



EMB145 - EMB135

AIRCRAFT
MAINTENANCE MANUAL

RVSM CRITICAL REGION - INSPECTION/CHECK

EFFECTIVITY: RVSM COMPLIANT AIRCRAFT

1. General

- A. The function of the one-thousand foot Reduced Vertical Separation Minimum (RVSM) is to permit the aircraft to operate with a reduced vertical separation of 1000 ft. from other aircraft between flight level 290 and flight level 410. Then it is necessary to establish the airframe geometry variance that is an important source of Altimetry System Error (ASE).
- B. This section gives the procedures to do the geometric inspection of the fuselage critical region around the static ports.
- C. The [AMM TASK 34-13-04-200-801-A/600](#) permits you to quantify the essential variations in the static port installation and fuselage contour deviations (waviness).
- D. The [AMM TASK 34-13-04-200-802-A/600](#) permits you to inspect the static port surrounding plate for flushness and integrity.
- E. For Aircraft with Oxygen Servicing Panel closed with screws, the [AMM TASK 34-13-04-200-803-A/600](#) permits you do the geometric inspection of the Oxygen Servicing Panel surrounding for flushness and integrity.
- F. First, do [AMM TASK 34-13-04-200-802-A/600](#) and make sure that all measures are in the specified tolerances. Then, do [AMM TASK 34-13-04-200-801-A/600](#) and send the test results as given in the procedure.
- G. Do not use the "Embraer SWSS (Pass-Fail).xls" tool on aircraft that got damage or repairs in the RVSM critical region. Such cases must be sent directly to Aeromech by e-mail emb.rvsm@aeromechinc.com.
- H. The procedures in this section are given in the sequence below. The tasks identified with (♦) are part of the Scheduled Maintenance Requirements Document (SMRD).

TASK NUMBER	DESCRIPTION	EFFECTIVITY
34-13-04-200-801-A ♦	RVSM CRITICAL REGION (SKIN) FOR WAVINESS - INSPECTION	RVSM COMPLIANT AIRCRAFT
34-13-04-200-802-A ♦	STATIC PORT SURROUNDING PLATE FOR FLUSHNESS AND INTEGRITY - INSPECTION	RVSM COMPLIANT AIRCRAFT
34-13-04-200-803-A ♦	OXYGEN SERVICING PANEL SURROUNDING FLUSHNESS AND INTEGRITY - INSPECTION	AIRCRAFT WITH OXYGEN SERVICING PANEL CLOSED WITH SCREWS



EMB145 – EMB135

AIRCRAFT
MAINTENANCE MANUAL

TASK 34-13-04-200-801-A

EFFECTIVITY: RVSM COMPLIANT AIRCRAFT

2. RVSM CRITICAL REGION (SKIN) FOR WAVINESS - INSPECTION

A. General

- (1) This task gives the procedures to do the geometric inspection of the RVSM critical region (skin) for waviness.

NOTE: Before you do this task, make sure that [AMM TASK 34-13-04-200-802-A/600](#) was already done and the test results are within the specified tolerances.

- (2) Either GSE 268 plus GSE 269 or GSE 448 can be used to perform the task.

B. References

REFERENCE	DESIGNATION
AMM TASK 34-13-04-200-801-A/600	RVSM CRITICAL REGION (SKIN) FOR WAVINESS - INSPECTION
AMM TASK 34-13-04-200-802-A/600	STATIC PORT SURROUNDING PLATE FOR FLUSHNESS AND INTEGRITY - INSPECTION
AMM TASK 34-13-04-200-803-A/600	OXYGEN SERVICING PANEL SURROUNDING FLUSHNESS AND INTEGRITY - INSPECTION

C. Zones and Accesses

Not Applicable

D. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 268	Data Acquisition Gaging Equipment	To measure the skin contour around the static ports	
GSE 269	Data Transmission & Storage Interface Equipment	To store and transfer the data measured from static ports to PC	
GSE 448	Data Acquisition, Transmission and Storage equipment	To measure, transfer and store data of skin contour around the static ports	

E. Auxiliary Items

Not Applicable

F. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
ASTM-D740	Methyl ethyl ketone (MEK)	AR

G. Expandable Parts

Not Applicable

H. Persons Recommended

<i>QTY</i>	<i>FUNCTION</i>	<i>PLACE</i>
2	To hold the tool	Outside the aircraft
1	To do the measurements	Outside the aircraft

I. Preparation
SUBTASK 841-002-A

- (1) Clean the RVSM critical region ([Figure 601](#)) with MEK.
- (2) Do the steps that follow to inhibit the sensor heating system:
 - (a) On the LH electrical-power control/distribution box, open the circuit breakers:
 - HEATING/TAT 1.
 - HEATING/PITOT 1.
 - HEATING/AOA 1.
 - (b) On the RH electrical-power control/distribution box, open the circuit breakers:
 - HEATING/TAT 2.
 - HEATING/PITOT 2.
 - HEATING/AOA 2.
 - PITOT HTG 3.
- (3) Do the steps that follow to set up the measurement tool ([Figure 602](#)):
 - (a) Put the -1 Gaging assembly on a flat surface.
 - (b) With a 5/32 in. Allen wrench, loosen the four GE-103 fasteners (two on each GE-102 Handle) and remove them.
 - (c) Align each GE-102 Handle with the two 0.20 in.-diameter holes on the inboard surface (flight direction) at each end of the GE-100 Beam.
 - (d) Install the GE-103 fasteners again. Use the 5/32 in. Allen wrench to tighten them.
 - (e) Make sure that the GE-150 Digital Indicator is installed on the correct side of the GE-100 Beam ([Figure 602](#)) - Sheet 1. If not, remove it from the GE-120 gage Carrier Block and install it on the opposite side of the GE-100 Beam.
- (4) Do the steps that follow to find the Tooling Reference Point (TRP) marks to put the -1 Gage Assembly in position:
 - (a) Align the -1 Right-Hand Side Template or -1 Left-Hand Side Template with the primary static ports.
 - (b) Temporarily hold the template with masking tape.
 - (c) Examine the alignment of the template with the primary static ports and with the reference lines. Adjust, if necessary.

- (d) Mark the Tooling Reference Points with a water-soluble marker.
- (e) Do steps (4)a to (4)d again for the other side of the aircraft.

J. Inspection of RVSM Critical Region (Skin) for Waviness

SUBTASK 280-002-A

- (1) Do the steps that follow to do the inspection:

- (a) Do the steps that follow to do the zero procedure on the GE-150 Digital Indicator ([Figure 603](#)):

- 1 Put the -1 Gaging Assembly on a flat surface.
 - 2 Put the GE-120 Gage Carrier Block in such a position that the GE-150 Digital Indicator spindle is within 2.0 in. of the GE-132 Support Rods at each end of the -1 Gaging Assembly where the GE-130 Foot Plate Assembly is.
 - 3 Fully retract the spindle.
 - 4 Put the Gage block against the GE-100 Beam inboard surface (opposite surface to the GE-111 Linear Rail). Hold it in position with finger pressure.
 - 5 Release the spindle for the GE -151 Roller Contact Point to touch the gage surface.
 - 6 On the GE-150 Digital Indicator, push the ON/OFF button.
 - 7 Push the ZERO/ABS button (tolerance equal ± 0.00050 in.).

NOTE: A negative value can result if you do not set the GSE-150 Digital Indicator to "REV" mode during the zeroing procedure. If you do not see the "REV" indication on the Digital Indicator display, press the "+/-" button on the Digital Indicator until the "REV" indication appears on the screen.

- 8 Remove the Gage block.
 - 9 Hold the -1 Gaging Assembly by the GE-102 Handles on the "WL-10" as in ([Figure 601](#)), in such a position that the GE-130 Foot Plate Assembly point to the rear of the aircraft.

NOTE: • The center and lower GE-132 Support Rods of the GE-130 Foot Plate Assembly must touch the surface of the aircraft, together with the forward GE-132 Support Rod of the -1 Gaging Assembly.

- 10 Put the GE-120 Gage Carrier Block fully against the stopper at the aft end of the -1 Gaging Assembly.
 - 11 Move the GE-120 Gage Carrier Block fully forward until the GE-151 Roller Contact Point is directly over the forward GE-132 Support Rod. Make sure that most of the readings shown on the GE-150 Digital Indicator are between 0.040 in. and 0.110 in.. If not, do steps (a)1 to (a)8 again to make sure that the zero procedure was done correctly.

NOTE: If the zero procedure is correct and most of the readings shown on the GE-150 Digital Indicator are not between 0.040 in. and 0.110 in., then continue to do the inspection, and then send the data for analysis at Aeromech by e-mail emb.rvsm@aeromechinc.com.

- (b) Do the steps that follow to do the IE-100 Micropak Datalogger initialization:
- 1 Push the power (P) button on the IE-100 Micropak Datalogger.
 - 2 Push the right cursor (→) button until the display flashes on the letter C.
 - 3 Push the Mode (M) button.
 - The display shows mC;?;?;Clear.
 - 4 Push the right cursor (→) button.
 - The display shows mC;?;?;First.
 - 5 Push the down cursor (↓) button.
 - The display shows mC;1;?;First.
 - 6 Push the right cursor (→) button.
 - The cursor shows mC;1;?;Last bin.
 - 7 Push the up cursor (↑) button.
 - The display shows mC;1;99;Last bin.
 - 8 Push the Mode (M) button.
 - The display shows Yes;No;Clr;1-99.
 - 9 Put the cursor on the letter Y (Yes) to make sure of the clearing and then push the Mode (M) button to clear all data in the IE-100 Micropak Datalogger.
 - When the clearing is completed, the display comes back to the main menu (BRCPST;Clear).
 - 10 Push the left cursor (←) button.
 - The display flashes on the letter R.
 - 11 Push the Mode (M) button.
 - The display shows Bin;x;ls;empty.
Where is the number of the last position measured.
 - 12 Push the left cursor (←) button and then push the up cursor (↑) button or the down cursor (↓) button until the display shows 1;W-10;LHS.
 - 13 Push the Mode (M) button.
 - The display shows Bin;1;ls;empty.

