**DRAWING LIST FOR TRUE QUANTITY GAUGE INSTALLATION**

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**Drawing list on second page**

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# DRAWING LIST

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</table>
INSTALLATION INSTRUCTIONS

Table of Contents

PARTS LIST ........................................................................................................................................ 2
INSTALLATION .................................................................................................................................. 3
DIP SWITCH SETTINGS .................................................................................................................... 5
TROUBLE SHOOTING ..................................................................................................................... 6
OPERATION INSTRUCTIONS ......................................................................................................... 7

Note:
In installation instructions and drawings aircraft model number is used to reference all models in the series.
Examples:
400 Represents AT-400, AT-400A
402 Represents AT-402, AT-402A, AT-402B
502 Represents AT-502, AT-502A, AT-502B
504 Represents AT-504
602 Represents AT-602
802 Represents AT-802, AT-802A
510 Thrush represents Thrush models: S2R, S2R-G1, S2R-G5, S2R-G6, S2R-G10, S2R-H80, S2R-T15,
S2R-T11, S2R-T34, S2R-T45, S2R-T65, S2R-PH-T34, S2R-PH-T65
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**Note:**

*The Drawing 6-3-1-TAB was updated to have the last three digits of the part number be the stroke length of the quantity probe.*
REBE AIRCRAFT IMPROVMENT

INSTALLATION INSTRUCTIONS

“TRUE QUANTITY” HOPPER QUANTITY & BOOM PRESSURE GAUGE

INSTALLATION: Airplane

PRESSURE PROBE INSTALLATION

Cut existing boom pressure line 1 foot above belly skin. Connect transducer to line using 1/4 npt x 1/8 npt reducer (PN 3300 X 4X2 WEATHERHEAD), 1/8 inch npt x 1/4 inch compression adaptor (ON 68X4 WEATHERHEAD), and 1/4 inch tube support insert (2030X44 WEATHERHEAD). Tie wrap (PN 6-4-0-000) transducer to airframe tubing within 45° of vertical. Pressure line should be on a continuous downward route to boom. Remove inoperative pressure gauge. See Pressure Probe Mounting drawing. (6-0-4-000)

COCKPIT DISPLAY INSTALLATION

Main display (PN 6-1-0-000) may be mounted in same location as original hopper display or atop of dash, or to glare shield on Thrush. If in-dash installation is elected, enlarge dash cutout per Main Display Mounting Drawing (6-0-2-000). Attach display behind dash using the (4) face plate screws. If on-dash mount is elected, locate display to left of center atop dash; or to glare shield on Thrush. Produce mounting angles per Main Display Mounting Drawing (6-0-2-000). Attach to dash top using AN526-832 screws and AN365-832 self-locking nuts. Attach display to angles using bottom (2) faceplate screws. Install 3M mounting tap under cable end of display to add stability. Cover or blacken cable connectors to reduce reflection in windshield. The mechanical Hopper Quantity gauge (if equipped) may be removed or left operational.

QUANTITY PROBE INSTALLATION

1) Drill hole
   a) AT-400/402 Series - Drill ¾ inch hole in top of hopper 2¼ inch forward of lid and 5 ½ + ½ inches to left of center. Hole should align with light bar support.
   See Drawing (6-0-5-000).
   b) AT-502/504/602/802 Series - Drill ¾ inch hole in top of hopper 2¼ inch forward of lid and 9 ½ + 1 inches to right of center.
   See Drawing (6-0-5-000).
   c) S10 Thrush - Drill ¾ inch hole in top of hopper 6 inches right of lid and 31 inches forward of aft hopper wall.
   See Drawing (6-0-5-000)

2) Install probe (PN 6-3-1-xxx) with sealant applied to washer outside of hopper and secure with self-locking nut (Lubricate self-locking nut and probe threads with grease for use on stainless steel, Moly grease is recommended). Orientate probe so connector is pointed aft.
   See Quantity Probe Mounting Drawing. (6-0-5-000)

3) Install float (PN 6-3-2-000) “NO” side up.

4) Install float clamp (PN 6-3-3-000) such that top of stop is 1½ inches from bottom of probe.
   See Quantity Probe Mounting Drawing (6-0-5-000).

5) Sub Tank mounting
   a) AT-400/402/502/504/602/802 Series - Drill ¼ inch hole in right gate box baffle and float clamp tab such that float sets outboard of notch in baffle when float clamp is attached to baffle and float clamp is 1 ½ inch from end of probe with AN4C4 bolt and MS21044C4 self-locking nut.
   See Quantity Probe Mounting Drawing (6-0-5-000)
   b) S10 Thrush - Drill ¼ inch hole in right gatebox baffle and float clamp tab such that float sets inboard of notch in baffle when float clamp is attached to baffle and float clamp is 1 ½ inch from end of probe with AN4C4 bolt and S21044C4 set-locking nut.
   See Drawing 6-0-5-000

REMOTE DISPLAY INSTALLATION (optional)

Cut hole per Remote Display Mounting Drawing (6-0-3-000) in fuselage main upper skin, 24 inches aft of left door and ½ inch above side skin. Attach Remote Display (PN 6-2-0-000) to inboard side of skin using (4) face plate screws. Re-seal screws with RVT silicone sealant.
CABLE INSTALLATION: AIRPLANE

Running the Cables:
Run the cables away from high power lines such as: Air conditioner, Blower, motor, pump, or main buss lines. If a cable must pass one of these lines try and pass at a right angle. See Drawing 6-0-0-TAB

Quantity Probe Cable:
To connect the Quantity Probe to the main box, use the Quantity Probe Cable (PN 6-5-0-000). You can identify this cable because it is the only one with a 90° connection. The end with the 90° connection connects to the top of the quantity probe. The other end of the cable connects to the back of the main box to the port labeled “QTY GAUGE”.

Silicone seal the 90° connector after installation.

