installation guide.		

19’, 4” Spacing Boom Kit:320150-019-4—Models: 802/602

Part Number	Description	Qty
320100-019-4	Boom, 19Ft, 4" Spacing	2
320015-107	Valve Assy, Main, SwathPRO	106
320100-051	Dzus, Lion, Receptical, Clip On	228
320100-056	Clip, Cable Holder	50
709031-506	Screw, 8-32 x 1/2", Nylon	48
320125-099	Assembly, VCM, 4" Spacing	6
320124-346	Harness, Boom Control, 4" Spacing, 19Ft	2
706530-259	Dust Cap Plug, Circular, 24 Shell	2
716008-328	Plug, Countersunk, Brass 1/4" NPT	8
320102-016	Assembly, Boom Shell, No Slot	106
320102-018	Assembly, Shell, VCM	8
320125-102	Assembly, VCM, 4" Spacing, Center	2
320101-020	Shell End Cap	2
709031-509	Screw, Sheet Metal, #8 x 1/2 SS	4
320015-006	Dust Plug, Aerial, VCM Harnesses	8
Note: The boom kit comes assembled. Individual part numbers may not be called out specifically in the installation guide.		

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17’, 4” Spacing Boom Kit: 320150-017-4—Models:502/402

Part Number	Description	Qty
320100-017-4	Boom, 17Ft, 4" Spacing	2
320015-107	Valve Assy, Main, SwathPRO	94
320100-051	Dzus, Lion, Receptical, Clip On	204
320100-056	Clip, Cable Holder	44
709031-506	Screw, 8-32 x 1/2", Nylon	42
320125-099	Assembly, VCM, 4" Spacing	6
320124-345	Harness, Boom Control, 4" Spacing, 17Ft	2
706530-259	Dust Cap Plug, Circular, 24 Shell Deutsch	2
716008-328	Plug, Countersunk, Brass 1/4" NPT	8
320102-016	Assembly, Boom Shell, No Slot	94
320102-018	Assembly, Shell, VCM	8
320125-102	Assembly, VCM, 4" Spacing, Center	2
320101-020	Shell End Cap	2
709031-509	Screw, Sheet Metal, #8 x 1/2 SS	4
320015-006	Dust Plug, Aerial, VCM Harnesses	20
Note: The boom kit comes assembled. Individual part numbers may not be called out specifically in the installation guide.		

SwathPRO Shutoff Kit: 320124-008—Models: 802/602/502/402

Part Number	Description	Qty
320015-096	Toggle Switch, Triple Pole	1
320015-097	Toggle Switch, DPST	1
320015-098	Toggle Switch, SPST	1
320015-099	Microswitch assy	1
703500-152	Relay, w/ diode, SPDT, 24V	1
320124-008-1	Harness, Shutoff, Power, MicroSW	1
320124-008-2	Harness, SPST Switch	2
320124-008-3	Harness, Shutoff, Gateway, Pigtail	1
320124-008-7	Harness, Shutoff, 12 Pin Gateway	1
320124-008-8	Harness, Fan Brake Relay, Ground	1
320124-008-9	Harness, Fan Brake Relay, Signal	1
320124-008-10	Harness, Microswitch to Relay	1
715005-156	Sleeve, Solder 14-16Ga.	3
320015-019	Bracket, Microswitch Mount	1
MS35206-219	Screw 4-40 x 3/4 Cad Plated	2

Part Number	Description	Qty
AN960-4L	Washer, Flat, #4, Cad Plated	2
AN364-440A	Nut, 4-40 Thin, Cad Plated	2
716023-112	Rivet, 1/8 Dia, Aluminum	2
M7928/1-30	Ring terminal, #6, 18Ga	6

Spare Parts: 320150-005—Models: 802/602/502/402

Part Number	Description	Qty
706530-425	Plug, Dust, 6 Pin DTM	2
705725-137	Fuse, 15A, Type ATO/ATC	4
320102-016	Assy, Boom Shell, No Clip	4
320100-051	Clip On Receptical	8
320015-109	Valve Assembly, 7W, Tee-Jet, SwathPRO	4
320102-018	Assembly, Aerial VCM Shell	4
320015-006	Dust Plug, Aerial, VCM Harness	4
320015-007	Transfer Tube, NPT-SAE	2
715022-012	O-Ring, .364” ID, Brown	2

Main Power: 320124-020—Model: 802

Part Number	Description	Qty
703500-155	Contactor, Main power	1
320124-012	Harness, relay to DPST switch, main power	1
320124-013	Harness, DPST switch to ground, main power	2
320015-097	Toggle Switch DPST	1
320015-084	Circuit breaker 60Amp	1
320124-029	Harness, Contactor to DPST switch	1
320124-027	Harness, Power, 2Ga, SwathPRO	1
320124-030	Harness, Contactor to Main Power Relay	1
703500-152	Relay, w/ diode, SPDT, 24V	2
MS21919-WDG22	Clamp, Adel, 1-3/8"	4
320015-011	Bracket circuit breaker	1
AN365-1032A	Nut, Hex elastic stop, 10-32 Cad	6
AN960-10	Washer, Flat, #10, Cad plated	6
AN3-5A	Bolt, Hex, 10-32 x 21/32 Cad plated	2
320124-354	Harness, Power, 6Ga. SwathPRO	1
320015-092	Power supply assembly, 24V to 19V, SwathPRO	1
AN3-4A	Bolt, Hex, 10-32 x 17/32 Cad plated	2

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Part Number	Description	Qty
MS21919-WDG24	Clamp, Adel, 1-1/2"	4
NAS43HT3-48	Spacer, #10, 3/4" Cad Plated	2
MS21919-WCJ7	Clamp, Adel, 7/16" High Temp	2
MS35207-271	Screw, pan head, 10-32 x 2" Cad Plated	1
MS21045L3	Nut, Self locking, 10-32, Cad Plated	2
MS35207-264	Screw, Pan head, 10-32 x 5/8", Cad plated	1

Main Power: 320124-031—Models: 402/502/602

Part Number	Description	Qty
703500-155	Contactor, Main power	1
320124-012	Harness, relay to DPST switch, main power	1
320124-013	Harness, DPST switch to ground, main power	2
320015-097	Toggle Switch DPST	1
320124-028	Harness, Power, 4Ga, SwathPRO	1
320015-084	Circuit breaker 60Amp	1
320124-029	Harness, Contactor to DPST switch	1
320124-030	Harness, Contactor to Main Power Relay	1
703500-152	Relay, w/ diode, SPDT, 24V	2
MS21919-WDG22	Clamp, Adel, 1-3/8"	2
320015-011	Bracket circuit breaker	1
AN365-1032A	Nut, Hex elastic stop, 10-32 Cad	4
AN960-10	Washer, Flat, #10, Cad plated	4
AN3-5A	Bolt, Hex, 10-32 x 21/32 Cad plated	2
320124-354	Harness, Power, 6Ga. SwathPRO	1
320015-092	Power supply assembly, 24V to 19V, SwathPRO	1
AN3-4A	Bolt, Hex, 10-32 x 17/32 Cad plated	2
MS21919-WDG24	Clamp, Adel, 1-1/2"	2

Ground Support Kit: 320150-011

Part Number	Description	Qty
320025-001	Tool, T35, Valve Body Removal	1
118640-040	Key Fob	1
120015-001	Thumb Drive	1
320700-002	Manual, Operators, ProMaker Software	1

Before Installation of the CapstanAG™ System

If the SwathPRO™ system has not been installed on your aircraft before, continue to use this installation guide for correct installation procedures.

If the SwathPRO™ booms have been removed and you are installing the booms again, refer to the SwathPRO™ Instructions for Continued Airworthiness (ICA) manual for the correct installation procedures.

1. Make sure that the aircraft key is off.
2. Empty the hopper and clean the spray system and aircraft.
3. Make sure that the aircraft in on a solid, level surface, with the wheels chocked.
4. Remove access shields from the fuselage of the aircraft.

Remove the Factory Spray System

1. Record how many washers and/or spacers are on each boom hanger bolt.

   This hardware will be used to install and shim the SwathPRO™ booms the same way as the existing booms.
2. Remove the existing booms and boom hangers from the aircraft.
3. Keep the spacers and washers used on the boom hangers.

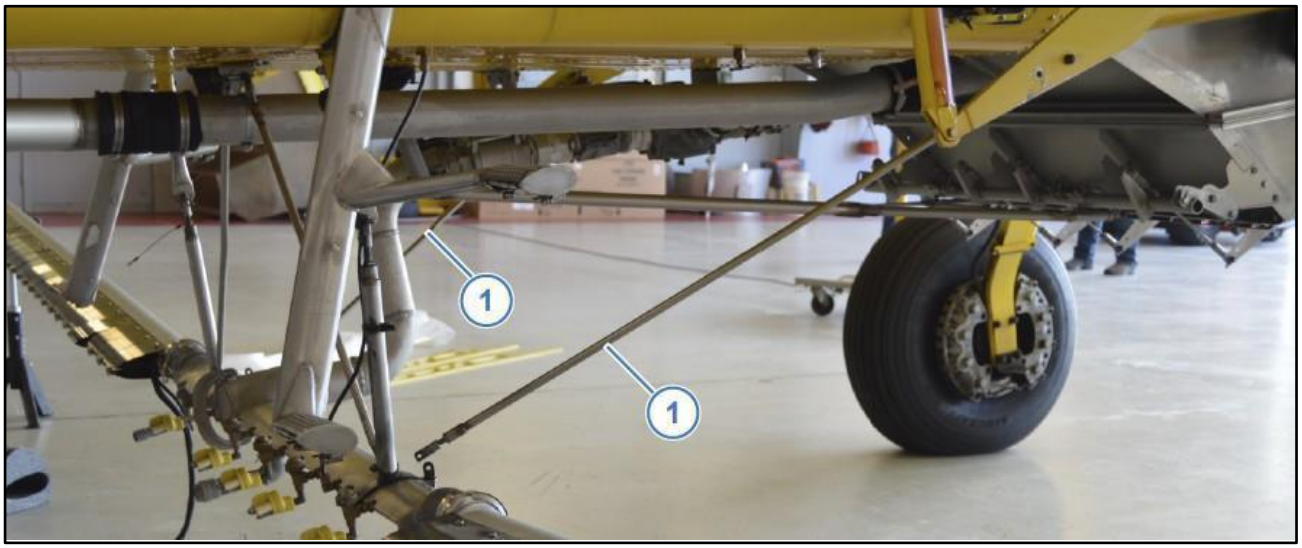

Figure 1: Disconnect the Support Tube Assemblies

4. If installed, disconnect the forward-facing support tubes (Figure 1, Item 1) on the center boom.

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Install the Booms and Boom Hangers

Note: All match drilling of holes shall be in accordance with AC 43.13-1B Chapter 4, Section 4.

1. Make sure that you have completed the procedures in Before Installation of the CapstanAG™ System.

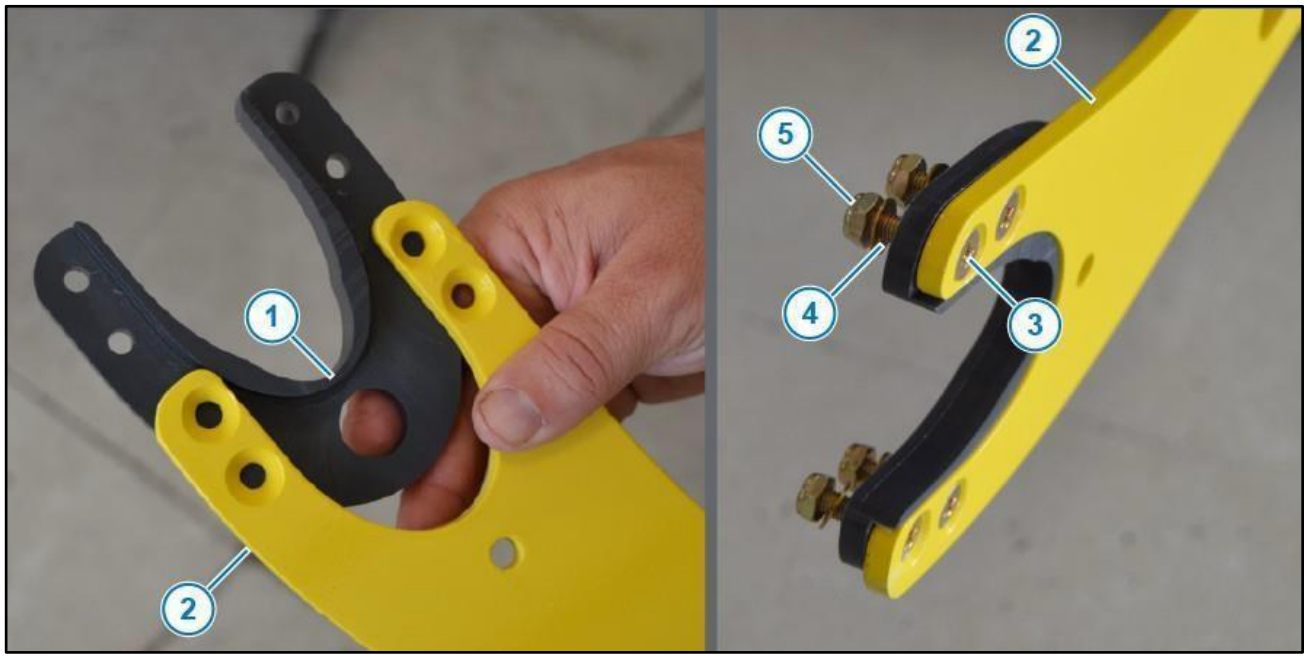

Figure 2: Centering Plate Installation

2. Install the plastic centering plate (Figure 2, Item 1) onto the SwathPRO™ boom hangers (Figure 2, Item 2).
   a. Install and tighten the 1/4-28 x 1 machine screws (Figure 2, Item 3) through the countersink holes and then through the plastic centering plate.
   b. Attach and tighten the screws to the boom and centering plate with the 1/4 inch washers (Figure 2, Item 4) and 1/4-28 thin stop nuts (Figure 2, Item 5).

Table 5: Parts for Centering Plate Installation

Parts from the Boom Hanger Kit

Refer to Table 2: AN Part Numbers and Torque Specifications

Item	Part Number	Description	Qty
1	320100-014	Centering Plate, Plastic	6
2	Varies by aircraft Refer to Parts List for correct part number	Boom Hanger, Left	3
		Boom Hanger, Right	3
3	MS24693-S298	Screw, Machine, 100 Deg, 1/4-28 X 1, Cad Plated	24
4	AN960-416L	Washer, Mil-Spec, 1/4, Cad Plated	24
5	AN364-428A	Nut, Stop, Hex, Thin, 1/4-28 Cad Plated	24

Figure 3: Boom and Boom Hanger Prep for Installation

3. Place two adjustable stands (Figure 3, Item 1) on a solid, level surface below each wing of the aircraft.
4. Place both of the booms (Figure 3, Item 2) onto the adjustable stands.

Table 6: Boom Part Numbers

Parts from the Boom Kit

Refer to Figure 3

Item	Part Number	Description	Qty
2	320150-019-4	19 ft 4 inch Spacing Boom Kit 802/602	1
	320150-017-4	17 ft 4 inch Spacing Boom Kit 502/402	

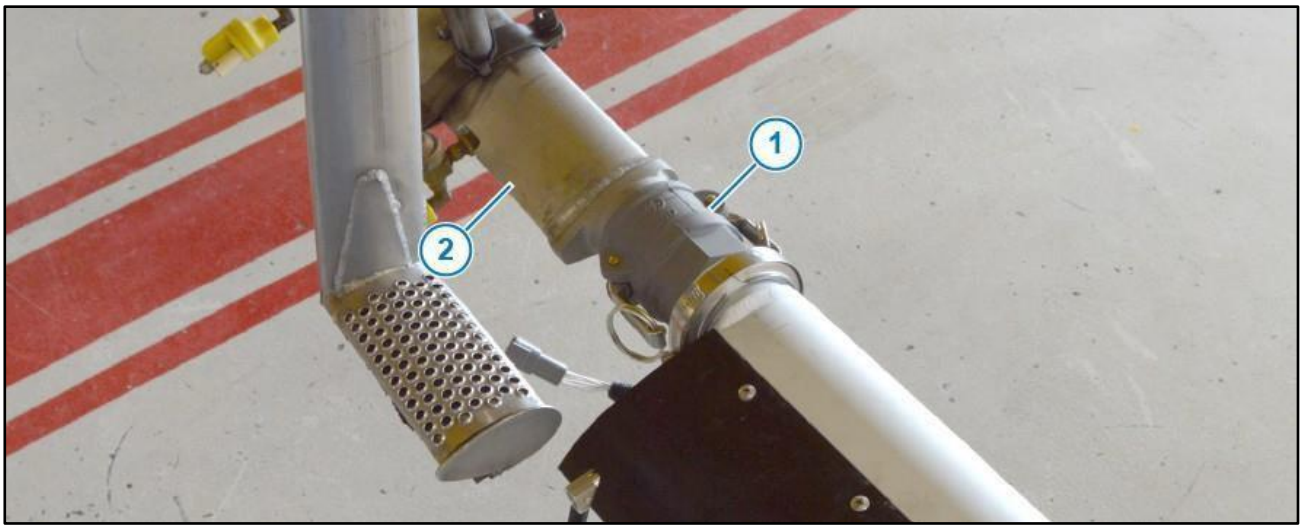

Figure 4: Center Boom Connector Adjustment

5. Adjust the stands vertically, forward/aft, and left/right until the camlock fittings (Figure 5, Item 1) can correctly connect on each boom and the center boom (Figure 4, Item 2).

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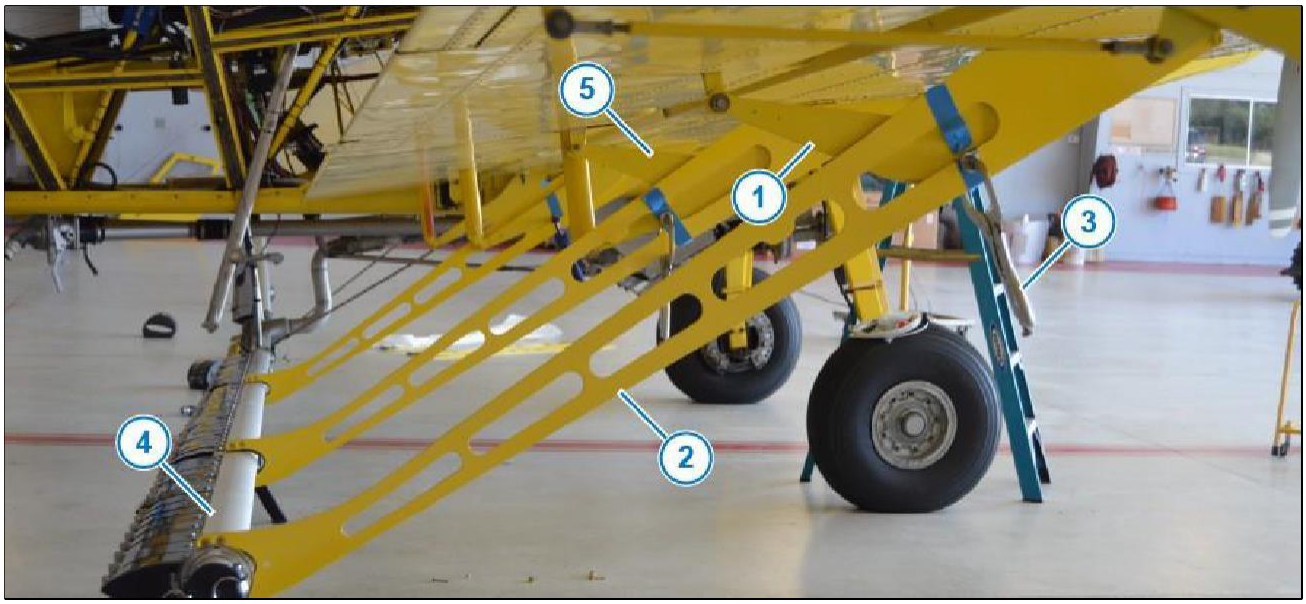

Figure 5: Outermost and Middle Boom Hanger Positions

6. Go to the outermost boom hanger position (Figure 5, Item 1) and temporarily attach the SwathPRO™ boom hanger (Figure 5, Item 2) in the same position as the factory boom hanger using clamps (Figure 5, Item 3).

   Note: Make sure the countersunk side of the boom hanger is facing outward, away from the aircraft.

   IMPORTANT: For 802 aircraft, use part number 320100-802-R and 320100-802- L for the outermost boom hanger. These hangers have five slots cut into them.

Table 7: Outermost Boom Hanger Parts

Parts from the Boom Hanger Kit

Refer to Figure 5

Item	Part Number	Description	Qty
2	Varies by aircraft Refer to Parts List for correct part number	Boom Hanger, Left	3
		Boom Hanger, Right	3

7. Slide the boom (Figure 5, Item 4) into the SwathPRO™ boom hanger.

   You may need to wiggle the hanger onto the boom.

8. Make sure that you have not moved the boom out of position.

   As necessary, adjust the stands vertically, fore/aft, and left/right until the boom hanger is in the correct position, the boom is straight, and the camlock fittings can correctly connect on each boom and the center boom.

   The boom hanger should be parallel with the direction of flight. The top of the boom hanger should be parallel to the bottom of the wing to keep the entire boom parallel to the wing. If the boom is not level with the bottom of the wing, it will cause the boom to act as its own wing, creating lift or downforce that is different than the opposite side of the aircraft.

9. After the outermost boom hanger is clamped into place, go to the location of the middle boom hanger (Figure 5, Item 5).

The boom hanger is only clamped into place and not fully installed yet. Later in the procedure, the installation of the boom hangers will be completed.

IMPORTANT: For 802 aircraft, use part number 320101-802-R and 320101-802-L for the middle boom hanger. These hangers have four slots cut into them.

Table 8: Middle Boom Hanger Parts

Parts from the Boom Hanger Kit

Refer to Figure 5

Item	Part Number	Description	Qty
5	Varies by aircraft Refer to Parts List for correct part number	Boom Hanger, Left	3
		Boom Hanger, Right	3

10. Slide the middle boom hanger onto the boom, then clamp it into place.

    Make sure that the countersunk side of the hanger is facing outward.

11. Make sure that you have not moved the boom out of position.

    As necessary, adjust the stands vertically, fore/aft, and left/right until the boom hanger is in the correct position, the boom is straight, and the camlock fittings can correctly connect on each boom and the center boom.

    The boom hanger should be parallel with the direction of flight. The top of the boom hanger should be parallel to the bottom of the wing to keep the entire boom parallel to the wing. If the boom is not level with the bottom of the wing, it will cause the boom to act as its own wing, creating lift or downforce that is different than the opposite side of the aircraft.

12. After the middle boom hanger is clamped, go to the innermost boom hanger.

    The boom hanger is only clamped into place and not fully installed yet. Later in the procedure, the installation of the boom hangers will be completed.

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Figure 6: Innermost Boom Hanger Position

13. Slide the innermost boom hanger (Figure 6, Item 1) onto the boom (Figure 6, Item 2), then clamp it into place.

The boom hanger is only clamped into place and not fully installed yet. Later in the procedure, the installation of the boom hangers will be completed.

IMPORTANT: For 802 aircraft, use part number 320101-802-R and 320101-802- L for the innermost boom hanger. These hangers have four slots cut into them.

Table 9: Innermost Boom Hanger Parts

Parts from the Boom Hanger Kit

Refer to Figure 6

Item	Part Number	Description	Qty
1	Varies by aircraft Refer to Parts List for correct part number	Boom Hanger, Left	1
		Boom Hanger, Right	1

14. Make sure that you have not moved the boom out of position.

Adjust the stands vertically, fore/aft, and left/right as necessary until the boom hanger is in the correct position, the boom is straight, and the camlock fittings can correctly connect on each boom and the center boom.

The boom hanger should be parallel with the direction of flight. The top of the boom hanger should be parallel to the bottom of the wing to keep the entire boom parallel to the wing. If the boom is not level with the bottom of the wing, it will cause the boom to act as its own wing, creating lift or downforce that is different than the opposite side of the aircraft.

Figure 7: Remove the Shells

15. Loosen the quarter-turn fasteners (Figure 7, Item 2) on both the top and bottom of the shell(s) at the locations where the boom hangers will attach to the booms (Figure 7, Item 1).

16. Remove the shell(s).

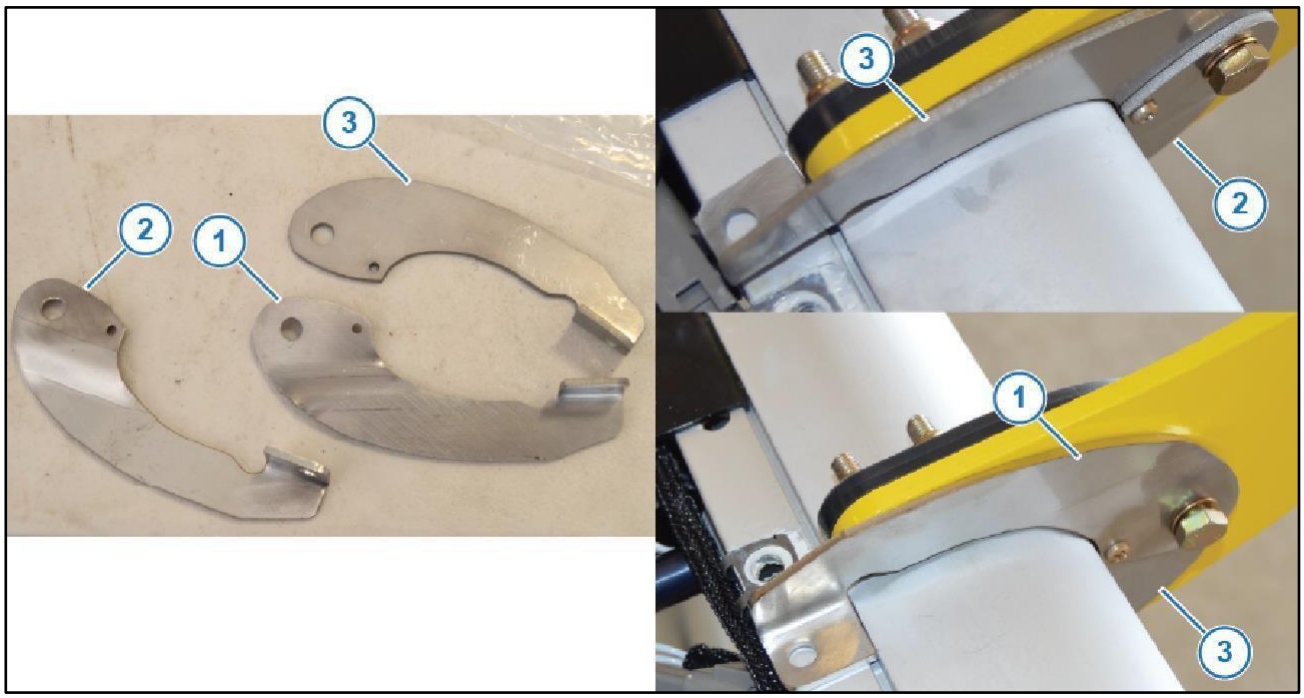

Figure 8: Boom Hanger Tabs

17. There are two curved boom hanger tabs supplied, determine which you need:

- Boom Hanger Tab—Right (Figure 8, Item 1)
- Boom Hanger Tab—Left (Figure 8, Item 2)

Make sure that each boom hanger tab assembly has a straight piece (Figure 8, Item 3), and a curved piece.