- (c) Do the steps that follow to make geometric measurements on the left-hand side of the aircraft:
- 1 Connect the correct end of the IE-140 Interface Cable to the GE-150 Digital Indicator and the other end to the IE-100 Micropak Datalogger ([Figure 604](#)).
 - 2 Do steps (a) 9 and (a) 10 again.
 - 3 Push the right cursor button (→) on the IE-100 Micropak Datalogger. The datalogger will record the measurement for this point.
 - 4 Move the GE-120 Gage Carrier Block along the GE-100 Beam until the forward side straightedge of the GE-120 Gage Carrier Block is aligned with the line marked "-10" on the GE -100 Beam and push the right cursor button (→) on the IE-100 Micropak Datalogger.
 - 5 Move the GE-120 Gage Carrier Block at one-inch increments in a forward movement. Record a measurement while you push the right cursor button (→) on the IE-100 Micropak Datalogger each inch all the way up to the line marked "14" on the GE-100 Beam.
 - 6 Move the GE-120 Gage Carrier Block totally forward until the GE-151 Roller Contact Point is directly over the forward GE-132 Support Rod. Push the right cursor button (→) on the IE-100 Micropak Datalogger to record the measurement of the forward TRP for Waterline "WL-10".
 - 7 Push the Mode (M) button on the IE-100 Micropak Datalogger.
 - The cursor will flash on the letter R.
 - 8 Push the left cursor (←). The cursor will flash on the letter B. Push the mode (M) button again.
 - The display shows 1;W -10;LHS.
 - 9 Push the down cursor button (↓) on the IE-100 Micropak Datalogger.
 - The display shows 2;W -09;LHS.
 - 10 Push the Mode button (M). The cursor will flash on the letter B. Then push the right cursor button (→). The cursor will flash on the letter R. Push the Mode button (M) again.
 - The display shows Bin;2 ;ls;empty.
 - 11 Put the -1 Gaging Assembly on the next Waterline (WL -09,-08,-07,...,+09,+10).
 - 12 Do steps (c)2 to (c)12 until the geometric measurement of the left-hand side of the aircraft is completed.
- (d) Do the steps that follow to make geometric measurements on the right-hand side of the aircraft:

- 1 Remove the GE-150 Digital Indicator from the GE-120 gage Carrier Block and install it on the opposite side of the GE-100 Beam as in the ([Figure 602](#)) - Sheet 2 VIEW "A".
- 2 Remove the GE-102 Handle from the GE-130 Foot Plate Assembly and install it in the correct position for measurements on the right-hand side of the aircraft ([Figure 602](#)) - Sheet 2 VIEW "A".
- 3 Do the (1)(a) procedure again ([Figure 603](#)).
- 4 Push the Mode (M) button on the IE-100 Micropak Datalogger.
 - The cursor will flash on the letter R.
- 5 Push the left cursor (←). The cursor will flash on the letter B. Push the mode (M) button again.
 - The display shows 1;W -10;LHS.
- 6 Push the down cursor button (↓) until the display shows Bin;51;ls;empty.
- 7 Push the right cursor button (→). The cursor will flash on the letter R. Push the Mode button (M) again.
- 8 Do steps (c)2 to (c)12 until the geometric measurement of the right-hand side of the aircraft is completed.

NOTE: Measurements for LHS are recorded in Bins 1-21, and measurements for RHS are recorded in Bins 51-71.

K. Follow-on

SUBTASK 842-002-A

- (1) On the LH electrical-power control/distribution box, close these circuit breakers:
 - HEATING/TAT 1.
 - HEATING/PITOT 1.
 - HEATING/AOA 1.
- (2) On the RH electrical-power control/distribution box, close these circuit breakers:
 - HEATING/TAT 2.
 - HEATING/PITOT 2.
 - HEATING/AOA 2.
 - PITOT HTG 3.
- (3) **NOTE:** To do the data transfer to the computer is necessary to have the IE-120 WinWedge software installed and configured correctly.

Do the data transfer to the computer as follows:

- (a) Do the steps that follow to install the IE-120 WinWedge software in the computer:

- 1 Put the "Disk 1" into the "A" drive . Select Start, then Run.
 - 2 When the "Run" dialog box comes into view, type the command "A:\Setup" and click "OK".
 - 3 Follow all prompts until you installed your software completely. Reboot your computer.
- (b) Do the steps that follow to configure the IE-120 WinWedge software for Data Download:
- 1 After the computer is rebooted, select Start, then Programs, then WinWedge.
 - 2 In WinWedge, you will have 5 options to select from. Scroll totally to the bottom and select WinWedge.
 - 3 A "Software Wedge Setup (untitled)" will come into view. Select Mode, then Send Keystrokes To.
 - 4 In the "Send Keystrokes To" window, go to the "Application Title Bar Text" line and delete the word "Notepad" and type in "Excel".
 - 5 Go to the "Command" line and delete "Notepad.exe" and type in "Excel.exe". Click "OK".
 - 6 Then, go to Port, and then to Settings. Make sure that "COM1" is selected (if your COM1 port is already in use, select COM2 if it is available on your computer) and that the Baud Rate is at 9600.
 - 7 Then, go to Activate, and then select the Normal Mode. When prompted to save, select "Yes". Name the file "Datalogger" and save it in the "WinWedge" folder. Close the "Software Wedge COM1" window.
- (c) Do the steps that follow to download the geometric measurements data (Waviness data) from the IE-100 Micropak Datalogger to the laptop computer:
- 1 Use the IE-170 Data Transfer Cable to connect the IE-100 Micropak Datalogger to the computer ([Figure 605](#)).
 - 2 After the computer initialization, double-click on the "Datalogger.SW3" icon.
 - The Software Wedge-COM1 window is shown.
 - 3 Minimize the Software Wedge-COM1 window.
 - 4 Open the IE-130 MSEExcel.
 - 5 On the IE-130 MSEExcel, select the Countour Data spreadsheet ([Figure 606](#)).
 - 6 Enter with the aircraft information in the box to the right of the data fields.
 - 7 Push the power (P) button on the IE-100 Micropak Datalogger.

- The IE-100 Micropak Datalogger shows CMTB;m;Comp;cmd while the cursor flashes on the letter C.

- 8 Double-click on the Datalogger icon.
 - The IE-120 Software Wedge - COM1 window comes into view.
- 9 Minimize this window and maximize the IE-130 MSEExcel window.
- 10 On the Countour Data spreadsheet , highlight cell E6 ([Figure 606](#)).
 - This is where the downloading of data will start.
- 11 Push the right cursor button (→). The cursor will flash on the letter M. Push the Mode button (M).
 - The IE-100 Micropak Datalogger shows M/P;cmd;B1;C cl.

NOTE: If "B1" does not come into view on the display, push the up cursor button (↑) or down cursor button (↓) to scroll to Bin1(B1).
- 12 Push the right cursor button (→).
 - The data for Waterline-10 (Bin1) will be automatically downloaded to the PC.
- 13 After Bin1 is downloaded, the next highlighted cell will be E34 (Waterline -09). Push the down cursor button (↓) on the IE-100 Micropak Datalogger.
 - The display shows B2 on the bottom, left-hand corner of the screen.
- 14 Push the right cursor button (→).
 - The data for Waterline-09 (Bin2) will be automatically downloaded to the laptop.
- 15 Do this procedure again: push the (↓) button: B_n will be shown. Push the (→) button, until Bins1 (WL-10) through 21 (WL +10) is downloaded.
- 16 After the Left-Hand Side (Bin1 - Bin21) download is completed, on the IE-130 MSEExcel Countour Data spreadsheet, highlight cell I6 (WL-10 Right-Hand Side).
- 17 Push the down cursor button (↓) on the IE-100 Micropak Datalogger until the display shows B51 on the bottom, left hand corner of the screen.
 - The IE-100 Micropak Datalogger displays M/P;cmd;B51;C cl.
- 18 Push the right cursor button (→).
 - The data for Waterline-10 (Bin51) will be automatically downloaded to the laptop.
- 19 Do this procedure again: push the (↓) button: B_n will be shown. Push the (→) button, until Bins51 (WL-10) through 71 (WL +10) is downloaded.

- 20 After the downloading process is completed, close the Software Wedge - COM1 program.
- 21 On the IE-130 MSEExcel, click on the File menu and select Save.
- 22 Turn the power off on the IE-100 Micropak Datalogger.
- 23 Disconnect the IE-100 Micropak Datalogger.
- 24 Send the saved Excel file with collected data in step K(3) of [AMM TASK 34-13-04-200-802-A/600](#) and step K(3) of [AMM TASK 34-13-04-200-803-A/600](#) (if applicable) by e-mail to this address: "emb.rvsm@aeromechinc.com".
- 25 The Skin Waviness Pass-Fail Evaluation Tool, file name EmbraerSWSS(Pass-Fail).xls, will show if the aircraft can use the tool. To do it, input the aircraft serial number into EmbraerSWSS(Pass-Fail).xls.

NOTE: Do not use the "Embraer SWSS (Pass-Fail).xls" tool on aircraft that got damage or repairs on the RVSM critical region. Such cases must be sent directly to Aeromech by e-mail emb.rvsm@aeromechinc.com .