Air Tractor: Silicone cable to top of hopper as cable leads toward firewall, enter fuselage aft of firewall through ¾ inch hole and close with grommet or silicone. Tie wrap along top left longeron to cockpit. Enter cockpit through 1 inch hole and close with grommet. Locate 1 inch hole with routing of remote cable in mind. Connect to “QTY GAUGE”. Excess length may be coiled. NOTE: Existing wire feed thorough holes may be used if cable length allows.

Thrush: Attach cable to top of hopper using silicone or adle clamps, as cable leads aft toward cockpit. Enter cockpit aft of hopper and forward of right corner windshield through ¾ inch hole. Close hole with a grommet or silicone. Connect to “QTY Gauge.” Excess length may be coiled.

Power Cable:
To connect the power to the main box, use the Power Cable (PN 6-7-0-000). You can identify this cable because it has a connector only on one end.

Connections to aircraft using AMP terminal ends or other methods acceptable by AC 43.13:
Black: connects to aircraft Ground
Blue: connects to +24V through a 1 amp breaker (Klixon 7227-2-1 or equivalent) label breaker (Hopper Display) Breaker to be installed into breaker panel.
Brown: connects to the Torque sense side of the Hobbs meter

The other end of the cable connects to the back of the main box to the port labeled “POWER”.

Pressure Probe Cable:
To connect the Pressure probe to the main box, use the Pressure Probe Cable (PN 6-6-0-000). You can identify this cable it will be the larger diameter cable with 4 pins in the male end. The female end of the cable connects to the Pressure Probe. The other end of the cable connects to the back of the main box to the port labeled “PRES GAUGE”.

Tie wrap cable to airframe and route up to cockpit and enter through 1 inch. Excess length may be coiled.

Remote Box Cable:
To connect the Remote Box to the main box, use the Remote Cable (PN 6-8-0-000). You can identify this cable it will be the smaller diameter cable with 4 pins in the male end. The female end of the cable connects to the Remote Box. The other end of the cable connects to the back of the main box to the port labeled “REMOTE”.

Tie wrap cable to Airframe and route forward to cockpit and enter through 1 inch hole used by pressure probe wire.
DIP SWITCH SETTINGS

To check dip switch setting without opening the box refer to the “Display Settings Info” section. The Main Box is the same for all aircraft. The way the box is set for a particular aircraft is thru the dip switch settings.

To change the dip switch setting unscrew the dim button cover and take the four screws out of the back of the main box. You will now be able to slide the main board and back out of the box. On the top of the main board you will see a series of dip switches. The switches are labeled and switch 1 should be closest to the display board. For a serial number C or later the dip switches are on the back of the display board with switch 1 at the top.

Setting the Switches: Switch 1 is used to select English or Metric units, when switch 1 is turned on then Metric is selected.

If Metric is selected the Main Display should be relabeled to indicate “LITER” and “BAR”. The remote display should be relabeled to indicate “LITERS X 10”.

Relabeling can be done with self-adhesive labels or by changing from the English to Metric Front Cover both shown below.

6-1-4-00E Front Cover, English
Units are labeled “PSI” and “GAL”

6-1-4-00M Front Cover, Metric
Units are labeled “BAR” and “LITER”

Switch 8 is used to invert ground mode indication; normal setting is switch 8 off.

The other switches are used to select the aircraft you have. Refer to the table for the settings for your aircraft.

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Software Ver Intro, is the software version that that model airplane was added to the software. All later software has preceding aircrafts data. To check software version, hold dim button when powering the unit on.
TROUBLE SHOOTING

If the unit is not powering on, check the power supply for the box.
- Check circuit breaker
- Make sure you have the black to ground and the blue to power
- Check cable connection to back of main display box, remove and reinstall power cable from main box

If you get an Erro on either line of the display it is saying that the sensor is out of range.
- If the Erro is on the pressure line the error is with the pressure probe, or connection.
- If the Erro is on the quantity line the error is with the quantity probe, or connection.

An error is normally caused by a bad connection or sometimes the cable. Check your connections and make sure you did not kink the cable when running it. You can check the continuity of the cable with a multi meter to verify if it is the cable.

If you have erratic or incorrect readings on the quantity gauge.
- Check the cable connections from the main box to the quantity gauge, remove and reinstall connections
- Check that the float is free on the rod and functioning properly.
- Check that quantity rod is not overly coated with residue, clean rod with power washer
- Check that no magnetic hardware or strong magnetic fields are around the Quantity gauge.

If the pressure displays numbers that are obviously incorrect; cycle power off then on holding the dim button with spray pump off. Doing this will set a new zero pressure setting.

TESTING

See Ground test document #Ground test – 1.

Any Further Questions Please Email:

ReabeDesign@gmail.com

or Call

TIP-PLAN-FIX
(847) 752-6349
OPERATION INSTRUCTIONS

Normal Operation/Screen Dimming:

During operation the display will show the boom pressure reading on the upper line and the hopper quantity on the lower line. There are two green LED’s in the display. The LED labeled “GROUND” is located in the lower right hand side of the display and this is used to show when the quantity is set to ground mode. The LED labeled “SUCK BACK” is located in the upper left hand side of the display and this is used to show a negative pressure in the boom. Dim button maybe repeatedly pressed to change cockpit display brightness.

Display Setting Info:

To see what the Dip Switch settings are, hold down the DIM button when the box is powered on, release button when “Cal” is displayed. The box will then display the Firmware Version, Units and Aircraft settings.
This will also set a new zero point for the pressure gauge.

Gyro Attitude Initialization:

With aircraft parked on a level surface, press and hold the DIM button then turn power on. Continue to hold the DIM button through boot sequence until display shows “Press Butt.” At this point press DIM 3 times and wait for “Good Cal” to be displayed.
OPTIONAL REMOTE BOX

NOTE:
1) BLUE CONNECTS TO +24V THROUGH AN 1 AMP BREAKER SUCH AS (KLIXON 7227-2-1)
LABEL BREAKER (HOPPER DISPLAY) BREAKER TO BE INSTALLED INTO BREAKER PANEL.