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Make sure that the tabs do not interfere with the 1/4-turn holes on the booms and that the bracket ears are facing the same direction.

The straight piece must be installed tight against the boom hanger and can be on the top or bottom of the hanger. The curved boom hanger tabs should curve inward, and also be tight against the hanger.

Table 10: Boom Hanger Tab Parts List

Parts from the Boom Hanger Kit

Refer to Figure 8

Item	Part Number	Description	Qty
1	320100-008	Boom Hanger Tab, Front Mnt, Bottom Right	6
2	320100-010	Boom Hanger Tab, Front Mnt, Bottom Left	6
3	320100-009	Boom Hanger Tab, Front Mnt, Top Left	6

Note: There are three boom hangers per side of the aircraft. There will be extra curved boom hanger tabs after the installation.

18. Make sure that the boom is as far forward in the boom hanger as possible.
19. Test fit the tabs by straightening the boom to make sure that there is no interference with the 1/4-turn holes and that the tabs fit correctly.

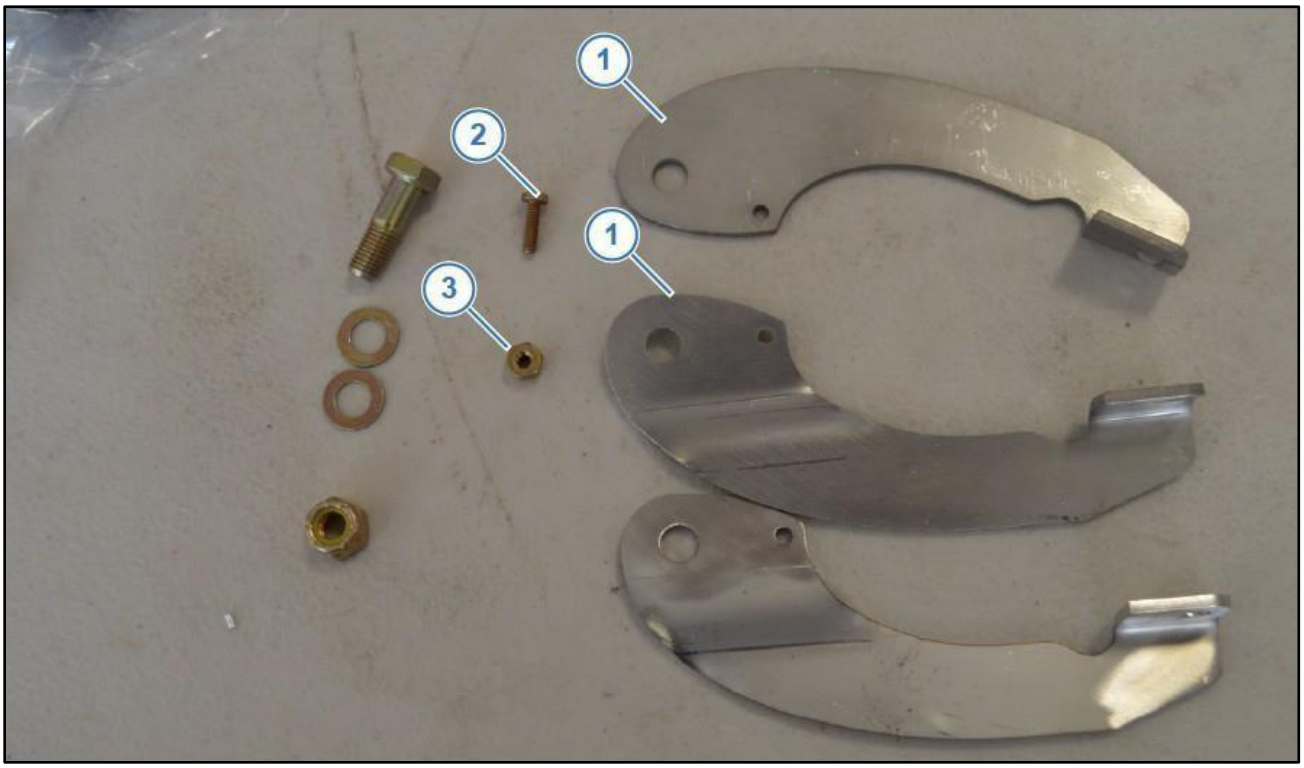

Figure 9: Boom Hanger Tab Assembly

20. Assemble the two boom hanger tab pieces (Figure 9, Item 1) with the holes lining up.
21. Install the 6-32 x 1/2 screw (Figure 9, Item 2) and nut (Figure 9, Item 3) into the boom hanger tabs so that the nut will be against the boom hanger.

Table 11: Boom Hanger Tab Installation Parts

Parts from the Boom Hanger Kit

Refer to Figure 9

Item	Part Number	Description	Qty
2	MS35206-230	Screw, Pan Head Philips, 6-32 x 1/2 Cad Plated	6
3	AN364-632A	Nut, Stop, Hex, Thin, 6-32 Cad Plated	6

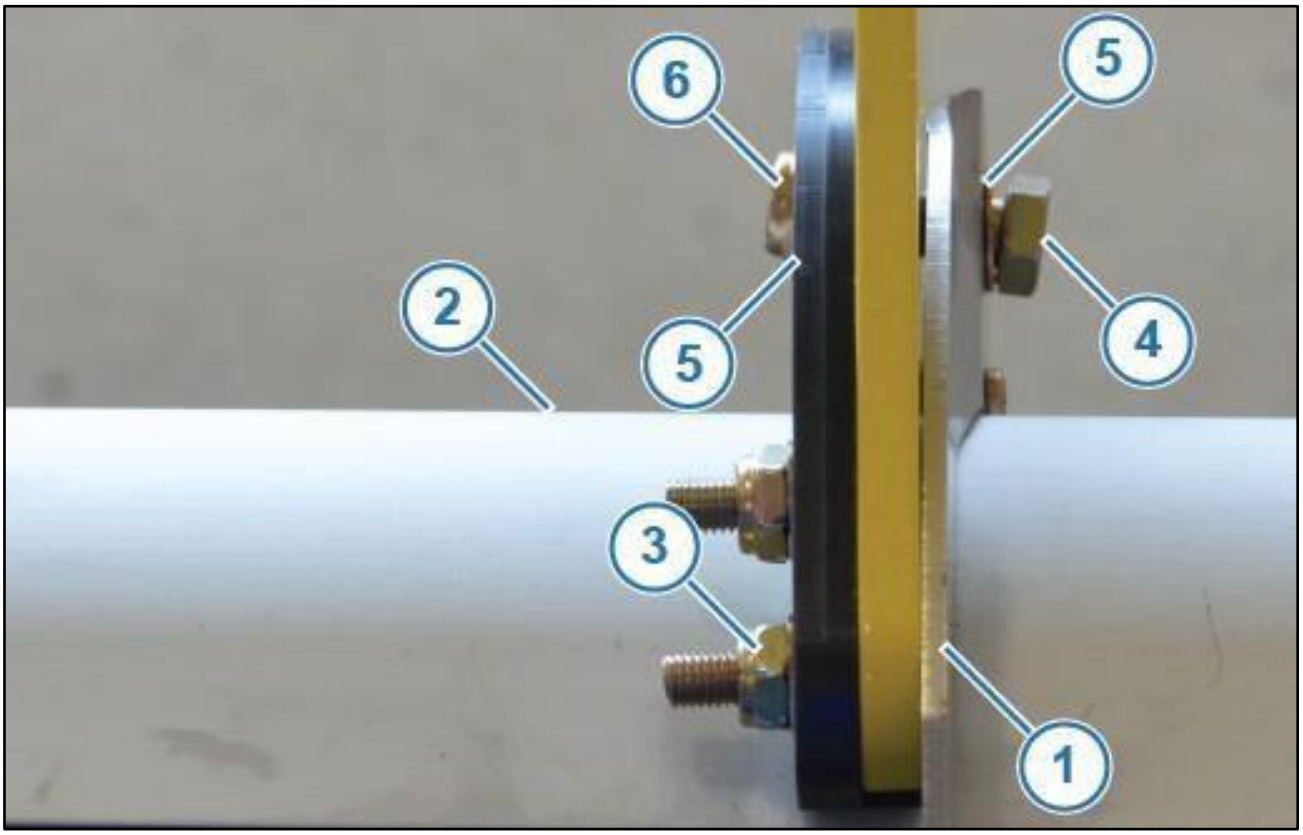

Figure 10: Installing the Boom Hanger Tabs

22. Slide the boom hanger tab assembly (Figure 10, Item 1) over the boom (Figure 10, Item 2) from the leading edge of the boom and onto the side of the boom hanger opposite of the plastic centering bracket nuts (Figure 10, Item 3).

23. Insert a 5/16 bolt (Figure 10, Item 4) through the boom hanger tab assembly and install the washers on each side (Figure 10, Item 5) and nut (Figure 10, Item 6).

Table 12: Boom Hanger Tab Installation Parts

Parts from the Boom Hanger Kit

Refer to Figure 10

Item	Part Number	Description	Qty
4	AN5-7A	Bolt, Mil-Spec 5/16-24 x 31/32 Cad Plated	6
5	AN960-516L	Washer, Mil-Spec, 5/16, Cad Plated	12
6	AN365-524A	Nut, Hex, Nylok, 5/16-24, Cad Plated	6

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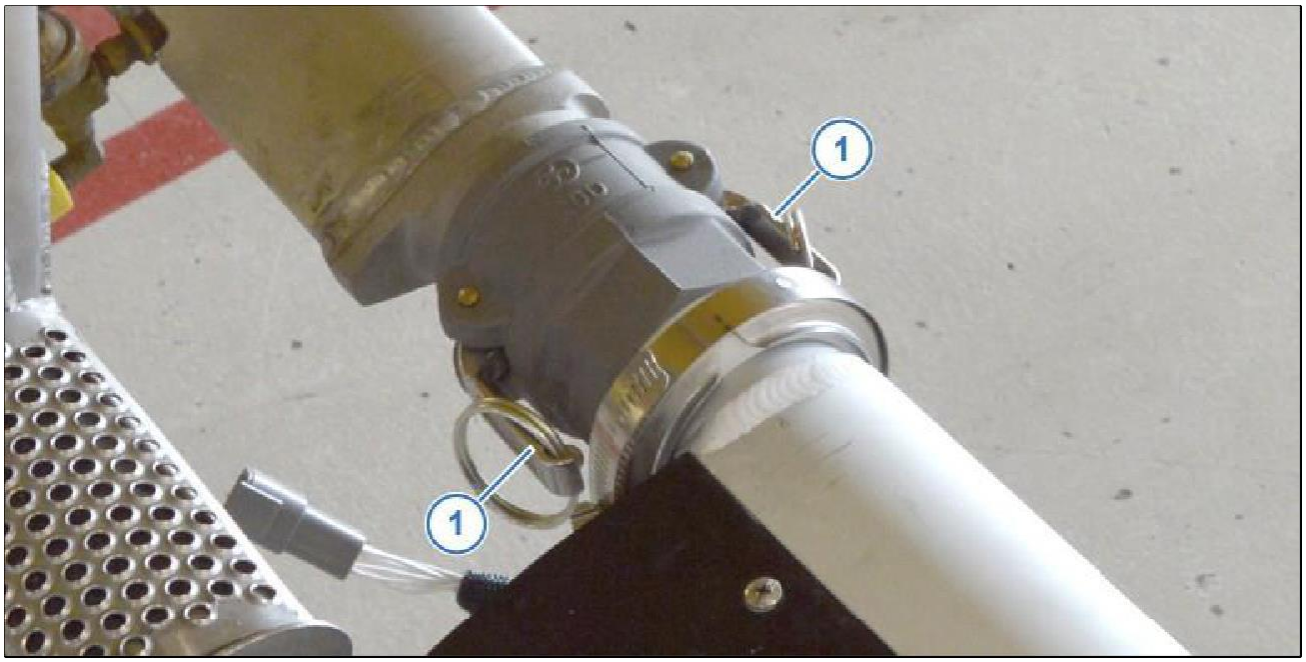

Figure 11: Check the Camlock Tension

24. Loosen and tighten the handles (Figure 11, Item 1) on the camlock to make sure that both handles have the same tension.

25. Check both sides of the aircraft to make sure that they have the same tension. If the handles have different levels of tension, remove the clamp from the boom hangers and adjust the boom forward or aft until the handles are equal in closing force. Once the handles have equal tension, install the clamps on the boom hangers again.

26. Check the straightness of the boom, position of the hangers, and tension on the camlock handles.

27. If the boom is straight, the hangers are in the correct position, and the tension on the camlock handles is equal, use the existing boom hanger mounting locations on your aircraft to match drill 1/4 inch holes into each of the SwathPRO™ boom hangers.

CAUTION: The minimum allowable distance from the center of a drilled hole to the edge of the boom hanger may be no less than 1.5 times the diameter of the hole.

Example: the center point of a 1/4 inch diameter hole must be at least 3/8 inch from the edge of the boom hanger.

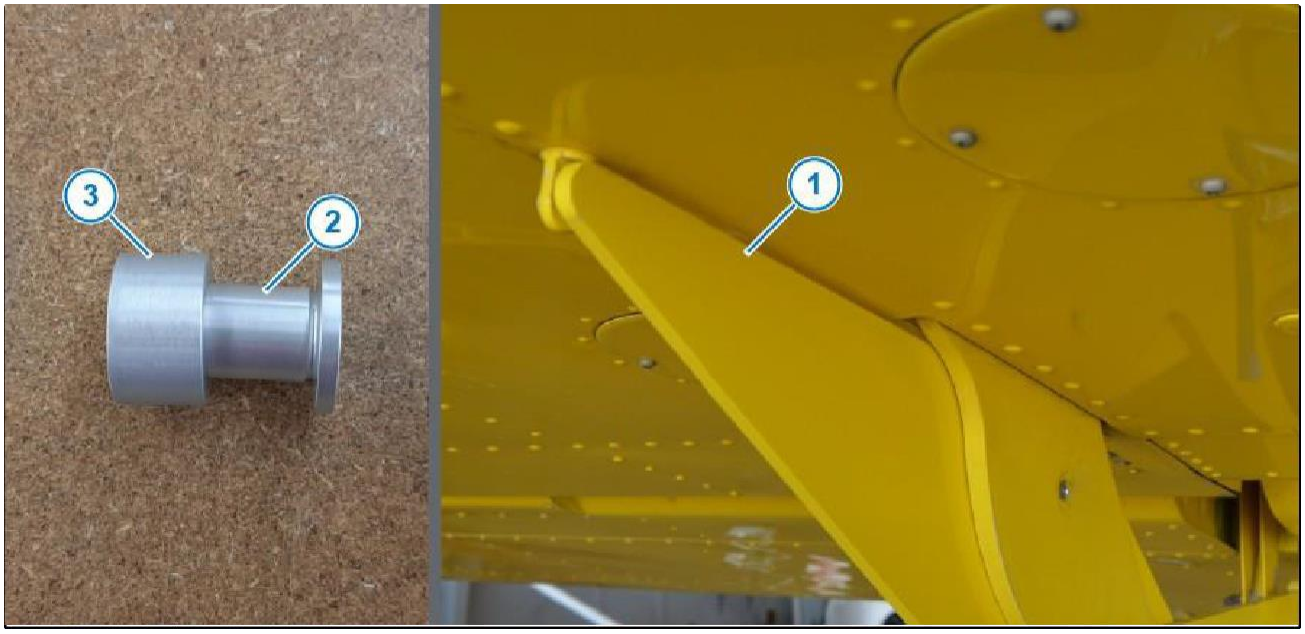

Figure 12: Installing the Bushing Kit

28. If necessary, install bushing kits to the boom hangers.

Table 13: Bushing Kit Part Numbers

Parts from the System Kit

Refer to Figure 12

Item	Part Number	Description	Qty
2 and 3	320150-007	Kit, Boom Hanger, Bushing and Sleeve	802—6
			602—2

On the 802 aircraft, a bushing kit needs installed in three locations on each side of the aircraft. On the middle hanger, a bushing kit is installed in the aft top location. On the innermost hanger, a bushing kit is installed in both mounting locations.

On 602 aircraft, a bushing kit needs installed in one location in each side of the aircraft. On the innermost hanger, a bushing kit is installed in the lowest hole.

a. Remove the boom hanger (Figure 12, Item 1).

b. Use a 39/64 inch drill bit to drill out the hole where the bushing will be installed.

c. Use a 5/8 inch reamer to ream out the 39/64 inch hole.

   Note: The final inner diameter of this hole must not be larger than 0.6257 inch.

d. Use a clamp to press the bushing (Figure 12, Item 2) into the hole until it is seated against its collar.

   The collar should be on the side of the boom hanger that will not be facing the mounting location.

e. If there are visual scratches on the bushing after pressing in, touch-up with Alodine around the outside of the bushing.

f. Install the bushing sleeve (Figure 12, Item 3) over the bushing.

g. Repeat steps a to f for every bushing that needs installed.

h. Install the boom hanger.

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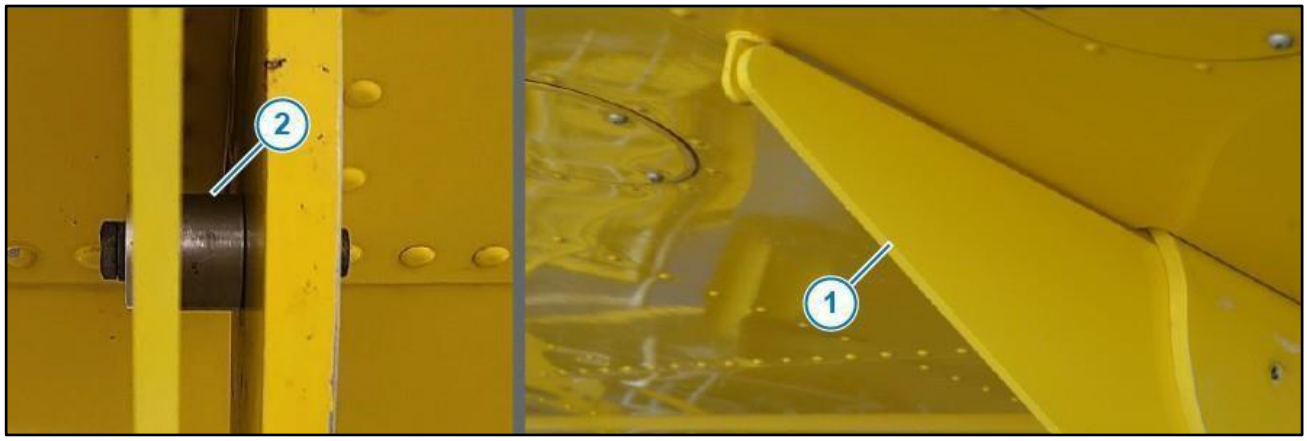

Figure 13: Boom Hanger Installation

29. Start at the outside of the aircraft, on each side, to install the boom hangers (Figure 13, Item 1) using the existing washers and/or spacers you kept when removing the existing boom hangers from the aircraft.

On the 602 and 802 aircraft, the bushing kit (Figure 13, Item 2) will replace the spacer that was installed when the hanger was removed.

30. Make sure that the hanger is parallel with the direction of flight.

Make adjustments by tapping the boom hanger tab assembly left or right to straighten the boom hanger. If the boom hanger has any bend in it, this can cause the spray pattern to have a gap in that location.

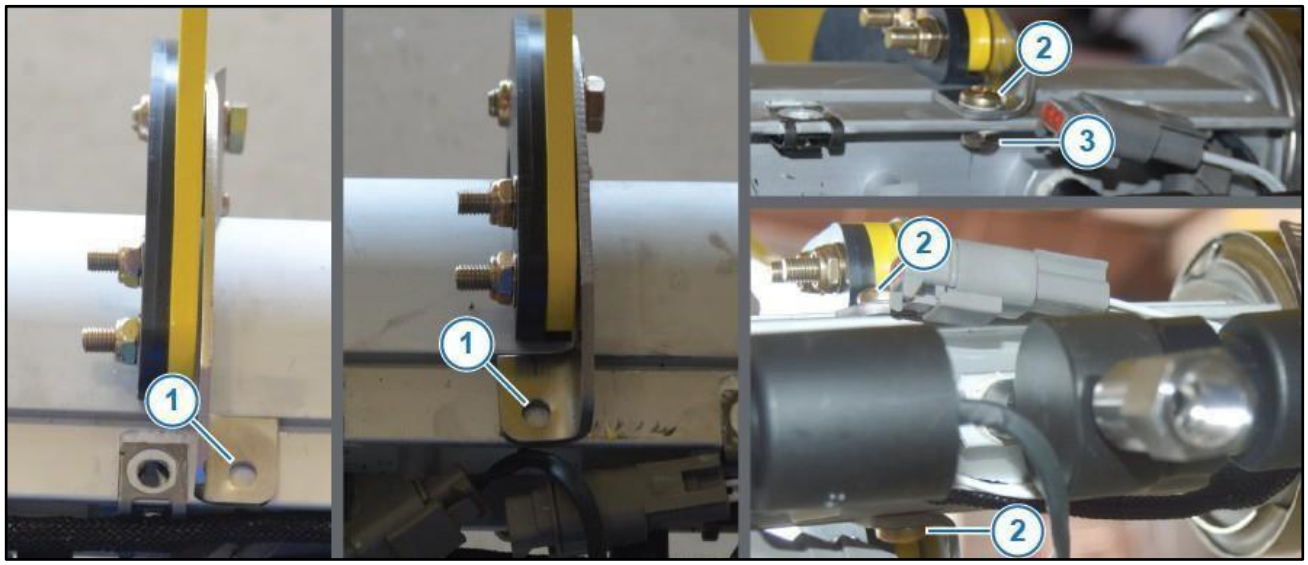

Figure 14: Boom Hanger Installation

31. Use the hole in the boom hanger tab assembly (Figure 14, Item 1) as a guide and match drill the 1/4-inch holes in the top and bottom of the boom for each boom hanger tab assembly.

32. Install the 1/4-28 x 5/8 screw (Figure 14, Item 2) and nut (Figure 14, Item 3) to the top and boom of the boom to attach the boom hanger tab assembly.

Table 14: Boom Hanger Installation Parts List

Parts from the Boom Hanger Kit

Refer to Figure 14

Item	Part Number	Description	Qty
2	MS35207-280	Screw, 1/4-28 x 5/8” Cad Plated	12
3	AN364-428A	Nut, Stop, Hex, Thin, 1/4-28 Cad Plated	12

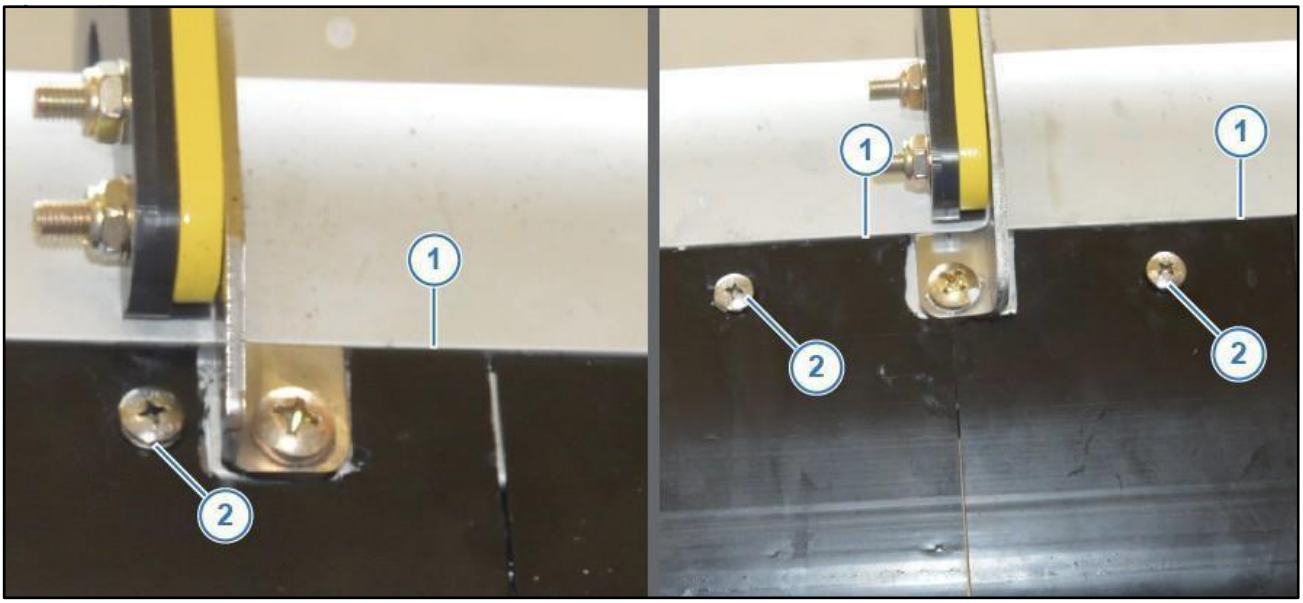

Figure 15: Install the Shells

33. Cut the shells (Figure 15, Item 1) to fit around the boom hanger tab assembly.

34. Install the shells and tighten the quarter-turn fasteners (Figure 15, Item 2)

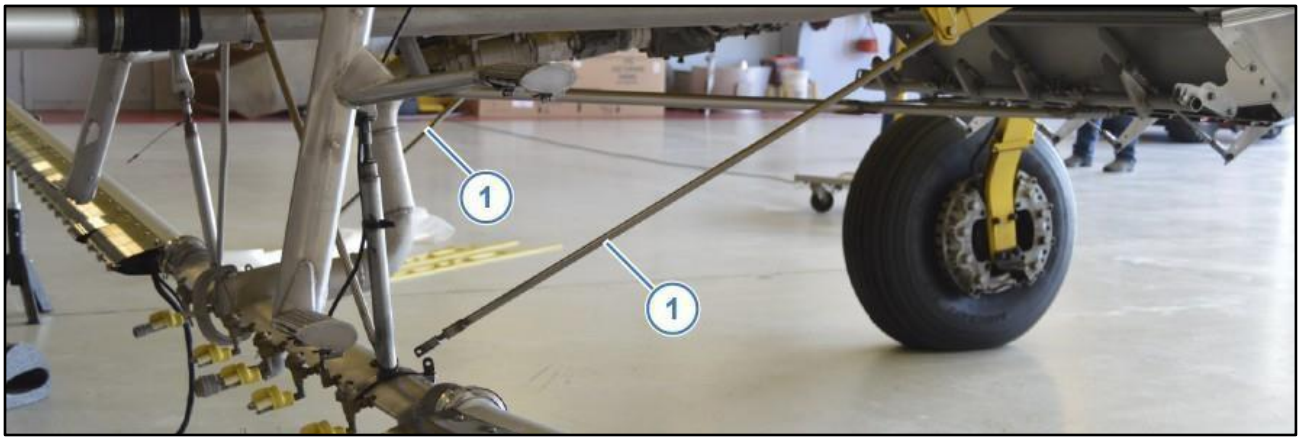

Figure 16: Forward Facing Support Tubes

35. Attach the forward facing support tubes (Figure 16, Item 1) on the center boom.

You may need to readjust the length of these tubes to get them to fit correctly again.