- a On the saved IE-130 MSEExcel file click on Contour Data tab and make sure that Contour Data Spreadsheet ([Figure 606](#)) is OK before it is moved to the EmbraerSWSS(Pass-Fail).xls . Do the steps that follow to make sure that the data is OK:
 - 1) The AFT TRP (AFT Tool Reference Point) cell, the FWD TRP (FWD Tool Reference Point) cell and TRPs (Tool Reference Point) cells from -10.0 to 14.0 must be fulfilled on each Waterline Table. If NOT, do [AMM TASK 34-13-04-200-801-A/600](#) again.
 - 2) Most of the values of the measurement data must be positive and between 0.040 and 0.110 inches on the Contour Data Spreadsheet cells. If NOT, do [AMM TASK 34-13-04-200-801-A/600](#) again. If the problem continues contact Aeromech by e-mail emb.rvsm@aeromechinc.com and Embraer respectively.

NOTE: A negative value can result if you do not set the GSE-150 Digital Indicator to "REV" mode during the zeroing procedure. If you do not see the "REV" indication on the Digital Indicator display, press the "+/-" button on the Digital Indicator until the "REV" indication appears on the screen.

- 3) To convert from a different data pattern to "0.XXXX" or "0,XXXX" pattern on the Contour Data Spreadsheet, you must use the Microsoft Excel command REPLACE to correct the content of the cells ([Figure 607](#)).

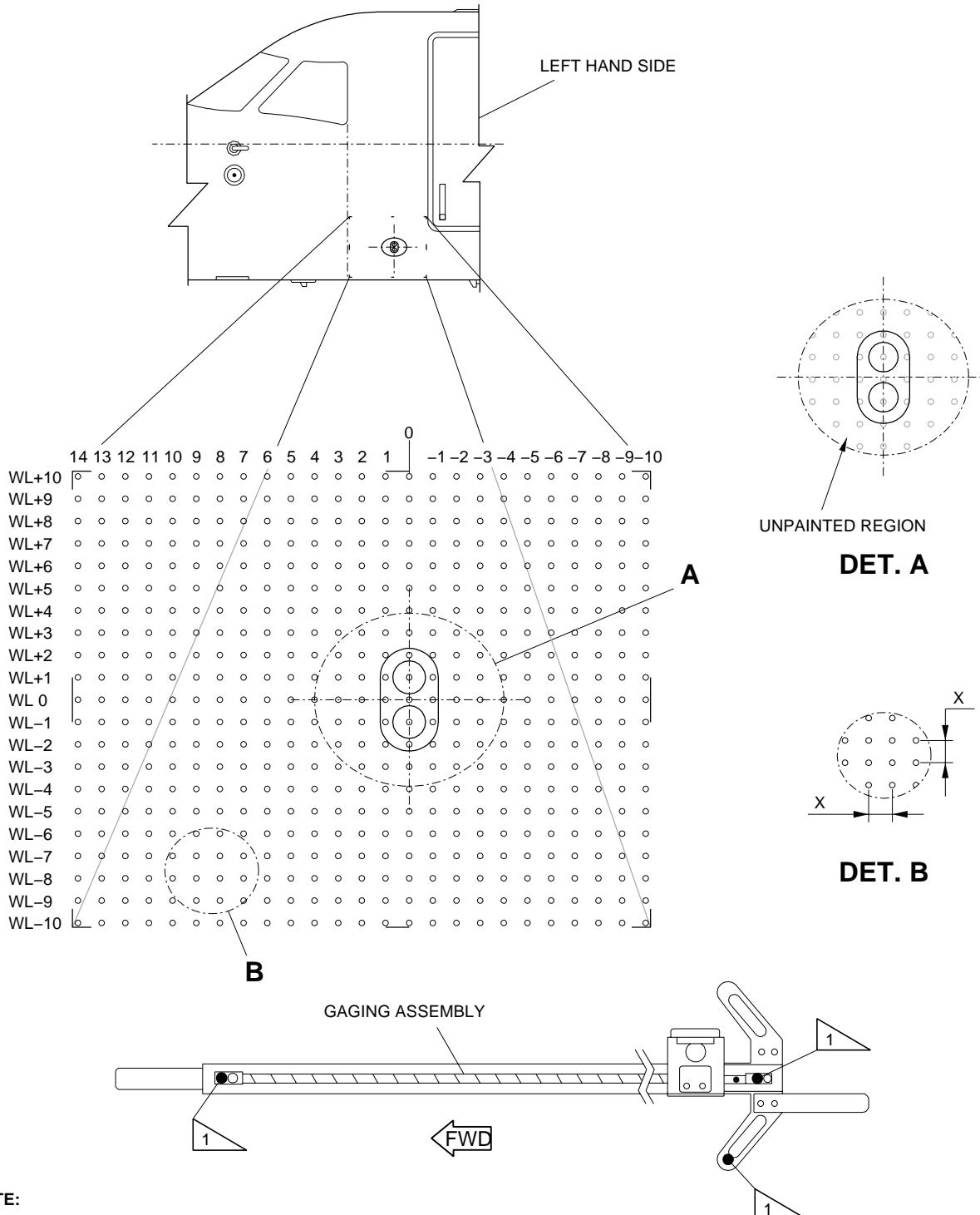
NOTE: On the EmbraerSWSS(Pass-Fail).xls file, the cells value must obey the regional keyboard configuration. In some cases you must change "," for "." or vice-versa.

- b Download the EmbraerSWSS(Pass-Fail).xls file from the AeroMech, Inc. website and save this file into your computer.
 - Go to the AeroMech website, <http://www.aeromechinc.com>. Select the RVSM Resources drop down tab and then select Reference Documents. Find the Embraer 135/145 Skin Waviness Spreadsheet, file name EmbraerSWSS(Pass-Fail). The direct link to this file is: [http://www.aeromechinc.com/docs/EmbraerSWSS\(Pass-Fail\).xls](http://www.aeromechinc.com/docs/EmbraerSWSS(Pass-Fail).xls) Click the download button.
 - A File Download window will appear and will ask if you want to open or save the file. Click on the Save button.
 - A Save As window will appear and will ask you where on your computer you want save the file. Specify the location you want the file saved.
- c Open the file you just saved. A Security Warning window may appear notifying you that the file contains macros. Click on the Enable Macros button.
- d A Password window will appear. Type in the password: TRP*060460 (note the password is case sensitive). Click on the OK button.
- e On the file EmbraerSWSS(Pass-Fail).xls, in the Measurement Data tab, fill in the "Airplane Information" table ([Figure 608](#)). For the model, enter BASIC in Cell M10. For S/N, enter the serial number in cell M11. Make sure you use the serial number format prompted on the spreadsheet. If you place the cursor over cell M11, a comment box will appear that shows the serial number format. After you have inputted the aircraft serial number, a red note to the right of the cell M11 will indicate whether the aircraft is eligible to use EmbraerSWSS(Pass-Fail).xls. If the aircraft is NOT eligible, go to step 26.
- f You must use the Microsoft Excel commands COPY and PASTE to transfer the measurement data (the blue numbers in cells E6:E592 and I6:I592) from Contour Data Spreadsheet to the Measurement Data tab (the blue numbers in cells D9:D595 and H9:H595) on the Embraer SWSS(Pass-Fail).xls, respectively ([Figure 609](#)).
- g On the EmbraerSWSS(Pass-Fail).xls, open the Measurement Data Check tab, review the graphs for each waterline, beginning with the first graph (WL-10 LHS/ WL-10 RHS) on the top ([Figure 610](#)).
- h Look for spikes or bad data points in the graphs. These graphs do NOT show the actual skin bumps or skin depressions, but just show the actual measurement data points ([Figure 611](#)).

NOTE: 1. For spikes in the graphs you must change the peak value for the medium value of amplitude. For this you must calculate the arithmetic average between the previous and later amplitude value ([Figure 612](#)), then you must replace the old value in the respective cell for the new one ([Figure 613](#)).

2. On the graph if the spike is happening in the first point (Tool Index "-10.0"), then replace for the next value of amplitude (Tool Index "-9.0").
 3. On the graph if the spike is happening in the last point (Tool Index"14.0", then replace for the previous value of amplitude (Tool Index"13.0).
- i On the EmbraerSWSS(Pass-Fail).xls, in the PASS-FAIL STATUS tab, Table 1 shows the result of the skin contour analysis for RVSM compliance ([Figure 614](#)). If the result is PASS for Captain and First Officer systems, this information and result can be saved and printed for documentation. If the result is FAIL for one of the systems, you must send the Excel file to Aeromech by email to emb.rvsm@aeromechinc.com and you must contact Aeromech and Embraer.
- 26 If the aircraft is NOT eligible to use the EmbraerSWSS(Pass-Fail).xls, you must contact AeroMech directly by e-mail: emb.rvsm@aeromechinc.com
- 27 Close all files and software, and stop the computer.