ITEM NO. PART NUMBER DESCRIPTION QTY.
1 6-1-0-000 MAIN DISPLAY UNIT 1
2 6-2-0-000 REMOTE DISPLAY UNIT 1
3 6-3-0-570 QUANTITY PROBE ASSEMBLY 1
4 6-4-0-000 PRESSURE PROBE 1
5 6-5-0-000 QUANTITY PROBE CABLE 1
6 6-6-0-000 PRESSURE CABLE 1
7 6-7-0-000 POWER CABLE 1
8 6-8-0-000 REMOTE CABLE 1

ITEM NO. PART NUMBER DESCRIPTION QTY.
1 6-1-0-000 MAIN DISPLAY UNIT 1
2 6-2-0-000 REMOTE DISPLAY UNIT 1
3 6-3-0-690 QUANTITY PROBE ASSEMBLY 1
4 6-4-0-000 PRESSURE PROBE 1
5 6-5-0-000 QUANTITY PROBE CABLE 1
6 6-6-0-000 PRESSURE CABLE 1
7 6-7-0-000 POWER CABLE 1
8 6-8-0-000 REMOTE CABLE 1

ITEM NO. PART NUMBER DESCRIPTION QTY.
1 6-1-0-000 MAIN DISPLAY UNIT 1
2 6-2-0-000 REMOTE DISPLAY UNIT 1
3 6-3-0-770 QUANTITY PROBE ASSEMBLY 1
4 6-4-0-000 PRESSURE PROBE 1
5 6-5-0-000 QUANTITY PROBE CABLE 1
6 6-6-0-000 PRESSURE CABLE 1
7 6-7-0-000 POWER CABLE 1
8 6-8-0-000 REMOTE CABLE 1

ITEM NO. PART NUMBER DESCRIPTION QTY.
1 6-1-0-000 MAIN DISPLAY UNIT 1
2 6-2-0-000 REMOTE DISPLAY UNIT 1
3 6-3-0-715 71.5" PROBE ASSEMBLY 1
4 6-4-0-000 PRESSURE PROBE 1
5 6-5-0-000 QUANTITY PROBE CABLE 1
6 6-6-0-000 PRESSURE CABLE 1
7 6-7-0-000 POWER CABLE 1
8 6-8-0-000 REMOTE CABLE 1

ITEM NO. PART NUMBER DESCRIPTION QTY.
1 6-1-0-000 MAIN DISPLAY UNIT 1
2 6-2-0-000 REMOTE DISPLAY UNIT 1
3 6-3-0-555 QUANTITY PROBE ASSEMBLY 1
4 6-4-0-000 PRESSURE PROBE 1
5 6-5-0-000 QUANTITY PROBE CABLE 1
6 6-6-0-000 PRESSURE CABLE 1
7 6-7-0-000 POWER CABLE 1
8 6-8-0-000 REMOTE CABLE 1

ITEM NO. PART NUMBER DESCRIPTION QTY.
1 6-1-0-000 MAIN DISPLAY UNIT 1
2 6-2-0-000 REMOTE DISPLAY UNIT 1
3 6-3-0-555 QUANTITY PROBE ASSEMBLY 1
4 6-4-0-000 PRESSURE PROBE 1
5 6-5-0-000 QUANTITY PROBE CABLE 1
6 6-6-0-000 PRESSURE CABLE 1
7 6-7-0-000 POWER CABLE 1
8 6-8-0-000 REMOTE CABLE 1

ITEM NO. PART NUMBER DESCRIPTION QTY.
1 6-1-0-000 MAIN DISPLAY UNIT 1
2 6-2-0-000 REMOTE DISPLAY UNIT 1
3 6-3-0-570 QUANTITY PROBE ASSEMBLY 1
4 6-4-0-000 PRESSURE PROBE 1
5 6-5-0-000 QUANTITY PROBE CABLE 1
6 6-6-0-000 PRESSURE CABLE 1
7 6-7-0-000 POWER CABLE 1
8 6-8-0-000 REMOTE CABLE 1

ITEM NO. PART NUMBER DESCRIPTION QTY.
1 6-1-0-000 MAIN DISPLAY UNIT 1
2 6-2-0-000 REMOTE DISPLAY UNIT 1
3 6-3-0-570 QUANTITY PROBE ASSEMBLY 1
4 6-4-0-000 PRESSURE PROBE 1
5 6-5-0-000 QUANTITY PROBE CABLE 1
6 6-6-0-000 PRESSURE CABLE 1
7 6-7-0-000 POWER CABLE 1
8 6-8-0-000 REMOTE CABLE 1

ITEM NO. PART NUMBER DESCRIPTION QTY.
1 6-1-0-000 MAIN DISPLAY UNIT 1
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7 6-7-0-000 POWER CABLE 1
8 6-8-0-000 REMOTE CABLE 1

ITEM NO. PART NUMBER DESCRIPTION QTY.
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ITEM NO. PART NUMBER DESCRIPTION QTY.
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5 6-5-0-000 QUANTITY PROBE CABLE 1
6 6-6-0-000 PRESSURE CABLE 1
7 6-7-0-000 POWER CABLE 1
8 6-8-0-000 REMOTE CABLE 1
TRUE QUANTITY GAUGE INSTALLATION

- **Quantity Probe Assembly** 6-3-0-TAB
- **Quantity Probe Cable** 6-5-0-000
- **Power Cable** 6-7-0-000
- **Main Display Unit** 6-1-0-000
- **Remote Cable** 6-8-0-000
- **Remote Display Unit** 6-2-0-000
- **Pressure Cable** 6-6-0-000
- **Pressure Probe** 6-4-0-000

**Drawing Information:**
- **Scale:** 1:2
- **Sheet:** 2 of 2
- **Drawn by:** TRR 7/23/2011
- **Checked by:** TRR 7/23/2011

