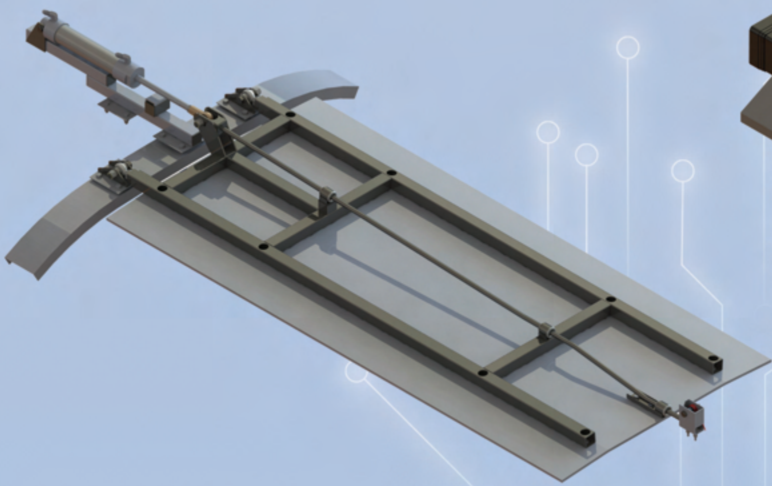
WINGMAN



Wingman Install Manual for AT-602

TABLE OF CONTENTS

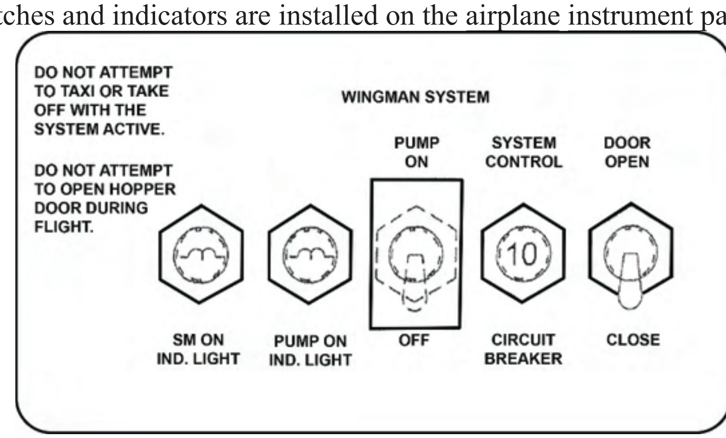
GENERAL

The 'Wingman' System consists of a hydraulically-operated Hopper Door and a hopper-filling Auger. The hydraulically-operated Hopper Door enables the pilot to open and close the Hopper Door by operating a control switch in the cockpit for the purpose of loading while on the ground. The Hopper Door actuator is installed on the Hopper Tank forward of the door cutout.

The hopper-filling Auger enables the filling of the forward and aft extremities of the top of the Hopper during the final stages of loading solids. The Auger assembly is installed inside the Hopper Tank. To activate the Auger, the momentary switch in the cockpit is provided.

A Hydraulic reservoir and pump unit is installed on the upper engine mounts, forward of the rinse tank.

The following switches and indicators are installed on the airplane instrument panel:



1. SM ON IND LIGHT (blue):	Indicates Wingman System is powered;
2. PUMP ON IND LIGHT (blue):	Indicates System Pump is operating;
3. PUMP ON/OFF Switch:	Energizes System Pump, spring-loaded to OFF (Guarded-closed);
4. System Circuit Breaker (10 amp):	Protects/Provides Power to the Wingman System;
5. Door Open/Close Switch:	Pre-selects (Arms) Hopper Door to intended position.

SECTION 1 – LIMITATIONS

-Inflight operation of the Hopper Door or Auger prohibited.

-Maximum continuous operating time for the Auger is 2 minutes.

-The Auger may only be installed for spreading of non-explosive and non-flammable solids.

-The Auger must be removed during operations involving the spreading of liquids.

-Wingman operation (ground) is restricted to a maximum windspeed of 40 mph.

SECTION 2 – NORMAL PROCEDURES

DAILY INSPECTION (Perform prior to 1st flight of the day):

1. Inspect 4 quick-release pins attaching Auger assembly for correct engagement.
2. Inspect Auger screw and support-bearing for security.
3. Inspect hydraulic hoses in the Hopper for condition and security.
4. Operate the Hopper Door and Auger to check for freedom of operation.

PRE-FLIGHT CHECKS:

1. Verify aircraft Master Switch is ON.
2. Press-To-Test PUMP ON and SM ON indicators to verify bulb operation.
3. Ensure PUMP ON switch and guard are in the closed/OFF position.
4. Ensure DOOR OPEN/CLOSE switch is in the close (down) position.
5. Ensure PUMP ON and SM ON annunciator lights are both NOT illuminated.
6. Ensure all switches DOWN & all lights OUT.

OPERATION (ground-only):

1. Hopper Door 'Open' or 'Close' Sequence:
   -Select DOOR OPEN/CLOSE switch to OPEN or CLOSE as desired.
   -Open PUMP ON/OFF switch guard and hold switch to ON.
   -Observe SM ON and PUMP ON indicator lights illuminate.
   -Observe Hopper Door opening or closing as selected.
   -When operation complete, ensure door is fully-closed and latched.
   -Ensure all switches DOWN & all lights OUT.

2. Auger Drive Engagement:
   -Hold PUMP ON/OFF switch to ON (Hopper Door must be fully OPEN);
   -Observe Auger turning; when leveling is complete release PUMP ON switch.

NOTE

Releasing the PUMP ON/OFF switch to the spring-loaded OFF position de-energizes the pump, causing the Auger to stop turning and the Hopper Door to stop in the current position (open, closed, or intermediate).

CAUTION

Do Not operate the Auger until Auger is submerged.

CAUTION

Do Not allow any foreign objects which could interfere with the Auger to enter the Hopper. Such objects must be removed before operating the Auger.

CAUTION

Keep personnel away from Hopper Door operation during loading. The Hopper Door and the Auger can cause serious injury during operation.

CAUTION

Do Not attempt to close the Hopper Door if solids are protruding above the Hopper contour.

SECTION 3 – EMERGENCY PROCEDURES

MALFUNCTION OF HOPPER DOOR OR AUGER:
- Pull System Circuit Breaker.

'PUMP ON' ANNUNCIATOR LIGHT ILLUMINATED DURING FLIGHT:
- Pull System Circuit Breaker.
- Land at nearest suitable location.

SECTION 4 - PERFORMANCE

No change to Airplane Flight Manual (AFM).