36. Remove the stands.

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Gateway Hub Mounting Location Options

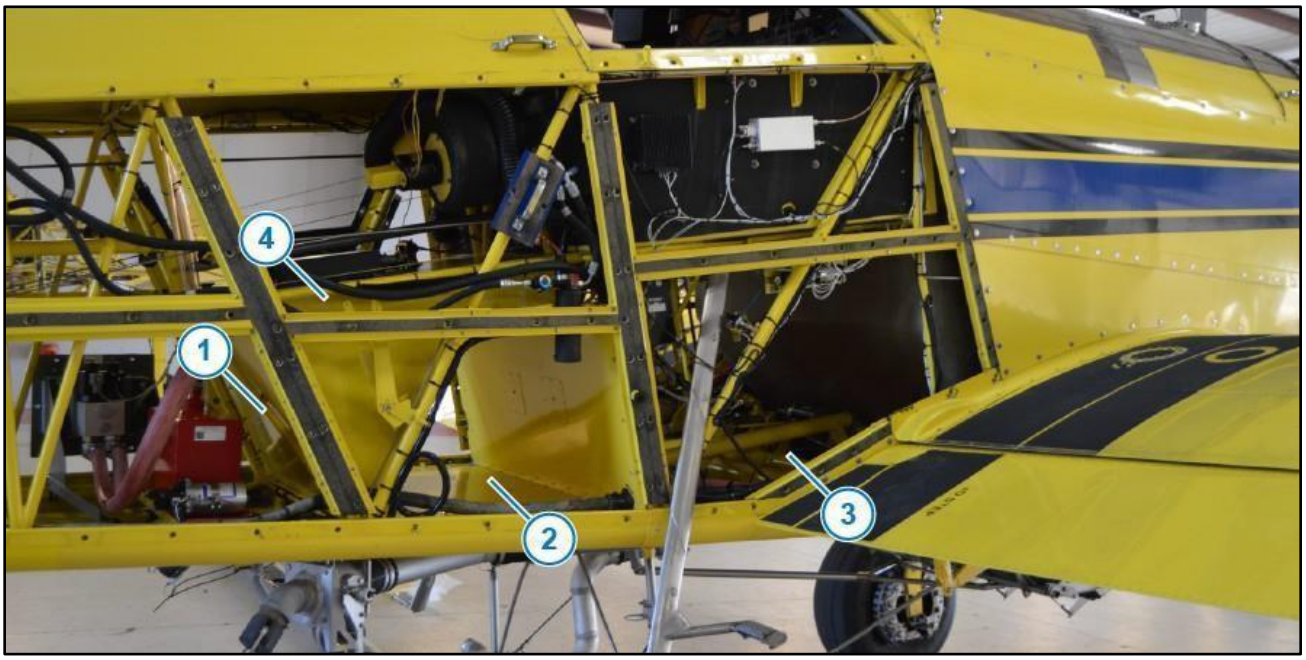

Figure 17: Gateway Hub Mounting Options

Find a suitable location for the Gateway hub. Recommended locations:

- Option 1 (Figure 17, Item 1)—Back of the luggage compartment
- Option 2 (Figure 17, Item 2)—Inside the luggage compartment
- Option 3 (Figure 17, Item 3)—Under the cockpit
- Option 4 (for AT-802/802A Only) (Figure 17, Item 4)—Top of the luggage compartment

Install the Gateway Hub On the Back of the Luggage Compartment

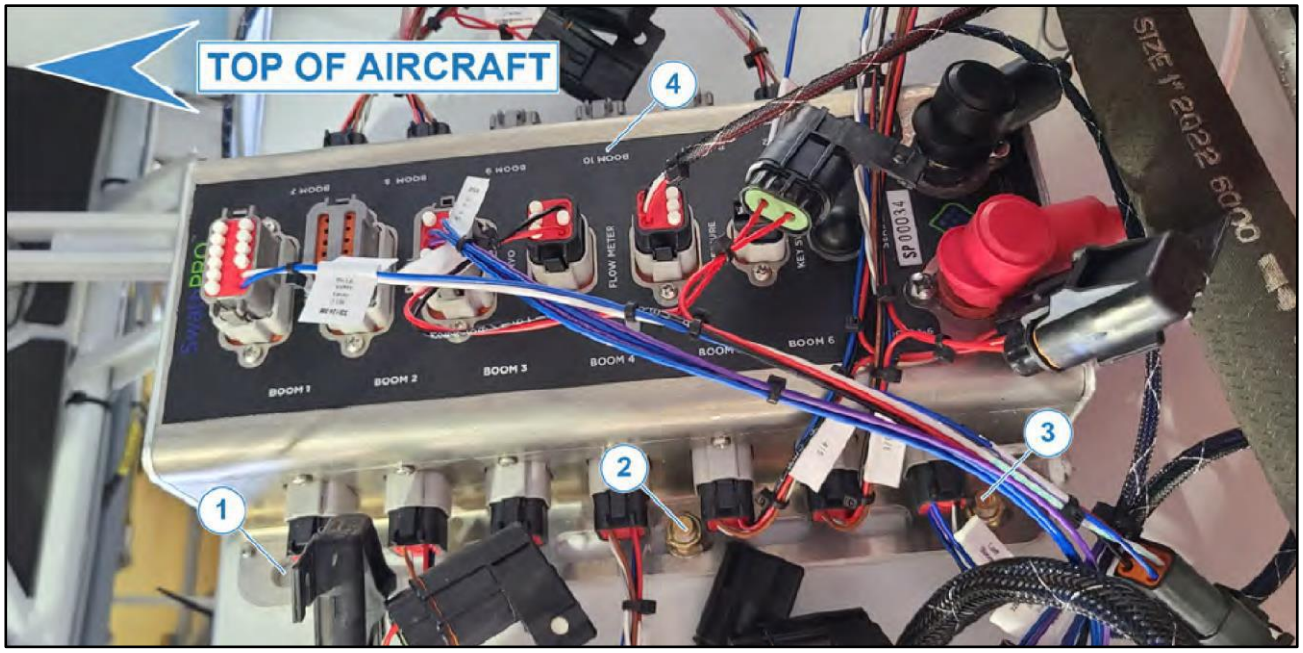

Figure 18: Back of the Luggage Compartment

1. Place the Gateway hub on the back of the luggage compartment. If possible, orient the hub vertically.

   Make sure to keep it clear of any moving parts.
2. Use the slots in the Gateway hub housing as a guide to match drill three holes on each side on the Gateway—top (Figure 18, Item 2), center (Figure 18, Item 3), and bottom (Figure 18, Item 4) on each side of the Gateway.
3. Install the Gateway hub (Figure 18, Item 5) to the back of the compartment with the supplied hardware —3/8-24 x 31/32 hex bolts, 3/8 flat washers, and 3/8-24 nuts.

Table 15: Gateway Hub Mounting Part Numbers

Parts from the Fuselage Kit

Refer to Figure 18

Item	Part Number	Description	Qty
5	320200-100	Assembly, Gateway Hub, SwathPRO	1
7	AN6-7A	Bolt, Hex 3/8-24 x 31/32 Cad Plated	6
	AN960-616L	Washer, Flat, 3/8, Cad Plated	12
	AN365-624A	Nut, Hex 3/8-24 Stop, Cad Plated	6

4. Make sure that all of the hardware is tightened to the correct specification. Refer to Table 2: AN Part Numbers and Torque Specifications.

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Install the Gateway Hub Inside the Luggage Compartment

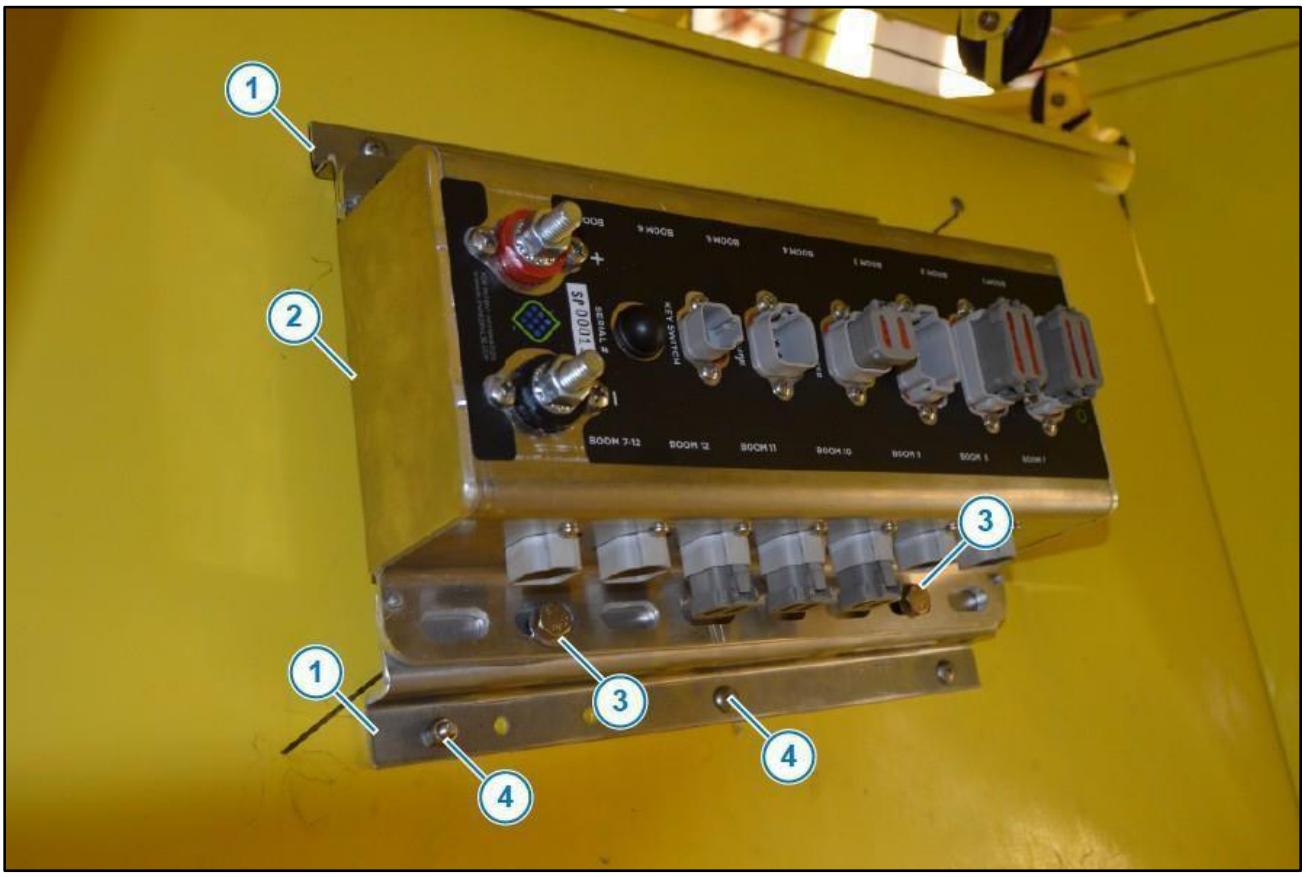

Figure 19: Mounting the Gateway Hub

1. Cut 12 inches off of each end of a supplied Gateway hub mounting bracket (Figure 19, Item 1).

   Note: If it is determined that the mounting brackets are not required, and the Gateway hub can be mounted directly to the side of the luggage compartment without them, omit the mounting brackets and use supplied hardware (Figure 19, Item 3)—3/8-24 x 31/32 hex bolts, 3/8 flat washers, and 3/8-24 nuts to mount the Gateway hub.

Table 16: Gateway Mount Part Numbers

Parts from the Fuselage Kit

Refer to Figure 19

Item	Part Number	Description	Qty
1	320015-018	Mount, Gateway	2

2. Place the Gateway hub (Figure 19, Item 2) onto each 12-inch mounting bracket, aligning the 3/8 holes in the bracket with the Gateway mount.

   Make sure that the brackets have the bottom leg of the bracket facing out and that the Gateway hub is flush with both ends of the brackets.

Table 17: Gateway Hub Mounting Part Numbers

Parts from the Fuselage Kit

Refer to Figure 19

Item	Part Number	Description	Qty
2	320200-100	Assembly, Gateway Hub, SwathPRO	1

3. Install the Gateway hub to the brackets with the supplied hardware (Figure 19, Item 3)—3/8-24 x 31/32 hex bolts, 3/8 flat washers, and 3/8-24 nuts.

Table 18: Gateway Hub Mounting Part Numbers

Parts from the Fuselage Kit

Refer to Figure 19

Item	Part Number	Description	Qty
3	AN6-7A	Bolt, Hex 3/8-24 x 31/32 Cad Plated	1
	AN960-616L	Washer, Flat, 3/8, Cad Plated	12
	AN365-624A	Nut, Hex 3/8-24 Stop, Cad Plated	6

4. Put the Gateway hub with the brackets into the desired location in the luggage compartment.
5. Match drill six locations with a #30 drill bit through the small holes of the mounting bracket
6. Attach the Gateway hub and mounts to the inside of the luggage compartment with the supplied Cherrymax rivets (Figure 19, Item 4).

Table 19: Rivet Part Numbers

Parts from the Fuselage Kit

Refer to Figure 19

Item	Part Number	Description	Qty
4	716023-112	Cherrymax Pop Rivet, 1/8” Aluminum	6

7. Make sure all 3/8 hardware is tightened to the correct specification. Refer to Table 2: AN Part Numbers and Torque Specifications.

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Install the Gateway Hub Under the Cockpit

1. Install the Gateway hub onto both of the supplied mounting brackets, aligning the 3/8 holes in the brackets with the Gateway mount.

   Make sure that the brackets have the bottom leg of the bracket facing out.

Table 20: Gateway Hub Mounting Bracket Part Numbers

Parts from the Fuselage Kit

Part Number	Description	Qty
320200-100	Assembly, Gateway Hub, SwathPRO	1
320015-018	Mount, Gateway	2

2. Mount the Gateway hub to the mounts with the supplied hardware—3/8-24 x 31/32 hex bolts, 3/8 flat washers, and 3/8-24 nuts.

Table 21: Gateway Hub Mounting Part Numbers

Parts from the Fuselage Kit

Part Number	Description	Qty
AN6-7A	Bolt, Hex 3/8-24 x 31/32 Cad Plated	6
AN960-616L	Washer, Flat, 3/8, Cad Plated	12
AN365-624A	Nut, Hex 3/8-24 Stop, Cad Plated	6

3. Put the Gateway hub with the brackets under the cockpit, and span across the two tubes located on the right side of the aircraft.
4. If desired, one or both of the brackets may be cut to length.
5. Use four Adel clamps and the supplied hardware— to attach the mounting brackets to the tubes. If pre-drilled holes do not align with clamps, it is acceptable to drill new holes.

   Adel clamp sizing:

   - MS2191-WDGXX1[1] for aluminum
   - MS2191-WSSXX1[1] for stainless steel

Table 22: Clamp Part Numbers

Parts from the Fuselage Kit

Part Number	Description	Qty
AN3-5A	Bolt, Hex 10-32 x 21/32 Cad Plated	4
AN960-10	Washer, Flat, #10 Cad Plated	4
AN365-1032A	Nut, Hex Elastic Stop, 10-32 Cad Plated	4

6. Make sure that all hardware is tightened to the correct specification. Refer to Table 2: AN Part Numbers and Torque Specifications.

1 XX is sized as required for mounting structure

Install the Gateway Hub on the Top of the Luggage Compartment

IMPORTANT: This mounting location is for Air Tractor 802/802A Models Only.

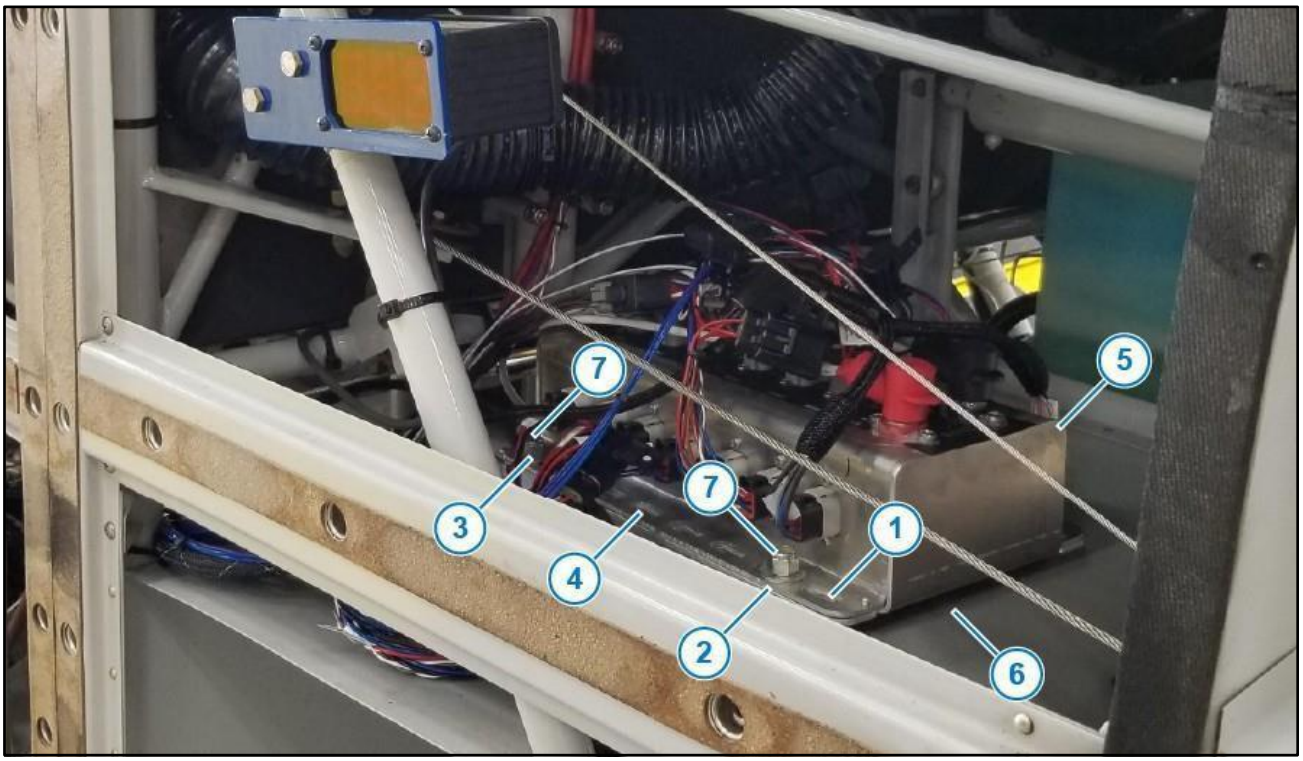

Figure 20: Gateway Hub on Top of the Luggage Compartment

1. Place the Gateway hub on top of the luggage compartment.

   Make sure to keep it clear of any moving parts.

2. Use the slots (Figure 20, Item 1) in the Gateway hub housing as a guide to match drill three holes on each side on the Gateway—bottom (Figure 20, Item 2), top (Figure 20, Item 3), and center (Figure 20, Item 4) on each side of the Gateway.

3. Install the Gateway hub (Figure 20, Item 5) to top of the luggage compartment (Figure 20, Item 6) with the supplied hardware (Figure 20, Item 7)—3/8-24 x 31/32 hex bolts, 3/8 flat washers, and 3/8-24 nuts.

Table 23: Gateway Hub Mounting Part Numbers

Parts from the Fuselage Kit

Refer to Figure 20

Item	Part Number	Description	Qty
5	320200-100	Assembly, Gateway Hub, SwathPRO	1
7	AN6-7A	Bolt, Hex 3/8-24 x 31/32 Cad Plated	6
	AN960-616L	Washer, Flat, 3/8, Cad Plated	12
	AN365-624A	Nut, Hex 3/8-24 Stop, Cad Plated	6

4. Make sure that all hardware is tightened to the correct specification. Refer to Table 2: AN Part Numbers and Torque Specifications.

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Gateway Hub Identification

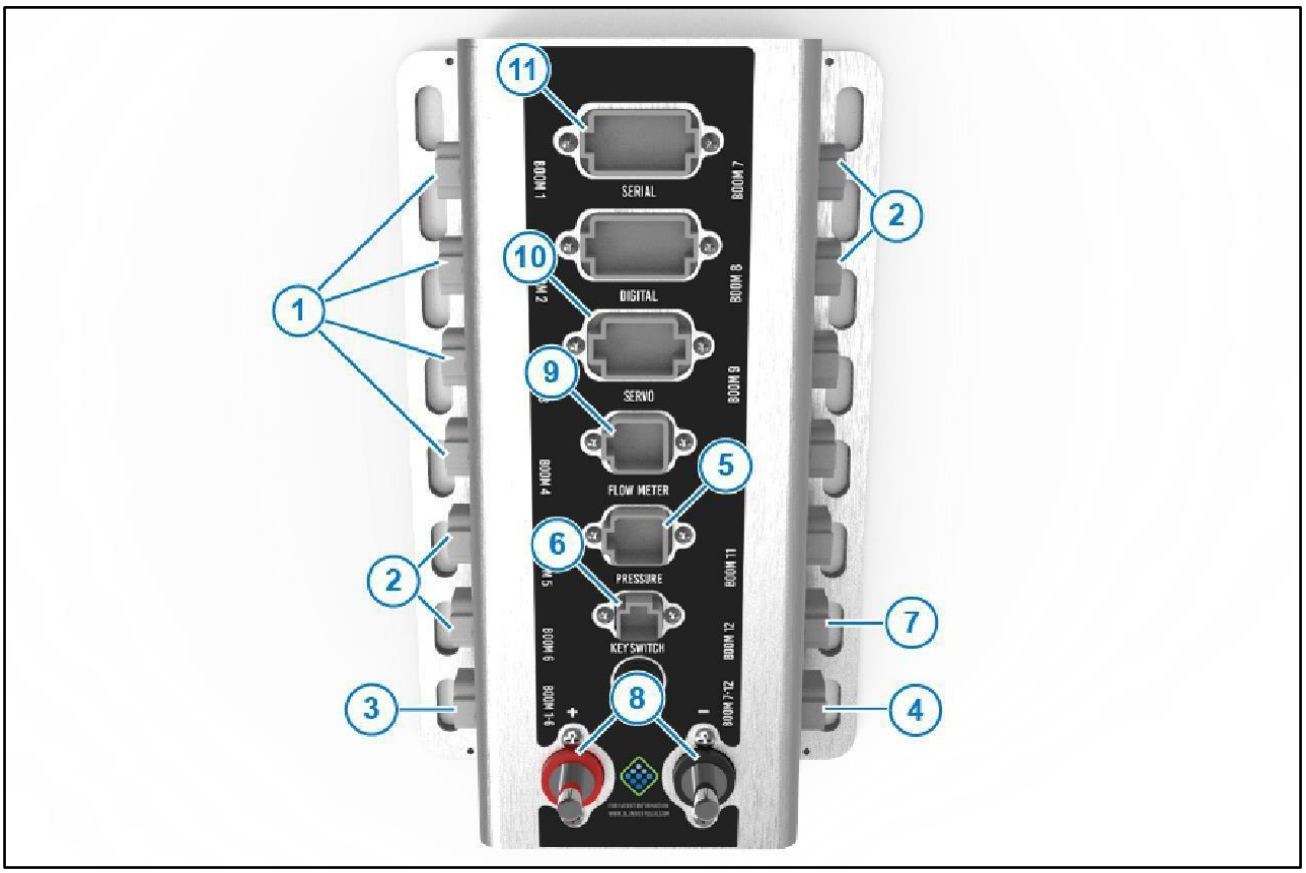

Figure 21: Gateway Hub Identification

Table 24: Gateway Hub Identification

Item	Description		Item	Description
1	Left Boom Extension Harness Connector Ports		7	CapView Harness Connector Port
2	Right Boom Extension Harness Connector Ports		8	Battery Power Harness Terminals
3	L Boom Connector Port		9	Flowmeter Connector Port
4	R Boom Connector Port		10	Servo Port
5	Pressure Connector Port		11	Serial Port
6	Key Switched Power Connector Port			