**Material:**
- **Dimensions are in inches.**
- **Tolerances:**
  - Fractional: ±1/16
  - Angular: ±1/2
  - Two place decimal: ±.015
  - Three place decimal: ±.005

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NOTES:
1.) INSTALL WIRING IN ACCORDANCE WITH AC 43.13-1B
AT-400, AT-402
ON DASH MOUNT

AT-502, AT-504, AT-602, AT-802
ON DASH MOUNT
THRUSH 510 ON GLARE SHIELD
OR
IN DASH MOUNT
AT-400, AT-402
AT-502, AT-504,
AT-602, AT-802
THRUSH 510

REVISIONS

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<th>REV.</th>
<th>DESCRIPTION</th>
<th>DATE</th>
<th>APPROVED</th>
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<td>TRR</td>
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<td>9/16/2011</td>
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<td>9/23/2014</td>
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<td>D</td>
<td>ADDED AT-802, THRUSH 510</td>
<td>08/31/2015</td>
<td>TRR</td>
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MAIN DISPLAY MOUNTING

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/16
ANGULAR: ± 1/2°
TWO PLACE DECIMAL ± .015
THREE PLACE DECIMAL ± .005

MATERIAL

NAME | DATE       | REV
-----------------|------------|---
DRAWN | TRR | 7/25/2011 | A
CHECKED | TRR | 7/25/2011 | D

SCALE: 1:4
WEIGHT:
SHEET 1 OF 3
IN DASH MOUNT

STOCK AIR TRACTOR DASH CUTOUT

4X Ø .170 DRILL THRU
#18 DRILL THRU
FOR #6 CLEARANCE

NOTE:
PAINT CUTOUT PER
AIRCRAFT MAINTENANCE
MANUAL

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/16
ANGULAR ± 1/2°
TWO PLACE DECIMAL ± .015
THREE PLACE DECIMAL ± .005

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MAIN DISPLAY MOUNTING

SIZE
DWG. NO.
REV

A
6-0-2-000
D

SCALE: 1:1
WEIGHT:
SHEET 2 OF 3

DRAWN
CHECKED
DATE
DATE
TRR
TRR
7/25/2011
7/25/2011

TRR 7/25/2011
TRRCHECKED
DRAWN
AT-400, AT-402
ON DASH MOUNT

MOUNTING BRACKETS
BOLTED TO DASH USING:
AN526-632 SCREWS
AN365-632 NUTS

LEFT MOUNTING BRACKET

MOUNTING BRACKET
MATERIAL: 2024-T3

AT-502, AT-504, AT-602, AT-802
ON DASH MOUNT
THRUSH 510 ON GLARE SHIELD

MOUNTING BRACKET
MATERIAL: 2024-T3

RIGHT MOUNTING BRACKET

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED:
SCALE: 1:1
WEIGHT:
SHEET 3 OF 3

MATERIAL
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL: ± 1/16
ANGULAR: ± 1/2°
TWO PLACE DECIMAL: ± .015
THREE PLACE DECIMAL: ± .005

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AT-400, AT-402
ON DASH MOUNT

MOUNTING BRACKETS
BOLTED TO DASH USING:
AN526-632 SCREWS
AN365-632 NUTS

LEFT MOUNTING BRACKET

MOUNTING BRACKET
MATERIAL: 2024-T3

RIGHT MOUNTING BRACKET

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED:
SCALE: 1:1
WEIGHT:
SHEET 3 OF 3

MATERIAL
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL: ± 1/16
ANGULAR: ± 1/2°
TWO PLACE DECIMAL: ± .015
THREE PLACE DECIMAL: ± .005

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REPRODUCTION IN PART OR AS A WHOLE
WITHOUT THE WRITTEN PERMISSION OF
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PROHIBITED.
NOTE: STOCK AIRCRAFT REMOTE GAUGE LOCATION CAN BE USED IF AVAILABLE

NOTE: PAINT CUTOUT PER AIRCRAFT MAINTENANCE MANUAL

NOTE: AIRTRACTOR REMOTE MOUNT CAN BE USED IF AVAILABLE

RESEAL SCREWS WITH RTV SILICONE SEALANT

REMOTE DISPLAY UNIT 6-2-0-000

CUTOUT IN UPPER SKIN

POSITION FROM HERE

4X (0.17 DRILL THRU (#18 DRILL CLEARANCE FOR #6 SCREW)

THIS HOLE IS 24" AFT OF PANEL EDGE AND .5" ABOVE PANEL EDGE

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
- FRACTIONAL 1/16
- ANGULAR 1/2
- TWO PLACE DECIMAL .005
- THREE PLACE DECIMAL .000

MATERIAL: 1:

REVISIONS

REV DESCRIPTION APPROVED DATE
A ORIGINAL RELEASE TRR 7/25/2011
B ADDED CUTOUT TO SIDE VIEW TRR 9/14/2011
C POSITIONING HOLE NOW AFT HOLE TRR 11/21/2011
D ADDED STOCK AIR TRACTOR MOUNT TRR 12/17/2012
E NOTE CHANGED FROM AIRTRACTOR TO AIRCRAFT TRR 8/31/2015

REMTE DISPLAY MOUNTING

NOTE: DO NOT SCALE DRAWING
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<td>DWG. NO. WAS 6-0-0-004 ADDED PART NUMBERS</td>
<td>9/13/2011</td>
<td>TRR</td>
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<tr>
<td>C</td>
<td>ADDED INSERT TUBE SUPPORT</td>
<td>9/23/2014</td>
<td>TRR</td>
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</table>

**Pressure Probe Mounting**

- **Pressure Probe:** PN TY525M (6-4-0-000)
- **1/4" NPT to 1/8" NPT Reducer:** PN 3300 X4X2 (Weatherhead)
- **1/8" NPT to 1/4" Compression:** PN 68X4 (Weatherhead)
- **1/4" Compression Insert Tube Support:** PN 2030X44 (Weatherhead)
- **Crossed Zip Tie Between Probe and Frame**
- **Aircraft Frame**
- **Aircraft Bottom Skin**
- **Boom Pressure Line**
- **CUT LINE APPROXIMATELY 1 FOOT ABOVE SKIN**