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
RVSM Critical Region (Location and Measurement Points)
Figure 601 - Sheet 1



NOTE:

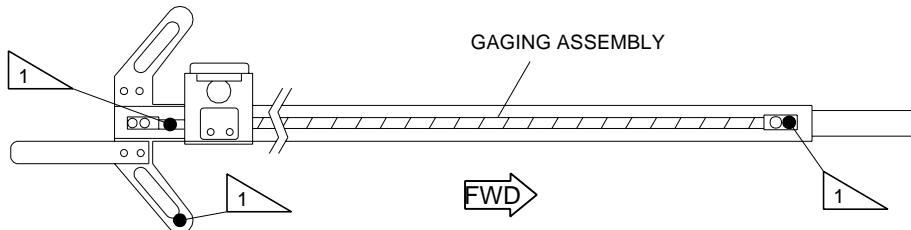
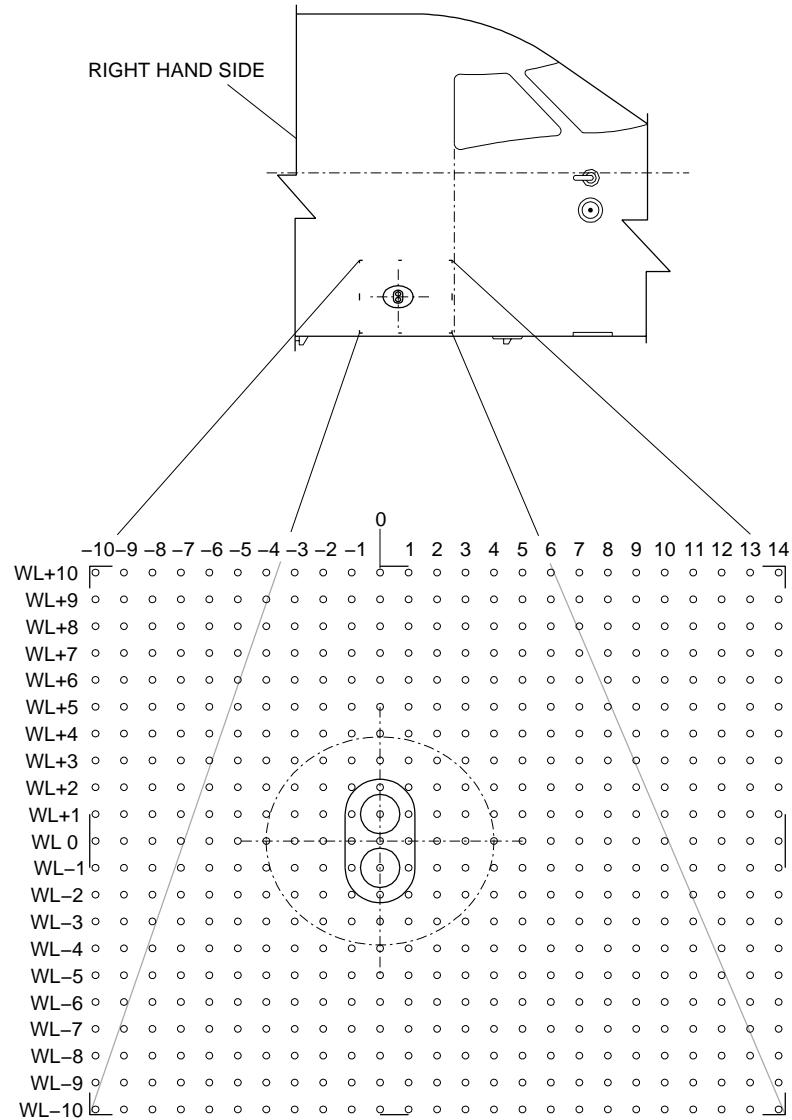
X= DISTANCE BETWEEN POINTS.

OBS.: THIS DISTANCE MUST BE THE SAME VERTICAL AND HORIZONTAL LINES.

 THESE GE-132 SUPPORT ROD MUST CONTACT THE AIRCRAFT SKIN.

EM145AMM340357C.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
RVSM Critical Region (Location and Measurement Points)
Figure 601 - Sheet 2



 THESE GE-132 SUPPORT ROD MUST CONTACT THE AIRCRAFT SKIN.

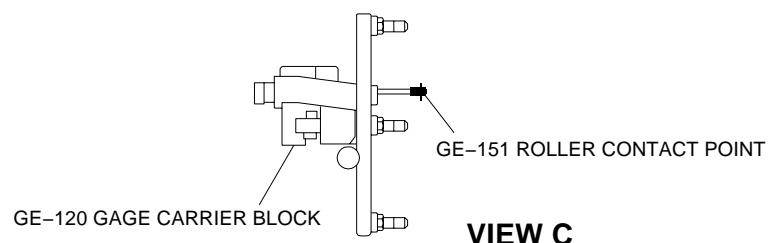
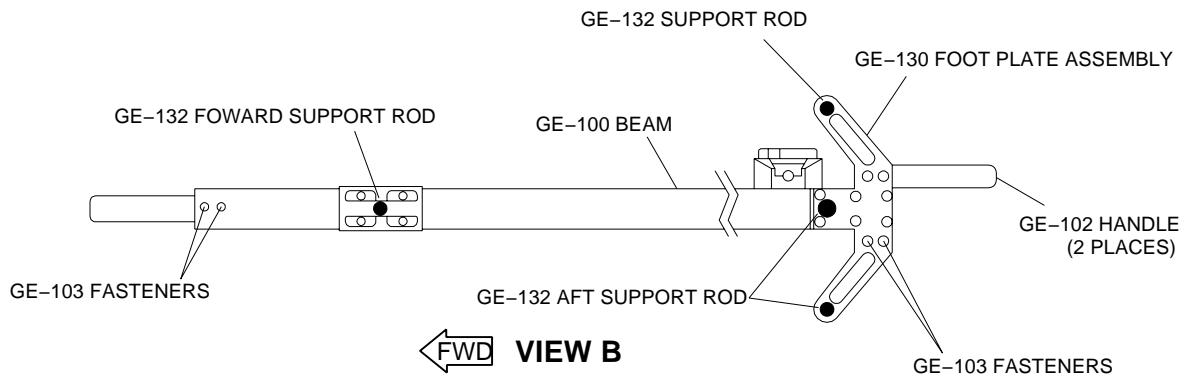
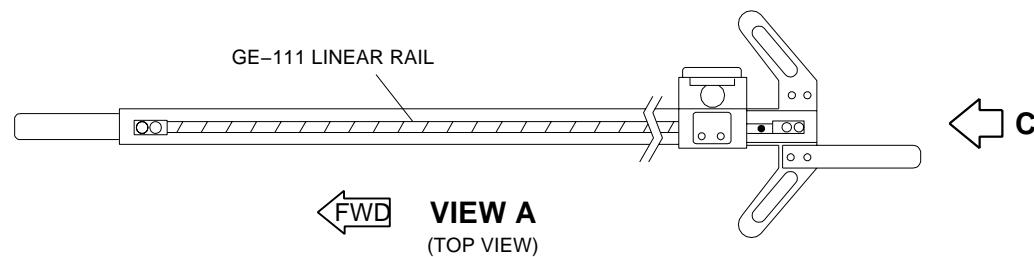
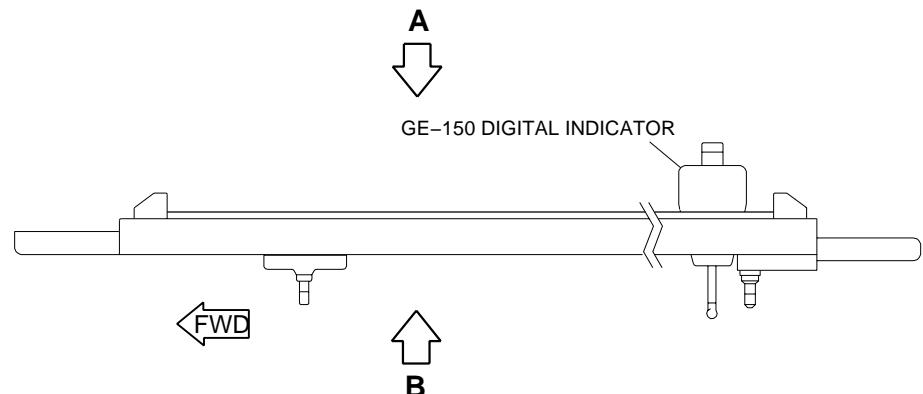
EM145AMM341108A.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT

-1 Gaging Assembly

Figure 602 - Sheet 1

-1 GAGING ASSEMBLY SET UP FOR MEASUREMENTS
ON THE LEFT SIDE OF THE AIRCRAFT



VIEW C

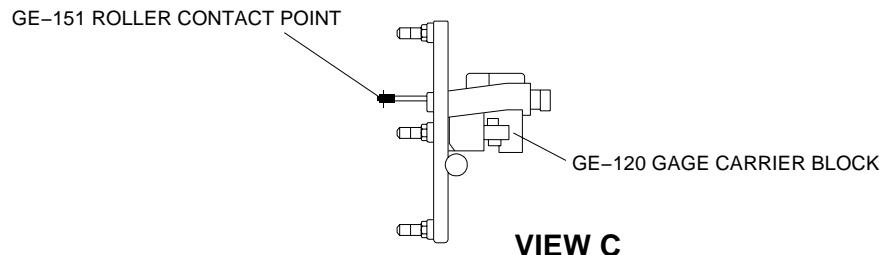
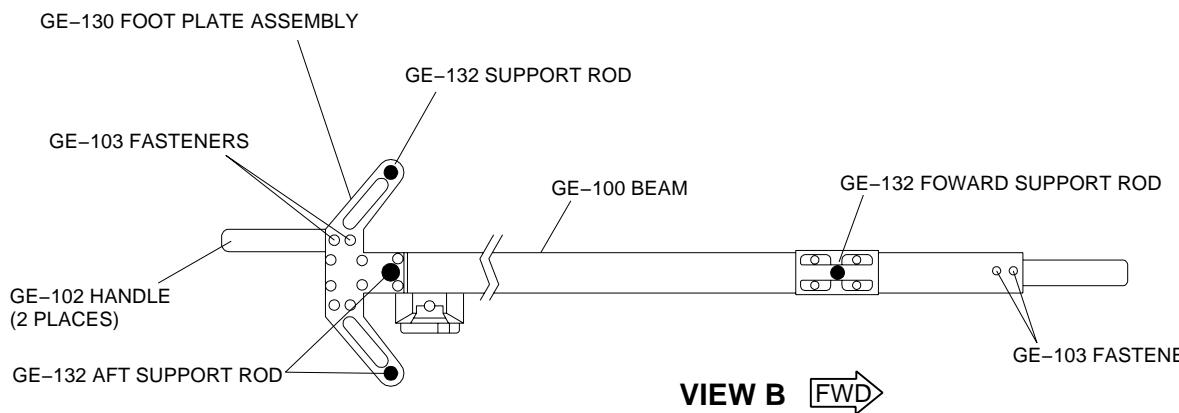
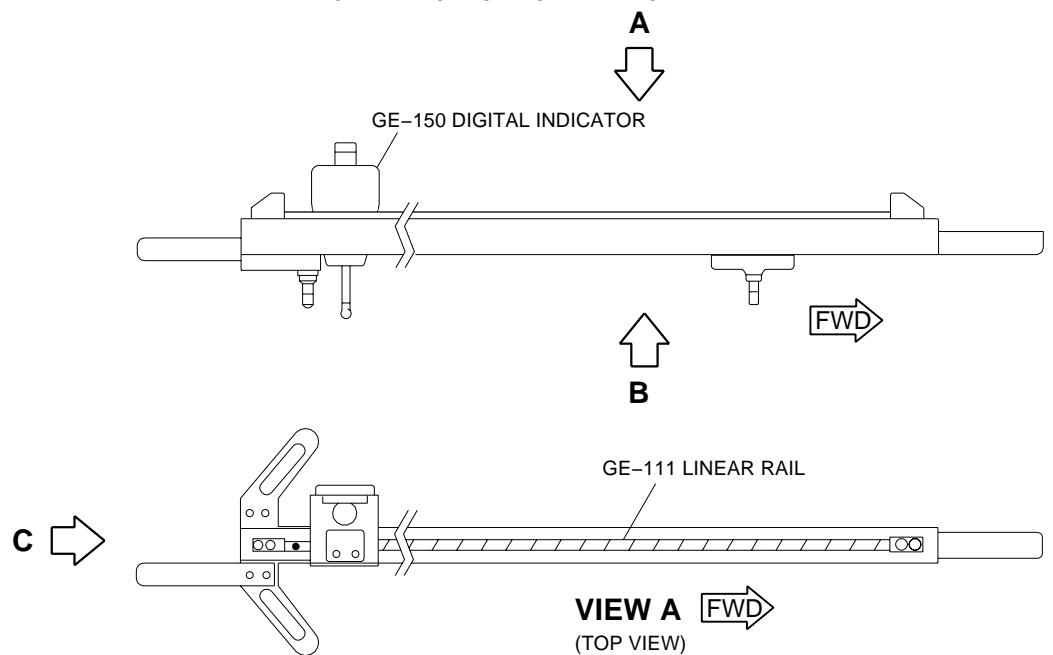
EM145AMM340359D.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT

-1 Gaging Assembly

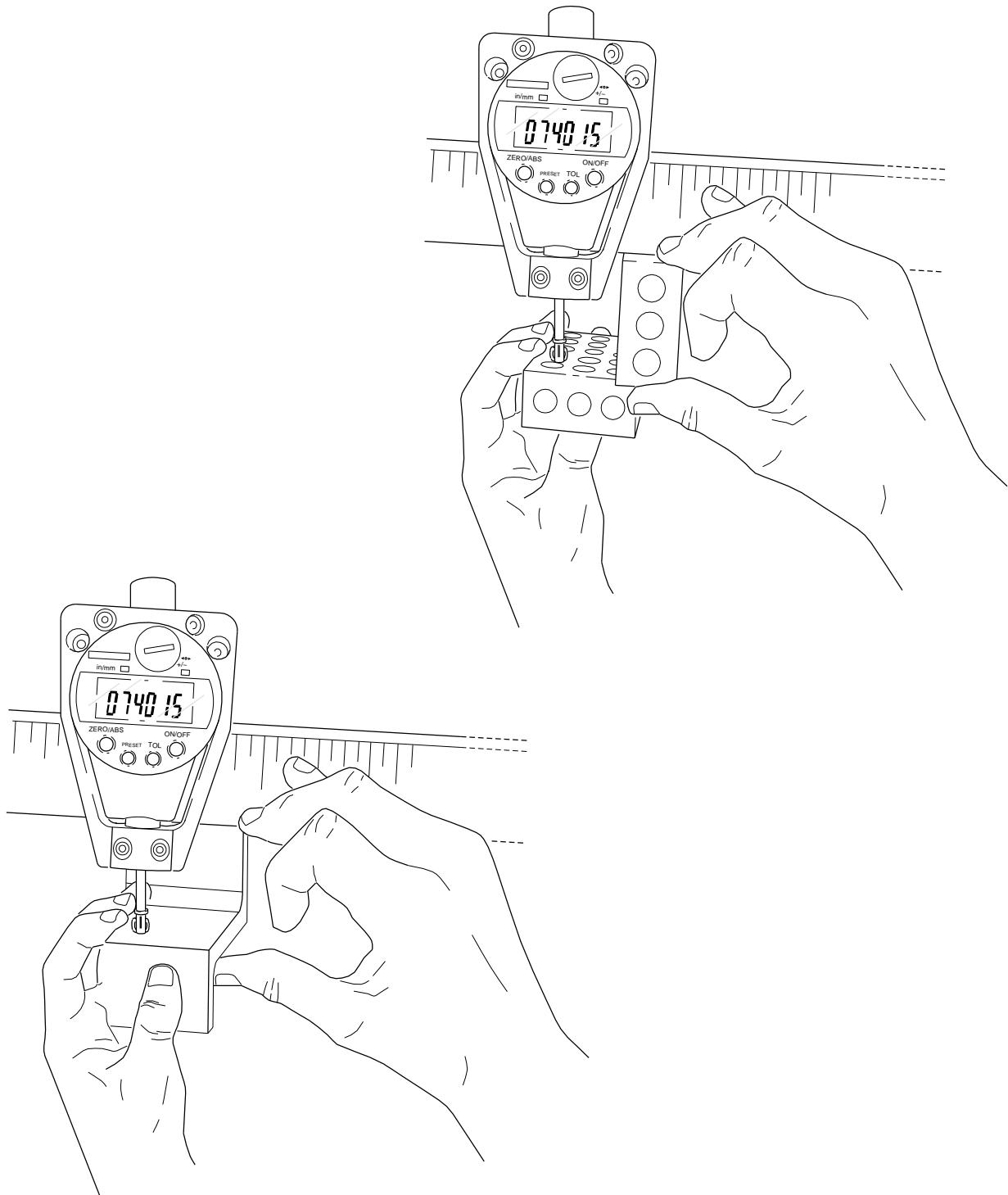
Figure 602 - Sheet 2

-1 GAGING ASSEMBLY SET UP FOR MEASUREMENTS
ON THE RIGHT SIDE OF THE AIRCRAFT



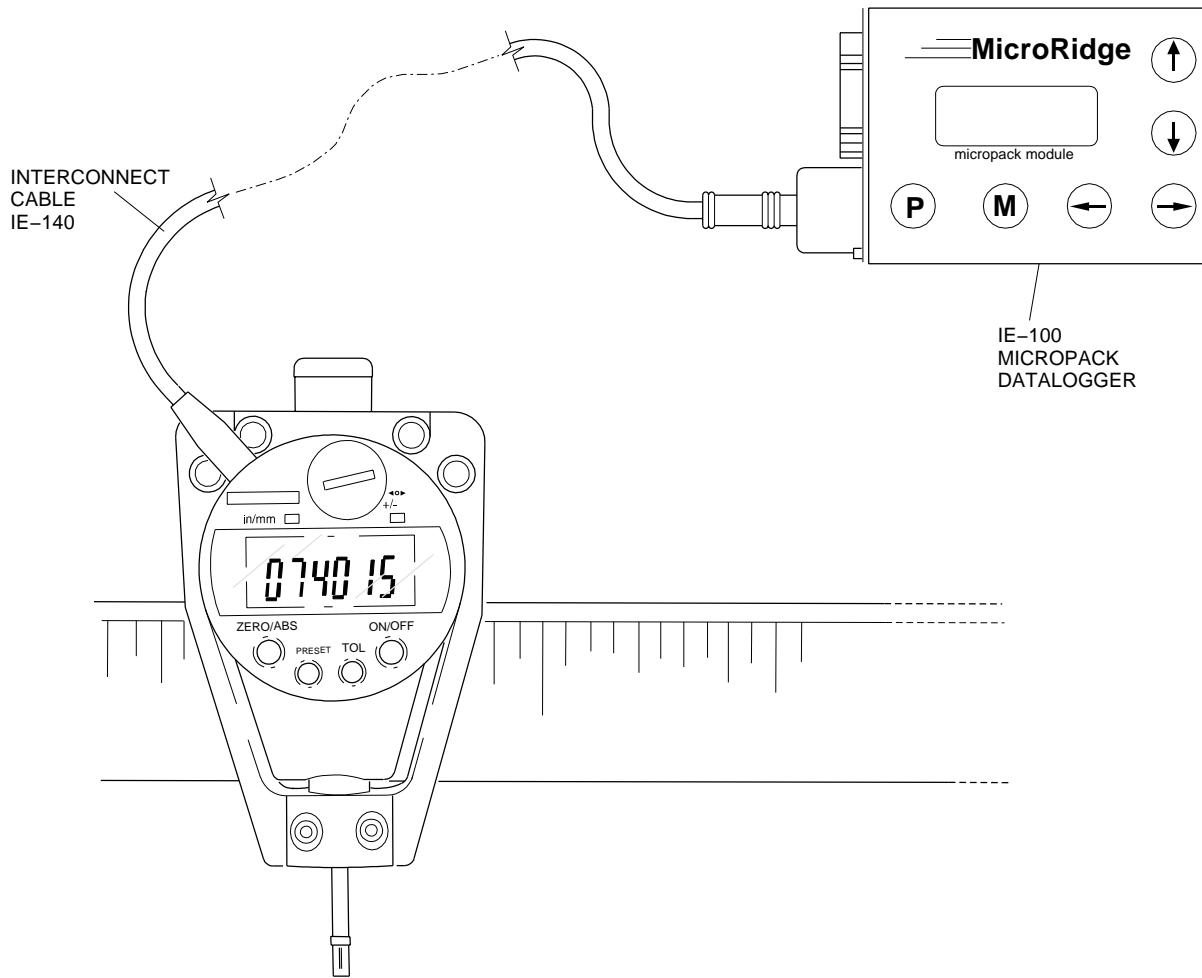
EM145AMM340458B.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
GE-150 Digital Indicator Calibration
Figure 603