Install the Main Power Kit

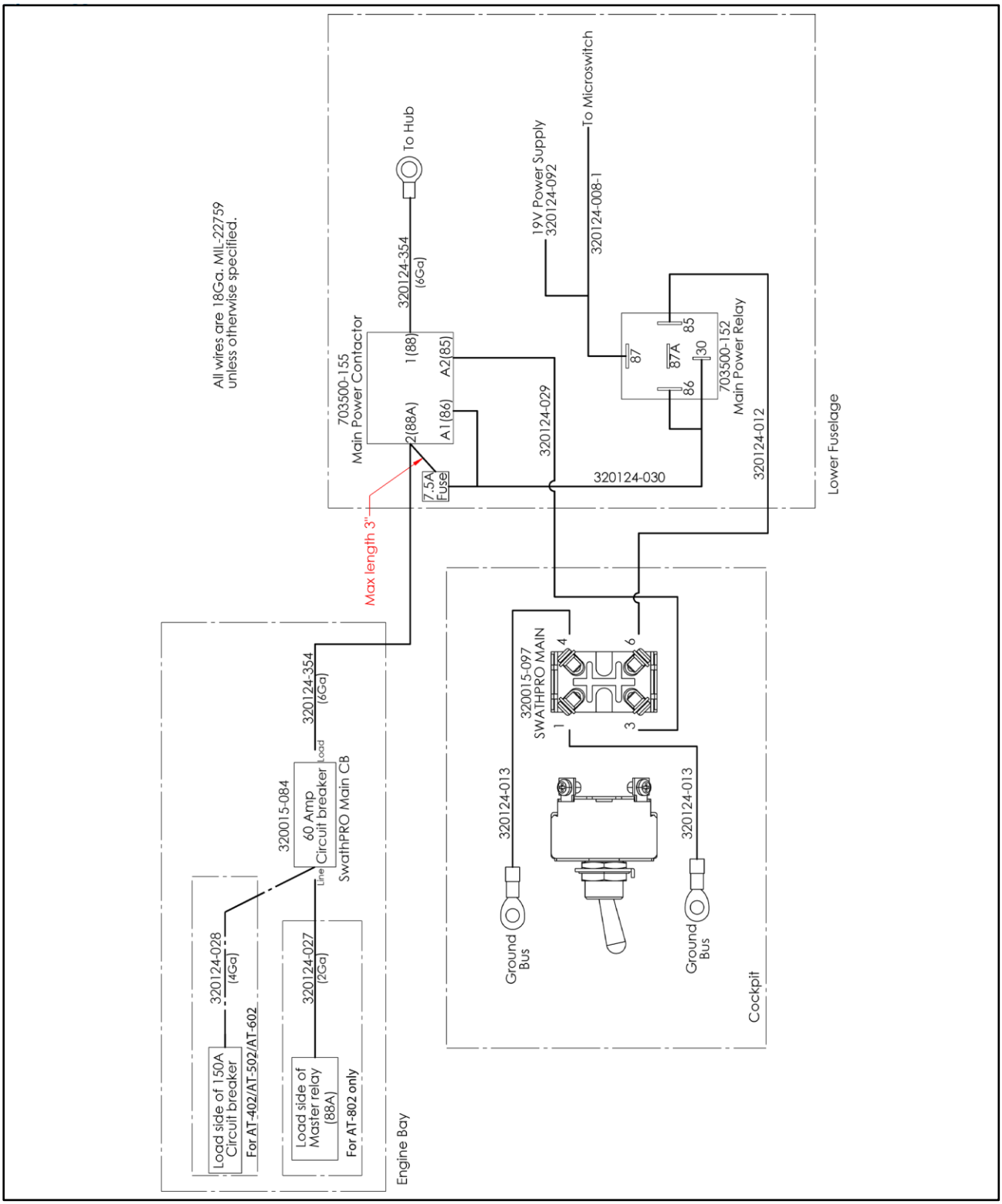

Figure 22: Main Power Schematic

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Install the 60A Circuit Breaker

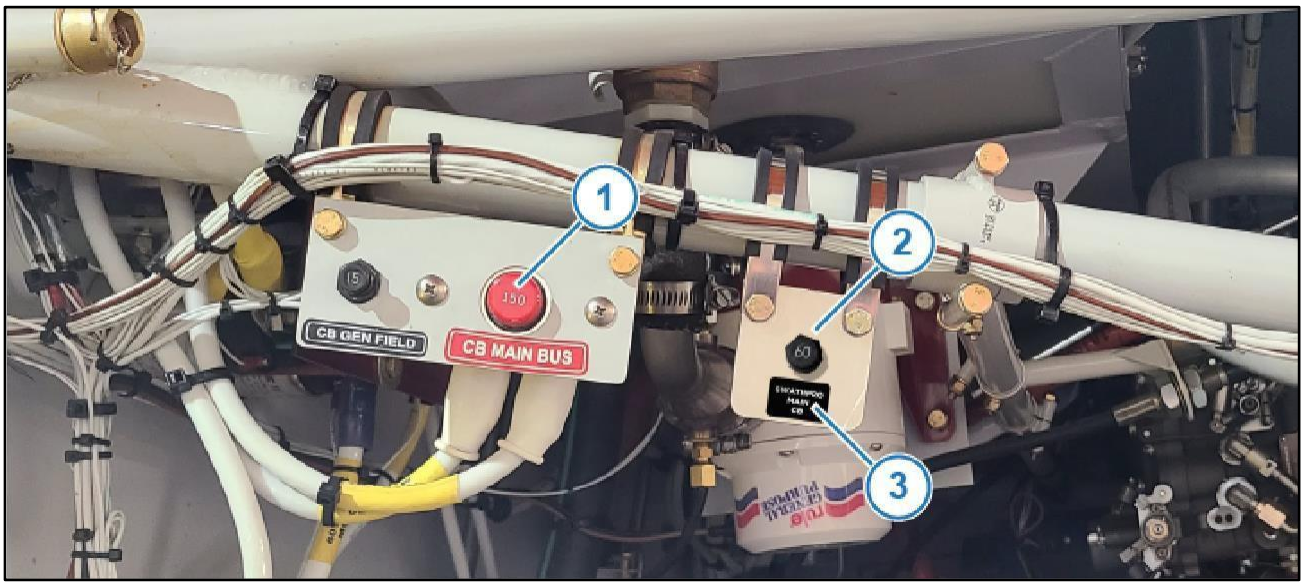

Figure 23: 60A Circuit Breaker (402, 502, 602)

1. For AT-802 aircraft, proceed to Step 4. For AT-402, 502, and 602, proceed to Step 2.
2. Find the master circuit breaker (Figure 23, Item 1).

   The master circuit breaker for your type of aircraft may be different than the one shown
3. Install the supplied SwathPRO™ 60A circuit breaker (Figure 23, Item 2) near the master circuit breaker for the plane using the supplied Bracket, Adel clamps and hardware. Proceed to Step 5.

   Note: Two different sizes of Adel clamps are supplied. Select the size that fits your application.

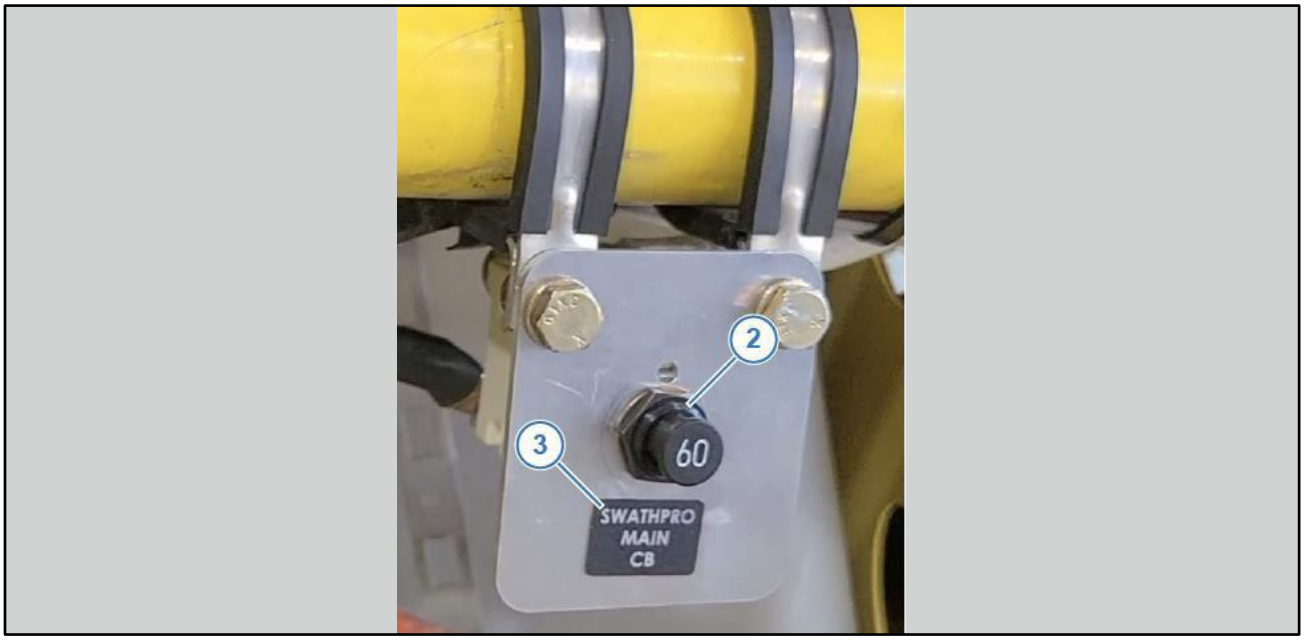

Figure 24: 60A Circuit Breaker (802)

4. Install the supplied SwathPRO™ 60A circuit breaker (Figure 24, Item 2) under the relay bank for the plane, using the supplied Bracket, Adel clamps and hardware.

   Note: Two different sizes of Adel clamps are supplied. Select the size that fits your application.

Table 25: Circuit Breaker Part Numbers

Parts from the Main Power Kit

Refer to Figure 23 and Figure 24

Part Number	Description	Qty
320015-011	Bracket, Circuit Breaker	1
AN3-5A	Bolt, Hex 10-32 x 21/32 Cad Plated	2
AN960-10	Washer, Flat, #10, Cad Plated	2
AN365-1032A	Nut, Hex elastic stop, 10-32, Cad Plated	2
MS21919-DG22	Clamp, Adel, 1-3/8"	2
MS21919-DG24	Clamp, Adel, 1-1/2"	2

5. Install the **SWATHPRO MAIN CB** label (Figure 23 and Figure 24, Item 3) below the 60A Circuit Breaker.

Table 26: Decal Page Part Number

Parts from the Main Power Kit

Refer to Figure 23 and Figure 24

Part Number	Description	Qty
320015-015	Decal, Page, Fuselage Decals	1

Install the 4Ga Power Cable (AT-402/502/602 only)

This procedure is for AT-402, AT-502, and AT-602 models using the 150A Main circuit breaker only.

For AT-802 models, refer to Install the 2Ga Power Cable (AT-802 only).

The master circuit breaker for your type of aircraft may be different than the one shown.

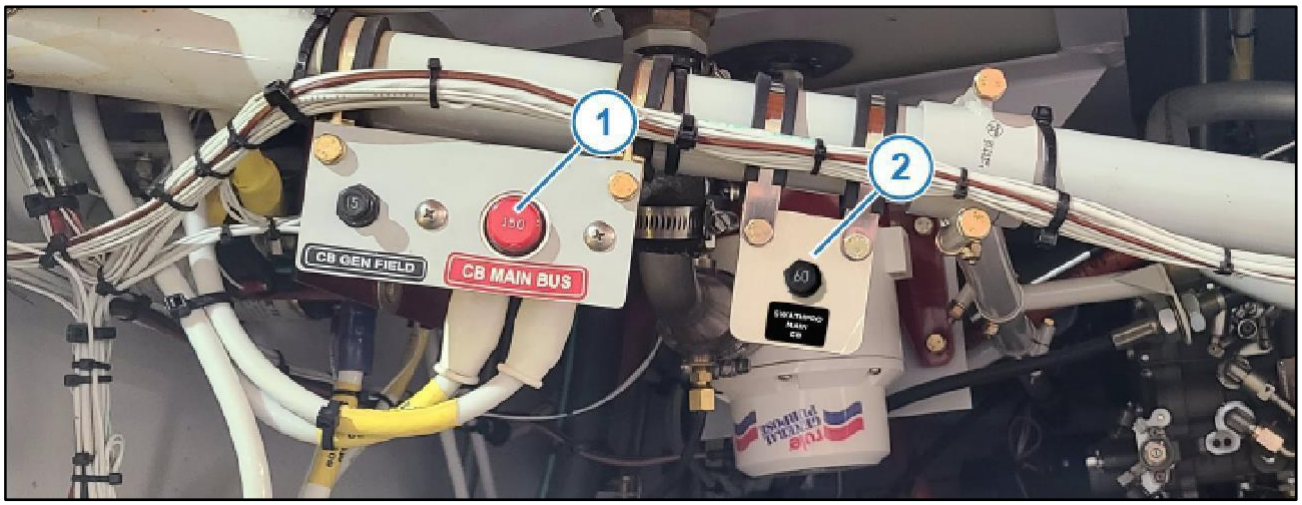

Figure 25: Master Circuit Breaker

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1. Connect one end of the *4Ga Power harness* to the **LOAD** side of the 150A circuit breaker. (Figure 25, Item 1)
2. Connect the other end of the *4Ga Power harness* to the **LINE** side of the 60A circuit breaker (Figure 25, Item 2).

Table 27: Power Harness Part Number

Parts from the Main Power Kit

Refer to Figure 25

Part Number	Description	Qty
320124-028	Harness, Power, 4Ga, SwathPRO	1

Install the 2Ga Power Cable (AT-802 only)

For AT-402, AT-502, and AT-602 models, refer to Install the 4Ga Power Cable (AT-402/502/602 only).

Figure 26: Master Relay

1. Install the M10 ring terminal side of the *2Ga Power Cable* to the **LOAD** side of the Master Relay (terminal 88A) (Figure 26, Item 1) If a shunt is installed on lug 88A, install using the bolt connecting the bus to 88A.

   Note: To locate the Master Relay, follow the positive cable from the middle battery to the relay. This is the Master Relay.

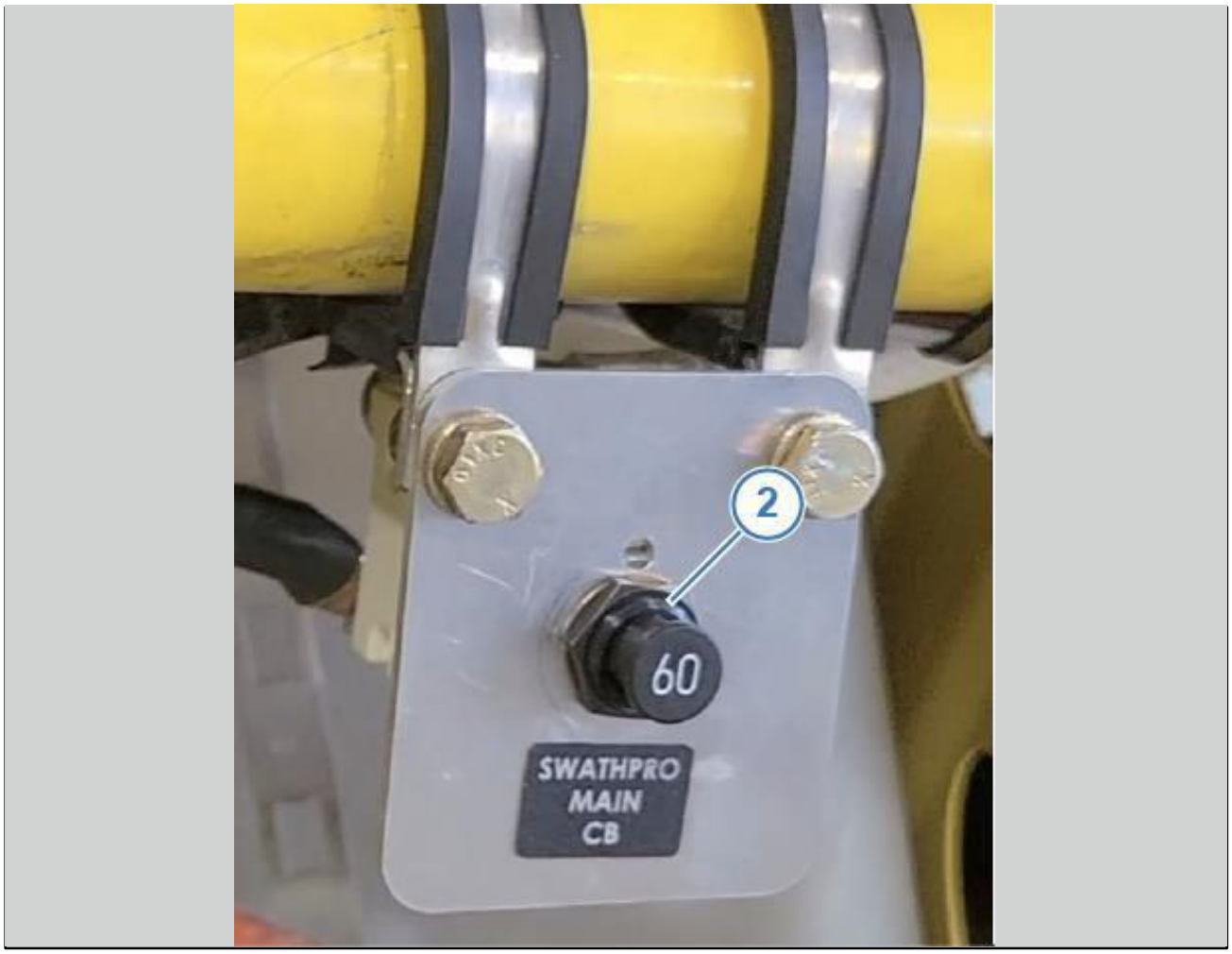

Figure 27: 60A Circuit Breaker (AT-802)

2. Install the 1/4” ring terminal side of the *2Ga Power Cable* to the **LINE** terminal on the 60A circuit breaker (Figure 27, Item 2).

   Important: The SwathPRO main power must come directly from the master relay with its own current protection. The SwathPRO power must not be installed after the aircraft OEM circuit breaker.

Table 28: 2Ga Cable Part Number

Parts from the Main Power Kit

Refer to Figure 30

Part Number	Description	Qty
320124-027	Harness, Power, 2Ga, SwathPRO	1

IMPORTANT: The *2Ga Power Cable* **MUST NOT** be bundled with any other harnessing. It must be routed by itself.

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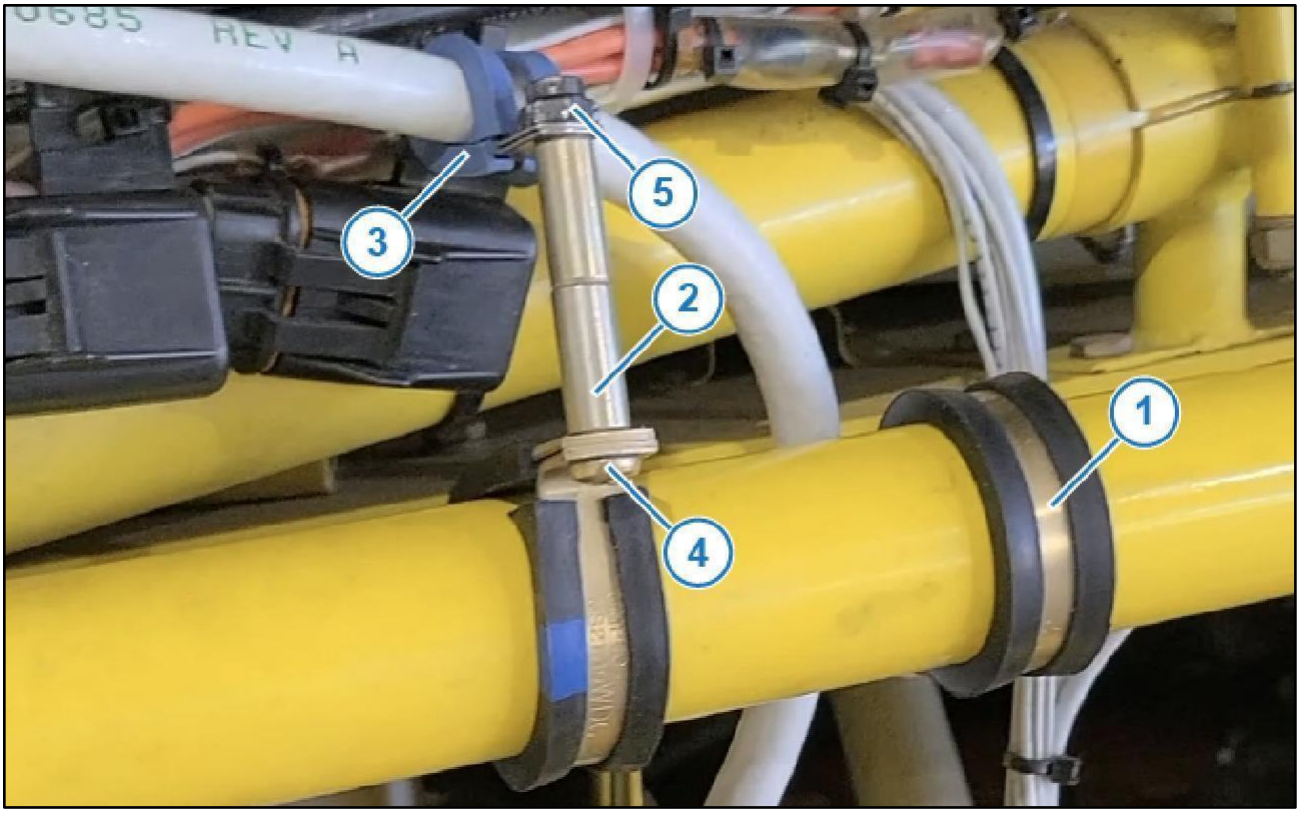

Figure 28: 2Ga Cable Routing

3. Using the supplied Adel clamps, clamp the 2Ga cable in two places as shown, ensuring it is clear of any obstructions.

Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.

Table 29: 2Ga Cable Installation Parts

Parts from the Main Power Kit

Refer to Figure 28

Item	Part Number	Description	Qty
1	MS21919-WDG24 or MS21919-WDG22	Clamp, Adel, 1-1/2" Clamp, Adel, 1-3/8”	2
2	NAS43HT3-48	Spacer, #10, 3/4" Cad Plated	2
3	MS21919-WCJ7	Clamp, Adel., 7/16" High Temp	2
4	MS35207-271	Screw, pan head, 10-32 x 2" Cad Plated	1
5	MS21045L3	Nut, Self locking, 10-32, Cad Plated	2
NA	MS35207-264	Screw, Pan head, 10-32 x 5/8", Cad plated	1

Install the Main Power Contactor

There are two mounting locations for the main power contactor. Location 1 is on the left cockpit sidewall. Location 2 is on the front wall of the luggage compartment. If the single point refueling STC is installed, the contactor MUST be installed in location 1. If the single point refueling STC is not installed, the contactor can be installed in either Location 1 or Location 2.

Location 1 – Left Cockpit Sidewall

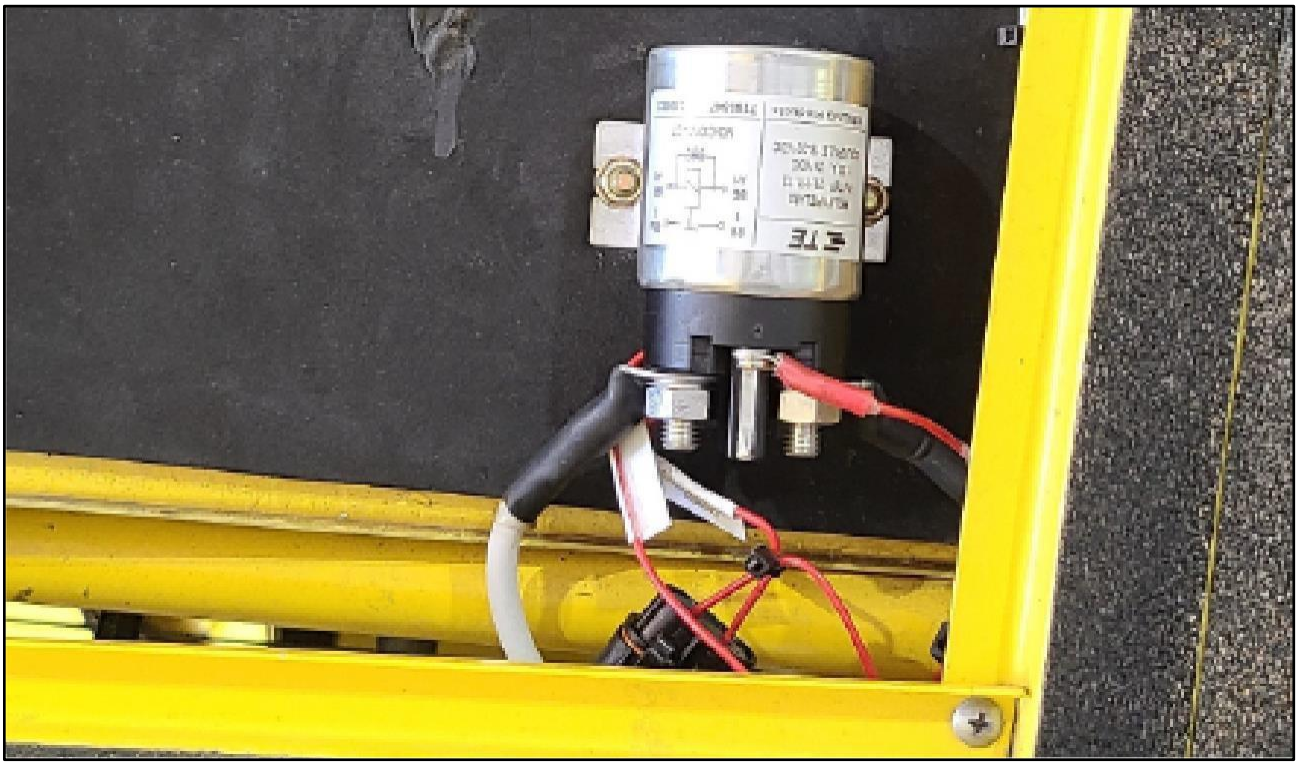

Figure 29: Location 1 Left Cockpit Sidewall

1. Locate a clear spot in the lower aft corner of the left cockpit sidewall to mount the Contactor.
2. Match drill two holes to mount the contactor.

   Note: Take care not to drill into anything on the other side of the sidewall.
3. Do not install the contactor yet, this will be done after all wires to contactor have been connected as described in upcoming steps.

Location 2 – Front Wall of Luggage Compartment

1. Find a clear spot on the outside of the front wall of the luggage compartment to mount the Contactor.
2. Match drill two holes to mount the contactor.

   Note: Take care not to drill into anything on the other side of the sidewall.
3. Do not install the contactor yet, this will be done after all wires to contactor have been connected as described in upcoming steps.