SECTION 5 - WEIGHT & BALANCE

Installation of the 'Wingman' System changes the airplane Weight & Balance as follows:

ITEM	WEIGHT (lbs.)	ARM (inches)	Moment (in.-lbs.)
Power Pack	+ 46.60	-35.55	1656.63
Auger	+ 55.60	0	0

TRANSLAND LLC.
1206 HATTON RD
SUITE A
WICHITA FALLS, TX 76302
(940)687-1100

WINGMAN SYSTEM INSTALLATION INSTRUCTIONS

FOR
AIR TRACTOR AT-602 AIRCRAFT

DRAWING #97418
Revision: F
Date: 5/23/22

Prepared by: ____Craig Shrum______
Approved by: ________________

REVISIONS

REVISION	DATE	REVISED BY	PAGES EFFECTED	REMARKS
D	8/24/16	Craig Shrum	Sect 11	Updated Sect 11
E	11/9/16	Craig Shrum	ALL	Updated Sect 11
F	5/23/22	Craig Shrum	1,6,7	Section 7 step 9 changed X2 to A2 Section 8 step 16 changed order of operation. 27443 was rev B 27450 was A 27458 was E 97409 was rev C 97410 was A

WINGMAN SYSTEM INSTALLATION INSTRUCTIONS.
AIR TRACTOR AT-602

The 'Wingman System' installation is only to be accomplished by AP mechanics Authorized by Transland LLC

TABLE OF CONTENTS PAGE

WINGMAN SYSTEM INSTALLATION

The 'Wingman System' installation is only to be accomplished by AP mechanics Authorized by Transland LLC

SECTION 1 PREPARATION OF THE AIRCRAFT

1. Disconnect the battery.
2. Remove both the left and right side cowl panels.
3. Remove the upper skin panels on both sides of the hopper.
4. Remove the top cowl assembly.
5. Remove the hopper door, door hinge, side latch, and the two bumper blocks from the right side of the hopper.
6. Remove the hopper rinse tank, P/N 80945-1(if installed).
7. See Section 11 for Drawings applicable to this installation.

SECTION 2 MODIFICATION OF THE AIRCRAFT

1. Fill all the open holes in the door (Air Tractor P/N 80224-1) and hopper(Air Tractor P/N 80978-1) with screws (P/Ns 80861, 80865, 81926) as needed.
2. Locate the 5 1/8 inch diameter hole in the firewall as specified in drawing 97400.
3. Using a rivet squeezer, install the backing plate (17464), on the aft side of the hole with twelve 80711 rivets. Seal backing plate (17364) using Permatex High Temperature Sealant, Permatex P/N 81160(26BR), 81915, 81409(26C), or 85915.
4. Drill two 0.563 holes in the hopper forward wall as shown in drawing 97401
5. Drill two one-half inch holes in the upper forward lip of the hopper as shown in drawing 97401.

SECTION 3 AUGER ASSEMBLY INSTALLATION

1. Use drawings 27438 and 27437 for reference.
2. Attach the Hydraulic Motor to the rear of the frame (57457) using four bolts (80161)and washers (81198) per drawing 27437.
3. Install Auger Tube Weldment (57458) and bearing (47427) using bolt (80127) , washer (81230), and nuts (80559) per drawing 27437.
4. Modify Baffle per drawing 97399.

5. Install rear support brackets (57440 and 57459) clamps (57444), and Dutchman clamps (57441) per drawing (27438).
6. Position modified baffle into the lower part of hopper.
   Note: Do not attach baffle until the auger assembly is installed.
7. Place the Auger Assembly(27437) on the clamps previously installed.
8. Using the hole in the supports (57441 , 57440, 57459) mark location for holes.
9. Remove auger and drill (4) "F" holes thru the frame at marks.
10. Replace auger in hopper and attach to support with faspin (81346).
11. Torque all bolts to standard torque values appropriate for each size bolt. See AC 43.13-1B Table 7.1.
    Note Lubricate all SST hardware with anti-seize.

SECTION 4 INSTALLATION OF HYDRAULIC POWER PACK

1. With drawing 27443 as reference, install the Hydraulic Power Pack as Follows.
2. Install bolt (80173) and washer (81230) in 4 holes in Power Pack mount.
3. Slip two clamp (57460) halves over the bolts (80173) in the upper half configuration. Install bushing (17502) between bottom of mount (27435) and clamp (57460).
4. Position the assembly(27435) on the engine mount approximately 26 inches forward of the engine firewall by sliding it fore and aft until the clamps mate correctly with the engine mount tubing.
5. Using a clamp half (57460) as template mark the Hydraulic Power Pack Mount(27435) with the location need for holes to install bolts for clamp halve.
6. Remove power pack (27435) from aircraft drill 4 holes (.257 diameter) in mount for mount clamps.
7. Install bolts (80173) and washers (81230) in holes and place top clamp halves on bolt. Ensure bushing (17502) is installed between bottom of mount and clamp.
8. Re-position the assembly (27435) on the engine mount.
9. Mark the position of the clamps (57460) on the tubing with a felt tip marker
10. After removing the assembly (27435), wrap the tubing area just marked with insulating tap to isolate clamps (57460) from engine mount tubing.
11. Install the assembly (27435) on the engine mount.
12. Install the lower halves of the clamps(57460) and secure them with washers (81249) and nuts (80558).
13. Torque all bolts in accordance with the applicable torque specifications. See AC 43.13-1B Table 7-1.

SECTION 5 DOOR ASSEMBLY INSTALLATION

1. Referencing drawings 27458 and 27439, assemble the door system as follows:

2. Position the door over the door opening in the hopper.
3. Install the rod ends (86439) in the threaded ends of the Door Frame (57455) using jam nut (80541).
4. Attach the hinge mounts (57426) to the rod end bearings (86439) with two bolts (80335) . Place (4) shim washers (81237) on each side of the rod end ball (86439).
5. Adjust the rod end bearings (86439) until the aft edge of the hinge mount (57426) is even with the threaded end of the door frame (57455).
6. Locate the door assembly (57455) on the door centerline with the forward end of the threaded boss 41934) 1.5 inches forward of the edge of the door.
7. Use a straight edge across both Door Hinges (57426) to ensure alignment.

Make certain that:

- The threaded ends of the Door Arms (57455) are 1.5 inches forward of the aft edge of door.
- The door is centrally aligned in the cutout.
- The Door Arm (57455) is on the centerline of the door.
- The Door Arm Hinges (57426) are aligned using a straight edge.

8. Using the Door Arm Hinges (57426) as a template drill (8) x #10 holes.
9. Use large area washers (81303) inside the door and seal them with PR1422B1/2
10. Using (8) bolts(80011) and nut (80570) attach the door frame (57455) to the OEM door. Install while sealant is wet.
11. Make a positioning mark from the screw holes in the left Door Arm Hinge (57426) to the screw holes in right Door Arm Hinge (57426) with a lead pencil. Use this mark for positioning the Door Actuator base (57454).
12. Position the door actuator base on the aircraft center line, and align the holes in the forward Door Actuator Support (57454) using the pencil mark made in the step above.
13. Drill (8) x #10 Holes using the Door Actuator Base (57454) as a template, make certain to keep proper alignment.
14. Place (4) 81303 large area washers under the forward four holes for the Door Actuator plate (57454) using PR1422B1/2 to seal.
15. Install and Torque four bolts (80013) and nuts (80570) on the forward end of the Door Actuator Base (57454) using the large area washers (81303) previously installed.
16. Position the Door Backup Plate (57434) inside the hopper to facilitate alignment with the Door Arm Hinges (57426) and the aft Door Actuator Base (57454).
17. Drill #10 hole in 12 places thru the previously drill holes for the Door Arm Hinges (57426) and the aft Door Actuator Base (57454).
18. Install and Torque (12)bolts (80013) and nuts (80570) on the Door Arm Hinges (57426) and the aft Door Actuator Base (57454).
19. Seal under all nuts and between the Door Backup Plate (57434) and the Hopper using PR1422B1/2.