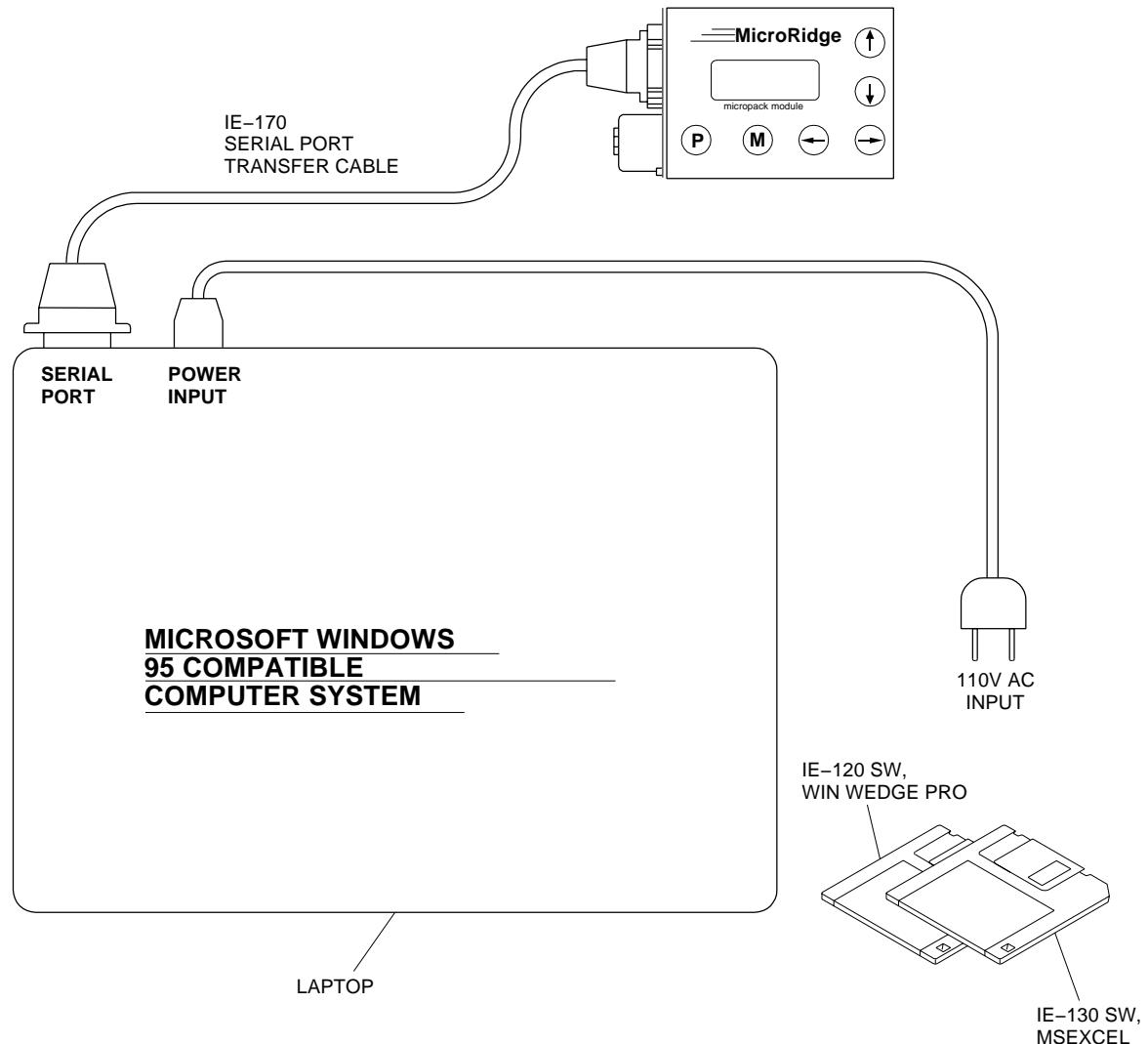
EM145AMM340364B.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
Micropak Datalogger/GE-150 Digital Indicator Connection
Figure 604



EM145AMM340371A.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
Micropak Datalogger/Computer Connection
Figure 605



EM145AMM340361B.DGN



**AIRCRAFT
MAINTENANCE MANUAL**

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
Contour Data Spreadsheet
Figure 606

WATERLINE										AFT TRP (TOOL REFERENCE POINT) CELL									
	B	C	D	E	F	G	H	I	J	K	L	M	N	O					
4			Left Hand Side Measurement Date				Right Hand Side Measurement Date												
5			MPM Bin # Orig. Data Repeat				MPM Bin # Orig. Data Repeat												
6	wl-10	Aft TRP				Aft TRP								Airplane Information					
7	-10.0	1					51							Model:					
8	-9.0	1					51							Date:					
9	-8.0	1					51							S/N:					
10	-7.0	1					51							Hours:					
11	-6.0	1					51							Cycles:					
12	-5.0	1					51							GENERAL NOTES:					
13	-4.0	1					51												
14	-3.0	1					51												
15	-2.0	1					51												
16	-1.0	1					51												
17	0.0	1					51												
18	1.0	1					51												
19	2.0	1					51												
20	3.0	1					51												
21	4.0	1					51												
22	5.0	1					51												
23	6.0	1					51												
24	7.0	1					51												
25	8.0	1					51												
26	9.0	1					51												
27	10.0	1					51												
28	11.0	1					51												
29	12.0	1					51												
30	13.0	1					51												
31	14.0	1					51												
32	Fwd TRP						Fwd TRP												
33																			

FWD TRP
(TOOL REFERENCE POINT) CELL

TOOL REFERENCE POINT CELL
(FROM TRP -10.0 TO TRP 14.0)

EM145AMM340362A.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
 Data Conversion on the Contour Data SpreadSheet
 Figure 607

CONTOUR DATA SPREAD SHEET – BEFORE FORMATTING

LEFT HAND SIDE MEASUREMENT DATA			RIGHT HAND SIDE MEASUREMENT DATA		
MPM Bin #	Orig. Data	Repeat	MPM Bin #	Orig. Data	Repeat
wl-10	Aft TRP	.09175	Aft TRP	-.06930	
	-10,0	1		-.06815	
	-9,0	1		-.07055	
	-8,0	1		-.07610	
	-7,0	1		-.07725	
	-6,0	1		-.08130	
	-5,0	1		-.08435	
	-4,0	1		-.09455	
	12,0	1			
	13,0	1			
	14,0	1			
	Fwd TRP	.07435	Fwd TRP	-.07330	
				-.07140	
				-.06790	
				-.06895	
wl-09	Aft TRP	.07535	Aft TRP	-.07180	
	-10,0	2		-.07155	
	-9,0	2		-.07865	
	-8,0	2		-.07760	
	-7,0	2		-.07610	
	-6,0	2		-.08205	
	-5,0	2		-.08790	
	-4,0	2		-.09405	

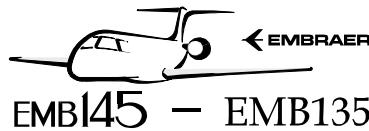
CHANGE THE VALUES TO OBEY THE PATTERN "0,XXXX" (IN THIS CASE)
e.g.: .09175 → 0.0918, OR
TO OBEY THE PATTERN "0.XXXX"
e.g.: .09175 → 0.0918

CHANGE THE VALUES TO OBEY THE PATTERN "0,XXXX" (IN THIS CASE)
e.g.: -.07180 → 0.0718, OR
TO OBEY THE PATTERN "0.XXXX"
e.g.: -.07180 → 0.0718

CONTOUR DATA SPREAD SHEET – AFTER FORMATTING

LEFT HAND SIDE MEASUREMENT DATA			RIGHT HAND SIDE MEASUREMENT DATA		
MPM Bin #	Orig. Data	Repeat	MPM Bin #	Orig. Data	Repeat
wl-10	Aft TRP	0,0918	Aft TRP	0,0693	
	-10,0	1		0,0682	
	-9,0	1		0,0706	
	-8,0	1		0,0761	
	-7,0	1		0,0773	
	-6,0	1		0,0813	
	-5,0	1		0,0844	
	-4,0	1		0,0946	
	12,0	1			
	13,0	1			
	14,0	1			
	Fwd TRP	0,0744	Fwd TRP	0,0733	
				0,0714	
				0,0679	
				0,0690	
wl-09	Aft TRP	0,0754	Aft TRP	0,0718	
	-10,0	2		0,0716	
	-9,0	2		0,0787	
	-8,0	2		0,0776	
	-7,0	2		0,0761	
	-6,0	2		0,0821	
	-5,0	2		0,0879	
	-4,0	2		0,0941	

EM145AMM341051C.DGN



AIRCRAFT MAINTENANCE MANUAL

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
Airplane Information Table
Figure 608

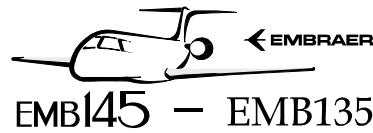
Embraer SWSS (Pass–Fail) .xls

MEASUREMENT DATA TAB

TYPE THE LETTERS "XR" IF THE AIRPLANE IS AN
EMB-145 XR MODEL OR TYPE THE WORD "BASIC"
IF THE AIRPLANE IS NOT AN EMB-145 XR.