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Table 30: Main Power Contactor Part Numbers

Parts from the Main Power Kit

Refer to Figure 29

Part Number	Description	Qty
703500-155	Main Power Contactor	1
AN3-4A	Bolt, Hex 10-32 x 17/32 Cad Plated	2
AN960-10	Washer, Flat, #10, Cad Plated	2
AN365-1032A	Nut, Hex, elastic stop, 10-32, Cad Plated	2

Install the Power Harness

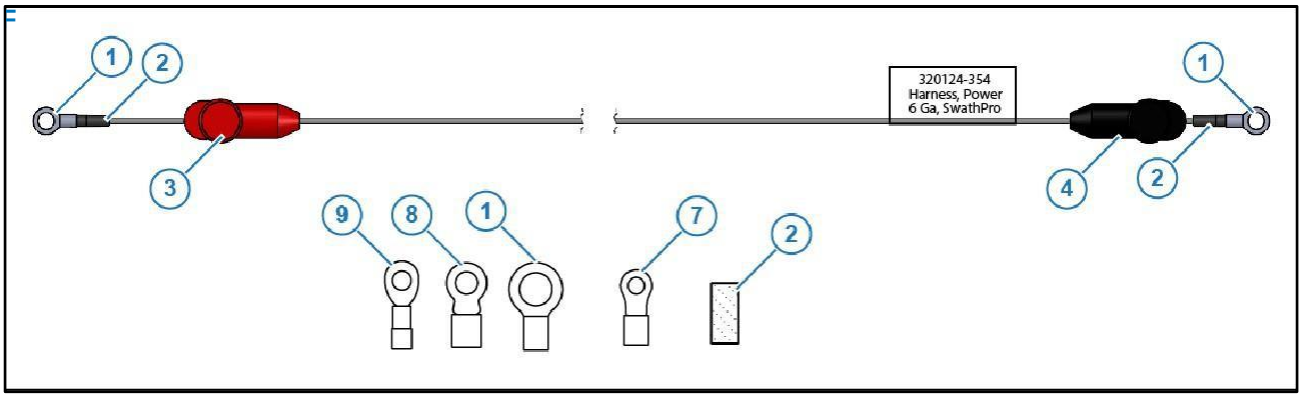

Figure 30: Power Harness

Three separate power cables will be built from the Power Harness (P/N: 320124-354).

- Grounding Power Cable
- Circuit Power Cable
- Contactor Power Cable

Build and Install the Grounding Power Cable

1. Measure and cut the Power Harness (Figure 30) from the black boot side (Figure 30, Item 4) to the correct length of harness to reach from the ground lug on the Gateway hub to an existing grounding point below the cockpit.

   Note: Do not install cable on the same lug as an existing electrical component.

Table 31: Power Harness Part Number

Parts from the Main Power Kit

Refer to Figure 30

Item	Part Number	Description	Qty
1	320124-354	Harness, Power, 6Ga.	1

For more information, refer to Gateway Hub Identification.

2. Locate the correct ring terminal size for ground lug.
3. Install a shrink tube (Figure 30, Item 2) and crimp a ring terminal (Figure 30, Item 8) to the opposite end of the harness from the black boot.

   Note: Crimp all ring terminals in accordance with AC 43.13-1B Chapter 11, Section 14.

Table 32: Power Harness Ring Terminal Part Number

Parts from the Main Power Kit

Refer to Figure 30

Item	Part Number	Description	Qty
8	MS20659-109	Ring Terminal, 6Ga. 1/4	1
2	M23053/4-105-0	Shrink Tube, 1/2"	1

You have now made the Grounding Power Cable.

4. Install the *Grounding Power Cable* between an existing grounding point below the cockpit and the Gateway hub.

   Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.

Make sure that the black boot is installed on the Gateway hub. For more information, see Gateway Hub Identification.

Build and Install the Circuit Power Cable

1. Measure and cut the Power Harness (Figure 30) from the bare end to the correct length, to reach from the 60A circuit breaker in the engine bay, to the main power contactor (Figure 29, Item 1).
2. Crimp a ring terminal to both ends.

   Note: 5/16” terminal on the contactor end and 1/4” terminal on the 60A circuit breaker end.

   Note: Crimp all ring terminals in accordance with AC 43.13-1B Chapter 11, Section 14.

Table 33: Power Harness Ring Terminal Part Number

Parts from the Main Power Kit

Refer to Figure 30

Item	Part Number	Description	Qty
9	MS20659-131	Ring Terminal, 6Ga. 5/16	1
8	MS20659-109	Ring Terminal, 6Ga. 1/4	1
2	M23053/4-105-0	Shrink Tube, 1/2"	2

You have now made the Circuit Power Cable.

3. Connect the *Circuit Power Cable* to the **LOAD** terminal on the 60A circuit breaker.
4. Connect the other end of the *Circuit Power Cable* to lug **2 (88A)** on the main power contactor.

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Build and Install the Contactor Power Cable

1. Measure and cut the Power Harness from the red boot (Figure 30, Item 3) to the correct length, to reach from the main power contactor to the power (+) terminal on the Gateway hub.
2. Crimp a ring terminal (Figure 30, Item 9) to the opposite end of the harness from the red boot.

   Note: Crimp all ring terminals in accordance with AC 43.13-1B Chapter 11, Section 14.

Table 34: Power Harness Ring Terminal Part Number

Parts from the Main Power Kit

Refer to Figure 30

Item	Part Number	Description	Qty
9	MS20659-131	Ring Terminal, 6Ga. 5/16	1

You have now made the *Contactor Power Cable*.

3. Connect the 5/16” ring terminal end of the *Contactor Power Cable* to lug 1 (88) on the main power contactor (Figure 25, Item 1) and the other end of the harness to the power (+) terminal on the Gateway Hub. Make sure that the red boot is installed on the Gateway hub.

   For more information, refer to Gateway Hub Identification.

   Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.

Install the Main Power Relay

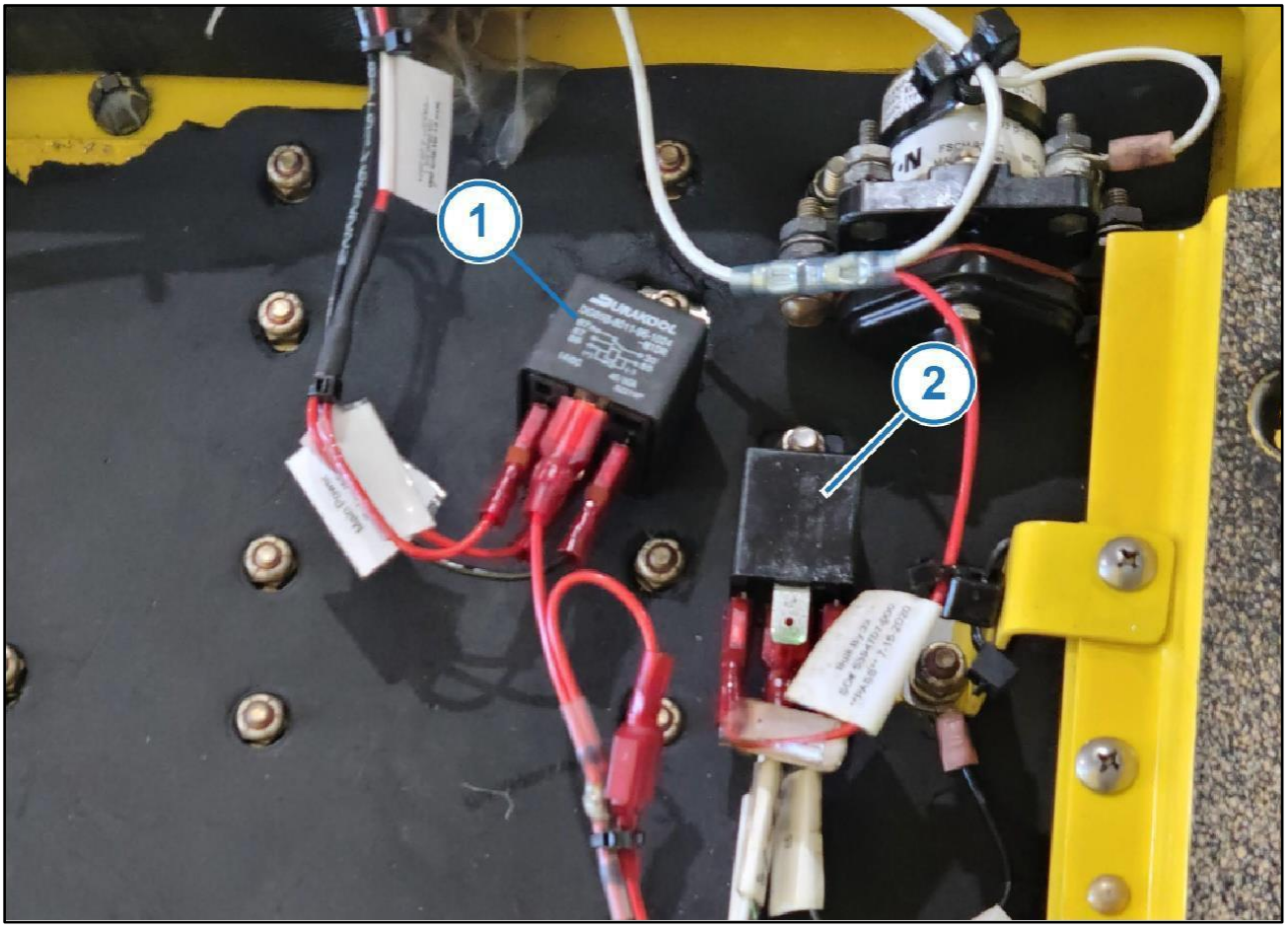

Figure 31: Relay Location

1. Mount the main power relay (Figure 31, Item 1) on the left side of the cockpit.

   Note: The relay from the Boom Shutoff Kit (Figure 31, Item 2) is mounted in this same area. Account for the space required for both relays.

Table 35: Relay Part Number

Parts from the Main Power Kit

Refer to Figure 31

Item	Part Number	Description	Qty
1	703500-152	Relay, SPDT, 24VDC	1

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Install the SwathPRO Main Toggle Switch

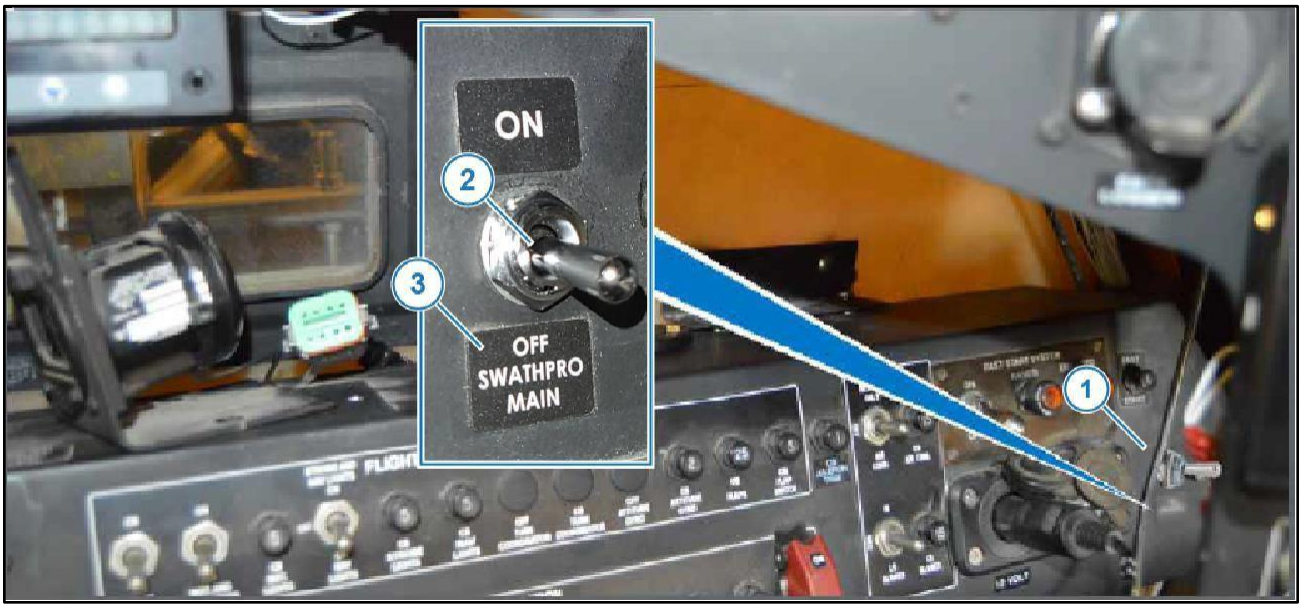

Figure 32: Label Location

Each aircraft is set up differently. Mounting locations can vary with each installation.

Find a location in the cockpit for the toggle switch from the main power kit.

Note: Four toggle switches will be installed with this system. Plan out where to install all of them. Refer to Boom Shutoff Kit for instructions for the other switches.

1. Make or locate an available hole in the lower instrument panel (Figure 32, Item 1) in the cockpit for the DPST toggle switch. (Figure 32, Item 2).

   Note: Do not install switch yet. The wires must be connected to the switch before installation.

Table 36: Toggle Switch Parts List

Parts from the Main Power Kit

Refer to Figure 32

Item	Part Number	Description	Qty
2	320015-097	Toggle Switch, DPST	1

Route and Install Main Power Toggle Switch Harnessing

1. Connect the end of the *Contactor to DPST Switch Harness* labeled **contactor A2 (85)** to screw A2 (85) on the contactor.

Table 37: Contactor to DPST Switch Harness Part Number

Parts from the Main Power Kit

Refer to Figure 30

Part Number	Description	Qty
320124-029	Contactor to DPST Switch Harness	1

2. Route the *Contactor to DPST Switch Harness* to the cockpit.
3. Connect the *Contactor to DPST Switch Harness* to screw #3 on the **DPST** switch that will be mounted in the cockpit.
4. Connect two of the *DPST Switch to Ground Harnesses*, from the end labeled **DPST**, to the #1 and #4 screws on the DPST switch, and route them to the grounding bus behind the dash in the cockpit.

Table 38: Relay to DPST Switch to Ground Harness Part Number

Parts from the Main Power Kit

Refer to Figure 30

Part Number	Description	Qty
320124-013	DPST Switch to Ground Harness	1

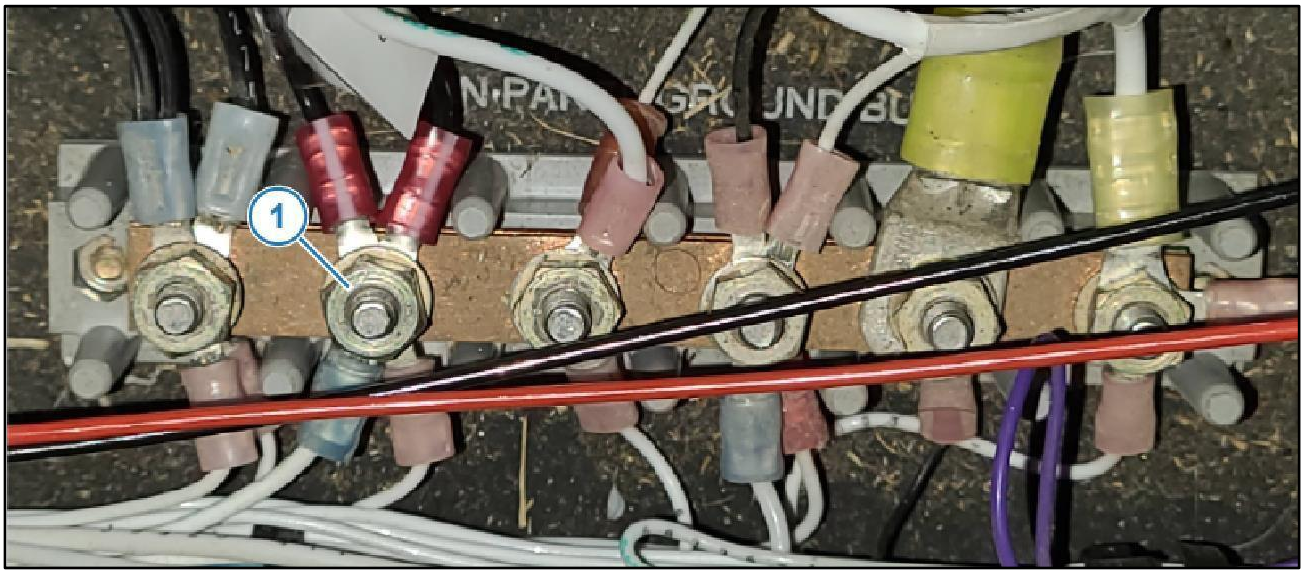

Figure 33: Grounding bus

5. Connect the two *DPST Switch to Ground Harnesses* to a grounding lug (Figure 33, Item 1) on the grounding bus.
6. Route the *Relay to DPST Switch Harness* to the Main power relay, located on the left side of the cockpit.

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Table 39: Relay to DPST Switch Harness Part Number

Parts from the Main Power Kit

Part Number	Description	Qty
320124-012	Relay to DPST Switch Harness	1

7. Connect the ring terminal labeled, **DPST**, to screw #6 on the DPST switch.
8. Connect the end labeled, **Main Power Relay**, to terminal 85 on the relay.

   Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.
9. Install the DPST toggle switch (Figure 32, Item 2) in the predetermined location of the lower instrument panel in the cockpit.
10. Install the **SWATHPRO MAIN** label (Figure 32, Item 3) below the DPST toggle switch.

Table 40: Decal Page Part Number

Parts from the Main Power Kit

Refer to Figure 32

Item	Part Number	Description	Qty
3	320015-015	Decal, Page, Fuselage Decals	1

11. Using the *Contactor to Main Power Relay Harness*, connect the end with the 5/16” ring terminal to lug **88A** on the contactor.
12. Connect the other leg coming from the fuse to **A1 (86)** on the contactor.
13. Route the harness to the main power relay.

    Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.
14. Connect the spade terminals to from the *Contactor to Main Power Relay Harness* to spades **86** and **30** on the Main power relay.

Table 41: Contactor to Main Power Relay Harness Part Number

Parts from the Main Power Kit

Part Number	Description	Qty
320124-030	Harness, Contactor to Main Power Relay	1

Mount the Contactor

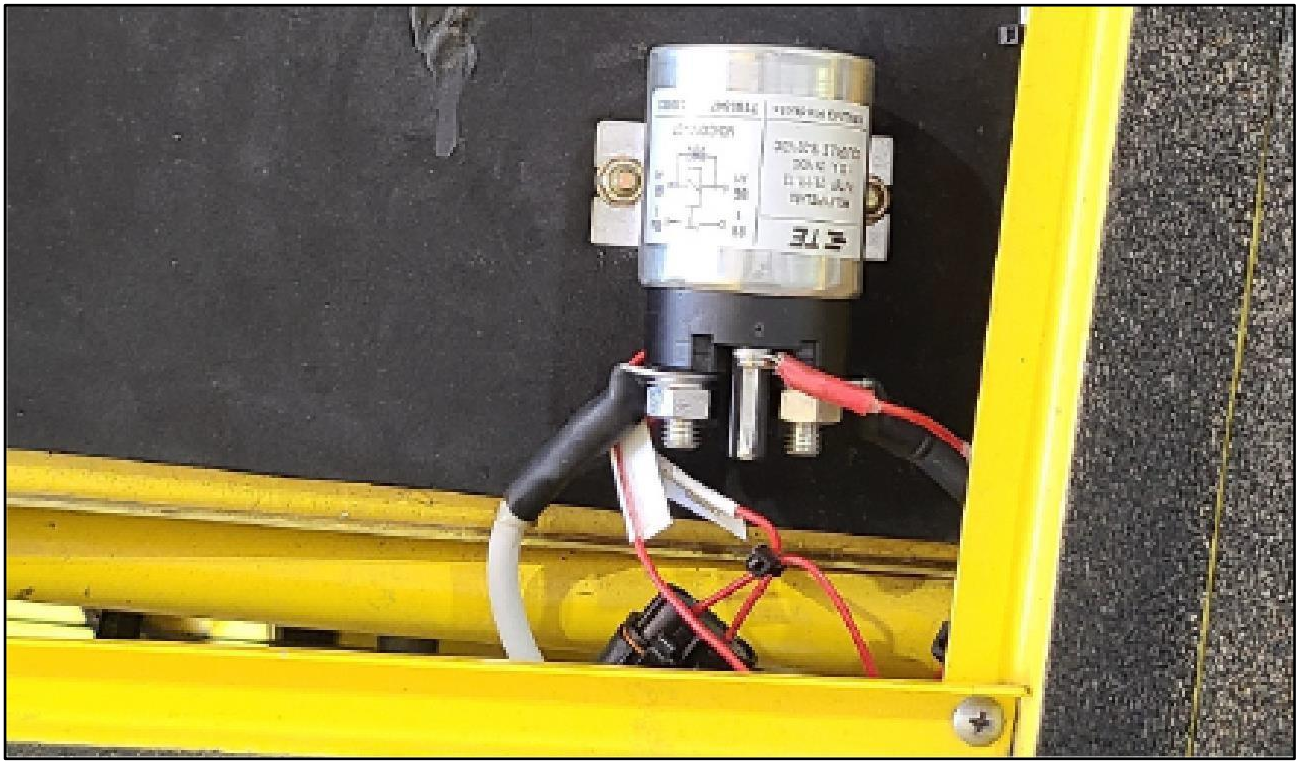

Figure 34: Main Power Contactor

1. Once all four wires are attached to the contactor, mount it into the predetermined location using the supplied hardware.

Table 42: Main Power Contactor Part Numbers

Parts from the Main Power Kit

Refer to Figure 34

Part Number	Description	Qty
703500-155	Main Power Contactor	1
AN3-4A	Bolt, Hex 10-32 x 17/32 Cad Plated	2
AN960-10	Washer, Flat, #10, Cad Plated	2
AN365-1032A	Nut, Hex, elastic stop, 10-32, Cad Plated	2

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Install the Power Supply

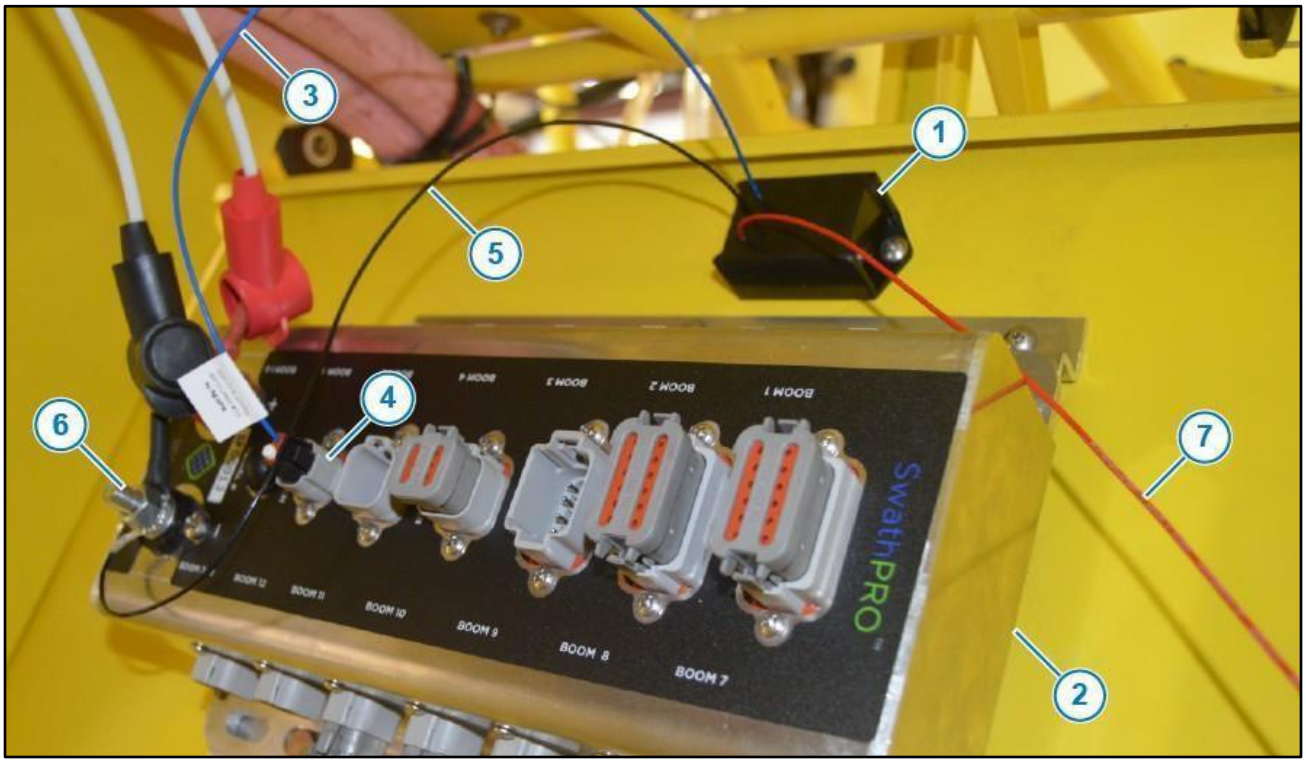

Figure 35: CapstanAG™ Power Supply

1. Mount the power supply (Figure 35, Item 1) near the Gateway Hub (Figure 35, Item 2).

Table 43: Power Supply Part Number

Parts from the Main Power Kit

Refer to Figure 35

Item	Part Number	Description	Qty
1	320015-092	Power Supply Assembly, 24V to 19V	1

3. Connect the 2-pin DT connector (Figure 35, Item 3), on the blue wire, to the Key Switch port (Figure 35, Item 4) on the Gateway hub.
4. Install the black wire (Figure 35, Item 5) with the ring terminal onto the ground lug (Figure 35, Item 6) on the Gateway hub.
5. Route the red wire (Figure 35, Item 7) to the Main power relay located on the left side of the cockpit.
6. Cut off and discard any extra harness length that is not needed to reach the main power relay.
7. Crimp a spade terminal onto the end of the red wire.

   Note: Crimp all ring terminals in accordance with AC 43.13-1B Chapter 11, Section 14.

Table 44: Ring Terminal Part Number

Parts from the Main Power Kit

Part Number	Description	Qty
715005-161	Terminal, Spade, 1/4 female	1

8. Retrieve the *Power Shutoff Harness* from the Shutoff Kit.

Table 45: Power Shutoff Harness Part Number

Parts from the Shutoff Kit

Part Number	Description	Qty
320124-008-1	Harness, Shutoff, Power	1

9. Connect the spade terminal labeled **Main Power Relay (87)** to spade 87 on the main power relay (Figure 31, Item 1)

   Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.

10. Connect the red wire from the power supply (Figure 35, Item 7) to the spade terminal labeled **19V Power Supply** on the *Power Shutoff Harness*.

Install the Pressure Sensor

Figure 36: Existing Pressure Sensor Location

1. Locate the existing pressure sensor on the aircraft.

   The usual location is on the right side of the cockpit (Figure 36, Item 1) inside the aircraft frame.