**Revisions**

- **Revision A:** Original Release
- **Revision B:** DWG. NO. WAS 6-0-0-004 ADDED PART NUMBERS
- **Revision C:** ADDED INSERT TUBE SUPPORT

**Material**

- **Dimensions:** In inches
- **Tolerances:**
  - Fractional: ± 1/16
  - Angular: ± 1/2°
  - Two Place Decimal: ± 0.015
  - Three Place Decimal: ± 0.005

**Note:** Do not scale drawing.
**REVISIONS**

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<td>ORIGINAL RELEASE</td>
<td>7/25/2011</td>
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<tr>
<td>B</td>
<td>DWG. NO. WAS 6-0-0-005 HOLE LOCATIONS SPLIT PER SHEET</td>
<td>9/13/2011</td>
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<tr>
<td>C</td>
<td>HOLE DISTANCE FROM CL WAS 6</td>
<td>11/21/2011</td>
<td>TRR</td>
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<tr>
<td>D</td>
<td>ADDED AT-802 DATA</td>
<td>2/10/2012</td>
<td>TRR</td>
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<tr>
<td>E</td>
<td>ADDED LOW PROFILE PROBE</td>
<td>10/08/2012</td>
<td>TRR</td>
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<tr>
<td>F</td>
<td>ADDED TRANSLAND FIRE GATE, MOVED 502/802 TOP HOLE FROM 5.5 TO 9.5</td>
<td>12/17/2012</td>
<td>TRR</td>
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<tr>
<td>G</td>
<td>602 MOUNT NOW COMMON WITH 502</td>
<td>1/29/2013</td>
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<td>H</td>
<td>ADDED AT-504</td>
<td>9/23/2014</td>
<td>TRR</td>
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<td>J</td>
<td>ADDED THRUSH</td>
<td>8/24/2015</td>
<td>TRR</td>
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<td>K</td>
<td>ADDED 550 710 THRUSH</td>
<td>8/12/2016</td>
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FRONT OF HOPPER

502 504 602 802 HOLE

502 504 602 802 HOLE LOCATION

HOPPER LID

TOP VIEW OF HOPPER

Δ Δ

G H

9.5 ± 1

2 3/4

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL: ± 1/16

ANGULAR: ± 1/2°

TWO PLACE DECIMAL: ± 0.015

THREE PLACE DECIMAL: ± 0.005

QUANTITY PROBE MOUNTING

PROPRIETARY AND CONFIDENTIAL
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DRAWN
CHECKED
TRR
TRR
7/25/2011
7/25/2011

NAME
DATE

DO NOT SCALE DRAWING

SIZE
DWG. NO.
REV

A
6-0-5-000
K

SCALE: 1:5
WEIGHT:
SHEET 2 OF 8

DATENAME
TRR 7/25/2011

7/25/2011 TRRCHECKED

DRAWN

DO NOT SCALE DRAWING
FRONT OF HOPPER

FROM EDGE OF HOPPER LID

6.0 +.5

-.5

510 THRUSH
400 THRUSH

HOPPER LID

TOP VIEW OF HOPPER

VENT HUMP

Ø.75 THRU

31.0 ±.5

FORWARD OF AFT HOPPER WALL

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL: ±1/16

ANGULAR: ±1/2°

TWO PLACE DECIMAL: ±.015

THREE PLACE DECIMAL: ±.005

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VENT HUMP

550 THRUSH

HOPPER LID

TOP VIEW OF HOPPER

Φ .75 THRU
INLINE WITH HOOPER OPENING
LOOK FOR THIN SPOT IN TANK

2.75±.50
FORWARD OF
WINDSHIELD

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL: ± 1/16
ANGULAR: ± 1/2°
TWO PLACE DECIMAL: ± .015
THREE PLACE DECIMAL: ± .005

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QUANTITY PROBE CABLE
6-5-0-000

NOTE: WIRE POINTING FORWARD AND SECURED TO SENSOR BODY

WASHER
NAS 1149C1290R

SEAL BOTH SIDES OF HOLE WITH RTV SILICONE

UPRIGHT PROBE TYPICAL INSTALLATION, WIRE LOCATION

QUANTITY PROBE
6-3-1-TAB

TYRAP
PN TY525M

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL: ± 1/16
ANGULAR: ± 1/2°
TWO PLACE DECIMAL: ± .015
THREE PLACE DECIMAL: ± .005

PROPRIETARY AND CONFIDENTIAL
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DRAWN: TRR 7/25/2011
CHECKED: TRR 7/25/2011

SCALE: 1:5
WEIGHT:
SHEET 6 OF 8
QUANTITY PROBE CABLE
6-5-0-000

QUANTITY PROBE
6-3-1-TAB

WASHER
NAS 1149C1290R

TYRAP
PN TY525M

SEAL BOTH SIDES OF HOLE
WITH RTV SILICONE

NOTE: WIRE POINTING FORWARD

LOW PROFILE PROBE
TYPICAL INSTALLATION, WIRE LOCATION

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL: ± 1/16
ANGULAR: ± 1/2°
TWO PLACE DECIMAL: ± .015
THREE PLACE DECIMAL: ± .005

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**DRILL THRU**

1/4" HOLE LOCATION DETAIL

1:2 SCALE

**FRONT**

1 3/4"

**BACK**

3/4"