A	B	K	L	M	CELL "M10"
8					
9					
10					
11					
Airplane Information					
Mode: basic					
S/N: 14500252					
Registration: ERJ-135 ER					
Operator: Embraer					
Date: 28/02/2007					
Hours: 7166,0					
Cycles: 6769					
Tool S/N: ???					
Facility: SJK					
Inspector Name: Adriano					

EM145AMM341052C.DGN



EMB145 – EMB135

**AIRCRAFT
MAINTENANCE MANUAL**

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT

Example of Data Transfer from Contour Data Spreadsheet to EmbraerSWSS(Pass-Fail).xls
Figure 609

CONTOUR DATA SPREADSHEET								
CONTOUR DATA TAB								
1	B	C	D	E	F	G	H	I
2								
3	LEFT HAND SIDE MEASUREMENT DATA						RIGHT HAND SIDE MEASUREMENT DATA	
4								
5				MPM Bin #	Orig0, Data	Repeat	MPM Bin #	Orig. Data
6	wl-10			Aft TRP	0,0918		Aft TRP	0,0693
	-10,0	1			0,0878		51	0,0682
	-9,0	1			0,0839		51	0,0706
	-8,0	1			0,0877		51	0,0761
	-7,0	1			0,0894		51	0,0773
	-6,0	1			0,0943		51	0,0813
	-5,0	1			0,0978		51	0,0844
	-4,0	1			0,1005		51	0,0946
590	13,0	21			0,1641		71	0,0943
591	14,0	21			0,1641		71	0,0939
592	Fwd TRP				0,0892		Fwd TRP	0,0781



DATA TRANSFER
FROM: COUNTOUR DATA SPREAD SHEET
(E6: E592) AND (I6:I592)
TO: Embraer SWSS
(Pass-Fail).xls
(D9:D595) AND (H9:H595)



Embraer SWSS (Pass-Fail) .xls

MEASUREMENT DATA TAB								
1	A	B	C	D	E	F	G	H
2								
3								
4								
5								
6	Ref.Info.	L/H MEASUREMENT			R/H MEASUREMENT			
7	Index	MPM Bin #	Meas.	Repeat	Repeat	MPM Bin #	Meas.	Repeat
8	[In]	[Dim]	[In]	[In]	[In]	[Dim]	[In]	[In]
9	wl-10	Aft TRP	0,0918			Aft TRP	0,0693	
10	-10,0	1	0,0878				0,0682	
11	-9,0	1	0,0839				0,0706	
	-8,0	1	0,0877				0,0761	
	-7,0	1	0,0894				0,0773	
	-6,0	1	0,0943				0,0813	
	-5,0	1	0,0978				0,0844	
	-4,0	1	0,1005				0,0946	
593	13,0	21	0,1641			71	0,0943	
594	14,0	21	0,1641			71	0,0939	
595	Fwd TRP				0,0892		Fwd TRP	0,0781

EM145AMM341053B.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT

Measurement Data Check tab

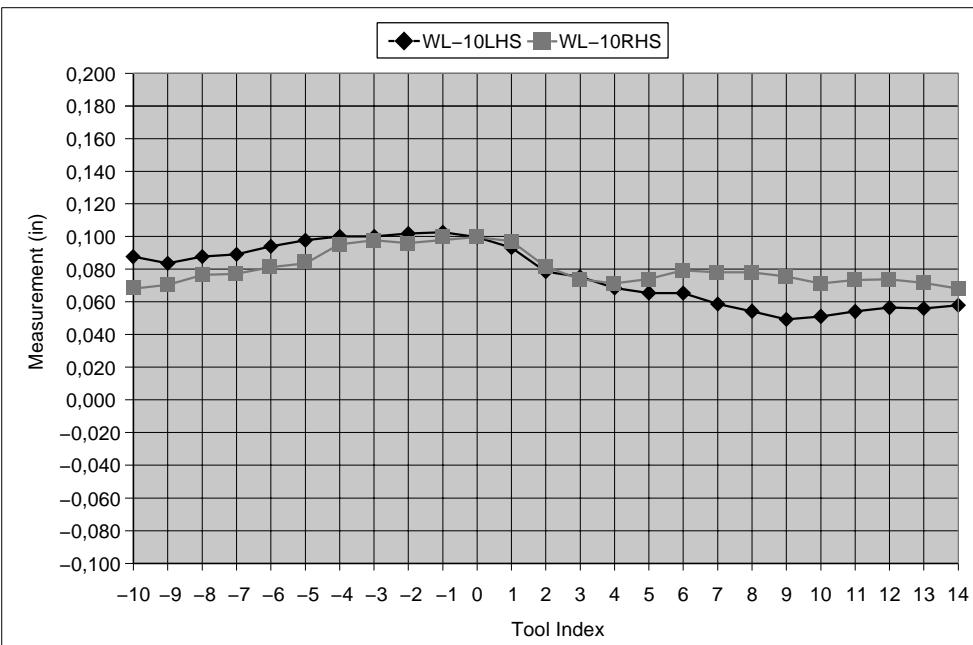
Figure 610

Embraer SWSS (Pass–Fail) .xls

Measurement Data Check

On this page, review the graphs for each waterline, beginning with the first graph on the top. These graphs show the measurement data for the left side (pink color) and right side (blue color). Look for bad data points.

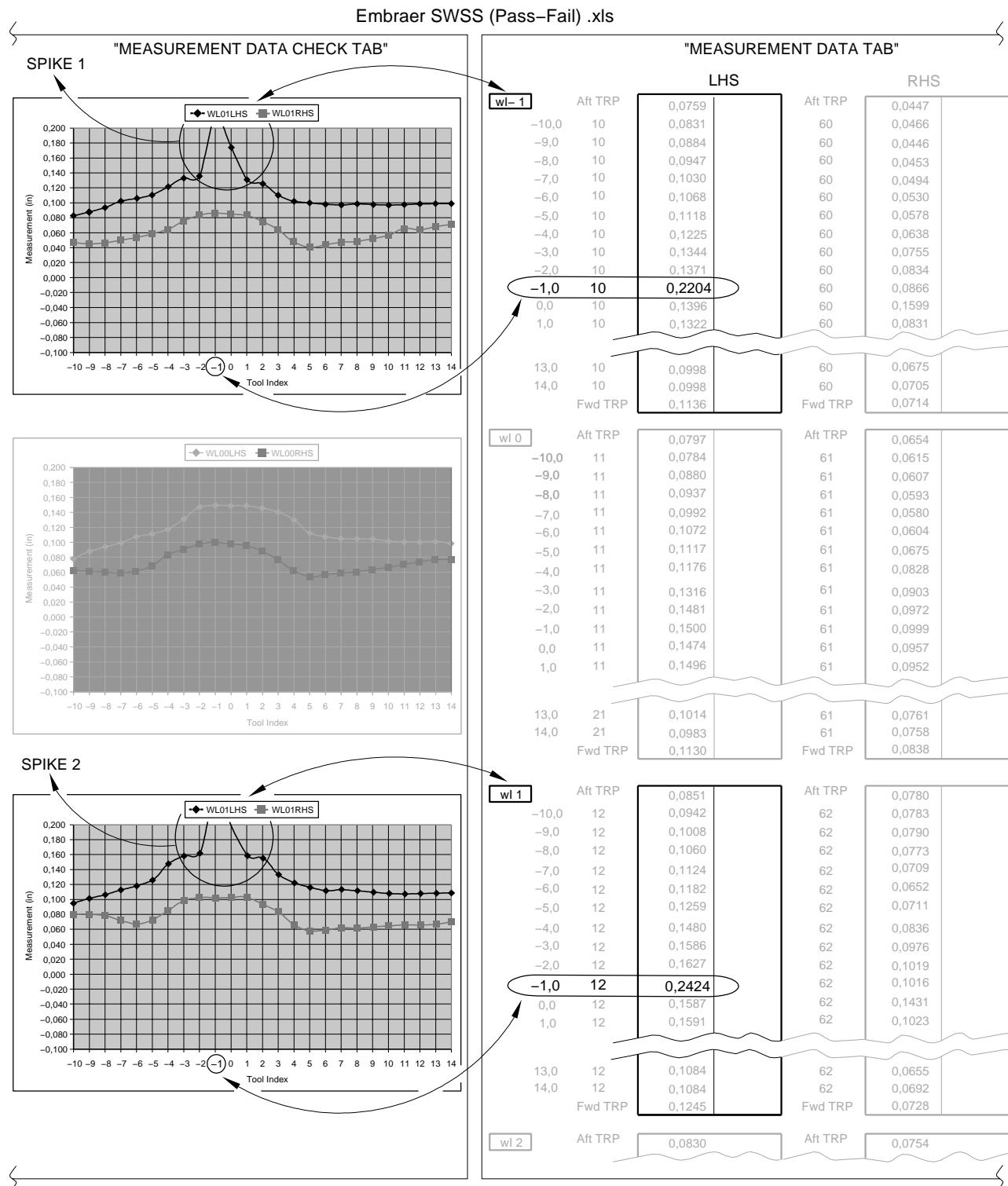
These charts do NOT show the actual skin bumps or skin depressions; these graphs just show the actual measurement data points.