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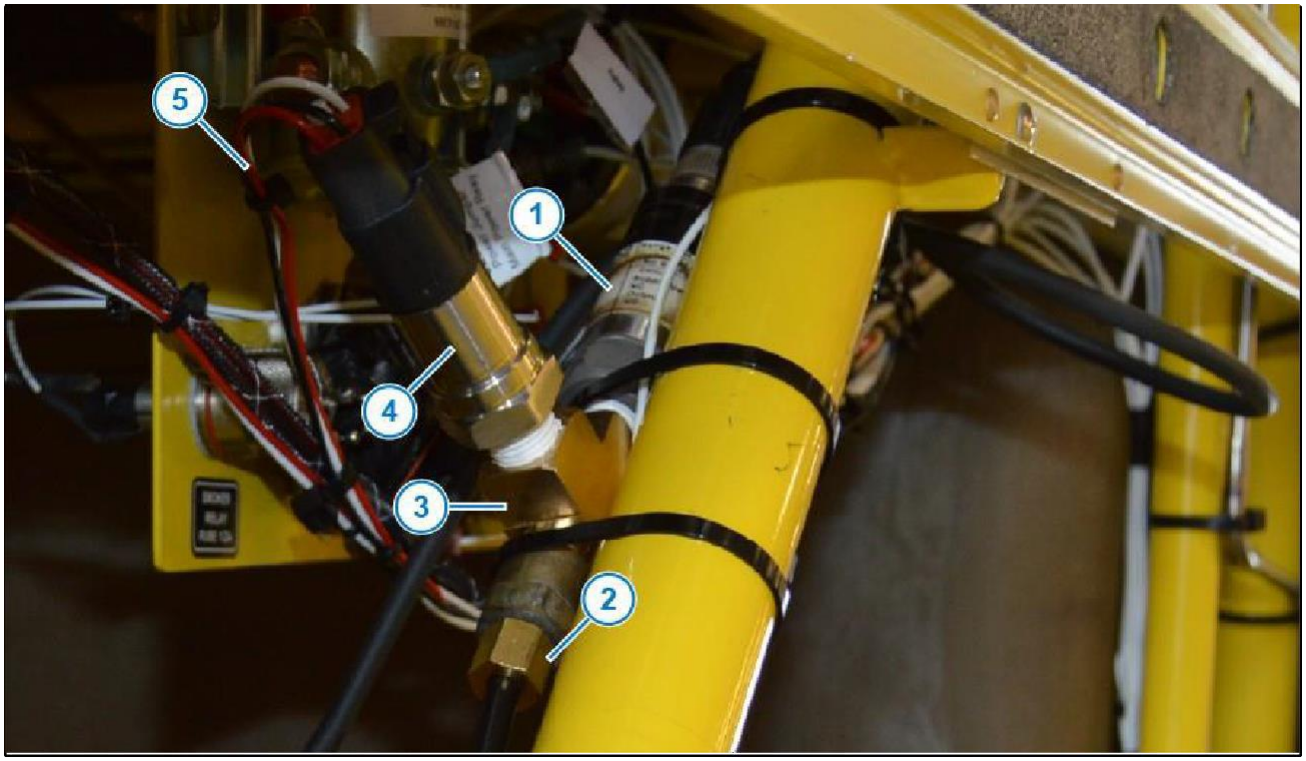

Figure 37: Pressure Sensor Installation

2. Remove the existing pressure sensor (Figure 37, Item 1) from the existing fitting (Figure 37, Item 2).
3. Install the existing hose and fitting (Figure 37, Item 2) onto the supplied 1/4 NPT tee street fitting (Figure 37, Item 3).

Table 46: Pressure Sensor Hardware Part Numbers

Parts from the Fuselage Kit

Refer to Figure 37

Item	Part Number	Description	Qty
3	716008-329	Tee Street, 1/4” NPT	1

4. Put thread sealant tape on the threads of the existing pressure sensor (Figure 37, Item 1).
5. Install the existing pressure sensor into the FPT port of the tee fitting that is opposite from the MPT port.
6. Make sure that the open 1/4 inch FPT port on the tee fitting is on the top.
7. Put thread sealant tape on the threads of the new CapstanAG pressure sensor (Figure 37, Item 4)

Table 47: Pressure Sensor Part Number

Parts from the Fuselage Kit

Refer to Figure 37

Item	Part Number	Description	Qty
4	116301-015	(CapstanAG) Pressure Sensor, 100PSI	1

8. Install the new CapstanAG pressure sensor to the tee fitting.

   Mount the CapstanAG pressure sensor so that it is leaning back at approximately a 20-degree angle, or at least vertically.

9. Connect the *Pressure Sensor Extension Harness* (Figure 37, Item 5) to the pressure sensor.

Table 48: Pressure Sensor Harness Part Number

Parts from the Fuselage Kit

Refer to Figure 37

Item	Part Number	Description	Qty
5	320124-009	Harness, Extension, Pressure Sensor	1

10. Route the *Pressure Sensor Extension Harness* to the Gateway hub.
11. Connect the *Pressure Sensor Extension Harness* to the **Pressure** port on the Gateway hub.

    For more information, refer to Gateway Hub Identification.

    Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.

Install the Gateway Boom Extension Harnesses

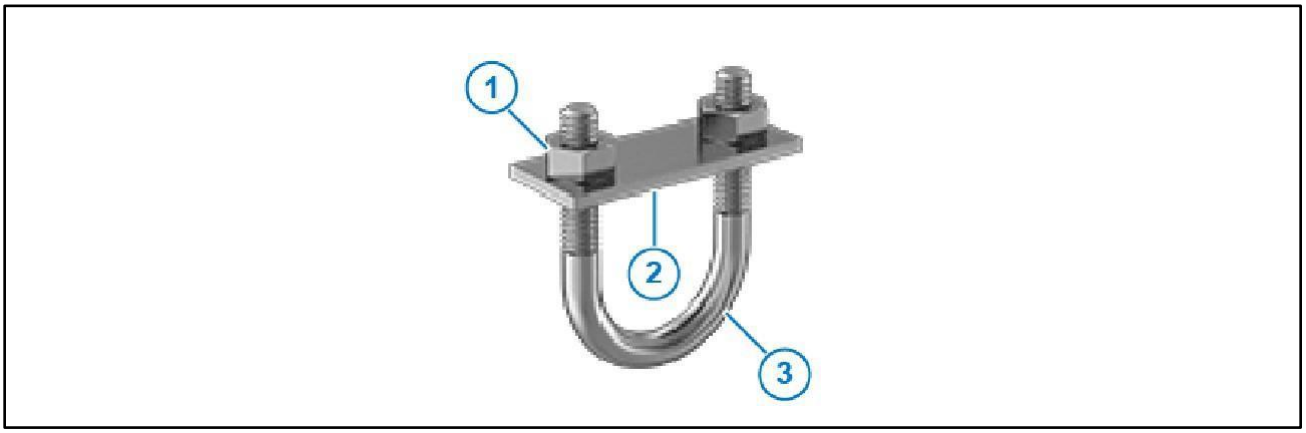

Figure 38: Disassemble the U-bolt

1. Remove and keep the nuts (Figure 38, Item 1) and mounting plate (Figure 38, Item 2) for the supplied U-bolt (Figure 38, Item 3).

Table 49: U-bolt Part List

Parts from the Fuselage Kit

Refer to Figure 38

Item	Part Number	Description	Qty
1—3	320100-032	U-Bolt, 1/4-20 x 1”, 304 SS, 425 Lb Cap	2

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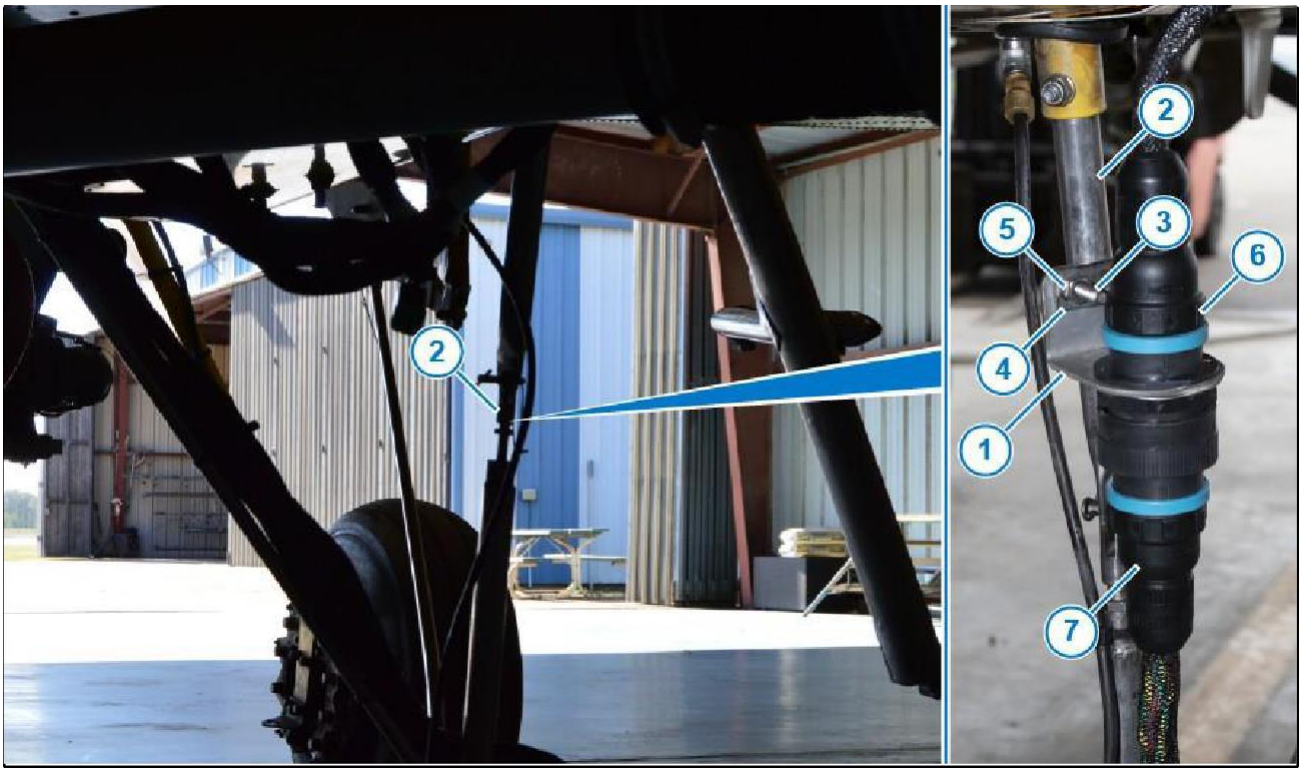

Figure 39: Bracket Installation

2. Install the bracket (Figure 39, Item 1) to the center boom support (Figure 39, Item 2) on each side of the aircraft using the U-bolt (Figure 39, Item 3), mounting plate (Figure 39, Item 4), and nuts (Figure 39, Item 5).

   Note: The mounting plate may not be required on the larger support tubes. Make sure that your aircraft needs the mounting plate. Discard if not necessary.

Table 50: Bracket Installation Parts List

Parts from the Fuselage Kit

Refer to Figure 39

Item	Part Number	Description	Qty
1	320100-031	Bracket, Boom Extension, Gateway	2
3—5	320100-032	U-Bolt, 1/4-20 x 1”, 304 SS, 425 Lb Cap	2

3. Remove the plastic nut and washer from the boom control extension harness 31-pin connector (Figure 39, Item 6).

Table 51: Boom Control Extension Harness Part Number

Parts from the Fuselage Kit

Refer to Figure 39

Item	Part Number	Description	Qty
6	320124-347	Harness, Boom Control Extension	2

4. Insert the connector from the top through the hole in the bracket.

   Note: Make sure to avoid pinch points and moving parts when routing the harnesses.

5. Slide the washer onto the connector and screw on the plastic nut until tight.
6. Mount the boom control extension harness 31-pin connector (Figure 39, Item 6) for each boom to the bracket.
7. Connect the boom control harness (Figure 39, Item 7) to the boom control extension harness.

Table 52: Bracket Installation Parts List

Parts from the Boom Kit

Item	Part Number	Models	Description	Qty
7	320124-346	802/602	Harness, Boom Control, 4” Spacing, 19Ft	2
	320124-345	502/402	Harness, Boom Control, 4” Spacing, 17Ft	2

8. Route the boom control extension harness to the Gateway hub.

   Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.

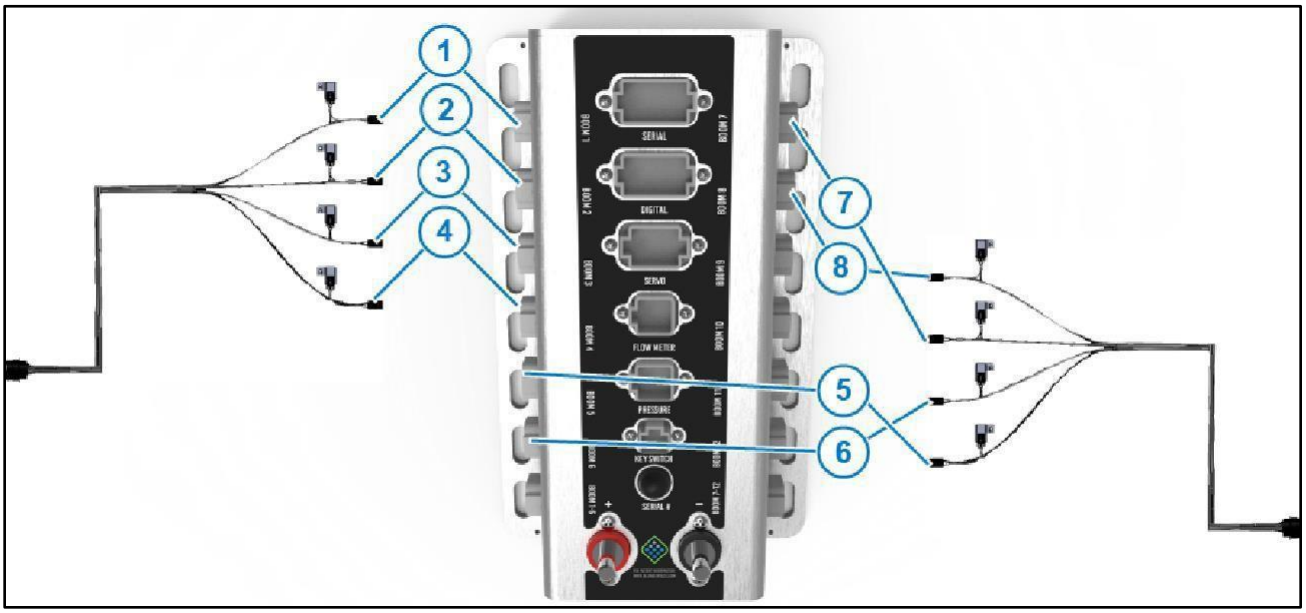

Figure 40: Gateway Boom Extension Harness Connections

9. Install the connectors to the correct ports of the Gateway hub.

Item	Left Boom Extension Harness		Item	Right Boom Extension Harness
1	Connector 1/8 to Boom 1 Port		5	Connector 4/5 to Boom 5 Port
2	Connector 2/7 to Boom 2 Port		6	Connector 3/6 to Boom 6 Port
3	Connector 3/6 to Boom 3 Port		7	Connector 2/7 to Boom 7 Port
4	Connector 4/5 to Boom 4 Port		8	Connector 1/8 to Boom 8 Port

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Boom Shut-off Kit Schematic

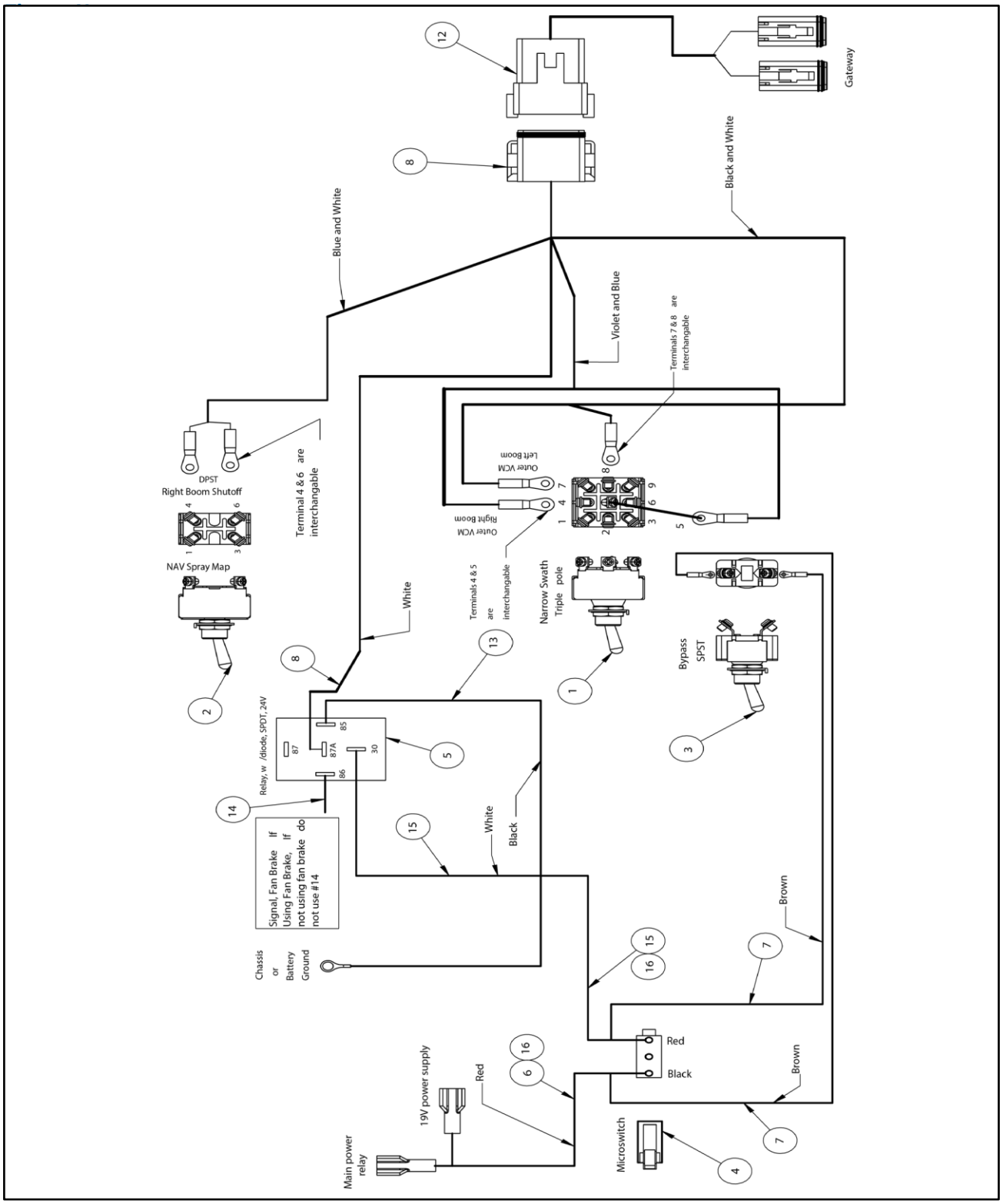

Figure 41: Boom Shutoff Kit Schematic

Table 53: Boom Shutoff Kit Schematic Parts List

Item	Part Number	Description	Qty
1	320015-096	Toggle Switch, Triple Pole	1
2	320015-097	Toggle Switch, DPST	1
3	320015-098	Toggle Switch, SPST	1
4	320015-099	Microswitch	1
5	703500-152	Relay, w/ diode, SPDT, 24V	1
6	320124-008-1	Harness, Shutoff, Power, MicroSW	1
7	320124-008-2	Harness, SPST Switch	2
8	320124-008-3	Harness, Shutoff, Gateway, Pigtail	1
12	320124-008-7	Harness, Shutoff, 12 Pin Gateway	1
13	320124-008-8	Harness, Fan Brake Relay, Ground	1
14	320124-008-9	Harness, Fan Brake Relay, Signal (Optional)	1
15	320124-008-10	Harness, Microswitch to Relay	1
16	715005-156	Sleeve, Solder 14-16 Ga.	3

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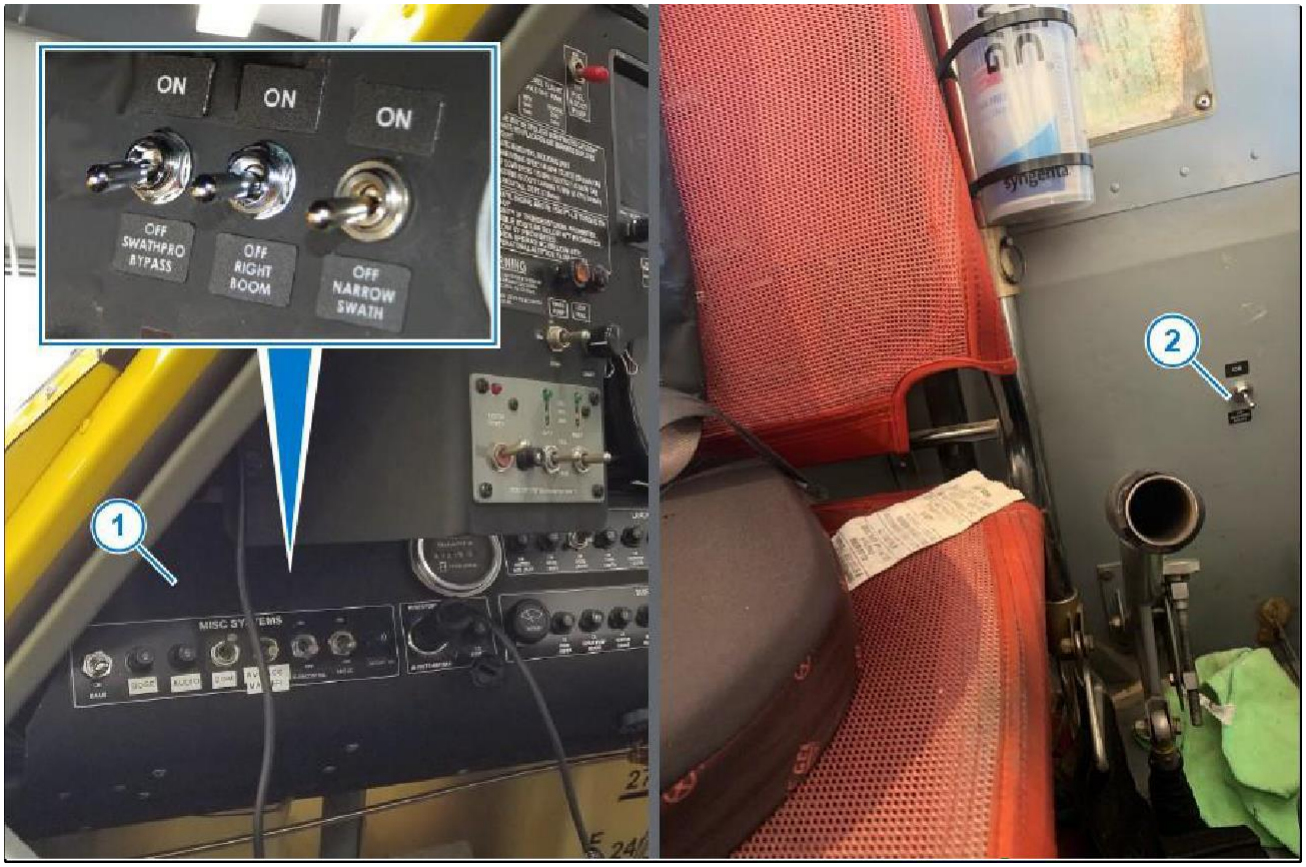

Figure 42: Switch Location Recommendations

1. Find three locations in the cockpit for the three toggle switches in the boom shutoff kit.

Recommended locations are:

Note: All switches must be mounted within reach of the pilot.

- Mount all of the switches on the left side of the lower instrument panel (Figure 42, Item 1) in the cockpit.
- If your existing system is already using a right boom shutoff switch, remove the existing switch and install the new SwathPRO™ switch in that location.
- The bypass switch mounted on the left side back wall aft of the spray handle (Figure 42, Item 2) or the left side console.

Do not install the switches yet. The wires must be connected to the switches before installation.

Table 54: Switch Part Numbers

Parts from the Boom Shutoff Kit

Part Number	Description	Qty
320015-097	Toggle Switch, DPST	1
320015-098	Toggle Switch, SPST	1
320015-096	Toggle Switch, Triple Pole	1

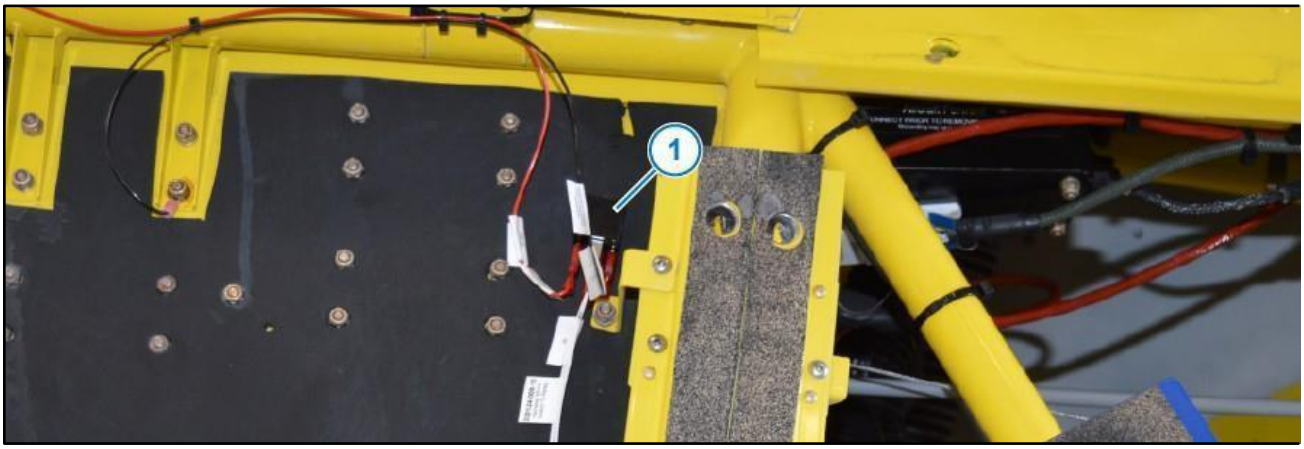

Figure 43: Relay Location

2. Mount the spray on/off relay (Figure 43, Item 1) on the left side of the cockpit.

   Table 55: Relay Part Number

   Parts from the Boom Shutoff Kit

   Refer to Figure 43

Part Number	Description	Qty
703500-152	Relay, SPDT, 24V	1

3. Route harnessing according to the Boom Shut-off Kit Schematic.

   For more information about the fan brake circuit refer to Install the Fan Brake Relay Signal Harness (Optional).

   Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.

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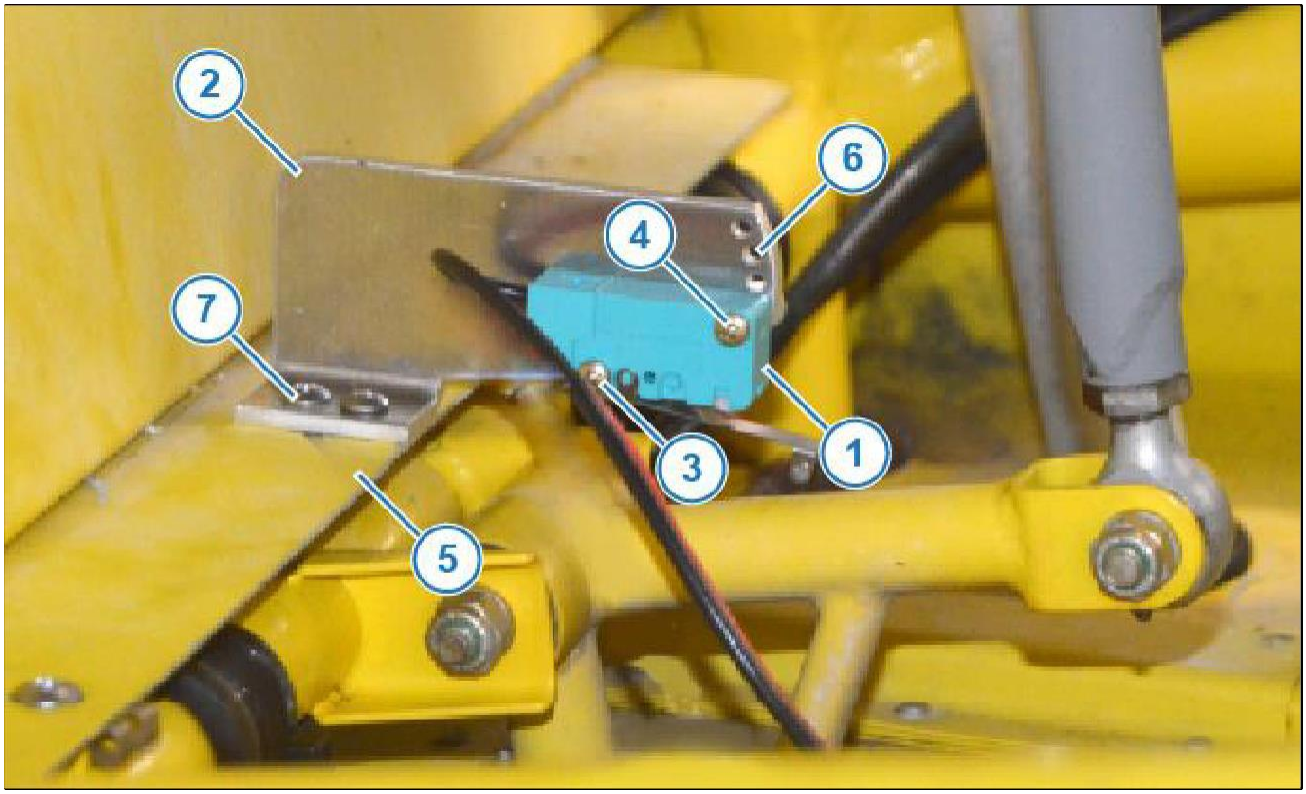

Figure 44: Microswitch Installation

4. Install the microswitch (Figure 44, Item 1) to the bracket (Figure 44, Item 2):

a. Install one screw (Figure 44, Item 3) with the associated hardware through the microswitch into the slotted hole of the bracket.

b. Install another screw (Figure 44, Item 4) with associated hardware through the microswitch into the third hole from the bottom on the bracket.
This hole positions the switch level.

c. Place the bracket/switch on the flat piece of metal (Figure 44, Item 5) located behind the spray handle in the fuselage.

d. Move the spray handle up and down to verify that the microswitch is working correctly in the current position.

e. If the microswitch does not work in the current location:

i. Remove the front screw.

ii. Move to the desired hole (Figure 44, Item 6).

iii. Install the front screw.

f. Once the desired position has been identified, match drill the bracket to the aircraft using a #30 drill bit.

g. Install two Cherrymax rivets (Figure 44, Item 7) per AC 43.13-1B, Chapter 4, Section 4, to attach the bracket to the aircraft.

h. Tighten the screws on the microswitch.

i. Make sure that the spray handle engages and disengages the microswitch. If adjustment up or down is needed, adjust as necessary.

Table 56: Power Supply Part Number

Parts from the Main Power Kit

Refer to Figure 44

Item	Part Number	Description	Qty
1	320015-099	Micro Switch	1
2	320015-019	Bracket, Microswitch Mount	1
3 and 4	MS35206-219	Screw 4-40 x 3/4 Cad Plated	2
	AN960-4L	Washer, Flat, #4, Cad Plated	2
	AN364-440A	Nut, 4-40 Thin, Cad Plated	2
7	716023-112	Cherrymax Rivet, 1/8 Dia, Aluminum	2

For more information, refer to Boom Shut-off Kit Schematic.

5. Connect the microswitch to the designated wires using the supplied solder sleeves.

Table 57: Solder Sleeve Part Number

Parts from the Shutoff Kit

Part Number	Description	Qty
715005-156	Sleeve, Solder 14-16Ga.	2

For more information, refer to Boom Shut-off Kit Schematic.

6. To splice the wires and use the solder sleeve:
   a. Strip the wire ends 3/8 inch.
   b. Slide the solder sleeve over one of the wires to be connected.
   c. Push all of the stripped wire ends together, inter-tangling the wires.
   d. Position the solder sleeve over the mat-ed wires. The internal solder stripe should be centered over stripped section of wires.
   e. Use a heat gun to apply heat in the center moving to both ends of the sleeve. Continue until the solder has flowed into the wires and the sleeve is tight to the wire. Use caution, do not overheat and melt the sleeve.
   f. Let the solder sleeve cool before handling.
7. Route the harnessing for the right boom shutoff, narrow swath, and bypass switches into the cockpit.

   Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.

   For more information, refer to Boom Shut-off Kit Schematic.
8. Cut off and discard the extra harness length that is not needed to reach the correct switches.
9. Crimp a ring terminal onto the end of all the wires that are being used.

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Table 58: Ring Terminal Part Number

Parts from the Fuselage Kit

Refer to Boom Shut-off Kit Schematic

Part Number	Description	Qty
M7928/1-30	Terminal, Ring, #6, 18 Ga.	1

10. Connect the designated wires (Figure 41, Items 7 and 8) to the correct switches.
11. Connect the wire labeled 87A on (Figure 41, Items 8) to terminal 87A on the spray on/off relay (Figure 43, Item 1).
12. Connect the shutoff harnesses' 12-pin connectors (Figure 41, Items 8 and 12) together.
13. Connect the SwathPRO shutoff harness 6-Pin connector labeled **L Boom** (Figure 41, Item 12) to the Boom 1-6 Port on the Gateway hub, and the 6-pin connector labeled **R Boom**, to the Boom 7-12 port on the Gateway hub.
    For more information, refer to Gateway Hub Identification.
14. Install the switches into the desired locations in the cockpit.
15. Install the **ON** and **OFF** labels, refer to Figure 42.
    a. SPST switch—**SWATHPRO BYPASS**
    b. Triple Pole switch—**NARROW SWATH**
    c. DPST switch—**RIGHT BOOM**

Table 59: Decal Page Part Number

Parts from the Fuselage Kit

Part Number	Description	Qty
320015-015	Decal, Page, Fuselage Decals	1

Install the Fan Brake Relay Signal Harness (Optional)

Note: The fan brake relay ground harness (Figure 41, Item 13) is required and must be installed, even if the fan brake relay signal harness is not.

1. If the aircraft has an unmodified fan brake circuit:
   a. Trace the signal wire from the fan brake switch in the cockpit until the wire exits the cockpit.
   b. Cut the wire.
   c. With the aircraft power key switch on, verify the wire from the switch has 24V when in the spray off position and 0V when in the spray on position.
   d. Splice the two wires back together with the fan brake signal harness (Figure 41, Item 14) added into the splice (3 wires total).
      i. Strip the wire ends 3/8 inch.
      ii. Slide the solder sleeve over one of the wires to be connected.
      iii. Push all of the stripped wire ends together, intertwining the wires.
      iv. Position the solder sleeve over the mat-ed wires. The internal solder stripe should be centered over stripped section of wires.
      v. Use a heat gun to apply heat in the center moving to both ends of the sleeve. Continue until the solder has flowed into the wires and the sleeve is tight to the wire. Use caution, do not overheat and melt the sleeve.
      vi. Let the solder sleeve cool before handling.
2. If the fan brake circuit has been modified with relays or an autoboom kit:

   Attach the fan brake signal harness (Figure 41, Item 14) to any point where there is 24V when in the spray off position and 0V in the spray on position.
3. If the fan brake signal harness (Figure 41, Item 14) is not to be installed, the system will only be able to be operated via the microswitch or the bypass switch, and it will not be able to be controlled by a fan brake switch, autoboom kit, or other relay.

Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.

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Install the Servo/Flow Control Valve Harness

This harness is required to operate automatic flow control in Auto mode.

The SwathPRO system is compatible with four brands of rate controllers:

- Satloc
- Insero
- Ag-Nav
- Tabula (TracMap)

Each brand of rate controller requires a different harness:

Satloc — P/N 320124-014

Insero — P/N 320124-015

Ag-Nav — P/N 320124-025

Tabula — P/N 320124-032

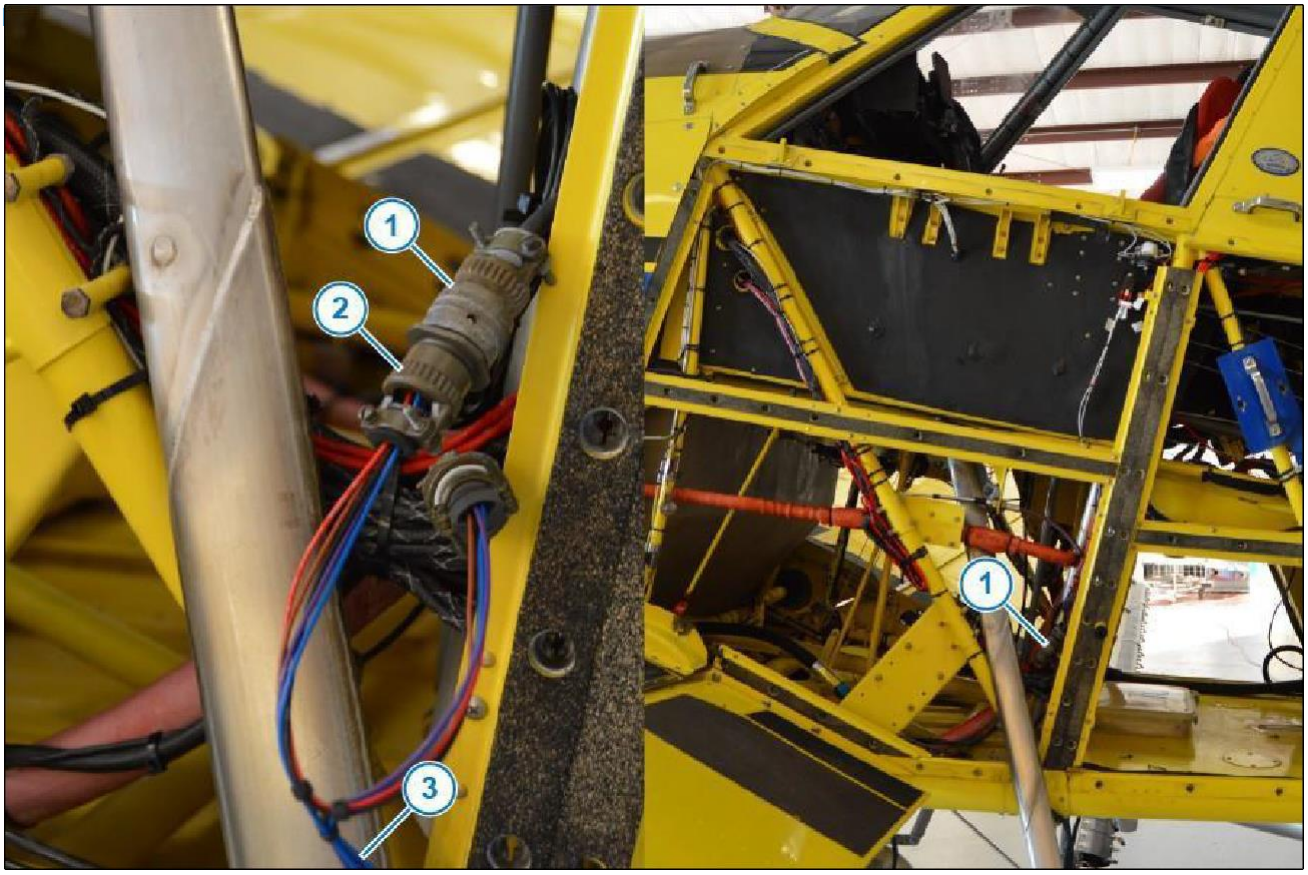

Figure 45: Servo/Flow Control Harness Install

1. Locate the existing connector (Figure 45, Item 1) in the fuselage above the servo/flow control valve.

   Satloc: 5-pin twist-lock Amphenol connector.

   Insero: 6-pin Deutsche connector.

   Ag-Nav: 6-pin twist-lock connector.

   Tabula (TracMap): 2-Pin Weather Pack connector.
2. Disconnect the existing connector.
3. Install the correct harness (Figure 45, Item 2) between the existing connectors.
4. Route the harness (Figure 45, Item 3) to the Gateway hub.

   Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.
5. Connect the 8-pin DT connector to the **SERVO** port on the Gateway hub.

   For more information, refer to Gateway Hub Identification.

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Install the GPS Receiver

Figure 46: GPS Receiver Location

1. Install the GPS receiver (Figure 46, Item 1) on top of the tubing, located under the canopy, behind the cockpit, at the highest point in the fuselage.

Table 60: GPS Receiver Part Number

Parts from the Fuselage Kit

Refer to Figure 46

Item	Part Number	Description	Qty
1	320015-020	Assembly, GPS, Hub 5Hz, Aerial	1

2. Use cable ties to attach the GPS receiver to the tubing.
3. Route the harness toward the Gateway hub.

   Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.
4. Connect the end of the GPS harness to the GPS-hub adapter harness.

Table 61: GPS Adapter Harness Part Number

Parts from the Fuselage Kit

Part Number	Description	Qty
320124-355	Harness, Adapter, GPS - Hub	1

5. Connect the connectors on the GPS-hub adapter harness to the **SERIAL** port and the **FLOWMETER** port on the Gateway hub.

   For more information, refer to Gateway Hub Identification.

Install the CapView

Figure 47: Back of CapView

1. Remove and keep the four screws (Figure 40, Item 1) from the back of the CapView (Figure 47, Item 2).

Table 62: CapView Display Part Number

Parts from the Fuselage Kit

Refer to Figure 47

Item	Part Number	Description	Qty
2	320200-300	Display, Capview, SwathPRO	1

2. Use the four screws to install a ball mount (Figure 47, Item 3) to the back of the CapView.

Table 63: Ball Mount Part Number

Parts from the Fuselage Kit

Refer to Figure 47

Item	Part Number	Description	Qty
3	118603-113	Ram Mount Ball, 1”	1

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3. Install the CapView harness to the Boom 12 port on the Gateway hub.

Table 64: CapView Harness Part Number

Parts from the Fuselage Kit

Part Number	Description	Qty
320124-352	Harness, Capview	1

For more information, refer to Gateway Hub Identification.

4. Route the CapView harness from the Gateway hub into the cockpit.

   Note: The 8-pin connector may need to be removed from the display harness to get it into the cockpit. Take a picture or record the pin locations before removing any wires from the connector.

   Note: Route the wiring in accordance with AC 43.13-1B Chapter 11, Section 8, paragraph 11-96 and secure per Chapter 11, Section 11.

Figure 48: CapView Mounting Location

5. In the cockpit of the aircraft, find the best location for the CapView (Figure 48, Item 1).

   Note: The CapView needs to have a clear line of sight and within reach of the pilot. The CapView also needs to allow the lower instrument panel to fold down.

   The CapView installation location recommendations include:

   a. Mounted on the face of the lower instrument panel as far to the right or left as possible.

b. Mounted on the left or right wall of the cockpit, below the window, as close to the lower instrument panel as possible.

c. Mounted on top of the lower instrument panel under the Controller display.

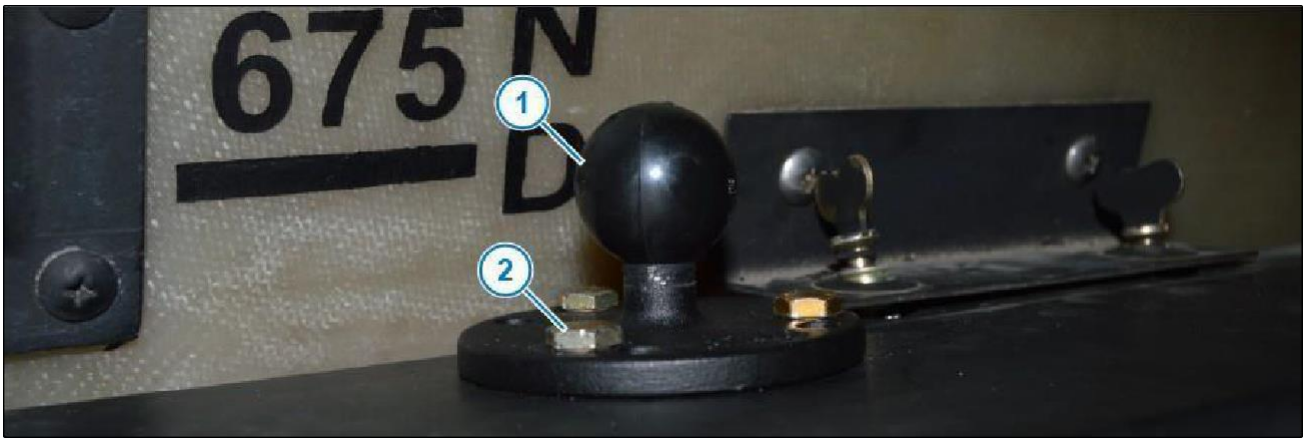

Figure 49: Ball Mount Installation

6. After the desired mounting location is established, attach a ball mount (Figure 49, Item 1) to the aircraft using the supplied 10-32 hardware (Figure 49, Item 2). 10-32 hex bolts, flat washers, and 10-32 stop nuts.

Table 65: Ball Mount Part Number

Parts from the Fuselage Kit

Refer to Figure 49

Item	Part Number	Description	Qty
1	118603-113	Ram Mount Ball, 1"	1
2	AN3-5A	Bolt, Hex 10-32 x 21/32 Cad Plated	4
	AN960-10	Washer, Flat, #10 Cad Plated	4
	AN365-1032A	Nut, Hex Elastic Stop, 10-32 Cad Plated	4

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Figure 50: Install the CapView

7. Connect the CapView harness (Figure 50, Item 1) into the back of the CapView (Figure 50, Item 2).
8. Install one end of the clamp (Figure 50, Item 3) onto the ball mount (Figure 50, Item 4) on the back of the CapView, and the other onto the ball mount attached to the aircraft.

Table 66: RAM Arm Clamp Part Number

Parts from the Fuselage Kit

Refer to Figure 50

Part Number	Description	Qty
118603-114	Ram Arm, Medium, B Size	1

9. Remove the screen protector from the CapView screen.

Install the Maneuvering Speed Placard Decal

CAUTION: Do not remove the existing maneuvering speed placard.

IMPORTANT: Must be installed ONLY on AT-802 aircraft.

1. Select the correct maneuvering speed placard decal for the aircraft's serial number, from the provided maneuvering speed decal.
2. Mount as close to the existing maneuvering speed placard, which is close to the airspeed indicator.

Install the Parts to the Center Boom

1. If the operator will have valves on the center boom, go to Step 3.

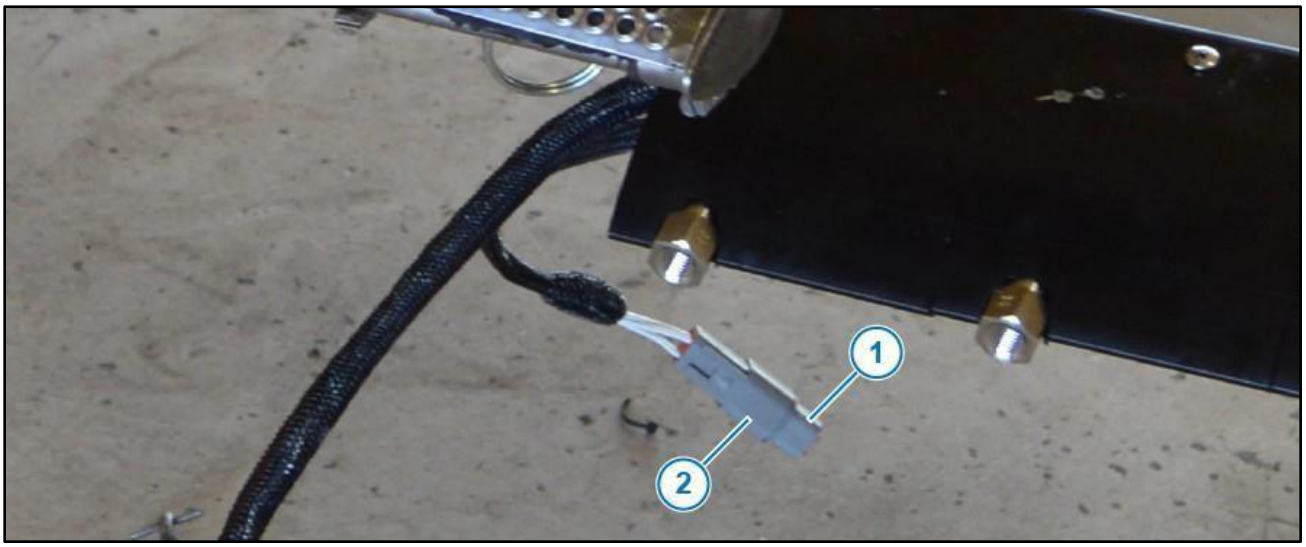

Figure 51: Dust Plug Installation

2. If the operator chooses not to use any center boom valves:
   a. Install the 6-pin DTM dust plug (Figure 51, Item 1) into the 6-pin DTM connector (Figure 51, Item 2) on the left and right center VCM harnesses.

Table 67: Dust Plug Part Number

Parts from the Spare Parts Kit

Refer to Figure 51

Item	Part Number	Description	Qty
1	706530-425	Plug, Dust, 6 Pin DTM	2

   b. Route the VCM harnesses and connectors (Figure 51, Item 2) back along the booms inside the shells.
   c. Go directly to Install the Nozzle Tips.

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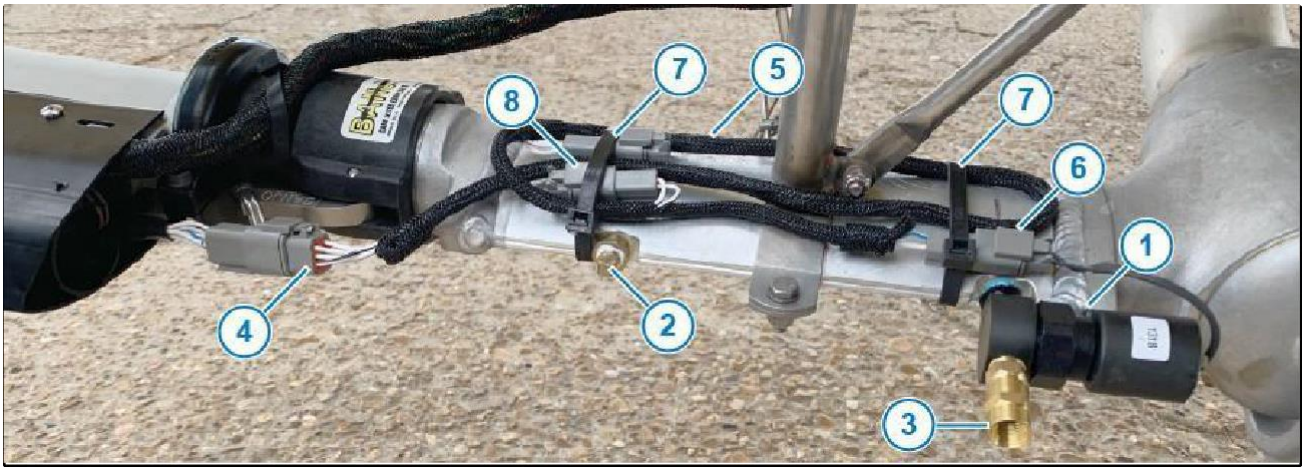

Figure 52: Parts Installation on the Center Boom

3. Install the valves (Figure 52, Item 1) to the desired open ports on the existing center boom.

   For Air Tractor models 402, 502, or 602, install 1/8” x 1/4” pipe adapters in the ports.

   Note: Each system can vary from what is shown. The operator may choose not to use all the ports on the center boom.

Table 68: Pipe Adapter Part Number

Parts from the System Kit

Part Number	Description	Qty
716008-330	1/8” x 1/4” pipe adapters	6

Table 69: Center Valve Part Number

Parts from the Fuselage Kit

Refer to Figure 52

Item	Part Number	Description	Qty
1	320015-108	Valve Assy, Center, SwathPRO	6

4. Plugs (Figure 52, Item 2) must be installed on any unused ports. Those parts are not supplied by CapstanAG.
5. Lay the right and left center boom harnesses along the center boom.

   Important: The right harness has a red stripe in the braiding, and the left harness has a yellow stripe in the braiding.
6. Connect the 6-pin DTM connectors (Figure 52, Item 4) from the center boom harness to the 6-pin DTM connectors from the left and right center VCM harnesses.
7. Route the center boom harness along the center boom (Figure 52, Item 5) and connect to the nozzle valve connectors (Figure 52, Item 6).

Table 70: Center Boom Harness Part Numbers

Parts from the Fuselage Kit

Refer to Figure 52

Item	Part Number	Description	Qty
5	320124-231	Harness, Boom, Center, 4 Space, Right	1
	320124-232	Harness, Boom, Center, 4 Space, Left	1

8. Make sure that the harness is attached to the center boom as necessary using cable ties (Figure 52, Item 7).
9. Install dust plugs (Figure 52, Item 8) on any unused 2-pin DTM connectors.