**QUANTITY PROBE CLAMP**

6-3-0-003

**QUANTITY PROBE FLOAT**

6-3-0-002

CLAMP TAB IS ON BOTTOM SIDE OF CLAMP

TOP OF CLAMP IS 1.5" FROM BOTTOM OF PROBE

CLAMP TAB IS BENT AND DRILLED FOR PROBE AND FLOAT CLEARANCE

**QUANTITY PROBE FLOAT**

6-3-0-002

2 WASHER SPACING

CLAMP OFF TURNBUCKLE

**QUANTITY PROBE CLAMP**

6-3-0-003

AFT BRACKET

**TURNBUCKLE**

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONAL ± 1/16

ANGULAR ± 1/2°

TWO PLACE DECIMAL ± .015

THREE PLACE DECIMAL ± .005

**TITLE:**

QUANTITY PROBE MOUNTING

**DRAWN**

TRR 7/25/2011

**CHECKED**

TRR 7/25/2011

**PROPRIETARY AND CONFIDENTIAL**

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DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± 1/16
ANGULAR: ± 1/2°
TWO PLACE DECIMAL ± 0.015
THREE PLACE DECIMAL ± 0.005

MATERIAL:
ACRYLIC SHEET

DO NOT SCALE DRAWING
UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL: ±1/16
ANGULAR: ±1/2°
TWO PLACE DECIMAL: ±.015
THREE PLACE DECIMAL: ±.005

MATERIAL
ACRYLIC SHEET

DO NOT SCALE DRAWING
**WEIGHT & BALANCE ANALYSIS**

*Data-* This data applies to all approved aircraft.

**AIRTRACTOR:**

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<th>Item</th>
<th>Weight Lbs.</th>
<th>Arm Inch</th>
<th>Moment</th>
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<td>59</td>
<td>29.5</td>
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<tr>
<td>Remote Display</td>
<td>0.5</td>
<td>109</td>
<td>54.5</td>
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<tr>
<td>Pressure Transducer</td>
<td>0.1</td>
<td>72</td>
<td>7.2</td>
</tr>
<tr>
<td>Quantity Probe</td>
<td>2.5</td>
<td>3</td>
<td>7.5</td>
</tr>
<tr>
<td>Cables</td>
<td>1</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td><strong>Total System</strong></td>
<td><strong>4.6</strong></td>
<td><strong>37.3</strong></td>
<td><strong>171.7</strong></td>
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**OTHER AIRCRAFT:** Calculate using chart below

<table>
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<tr>
<th>Item</th>
<th>Weight Lbs.</th>
<th>X Arm Inch</th>
<th>= Moment</th>
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</thead>
<tbody>
<tr>
<td>Main Display</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote Display</td>
<td>0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure Transducer</td>
<td>0.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quantity Probe</td>
<td>2.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cables</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total System</strong></td>
<td><strong>4.6</strong></td>
<td></td>
<td></td>
</tr>
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</table>

Total Moment___ ÷ Total Weight___ = Arm___

Jeffery Reabe   AP 399649349 IA
### ELECTRICAL LOAD ANALYSIS

<table>
<thead>
<tr>
<th>ORIGINATOR</th>
<th>ISSUANCE DATE</th>
<th>APPROVED BY</th>
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<tr>
<td>JRR, TRR</td>
<td>30 August 2011</td>
<td>JRR</td>
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<table>
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<tr>
<th>REVISION HISTORY</th>
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<th>REVISED BY</th>
<th>APPROVED BY</th>
<th>DESCRIPTION OF REVISION</th>
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<td>8/30/11</td>
<td>JRR</td>
<td>TRR</td>
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<td>B</td>
<td>10/03/11</td>
<td>TRR</td>
<td>TRR</td>
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<td>C</td>
<td>6/30/15</td>
<td>JRR</td>
<td>JRR</td>
<td>UPDATED FOR NEW AIRCRAFT ON AML</td>
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</tbody>
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**ELECTRICAL LOAD ANALYSIS**

1/4 Amp @ 24VDC True Quantity System Usage 1/4 Amp

1 Amp Breaker

Jeffery Reabe AP 399649349 IA
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

1) Introduction

Modification of an aircraft by this Supplemental Type Certificate obligates the aircraft operator to include the maintenance information provided by this document in the Operator’s Aircraft Maintenance Manual and the Operator’s aircraft scheduled maintenance program. This is applicable to all aircraft on the AML.

2) Description

The Air Tractor and Thrush Aircraft are designed for agricultural spraying applications. Previously they were equipped from the manufacturer with a hopper quantity indication system that had a high rate of failure or had poor accuracy. The Reabe Aircraft Improvement Digital Payload Hopper Quantity Indication system and Spray Boom Pressure Indication system (“True Hopper” system) is both highly reliable and highly accurate.

The Digital Payload Hopper Quantity Indication system and Spray Boom Pressure Indication system (“True Hopper” system) consists of a magnetostrictive sensor, pressure sensor and a digital cockpit display, with an optional external display. Both sensors are industrial components that are qualified for the application used in this aircraft alteration. The displays are custom designed components that indicate the quantity of the hopper (gallons or liters) and pressure of the of the spray boom (PSI).

The magnetostrictive probe and floating magnet measures payload fluid level to the nearest 0.001 inch of travel on the probe. The cockpit display uses look up tables to convert the probe output to the quantity of fluid in the tank. There are 2 look up tables, one for ground attitude and one for flight attitude, and is selected using an input from the aircraft hour meter torque pressure switch. The display also performs data averaging to reduce sloshing effects, thus increasing the accuracy of the system. If a remote display indicator is installed, an RS232 signal is sent from the cockpit display to the remote display, both displays will indicate the same quantity. A pressure sensor is installed in the left boom pressure line, and is wired to the display. The display indicates the pressure in the boom line, and also alerts the pilot if negative pressure is present by illuminating a light on the display indication “suck back”. This indicates when the aircraft recirculating ball valve feature is working. The cockpit display can be dimmed using the dim button.

There are differences in the installation design data for each of the Aircraft. The primary difference is due to the size of the hopper, which will require different part number probes, changing the probe...
length. There are dip switches on the indicator that then account for the probe/hopper changes in each model.

3) Control, Operation Information/Special Procedures

The cockpit display can be dimmed using the “dim” push button on the display.