20. Torque all bolts to standard torque values appropriate for each size bolt. See AC 43.13-1B Table 7-1.

SECTION 6 DOOR ASSEMBLY ADJUSTMENT

1. Referencing drawings 27439, 27458,and 27430; assemble the door system as follows:
2. Adjust the rod end bearings (86439) as required to fit the door in the hopper opening.
3. Remove or insert shim washers (81233) on each side of the Spherical Rod End (86429) as required to locate the door in the center of the opening.
4. Install elbows (81060) in the ports of the hydraulic actuator (86654).
5. Secure the forward end of the actuator (86654) using bolt (80124). Torque to ensure that the actuator (86654) is able to move on the bolt (80124).
6. Adjust the rod end bearing (86429) on the actuator (86654) to its fully extended position, and position the rod end (86429) so it contacts the aft end of the slot on the Arm Slot bracket, approximately 1/16 inches before the maximum extended position of the actuator. Then secure the jam nut (80525) on the rod end (86429). Place the Door Latch Rod (57428) in the Door Arm, passing the aft end through the Door Latch Support. Secure the aft end of the Actuator (86654) to the Actuator Base (57454), using a bolt (80124), washers (81227), and nut (80559). Do not over torque, as the actuator must be able to move.
7. Check that the aft end of the Door Latch Rod (57428) extends 1/4” ± 1/16” inches at maximum aft travel. If these tolerances are not obtained, The Door Latch Rod (57428) must be re-fitted.
8. Slide the Door Latch Rod (57428) and the actuator rod end to the full forward position. With the Door Latch Rod protruding ¼”, position the Door Latch Box (57415) with the forward edge even with the aft end of the Door Latch Rod (57428) and with the slot in the Door Latch Box (57415) aligned with Door Latch Rod (57428). Drill two # 10 holes through the holes in the bottom of the Door Latch Box (57415) and through the hopper.
9. Because of the difference in thickness of the hopper door gasket, the Door Latch Box (57415) may be shimmed to proper height in relation to the door washers (81303). Attach to hopper with screws (80865), washers (81219), and nuts (80570). Seal under the washer (81303) and the nuts with PR1422B1/2.
10. Door Latch Box to be assembled per drawing 27430. Ensure Spring (80347) is formed per drawing 80347, spring leg lengths are to be cut to length at assembly.

SECTION 7 ELECTRICAL SYSTEM INSTALLATION

1. Reference Drawings 97409 and 97410.
2. Install the main power cable (P/N 60302-901) from post ‘A2’ on the aircraft Master Circuit Breaker to the circuit breaker P/N 86494, post ‘X1’. Attach the main power cable (P/N 60302-902) to the circuit breaker P/N 86494, post ‘X2’, and route the cable upward and along side of the existing starter-generator cables securing them with cable ties.

Attach the other end to post ‘A1’ on the SM Relay R-3 (P/N 85453). Attach cable(P/N 60302-905) to Post ‘A2’ on the SM relay (R3) and route the cable upward and along side of the existing starter-generator cables securing them with cable ties. Attach the other end to ‘A1” post of the PMR solenoid (R1).

3. Take the wire in the wiring harness P/N 27450 labeled #5 and connect to aft solenoid control post X2 on the RMR relay. Mount the end of the short PMR ground cable (P/N 60302-903) to the PMR ‘G’ post. Attach the lower end of the cable to the hole on the left side of the aft mount angle (G2).
4. Install PMR ground cable (P/N 60302-904) from aft bolt of the Dutchman clamp on the port side of the PMR mount (G2) down to the upper inboard battery box mount bolt (G3).
5. Using the drawing 97413 as a reference, drill (5) 0.50” holes on the right side of instrument panel.
6. Install the placard P/N 97425.
7. Install the switches, circuit breaker, and the indicator lights as shown in Drawing 97413.
8. Connect 14 Ga. Wire P/N 60302-910 to an available terminal on the aircraft cockpit bus, and the other end to post X1 on the circuit breaker located in wiring harness P/N 27450.
9. Take wire #3 on wiring harness P/N 27450, route down the right side of the aircraft and connect to the PMR solenoid (R1) control post X1. Using wire #1 on the wiring harness P/N 27450, route it down the right side of the aircraft and attach to the sequence valve solenoid (DIN). Ground the other post of the DIN connector to the same #4 bolt as described in step 3 with wire P/N 60302-915. Route wire # 4 from the wiring harness along wire #3 and attach to PMR post A2. Secure all wiring to the aircraft structure with cable ties.
10. Attach the wire #2 of the wire harness P/N 27450 to the aircraft battery box ground (G3). Attach the wire P/N 60302-921 to post X1 of PMR solenoid and to terminal X1 of the SM relay (R3). Attach wire P/N 60302-922 to post X2 on the PMR solenoid to post X2 of the SM relay (R3). Attach harness wire #6 to post A2 of SM relay R3.

SECTION 8 HYDRAULIC PLUMBING AND ADJUSTMENT

1. Refer to drawings 97407, 97408, and 27460.
2. Use tefelon tape on all pipe thread fittings.
3. O-rings must be used on all sequence valve and hydraulic motor fittings.
4. All the rigid tubing must be removed after setting the ferrules to verify sufficient penetration of the tubing through the ferrule.
5. Install P/N 86483 baffle fitting through the front of the hopper. Install O-Ring (P/N 86427), Coupling (P/N 86434), Coupling (P/N 86435), and Adapter (P/N 86489) to baffle. See drawing 97401. Install fittings with PR1422B1/2 sealant.
6. Install Assembly 97402 thru the top of hopper. See Drawing 97402 and Drawing 97401. Install fittings with PR1422B1/2 sealant.
7. Using drawing 97407 and 97408 route and form tubing from supplied material.

8. Install formed tubes.
9. Torque all fittings and nuts as required to prevent leakage
10. Install Covers (P/Ns 17492 and 17493) with grommets, P/N 85394 over the 5-1/8 hole in the firewall. See Drawing 97400.
11. Secure all rigid tubing with Adel clamps every 16 inches.
12. Install hoses (P/N 29261) from adapter P/N 86489 located at fire wall to adapter 86492 located on Auger motor.
13. Install hoses (P/N 29262) from elbow assembly (97402) located on top of hoper to elbow (81060) located on door cylinder (86654).
14. Add one quart of Dextron II or III automatic fluid to the reservoir of the power pack.
15. Turn on the Master Power Switch.
16. Adjust the sequence valve as described below:
    - Use drawing 86430 for reference
    - With a hydraulic pressure gauge temporarily installed into the door closing side of the cylinder, adjust the relief valve on the PMR unit to between 2000- 2800 PSI while the door in the close cycle.
    - Adjust the needle valve 7A and 7B, turn clockwise until they are bottomed. (torque = 6 in-lbs. max.)
    - Now turn 7A and 7B counter clockwise ¼ turn. This is the setting point for further adjustments.
    - Use the needle valve 7A to adjust the door opening speed.
    - Use the needle valve 7B to adjust the door closing speed.
    - While cycling the door up and down adjust the respective needle valve until opening and closing speeds are between 2.5 and 3.5 seconds each.
    - Adjust the sequence valve adjustment (right side of the valve) clockwise until the auger does not rotate while the door is opening.
    - Remove the gauge and reinstall the flex hose.
    - Cycle the system several times to remove any trapped air and ensure proper operation.
    - Add fluid if necessary.
17. Turn off the Master switch.