Table 71: Dust Plug Part Number

Parts from the Spare Parts Kit

Refer to Figure 52

Item	Part Number	Description	Qty
8	320015-006	Dust Plug, Aerial, VCM Harness	4

Install the Nozzle Tips

Install the desired 1/4 inch NPT spray tips to each nozzle.

The spray tips can vary. The SwathPRO™ system is compatible with aftermarket spray tips.

Post-install Checklist

- Make sure that the quarter-turn fasteners on the top and boom of each shell are installed and tightened.
- Make sure that the harnesses are connected and fastened in place with cable ties.

  IMPORTANT: Do not attach the harnesses to the aircraft or components with cable ties until the dry test of the system is complete.

Electrical Loads

Update the aircraft electrical loads for the SwathPRO™ system.

	Phase of Flight (Amps)				
Aircraft	**Start[1]**	**Taxi[1]**	**Takeoff[1]**	**Cruise (Spraying)[2]**	**Landing[1]**
402/502	1	1	1	36	1
602/802	1	1	1	40	1

The maximum electrical loads installed by the SwathPRO™ system are as follows:

- AT-402 and AT-502 Series Aircraft: 44A
- AT-602 and AT-802 Series Aircraft: 49A

1 SwathPRO™ system idle
2 SwathPRO™ system at 80% duty cycle

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Weight and Balance Information

Weigh the modified aircraft and update the records.

Note: A calculated weight and balance is not acceptable to determine the updated weight and balance of the modified aircraft.

Return to Service

1. Execute FAA Form 337 in accordance with 14 CFR Part 43, Appendix B.
2. Insert these into the maintenance records of the modified aircraft:
   - Instructions for Continued Airworthiness
   - Copy of 337 and STC
3. Insert these into the Flight Manual for the Modified aircraft.
   - Revised empty weight and corresponding CG determined in Section 16.2
   - Aircraft Flight Manual Supplement
4. Make an entry into the maintenance record of the modified aircraft in accordance with 14 CFR 43.9.

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Section 4: Setup

Topics:

- CapView Button Descriptions
- System Setup
- Factory Reset Procedure
- Location Setup Procedure
- Input Total Number of Valves
- Upload a Profile and Set the Preset Buttons
- System Dry Tests
- System Wet Test

CapView Button Descriptions

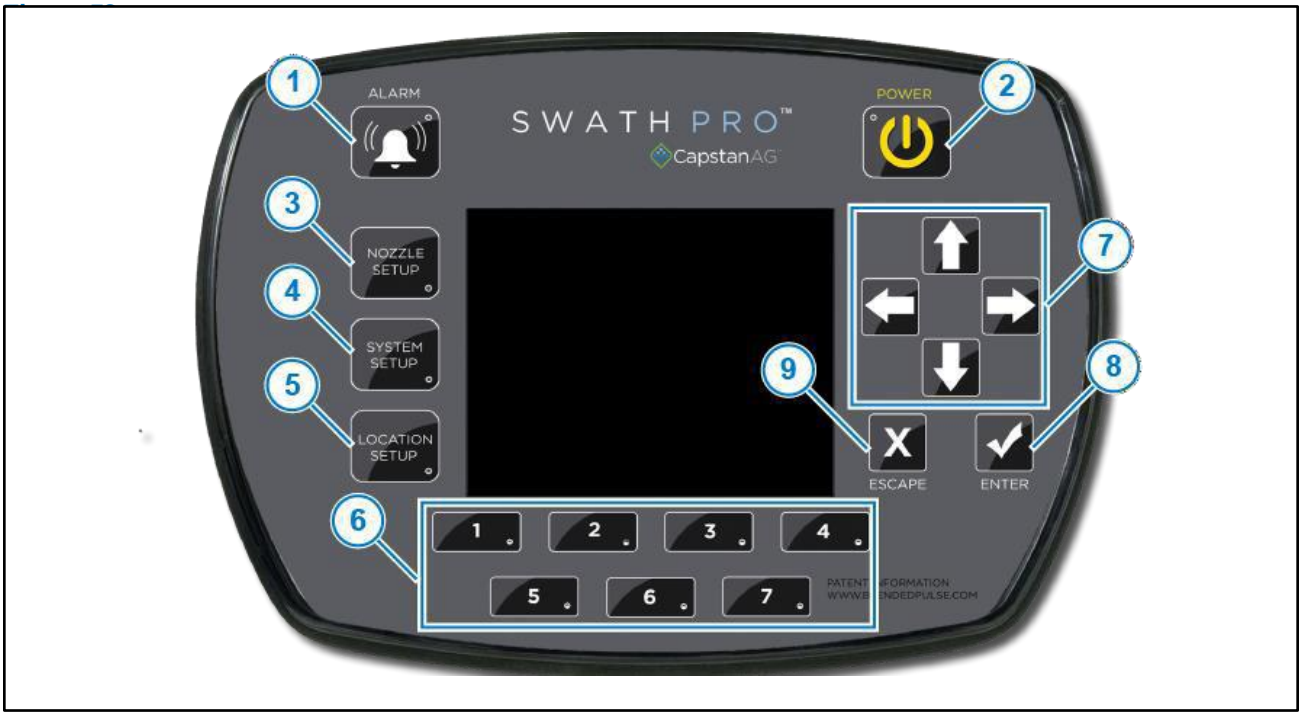

Figure 53: CapView Buttons

Table 72: CapView Button Descriptions

Item	Description	Function
1	ALARM	Press the button to silence an audible alarm
2	POWER	Press the button to start or shut down the CapView display
3	NOZZLE	SETUP Press the button to go to the Nozzle Setup Menu
4	SYSTEM SETUP	Press the button to go to the System Setup Menu
5	LOCATION SETUP	Press the button to go to the Location Setup Menu Press and hold the button for 10 seconds to edit the location setup information
6	Presets	Use the seven buttons to store and use the boom, tip size, and flow profiles
7	Navigation Arrows	Press the buttons to move through the menu items
8	ENTER	Press the button to open the selected menu screen or to accept the selected value
9	ESCAPE	Press the button to exit the current screen

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System Setup

The system setup procedure includes:

1. Factory Reset Procedure
2. System Setup Procedure
3. Nozzle Setup Procedure
4. System Dry Test
5. System Wet Test

Factory Reset Procedure

A factory reset must be performed during the initial system setup and if the CapView or a VCM is replaced.

Important: Leave both the aircraft key switch power and the **SWATHPRO MAIN** circuit breaker on to maintain power to the Gateway Hub during this procedure.

Figure 54: Advanced Settings—Factory Reset

1. Make sure that the aircraft key switch power is **ON**.
2. Press the **POWER** button (Figure 54, Item 1) on the display.
3. Take pictures of all the settings, or record all the settings in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual Supplement for SwathPRO™.
4. Press the **SYSTEM SETUP** button (Figure 54, Item 2) on the display.
5. Use the **UP** or **DOWN** arrow buttons (Figure 54, Item 3) to go to **Advanced Settings**.
6. Press the **ENTER** button (Figure 54, Item 4) on the display.
7. Use the up or down arrows to go to Factory Reset (Figure 54, Item 5).
8. Press the **ENTER** button on the display.
9. A message shows on the screen, use the left or right arrow buttons (Figure 54, Item 6) to select Yes.
10. Press the **ENTER** button on the display.

    The display will turn off when this procedure is complete.
11. Perform the location setup procedure after completing a factory reset. For more information, see the Location Setup Procedure.

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Location Setup Procedure

If you are not prompted to do this procedure, it is not necessary to complete.

Figure 55: Location Setup

1. Make sure that the aircraft key switch power is **ON**.
2. If the CapView is not on, press the **POWER** button (Figure 55, Item 1) on the display.
3. If a location setup is needed, the system prompts you when the CapView is powered on.
   Press the **ENTER** button (Figure 55, Item 3) on the display to select **OK**.
4. Press and hold the **LOCATION SETUP** button (Figure 55, Item 4) on the display for 10 seconds.
   Note: It is normal for the screen to change as you press and hold the button.
5. Use the left or right arrow buttons to go to **AUTO SETUP** (Figure 55, Item 5).
6. Press the **ENTER** button on the display.
7. Press the **ENTER** button on the display to accept the default 4-inch nozzle spacing.

Figure 56: Auto Location Setup

This screen shows a picture with the VCMs (Figure 56, Item 1) located on the booms.

The graphic along the bottom shows a VCM with a 15-nozzle wire harness (Figure 56, Item 2). The black dot (Figure 56, Item 3) represents the direction of the harness, and the nozzles are indicated with numbers. This graphic changes as you move the yellow highlighter from VCM to VCM. This can be an indicator of which VCM is which, based on the number and location of the valves on the VCM.

Start with the VCM located on the far left section of the left boom.

8. Use the **LEFT** or **RIGHT** arrow buttons (Figure 56, Item 4) to highlight the desired VCM.
9. Press the **ENTER** button (Figure 56, Item 5) on the display.

   The highlight color will change from yellow to red and the nozzles on that VCM will pulse.
10. With the help of another person, find the correct VCM that pulses the valves on VCM #1 (far left).

    Note: It may be necessary to scroll through multiple VCM's to find the one that pulses the valves on VCM #1. Press the **ENTER** button to change the color back to yellow to go to the next VCM.
11. Once VCM #1 is found, move the red-highlighted VCM using the **LEFT** or **RIGHT** arrow buttons to the physical location on the boom.

    Example: Selected far right VCM (VCM #8), but it pulses at physical location #1.
12. Press the **ENTER** button on the display to stop the pulsing.
13. Press the **UP** or **DOWN** arrow buttons to flip the VCM graphic, so the VCMs on the left side must show the black dot on the left side (Figure 56, Item 1). The VCMs on the right side must show the black dot on the right side.

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14. Repeat the process from left to right until all of the VCMs are moved to their proper location and flipped to their proper orientation.

    Note: It is easiest to go from VCM #1 to VCM #8 and place them in order.

15. When finished, press the **ESCAPE** (Figure 56, Item 6) button three times.
16. This screen will give the option **YES** (to save) or **NO** (not to save) the entered data. If the data is correct, use the **LEFT** or **RIGHT** arrow buttons to go to **YES**.
17. Press the **ENTER** button.

    A blue save bar will show and move across the screen. The CapView is saving all the data inside the VCMs. This process may take a few minutes to complete.

    IMPORTANT: The CapView will shutdown to reboot shortly after selecting **YES**.

Input Total Number of Valves

After a factory reset, input the total number of valves used on the system back into the Capview.

1. Press the **SYSTEM SETUP** button.
2. Using the **UP** or **DOWN** arrows, scroll to the Advanced Settings line (Line 29).
3. Press the **ENTER** button.
4. Using the **DOWN** arrow, scroll to the Total Number Valves Expected line (Line 10).
5. Press the **ENTER** button.

   The line will turn red.

6. Using the **UP** or **DOWN** arrows, select the desired number of nozzles.

   Once the total number of valves has been reached, the alarm light should turn off.

7. Press the **ENTER** button.

   The line will turn yellow.

8. Press the **ESCAPE** button or the **SYSTEM SETUP** button to return to the main screen.

   Note: Profiles cannot be uploaded until the Total Number Valves Expected line matches the total number of valves used on the SwathPRO system.

Upload a Profile and Set the Preset Buttons

You must first make a profile using ProMaker. Refer to the ProMaker User Manual for more information.

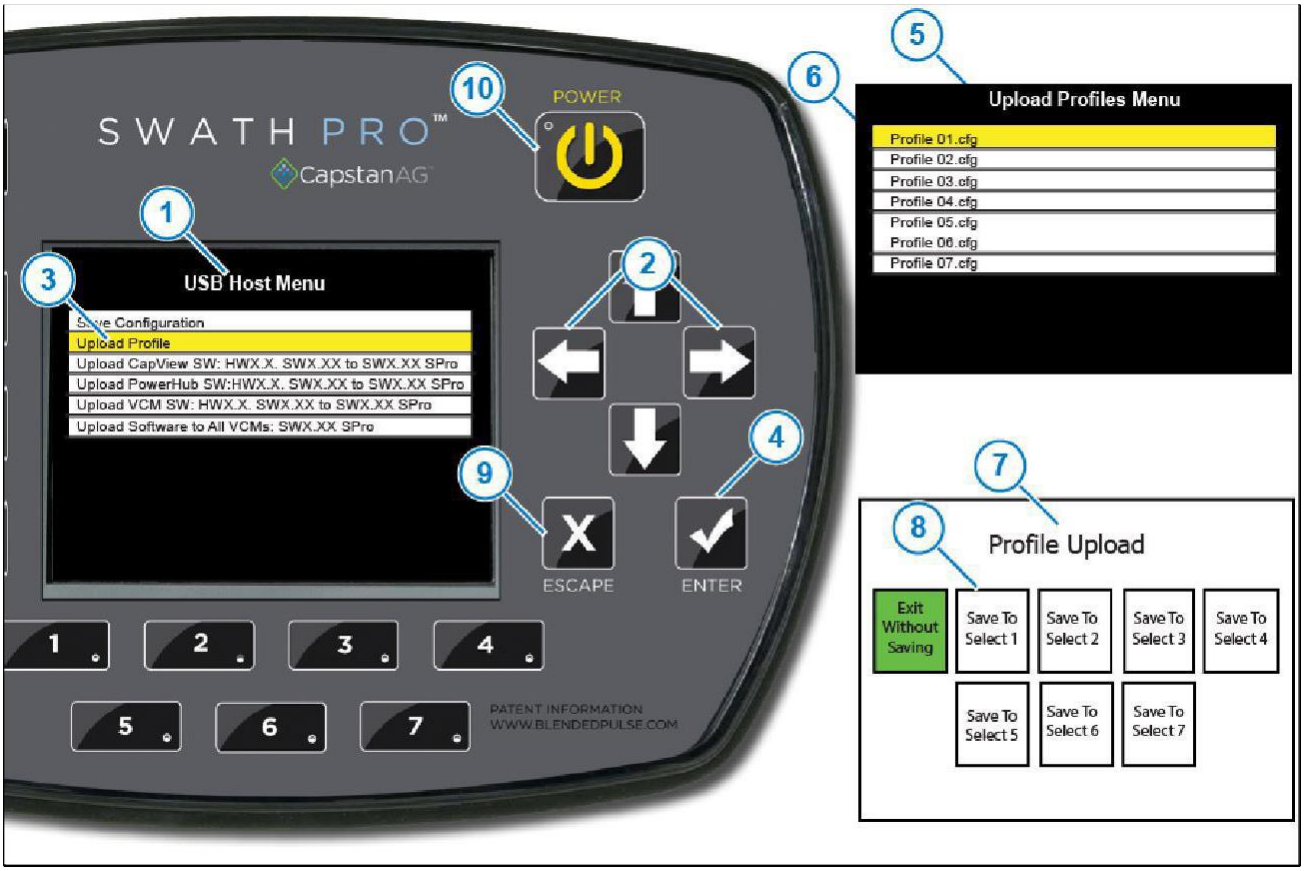

Figure 57: Upload Profile

1. Insert a USB memory device into the back of the CapView.
   The USB Host Menu screen (Figure 57, Item 1) will display.
2. Use the up or down arrow buttons (Figure 57, Item 2) to select the Upload Profile line (Figure 57, Item 3).
3. Press the **ENTER** button (Figure 57, Item 4).
   The Upload Profiles Menu screen (Figure 57, Item 5) will display.
4. Use the up or down arrow buttons to select the desired profile (Figure 57, Item 6).
5. Press the **ENTER** button.
   The Profile Upload screen (Figure 57, Item 7) will display.
6. Use the arrow buttons to select the desired profile number (Figure 56, Item 8).
7. Press the **ENTER** button.
   A blue bar will indicate the progress of uploading the profile to the CapView.
8. When the profile upload is complete, the Upload Profiles Menu screen will display.
9. Repeat Steps 4—8 until all the desired profiles are uploaded to the CapView.
10. Press the **ESCAPE** button (Figure 57, Item 9) to return to the main screen.

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11. Press the **POWER** button (Figure 57, Item 10) to turn off the CapView, then press the **POWER** button again to turn the CapView on again.

    Note: Profiles cannot be uploaded until the Total Number Valves Expected line matches the total number of valves used on the SwathPRO system.

System Dry Tests

Perform the following procedures to make sure that the nozzle valves are operating correctly:

- Boom Dry Test
- Key Fob Boom Dry Test

Boom Dry Test

1. Make sure that the engine is off and the aircraft key switch is on.
2. Make sure that the circuit breaker switch labeled **SWATHPRO MAIN** is on.
3. Turn on the CapView display.
4. If using the fan brake relay, put the fan brake switch in the SPRAY ON position.
5. Push the spray handle down.

   All nozzle valves on the boom should start clicking.
6. Pull the spray handle up.

   All nozzle valves should turn off and stop clicking.

Key Fob Boom Dry Test

Using the key fob to operate the boom sections lets the operator see the operation of the nozzle valves. Use the key fob to operate each nozzle.

Figure 58: System Setup — Nozzle Control

1. Activate the Nozzle Control (Key Fob) on the CapView.
   a. Press the **SYSTEM SETUP** button (Figure 58, Item 1).
   b. Use the **UP** or **DOWN** arrow buttons (Figure 58, Item 2) to go to Nozzle Control (Key Fob) (Figure 58, Item 3).
   c. Press the **ENTER** button (Figure 58, Item 4).
   d. Use the **UP** or **DOWN** arrow buttons to go to Key Fob Active.
   e. Press the **ENTER** button.

      When the key fob mode is activated, all the nozzles are turned off. The CapView shows that the Key Fob Mode is active. This is indicated by the text block in the upper left corner and the blinking LEDs.
2. Press the top/bottom buttons on the key fob to turn on or off each boom section.

   Make sure that each boom section is operating (clicking) in the correct order.

   Note: If the nozzles do not turn on in sequential order, it indicates the VCMs are not set up correctly.
3. Press the right/left buttons on the key fob to turn on or off each individual nozzle.

   Make sure that each nozzle is operating (clicking) in the correct order.
4. Press the center button on the key fob to turn off the whole boom.
5. Activate Nozzle Control (Key Fob) in the **SYSTEM SETUP** and change the setting back to 12V Active or the previous setting.

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System Wet Test

Perform this procedure to make sure that the nozzle valves are operating correctly.

Key Fob Boom Wet Test

Using the key fob to operate the boom sections lets the operator see the operation of the nozzle valves. Use the key fob to operate each nozzle.

The key fob works well when checking for plugged tips without wasting a significant amount of product.

Figure 59: System Setup — Nozzle Control

1. Activate the Nozzle Control (Key Fob) on the CapView.
   a. Press the **SYSTEM SETUP** button (Figure 59, Item 1).
   b. Use the **UP** or **DOWN** arrow buttons (Figure 59, Item 2) to go to Nozzle Control (Key Fob) (Figure 59, Item 3).
   c. Press the **ENTER** button (Figure 59, Item 4).
   d. Use the **UP** or **DOWN** arrow buttons to go to Key Fob Active.
   e. Press the **ENTER** button.

      When the key fob mode is activated, all the nozzles are turned off. The CapView shows that the Key Fob Mode is active. This is indicated by the text block in the upper left corner and the blinking LEDs.

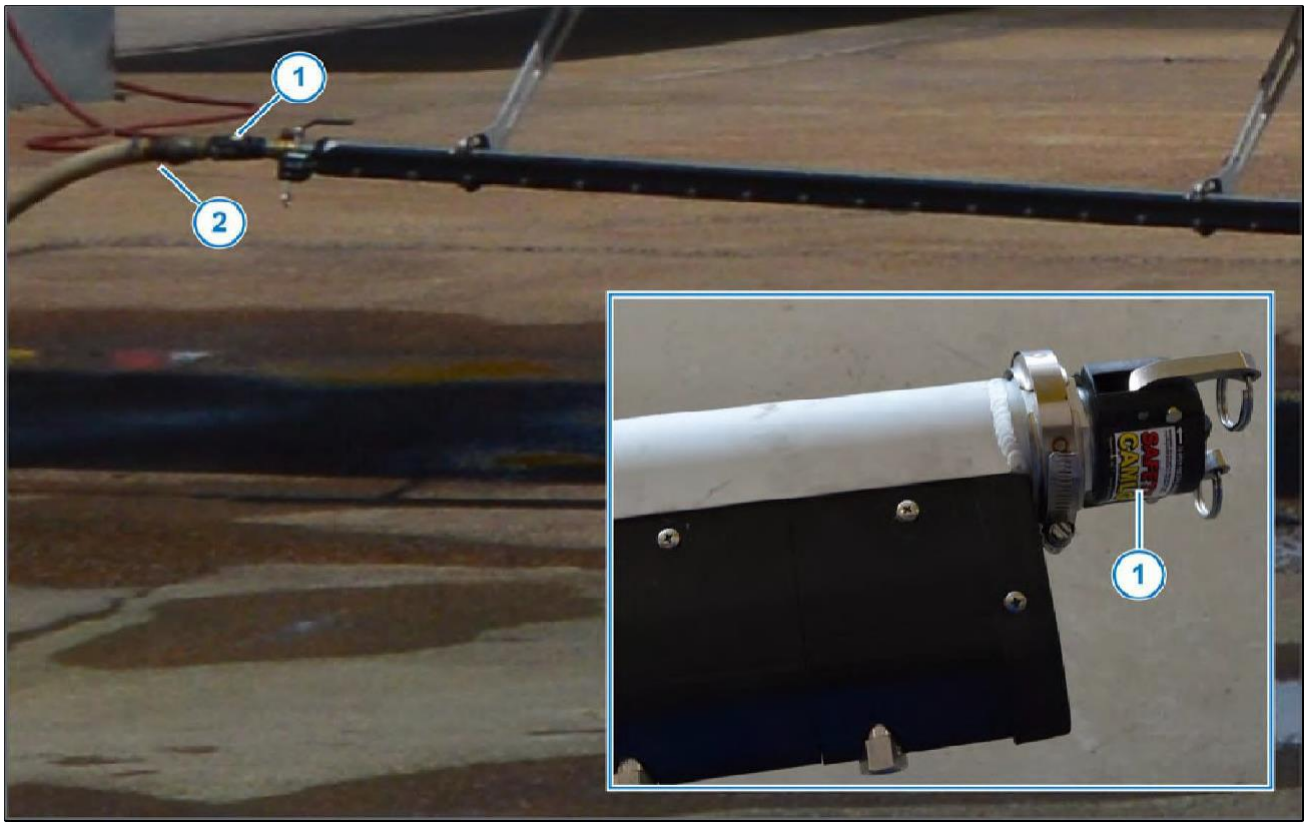

Figure 60: Connect Water Line

1. Use one of the camlock fittings (Figure 60, Item 1), located at the end of each boom, to attach a water line. (Figure 60, Item 2) that can build more than 5 psi inside of the boom.
2. Press the top/bottom buttons on the key fob to turn on or off each boom section.

   Make sure that each boom section is operating (clicking) in the correct order.

   Note: If the nozzles do not turn on in sequential order, it indicates the VCMs are not set up correctly.
3. Press the right/left buttons on the key fob to turn on or off each individual nozzle.

   Make sure that each nozzle is operating (clicking) in the correct order.

   Note: If a nozzle valve is leaking or dripping, use a marker to mark the nozzle valve. Continue to check all nozzle valves.
4. Press the center button on the key fob to turn off the whole boom.
5. Activate Nozzle Control (Key Fob) in the **SYSTEM SETUP** and change the setting back to **12V Active** or the previous setting.

 2025 Capstan Ag Systems, Inc.

Index

#

2Ga Power Cable 49
4Ga Power Cable 48
60A Circuit Breaker 47

A

Acronym List x
Applicable Aircraft Models 12

B

Before Installation 26
Before Installation of the CapstanAG™ System 26
Boom Dry Test 99
Boom Extension Harnesses 63
Boom Shut-off Kit 70
Boom Shut-off Kit Schematic 69
Build and Install the Contactor Power Cable 54
Build and the Grounding Power Cable 52
Build the Contactor Power Cable 54

C

CapView 80, 90
CapView Button Descriptions 84
Center Boom 79
Change Log iii
Chemical Safety 16
Circuit Power Cable 53
Contactor 51
Contactor Power Cable 54

E

Electrical Loads 86
Emergency Safety 16

F

Factory Reset Procedure 92
Fan Brake Relay Signal Harness 76

G

Gateway Boom Extension Harnesses 63
Gateway Hub Identification 45
Gateway Hub Mounting 39
Gateway Hub Mounting Location Options 39
GPS Receiver 79
Grounding Power Cable 52

I

Input Total Number of Valves 95
Install the 4Ga Power Cable (AT-402/502/602 only) 48
Install the 2Ga Power Cable (AT-802 only) 49
Install the 60A Circuit Breaker 47
Install the Booms and Boom Hangers 27
Install the CapView 80
Install the Circuit Power Cable 53
Install the Contactor Power Cable 54
Install the Fan Brake Relay Signal Harness 76
Install the Gateway Boom Extension Harnesses 63
Install the Gateway Hub Inside the Luggage Compartment 41
Install the Gateway Hub On the Back of the Luggage Compartment 40
Install the Gateway Hub on the Top of the Luggage Compartment 44
Install the Gateway Hub Under the Cockpit 43
Install the GPS Receiver 79
Install the Grounding Power Cable 52
Install the Main Power Contactor 51
Install the Main Power Kit 46
Install the Main Power Relay 55
Install the Maneuvering Speed Placard Decal 79
Install the Nozzle Tips 86
Install the Parts to the Center Boom 84
Install the Power Harness 52
Install the Power Supply 60
Install the Pressure Sensor 61
Install the Servo/Flow Control Valve Harness 77
Install the SwathPRO Main Toggle Switch 56

K

Key Fob Boom Dry Test 98
Key Fob Boom Wet Test 99

L

Location Setup Procedure 93

M

Main Power Contactor 51
Main Power Kit 46
Main Power Relay 55
Main Power Toggle Switch Harnessing 57
Maneuvering Speed Placard Decal 84
Mount the Contactor 59

N

Nozzle Tips 86

P

Parts List 19
Personal Protective Equipment 16
Post-install Checklist 86
Power Harness 52
Power Supply 60
Prepare for Installation and Setup 18
Pressure Sensor 61
Pressurized Fluid Lines 16

R

References ix
Remove the Factory Spray System 26
Required and Special Tools 13
Return to Service 87
Route and Install Main Power Toggle Switch Harnessing 57

S

Servo/Flow Control Valve Harness 77
Set the Preset Buttons 96
Signal Words 16
Special Tools 13
SwathPRO Main Toggle Switch 56
System Dry Tests 97
System Setup 91
System Wet Test 99

T

This Manual 12

U

Upload a Profile 96

W

Weight and Balance Information 87

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