The power to the Digital Payload Hopper Quantity Indication system is controlled by the Klixon PN 7277-2-1 or equivalent circuit breaker (1 amp), located in the breaker panel labeled Hopper Display.

4) Servicing

The Digital Payload Hopper Quantity Indication system service is based on condition only. There are no additional maintenance servicing requirements.

5) Maintenance Instructions

It is the Operators/Owners responsibility to ensure that the maintenance performed on the system does not adversely affect its intended function.

The system parts inside the hopper may be pressure washed. Do not pressure-wash any cable or cable connections.

Displays may be cleaned with a soft cloth. Avoid any abrasive cleaners to prevent scratching the plexiglass face of the displays.

At Annual Inspection check; quantity probe and clamp for security of mounting, float for unrestricted travel, pressure transducer for mounting and leakage, and conduct Test per 9) Test.

6) Troubleshooting

If the unit is not powering on, check the power supply for the box.
- Check circuit breaker
- Make sure you have the black to ground and the blue to power
- Check cable connection to back of main display box, remove and reinstall power cable from main box

If you get an Erro on either line of the display it is saying that the sensor is out of range.
- If the Erro is on the pressure line the error is with the pressure probe, or connection.
- If the Erro is on the quantity line the error is with the quantity probe, or connection.
An error is normally caused by a bad connection or sometimes the cable. Check your connections and make sure you did not kink the cable when running it. You can check the continuity of the cable with a multi meter to verify if it is the cable.

If you have erratic or incorrect readings on the quantity gauge.
- Check the cable connections from the main box to the quantity gauge, remove and reinstall connections
- Check that the float is free on the rod and functioning properly.
- Check that quantity rod is not overly coated with residue, clean rod with power washer
- Check that no magnetic hardware or strong magnetic fields are around the Quantity gauge.

If the pressure displays numbers that are obviously incorrect; cycle power off then on holding the dim button with spray pump off. Doing this will set a new zero pressure setting.

7) Removal and Replacement Information (Weight & Balance changes recorded in Aircraft Flight Manual using R.A.I. Weight & Balance Analysis Doc# Weight-1)

1. Main Display PN 6-1-0-000 Removal
   a. Pull Breaker labeled Hopper Display
2. Main Display Replacement See Main Display Mounting Drawing 6-0-2-000
   a. Mount display using faceplate screws
   b. Connect cables to back of display
   c. Energize Hopper Display breaker
   d. Test per 9) Test.

3. Remote Display PN 6-0-2-0-000 Removal
   a. Pull Breaker labeled Hopper Display
   b. Disconnect cables from back of display
   c. Remove mounting screws from face of display

4. Remote Display Replacement See Remote Display Mounting Drawing 6-0-3-000
   a. Mount display using faceplate screws
   b. Connect cables to back of display
   c. Energize Hopper Display breaker
   d. Test per 9) Test.

5. Pressure Probe PN 6-4-0-000 Removal
   a. Pull Breaker labeled Hopper Display
   b. Disconnect cable from top of probe
   c. Disconnect probe from pressure line

6. Pressure Probe Replacement See Pressure Probe Mounting Drawing 6-0-4-000
   a. Connect probe to pressure line
   b. Connect cables to top of probe
   c. Attach probe to airframe using zip ties
   d. Energize Hopper display breaker
   e. Test per 9) Test.

7. Quantity Probe PN 6-3-1-xxx Removal
   a. Pull Breaker labeled Hopper Display
   b. Disconnect cable from top of probe
   c. Remove Quantity Probe clamp from bottom of probe
   d. Remove float from Probe
   e. Remove retaining nut from Quantity Probe inside hopper
   f. Withdraw probe from hopper

8. Quantity Probe Replacement See Quantity Probe Mounting Drawing 6-0-5-000
   a. Insert Probe into Hopper
   b. Install retaining nut inside hopper
   c. Install float NO side up
9) Test/ Special Inspection

1. Introduction

The purpose of this Test is to provide a method for demonstrating the proper installation and operations of the Digital Payload Hopper Quantity Indication system and Spray Boom Pressure Indication system (“True Hopper” system).

2. Installation and Configuration

   a. Ensure the HOPPER DISPLAY circuit breaker is pushed in. While holding the “DIM” button on the Main Display Unit, turn on aircraft master power. Verify that the unit starts the self-test: all characters on the Main Display Unit and the Remote Display Unit are illuminated; verify the selected unit of measure (gallons or liters); verify aircraft model displayed matches the model being tested.

3. Functional Test

   a. Repeatedly cycle the “DIM” button on the Main Display Unit, ensure that the brightness level of the Main Display Unit changes.

   b. Pull the HOPPER DISPLAY circuit breaker. Ensure that all system has power is removed, and the Main Display and Remote Display are extinguished.

   c. Push in the HOPPER DISPLAY circuit breaker. Ensure that the Main Display and Remote Display Unit (if installed) indicates Pressure 0, Quantity Model; 400/402 = 1, 502 = 3, 504 = 3, 602 = 0, 802 = 1, 510 Thrush = 1. Ensure the Ground Light is illuminated.

   d. Raise Quantity Float (by hand or by filling with water) to top of float travel. Verify that the Main Display Unit and Remote Display (if installed) quantity indication with tank full, for model: 400/402 = 400 Gal; 502 = 500 Gal; 504 = 485 Gal; 602 = 620 Gal; 802 = 800 Gal; Thrush 510 = 505 Gal. (tolerance of +/- 10%).

      Note: If Main Display indicates FULL, lower the float 0.050”

   e. Start engine and bring the torque to 1000 lbs. Verify the Ground Light is extinguished and the Remote Display (if installed) indicates FLT. With the float in the same position as in step 3d, verify that the Main Display quantity indication is for model: 400/402 = 375; 502 = 475; 504 = 460; 602 = 580; 802 = 750; Thrush 510 = 494 (Tolerance of +/- 3%)

      Note: If Main Display indicates FULL, lower the float 0.050”

   f. Turn spray pump ON with boom valve OFF. Verify negative pressure indication and “SUCK BACK” light illuminated.

   g. Turn boom valve ON. Verify positive indication and “SUCK BACK” light is extinguished.

   h. Shut down the engine.
i. Ensure no leaks are present in the system.