SECTION 9 SYSTEM OPERATIONAL TEST

1. Turn on the Master Switch.
2. Set System Switch to OPEN/RUN position.
3. Move the pump switch to the ON position and observe the following.
    - Door opens in 2.5 to 3.5 seconds. (If the door opens outside this envelope, see Section 8 for adjustment instructions)

- As the door opens completely, the auger begins to run. (If auger starts to run before the door is fully open, see Section 8 for adjustment instructions)
- Both indicator lights are illuminated while PUMP switch is held in the ON position and both lights are extinguished when the switch is released.
- If either light does not illuminate, press to check the bulbs. If the lights remain on, check the solenoid for that light is operating correctly.

4. Set position switch to CLOSE/STOP position.
5. Move PUMP switch to ON position.
    - Door closes in 2.5 to 3.5 seconds.(If the door does not close within this time see Section 8 for adjustment instructions)
    - Auger does not run (If the auger turns more than one half revolution, see Section 8 for adjustment instructions.
    - After the door closes , the latch rod moves into the rod holder and locks the door close(If the door does not lock, See Section 6 for door assembly adjustments)
    - Both indicator lights are illuminated while the PUMP switch is ON, and both extinguish when the switch is released.

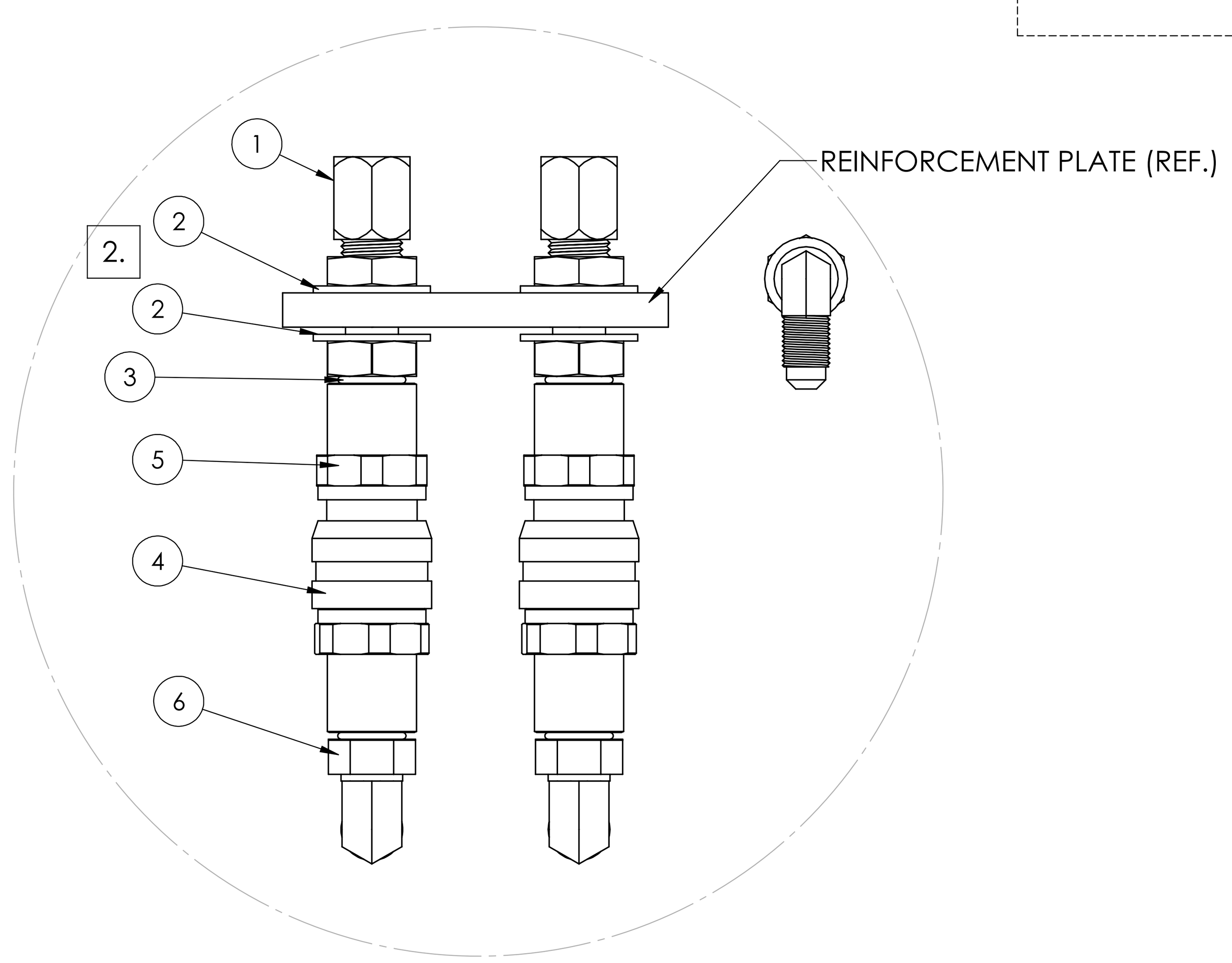
SECTION 10 CLOSING OF THE AIRCRAFT

1. Replace the hopper rinse tank, if removed per Section 1.
2. Reinstall all doors/panels/cowlings removed per Section 1.
3. Make aircraft log entry for system installation.

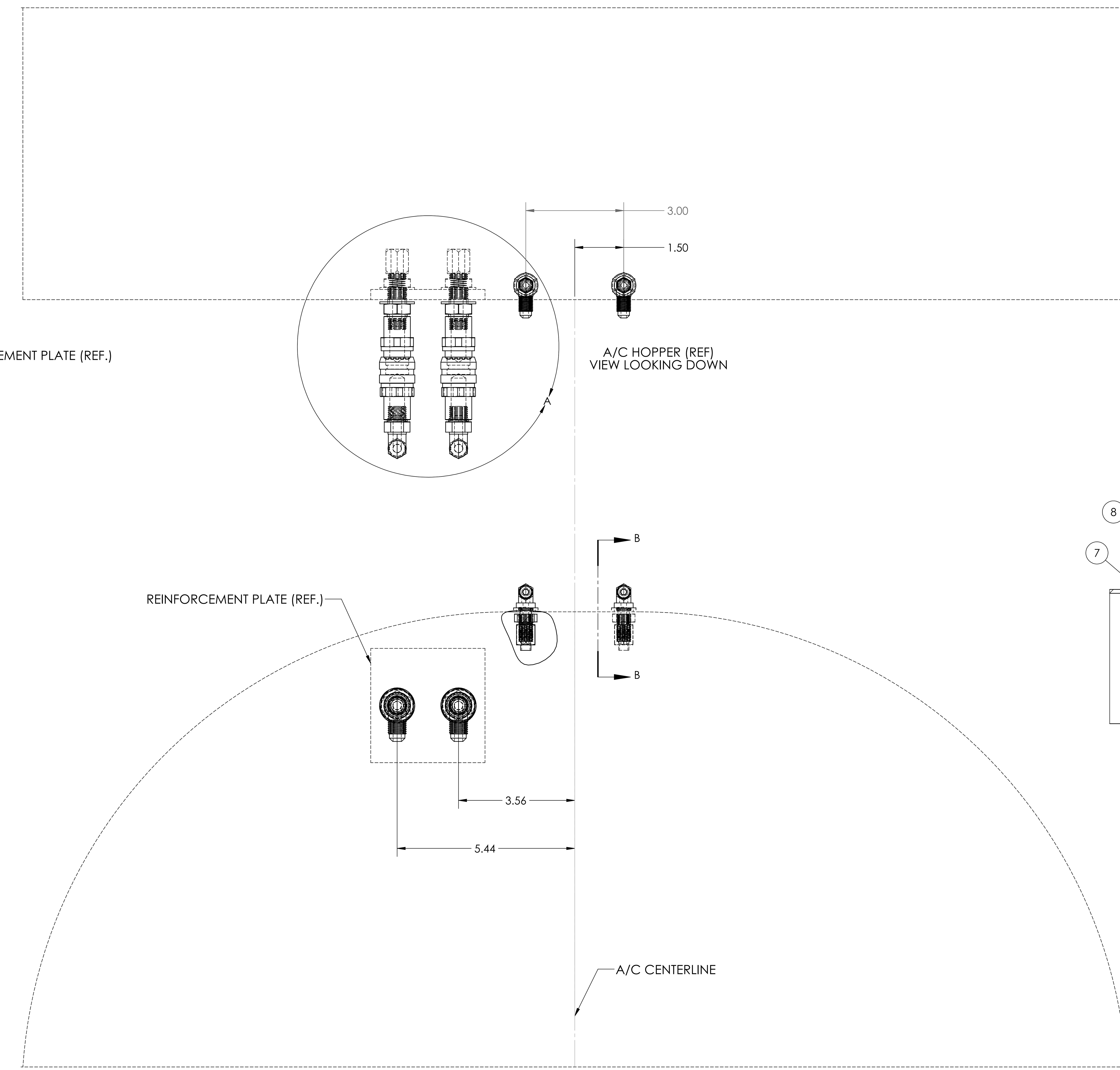
NOTES *(UNLESS OTHERWISE SPECIFIED)*

1. SUPERSEDES WINGMAN W-5004-rev-A
2. APPLY SEALANT MEETING MIL-S-8802 TYPE II, AMS-S-8802 SPECS. (A)

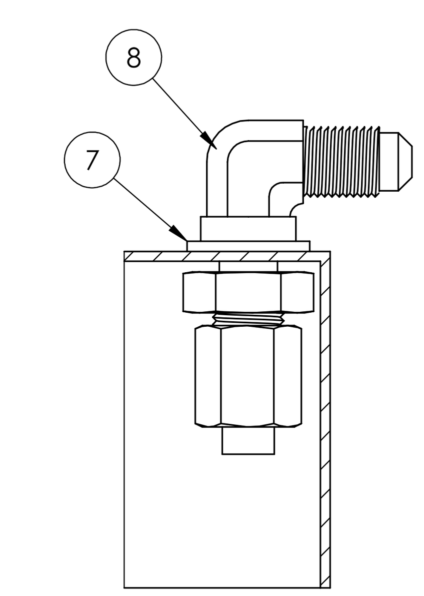
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	86483	BAFFLE FITTING	2
2	81301	FLAT WASHER AN960C-916	4
3	86427	O-RING	2
4	86434	QUICK COUPLING	2
5	86435	QUICK CONNECT COUPLING	2
6	86489	HYDRAULIC ADAPTER	2
7	81238	FLAT WASHER AN960-716	2
8	97402	ELBOW ASSEMBLY	2



DETAIL A
SCALE 6 : 8



A/C HOPPER (REF)
VIEW LOOKING AFT



SECTION B-B
SCALE 1 : 1

DWG NO:	REV:
97401	A

ENGINEERING APPROVED COPY FOR MANUFACTURE

ATTENTION

STC OR PMA CONTROLED PART

REV	E.O. #	DESCRIPTION	DATE	BY
A	3817	CORRECTED NOTE #1, ADDED NOTE #2	1/10/2013	PK
NC	3450	INITIAL RELEASED	10/15/2012	PK

REVISIONS

NO. REQD.	NEXT ASSEMBLY
	FINAL

MATERIAL

FINAL ASSEMBLY

FINISH

	NAME	DATE
DRAWN	PK	10-15-12
CHECKED	RR	1-11-13
ENG APPR.		

REMOVE ALL BURRS AND SHARP EDGES
INTERPRET DRAWING PER ANSI Y14.5M-1982
SURFACE ROUGHNESS PER MIL-STD-10
ALL MACHINED SURFACES NOT TO EXCEED 63 MICROINCHES PER MIL-STD-10 UNLESS NOTED

SolidWorks

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ±1/16
.XX ±.03
.XXX ±.010
ANGLE ± 1/2°
HOLE DIA:
.0135 - .125 DIA. +.004 -.001
.1260 - .250 DIA. +.005 -.001
.2510 - .500 DIA. +.006 -.001
.5010 - .750 DIA. +.008 -.001
.7510 - 1.000 DIA. +.010 -.001