10) Protective Treatment
   Electrical connection at top of probe is covered using RTV silicon seal.

11) DATA
   Power up unit while holding dimmer button. Firmware version and model calibration will be displayed.

12) SPECIAL TOOLS: None

13) N/A

14) TBO: None

15) Airworthiness Limitation The airworthiness limitations section is FAA approved and specifies maintenance required under §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.
   There are no additional airworthiness limitations applicable to the Air Tractor or Thrush aircraft as a result of this installation.

16) Revisions: To be submitted by STC holder, for FAA approval.
   Contact Reabe Aircraft Improvement
   W13105 Alp Ave.
   Plainfield, WI 54966
   Phone: (715)-335-6810

   For latest revision
MAIN DISPLAY MOUNTING

THROUZSHIELD ON CLEAR SHIELD
AT-602, AT-604, AT-802

AT-602, AT-604, AT-802
ON DASH MOUNT

AT-400, AT-402
ON DASH MOUNT

THRUHZGLO IN DASH MOUNT

REV. K

Page 6 of 13
MAIN DISPLAY MOUNTING

NOTE

1. For #6 Clearance
2. #10 Drill
3. #9 Drill

Stock Air Fracture Dash Cutout

Paint Cutout Per

MANUAL

PROGRAM MAINTENANCE

IN DASH MOUNT
REABE AIRCRAFT IMPROVEMENT
INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

TRUE QUANTITY HOPPER QUANTITY & BOOM PRESSURE GAUGE

INSTALLATION
TYPICAL PROBE CLAMP

INSTALLATION
TYPICAL PROBE CLAMP

ART BRACKET
QUANTITY PROBE CLAMP
TURNBUCULE
QUANTITY PROBE FLOAT
2 WASHER SPACING
1.5
6-30-002
QUANTITY PROBE CLAMP
CLAMP TAB IS ON BOTTOM SIDE OF CLAMP.
CLAMP TAB IS 1.5” FROM BOTTOM OF CLAMP.
TOP OF CLAMP IS 1.5” FROM TOP OF CLAMP.
NO FLAT ON SIDE UP.
ON FLAT.
1. Introduction

The purpose of this Ground Test is to provide a method for demonstrating the proper installation and operations of the Digital Payload Hopper Quantity Indication system and Spray Boom Pressure Indication system (“True Hopper” system).

NOTE: For the initial certification testing and for initial installation testing, all the test steps must be completed. This procedure is also referenced in the ICA to be used after maintenance is accomplished; for testing to support maintenance activities, the steps with the “*” may be omitted.

2. Installation and Configuration

a. Verify continuity checks have been completed.

PASS _______ FAIL _______

b. Ensure the HOPPER DISPLAY circuit breaker is pushed in. While holding the “DIM” button on the Main Display Unit, turn on aircraft master power. Verify that the unit starts the self-test: all characters on the Main Display Unit (drawing 6-1-0-000 sheet 3) and the Remote Display Unit (drawing 6-2-0-000 sheet 3) are illuminated; verify the selected unit of measure (gallons or liters); verify aircraft model displayed matches the model being tested.

PASS _______ FAIL _______

3. Functional Ground Test

a. Repeatedly cycle the “DIM” button on the Main Display Unit, ensure that the brightness level of the Main Display Unit changes.

PASS _______ FAIL _______

b. Pull the HOPPER DISPLAY circuit breaker. Ensure that all system has power is removed, and the Main Display and Remote Display are extinguished.

PASS _______ FAIL _______
REABE AIRCRAFT IMPROVEMENT
GROUND TEST PLAN
TRUE QUANTITY SYSTEM

c. Push in the HOPPER DISPLAY circuit breaker. Ensure that the Main Display and Remote Display Unit (if installed) indicates Pressure 0, Quantity Model; 400/402 = 1, 502 = 3, 504 = 3, 602 = 0, 802 = 1, 510 Thrush = 1. Ensure the Ground Light is illuminated.

   PASS _______   FAIL _______


d. Raise Quantity Float (by hand or by filling with water) to top of float travel. Verify that the Main Display Unit and Remote Display (if installed) quantity indication with tank full, for model: 400/402 = 400 Gal; 502 = 500 Gal; 504 = 485 Gal; 602 = 620 Gal; 802 = 800 Gal; Thrush 510 = 505 Gal. (tolerance of +/- 10%).

   Note: If Main Display indicates FULL, lower the float 0.050”

   PASS _______   FAIL _______


e. For a plane start engine and bring the torque to 1000 lbs. Verify the Ground Light is extinguished and the Remote Display (if installed) indicates FLT. With the float in the same position as in step 3d, verify that the Main Display quantity indication is for model: 400/402 = 375; 502 = 475; 504 = 460; 602 = 580; 802 = 750; Thrush 510 = 494 (Tolerance of +/- 3%)

   Note: If Main Display indicates FULL, lower the float 0.050”

   PASS _______   FAIL _______

f. Turn spray pump ON with boom valve OFF. Verify negative pressure indication and “SUCK BACK” light illuminated.

   PASS _______   FAIL _______


g. Turn boom valve ON. Verify positive indication and “SUCK BACK” light is extinguished.

   PASS _______   FAIL _______

h. Shut down the engine.

i. Ensure no leaks are present in the system.

   PASS _______   FAIL _______
j.* With power on the aircraft and all systems operating normally. Operate each aircraft system and equipment through a representative range of its functional envelope while qualitatively assessing EMI/RFI. Note any effects below.

- VHF Comm __________
- VOR/ILS __________
- DME __________
- GPS __________
- __________
- __________

PASS ______ FAIL ______

Ground Test Date: ______________________________________
Performed By: __________________________