THIRD ANGLE PROJECTION

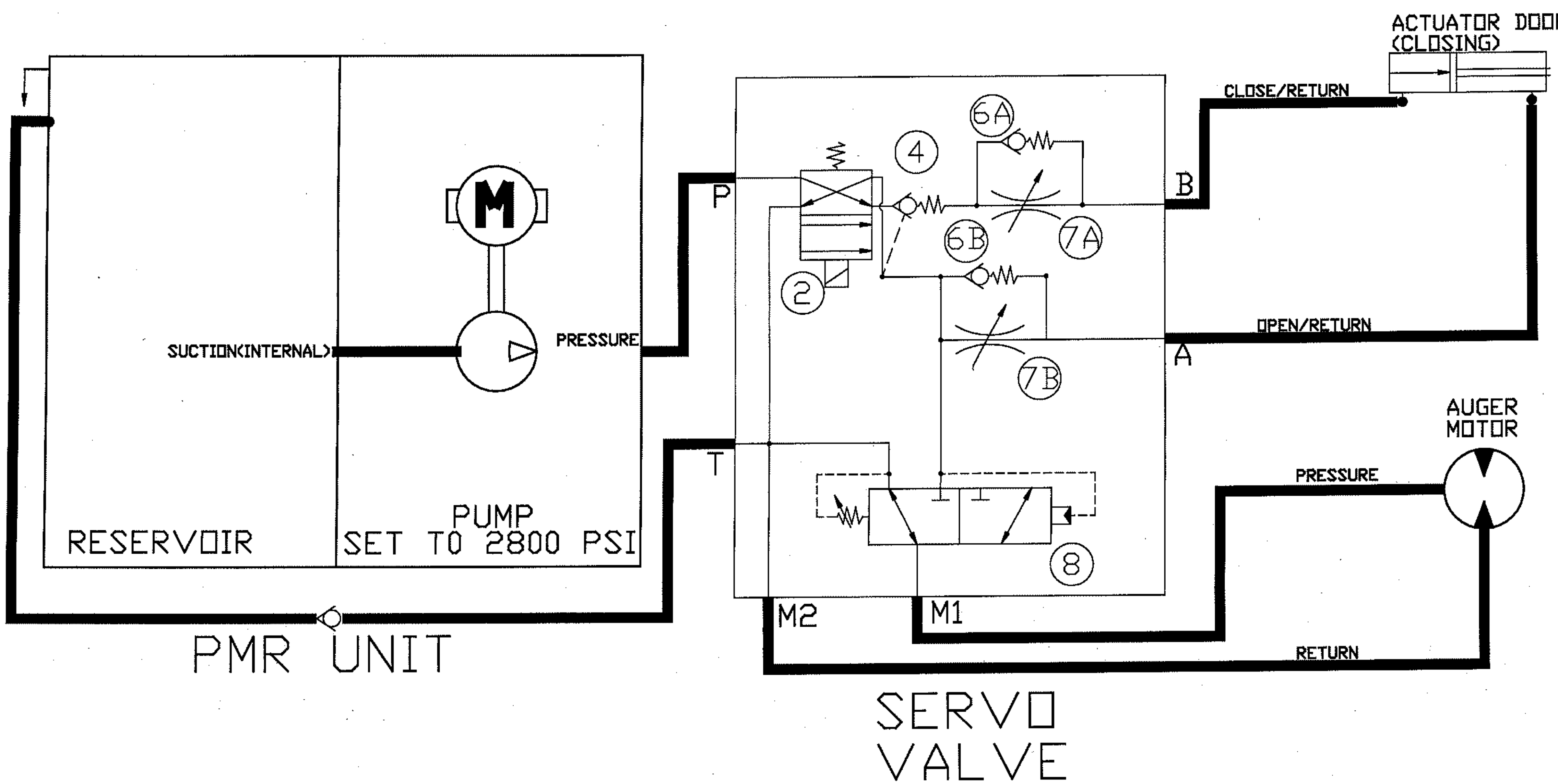
TRANSLAND

TITLE: **HOPPER HYDRAULIC ACCESS WINGMAN W-5004**

SIZE: D | DWG. NO. 97401 | REV A

SCALE: 1:2 | WEIGHT: | SHEET 1 OF 1

NOTES (UNLESS OTHERWISE SPECIFIED)
1. SUPERSEDES WINGMAN V-8003



ENGINEERING APPROVED COPY
FOR MANUFACTURE

REV.	E.O. #	DESCRIPTION	DATE	BY
A		2800 PSI WAS 3800 PSI	3/18/13	CAS

REVISIONS

NO. REQD.	NEXT ASSEMBLY		NAME	DATE
		DRAWN	CS	10-17-12
		CHECKED		
		ENG APPR.		
	FINAL ASSEMBLY	MATERIAL		
		FINISH		

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± 1/16
.XX ± .03
.XXX ± .010
ANGLE ± 1/2°
REMOVE ALL BURRS AND SHARP EDGES
INTERPRET DRAWING PER ANSI Y14.5M-1982
ALL MACHINED SURFACES NOT TO EXCEED 63 MICROINCHES PER MIL-STD-10 UNLESS NOTED

THIRD ANGLE PROJECTION
SolidWorks

TITLE: HYDRAULIC SCHEMATIC

SIZE	DWG. NO.	REV
C	97407	A

SCALE: 41 | WEIGHT: | SHEET 1 OF 1

NOTES (UNLESS OTHERWISE SPECIFIED)
1. SUPERSEDES WINGMAN W-

FROM	HARDWARE	DWG#	HARDWARE	HARDWARE
PMR Pump Pressure	86440 Elbow	29265	86493 ELBOW	Port P on Sequence Valve
RMR Return Port	86440 Elbow	29268	86493 ELBOW	86473 Check Valve
86473 Check Valve	86485 Adapter	29268	86493 ELBOW	Port T on Squence Valve
Sequence Valve Port M1	86493 Elbow	97403	86483 Connector	Auger Inboard Bulkhead Fitting
Sequence Valve Port M2	86493 Elbow	97404	86483 Connector	Auger Outboard Bulkhead Fitting
Sequence Valve Port A	86475 St. Connector	97406	81079,Sleeve Coupling	Door Port Bulkhead Fitting
Sequence Valve Port B	86474 Elbow	97405	81079,Sleeve Coupling	Door Starboard Bulkhead Fitting
Auger Inboard Bulkhead Fitting	86489 Elbow,plus 86434 Quick Disconnect,plus 86435 Quick Disconnect,plus 86427 O-Ring, plus 86583 Connector	29261	86492 Straight Adapter	Auger Motor
Auger Outboard Bulkhead Fitting	86489 Elbow,plus 86434 Quick Disconnect,plus 86435 Quick Disconnect,plus 86427 O-Ring, plus 86583 Connector	29261	86492 Straight Adapter	Auger Motor
Door Starbord Bulkhead Fitting	81089 Elbow,plus 81250 Washer,plus 86616 Nut,plus 81075 Nut,plus 81079 ,Sleeve Coupling	29266	81060 ELBOW	Door Cylinder
Door Port Bulkhead Fitting	81089 Elbow,plus 81250 Washer,plus 86616 Nut,plus 81075 Nut,plus 81079 ,Sleeve Coupling	29266	81060 ELBOW	Door Cylinder

ENGINEERING CONTROLLED COPY
FOR MANUFACTURING

REV.	E.O. #	DESCRIPTION	DATE	BY
A		FIXED HOSE CALLOUTS	10-21-13	CS

REVISIONS

NO. REQD	NEXT ASSEMBLY
	FINAL ASSEMBLY

	NAME	DATE
DRAWN	CS	10-17-12
CHECKED	RR	10-22-13
ENG APPR.		
MATERIAL		
FINISH		

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± 1/16
.XX ±.03
.XXX ±.010
ANGLE ± 1/2°
REMOVE ALL BURRS AND SHARP EDGES
INTERPRET DRAWING PER ANSI Y14.5M-1982
ALL MACHINED SURFACES NOT TO EXCEED 63 MICROINCHES PER MIL-STD-10 UNLESS NOTED

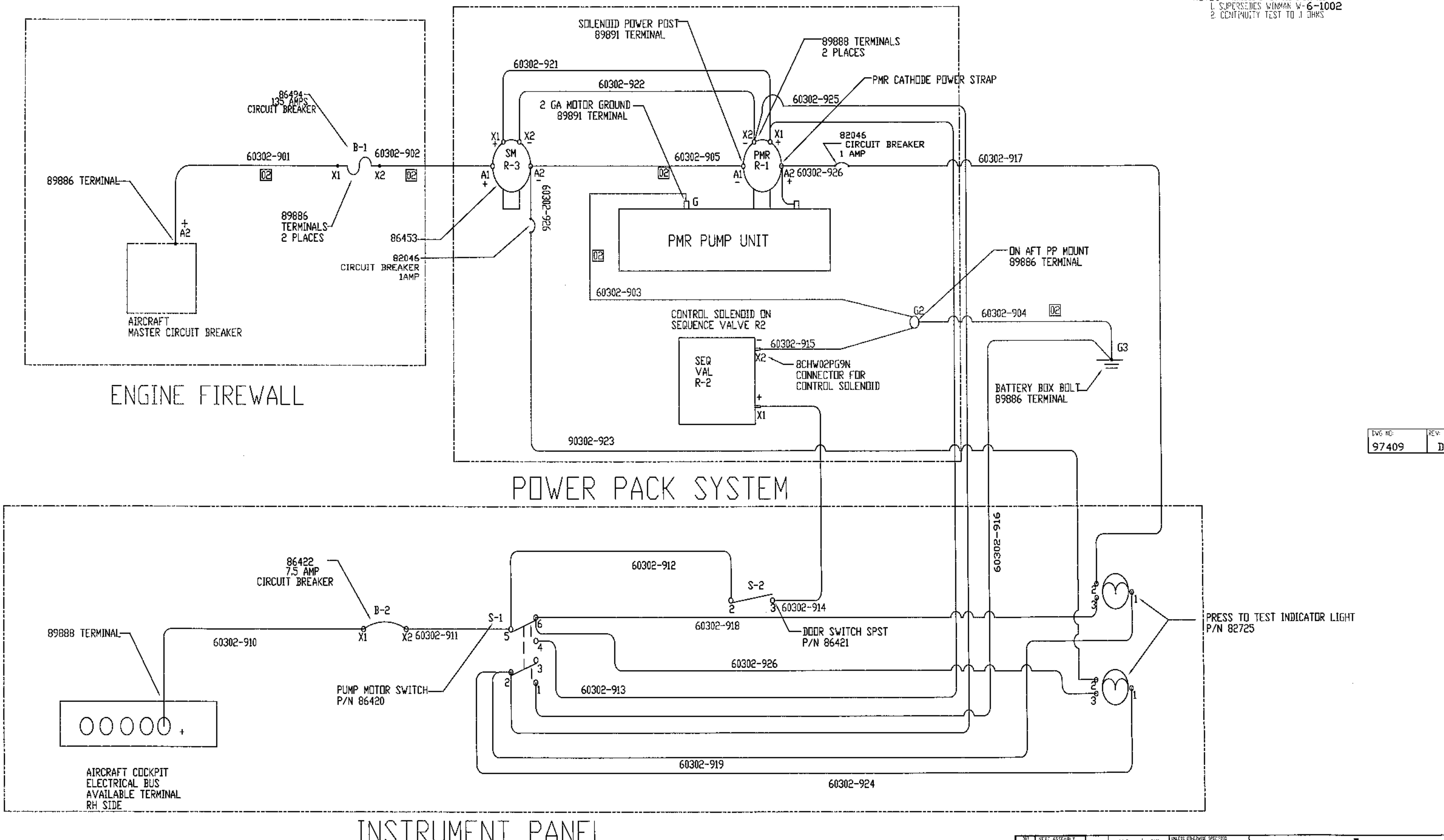
THIRD ANGLE PROJECTION
SolidWorks

TITLE: HYD. ROUTING CHART

SIZE	DWG. NO.	REV
C	97408	A

SCALE: 4:1 WEIGHT: SHEET 1 OF 1

NOTES (UNLESS OTHERWISE SPECIFIED)
1. SUPERSEDES WINMAN W-6-1002
2. CONTINUITY TEST TO .1 OHMS



ENGINEERING APPROVED COPY FOR MANUFACTURE

REV		REVISIONS	DATE	BY
D	11303	ADDED 2X 82046 CIRCUIT BREAKERS	1-03-22	CLK
C		ADDED NOTE 2	8-28-14	CAS
B		ADDED AMPERAGE TO CICUIT BREAKERS	8-29-14	R.R.
A		ADDED LABEL 60302-926	8-29-14	R.R.

	NAME	DATE
DRAWN	CS	10-22-12
CHECKED	R.R.	10-28-12
ENG APPR		

NEXT ASSEMBLY: FINAL ASSEMBLY

SolidWorks — THIRD ANGLE PROJECTION

TRANSLAND

TITLE: ELECTRICAL LAYOUT

SIZE: D | DWG NO. 97409 | REV: D

SCALE: 4:1 | WEIGHT: | SHEET 1 OF 1

NOTES (UNLESS OTHERWISE SPECIFIED)
1. SUPERSEDES WINGMAN W-860C.
2. ALL 14 GA AWG WIRE TO BE M22759/16-14. B
3. ALL 2 AWG WIRE TO BE M22759/34-2-9.

PART#	FROM	TERM	HARDWARE	WIRE SIZE	LENGTH	HARDWARE	TERM	TO
60302-901	Aircraft Master Circuit Breaker	A2	89886 Terminal	2 AWG	12 inches	89886 Terminal	X1	Circuit Breaker 86494(B-1)
60302-902	Circuit Breaker 86494(B-1)	X2	89886 Terminal	2 AWG	15 inches	89891 Terminal	A1	86453 Solenoid Power Post (R-3)
60302-903	#5 Ground Post on RMR Motor	G	89891 Terminal	2 AWG	7 inches	89891 Terminal	G2	#4 Hole on Aft PP Mount
60302-904	Dutchman Clamp Ground Bolt	G2	89886 Terminal	2 AWG	33 inches	89886 Terminal	G3	Battery Box Upper Inboard Mounting Bolt
60302-905	86453 Solenoid (R-3)	A2	89891 Terminal	2 AWG	52 inches	89891 Terminal	A1	PMR Solenoid Power Post A1(R-1)
60302-910	Aircraft Cockpit Bus		89888 Terminal	14 GA AWG	See Print 27450	See Print 27450		86422 Circuit Breaker
60302-911	86422 Curcuit Breaker		See Print 27450	14 GA AWG	See Print 27450	See Print 27450		86420 Switch S-1
60302-912	86421 Switch S-2		See Print 27450	14 GA AWG	See Print 27450	See Print 27450		86420 Switch S-1
60302-913	86420 Switch S-1		See Print 27450	14 GA AWG	See Print 27450	89885 Terminal	X1	PMR Sol. Control Post X1 (R-1)
60302-914	86421 Switch S-2		See Print 27450	14 GA AWG	See Print 27450	Solder to 8CHW02PG9N Plug		Sequence Valve Connector (R-2)
60302-915	Sequence Valve connector(R-2)	X2	Solder to 8CHW02PG9N Plug	14 GA AWG	10 inches	89887 Terminal	G2	#4 Hole on Aft PP Mount
60302-916	86420 Switch S-1		See Print 27450	14 GA AWG	See Print 27450	89888 Terminal	G3	Battery Box Upper Inboard Mounting Bolt
60302-917	82725 Indicator Light L-1		See Print 27450	14 GA AWG	See Print 27450	89888 Terminal	A2	PMR Power Strap(R-1)
60302-918	86420 Switch S-1		See Print 27450	14 GA AWG	See Print 27450	See Print 27450		82725 Indicator Light L-1
60302-919	82725 Indicator Light L-1		See Print 27450	14 GA AWG	See Print 27450	See Print 27450		86420 Switch S-1
60302-921	PRM Solenoid Post X-1	X1	89885 Terminal	14 GA AWG	52 inches	89885 Terminal	X1	SM Relay X1 (R-3)
60302-922	PRM Solenoid Control Post X2	X2	89885 Terminal	14 GA AWG	52 inches	89885 Terminal	X2	SM Relay X2(R-3)
60302-923	82725 Indicator Light L-2		See Print 27450	14 GA AWG	See Print 27450	89885 Terminal	A2	SM Relay Power Terminal (R-3)
60302-924	82725 Indicator Light L-2		See Print 27450	14 GA AWG	See Print 27450	See Print 27450		86420 Switch S-1
60302-925	86420 Switch S-1		See Print 27450	14 GA AWG	See Print 27450	89888 Terminal	X2	PMR Sol Control Post X2(R-1)
60302-926	86420 Switch S-1		See Print 27450	14 GA AWG	See Print 27450	See Print 27450		82725 Indicator Light L-2

ATTENTION

STC OR PMA CONTROLLED PART

ENGINEERING APPROVED COPY FOR MANUFACTURE

REV	EO #	DESCRIPTION	DATE	BY
B	14666	ADDED NOTES 2 & 3; ADDED "WINGMAN" TO TITLE	01/06/22	CAS
A		CHANGED 86423 TO 82725.	08/29/14	CAS

REVISIONS

NO. REQD. | NEXT ASSEMBLY | FINAL ASSEMBLY

	NAME	DATE
DRAWN	CS	11/22/12
CHECKED		
ENG APPR.		

MATERIAL

FINISH

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
FRACTIONS ± 1/16
.XX ±.03
.XXX ±.010
ANGLE ± 1/2°
REMOVE ALL BURRS AND SHARP EDGES
INTERPRET DRAWING PER ANSI Y14.5M-1982
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THIRD ANGLE PROJECTION

SolidWorks

TRANSLAND

TITLE: ELECTRICAL ROUTING CHART, WINGMAN

SIZE: C | DWG. NO. 97410 | REV: B

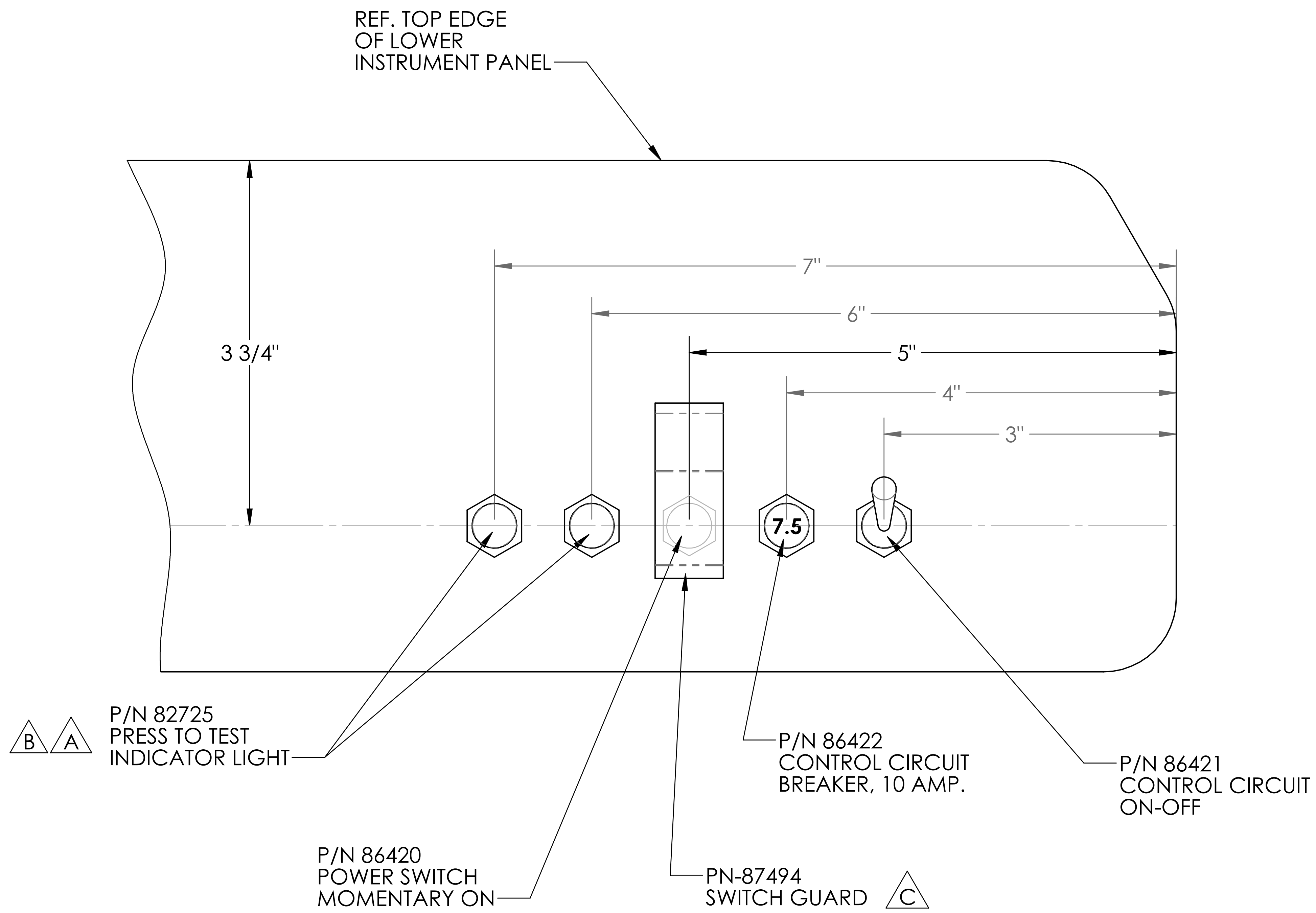
SCALE: 4:1 | WEIGHT | SHEET 1 OF 1

NOTES *(UNLESS OTHERWISE SPECIFIED)*

1. SUPERSEDES WINGMAN W-6002-rev-C

ATTENTION

STC OR PMA CONTROLED PART



ENGINEERING APPROVED COPY
FOR MANUFACTURE

REV.	E.O. #	DESCRIPTION	DATE	BY
C	5868	ADDED SWITCH GUARD PN-87494 QTY. 1	9/16/2014	PK
B	5814	PN-82725 (BLUE) WAS PN-86725	9/3/2014	PK
A	5800	PN-82725 (BLUE) WAS PN-86423 (AMBER)	8/28/2014	PK
NC	3475	INITIAL RELEASED	10/24/2012	PK

REVISIONS

NO. REQD.	NEXT ASSEMBLY
	FINAL ASSEMBLY

	NAME	DATE
DRAWN	PK	10-24-12
CHECKED	RR	9-16-14
ENG APPR.		

MATERIAL

FINISH

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONS ± 1/16
.XX ±.03
.XXX ±.010
ANGLE ± 1/2°
REMOVE ALL BURRS AND SHARP EDGES
INTERPRET DRAWING PER ANSI Y14.5M-1982

ALL MACHINED SURFACES NOT TO EXCEED 63 MICROINCHES PER MIL-STD-10 UNLESS NOTED

THIRD ANGLE PROJECTION

SolidWorks

TRANSLAND

TITLE: COCKPIT SWITCH LAYOUT WINGMAN W-6002

SIZE	DWG. NO.	REV
C	97413	C

SCALE: 3:4 | WEIGHT: | SHEET 1 OF 1