EM145AMM341054D.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT

Example of Spikes and Corresponding Value on the Measurement Data Tables WL-01 LHS and WL01 LHS
Figure 611

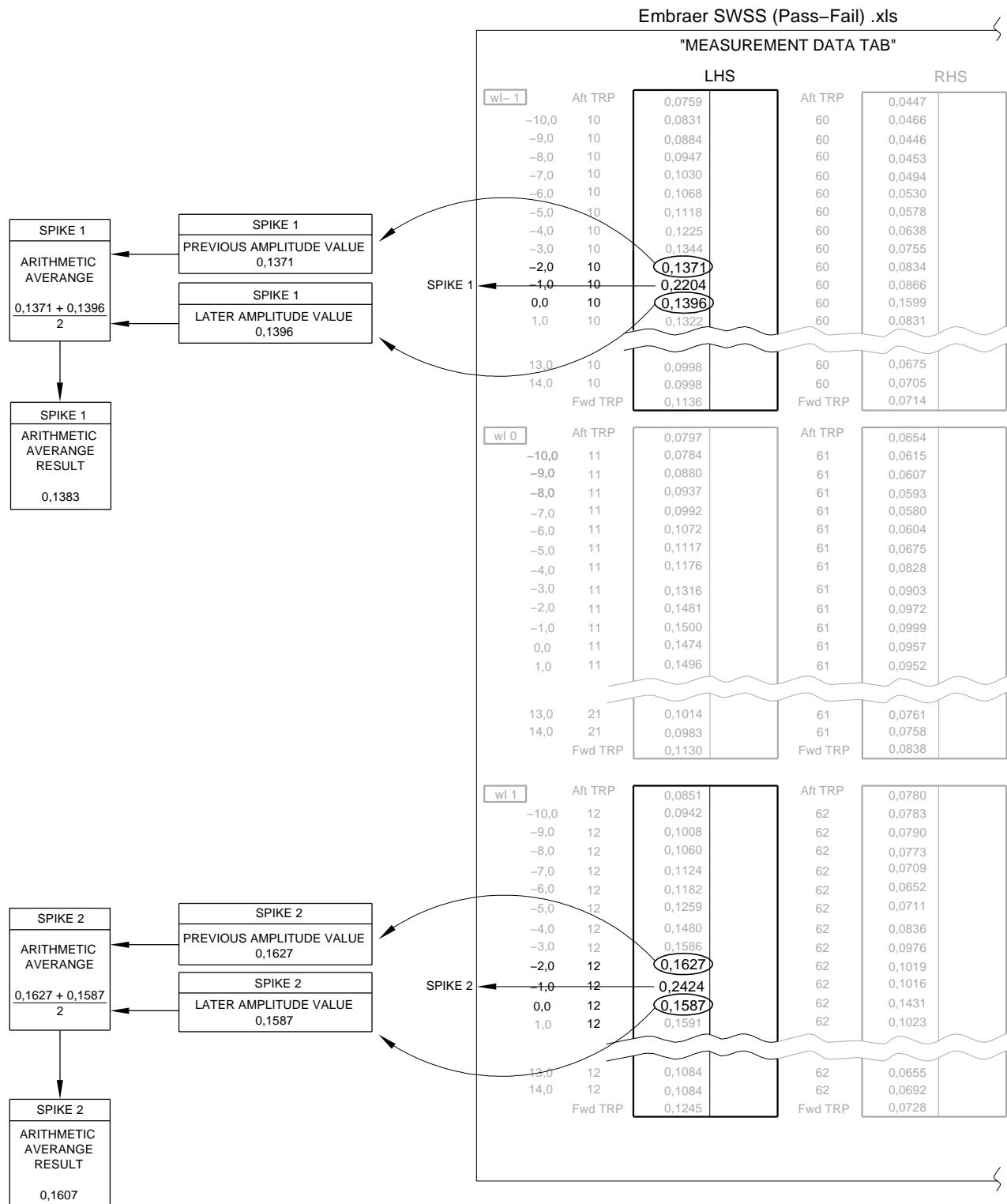


EM145AMM341055C.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT

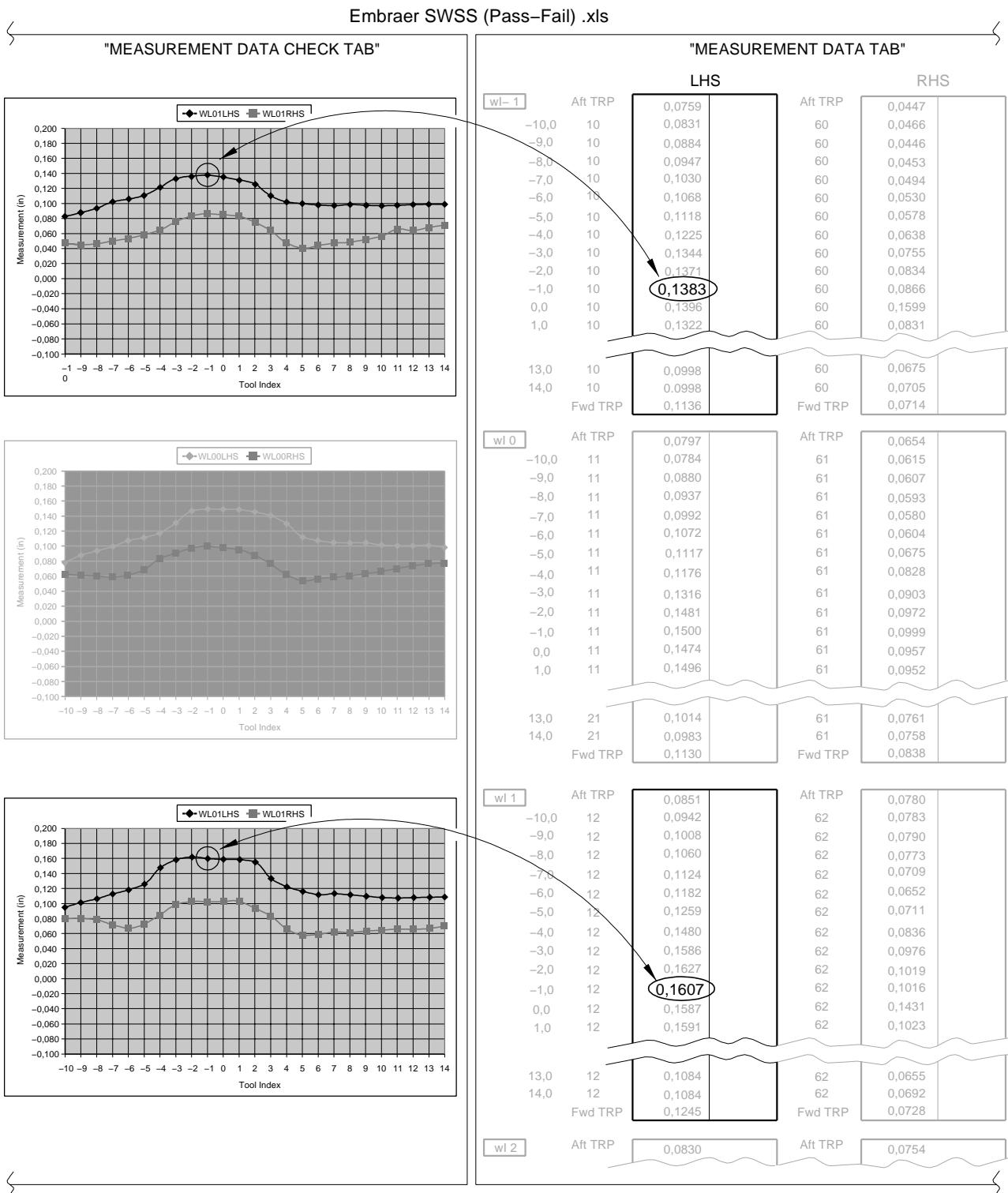
Example of Calculus of the New Arithmetic Average for Spike Points

Figure 612

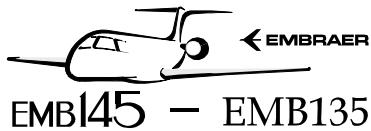


EM145AMM341056B.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
New Value after Correction and Replacement
Figure 613



EM145AMM341057C.DGN



AIRCRAFT MAINTENANCE MANUAL

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
RVSM Airframe Conformity Inspection Summary
Figure 614

Embraer SWSS (Pass-Fail) .xls

Reduced Vertical Separation Minimum (RVSM) Airframe Conformity Inspection Summary

Skin Contour Analysis for RVSM Compliance
EMB-135/-145 basic

Aircraft Serial Number: 14500252

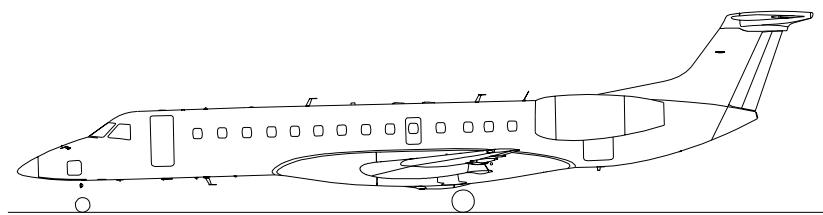
The airplane designated above has been inspected and analyzed in accordance with JAA and FAA approved procedures for RVSM airworthiness compliance. The results of the skin contour analysis are provided in Table 1.

System	Status
Captain's	PASS
First Officer's	PASS

Table 1. Results of Skin Contour Analysis for RVSM Compliance – EMB-135/-145
SN 14500252

This airplane meets the Embraer EMB-135/-145 RVSM Group Certification requirements for the 3s Skin Waviness Error Allowance.

Checked by: _____ Date: _____



Data Package: AMI-QD-EMB-9905 Rev: E
SWSS Rev: A

EM145AMM341058C.DGN



AIRCRAFT
MAINTENANCE MANUAL

TASK 34-13-04-200-802-A

EFFECTIVITY: RVSM COMPLIANT AIRCRAFT

3. STATIC PORT SURROUNDING PLATE FOR FLUSHNESS AND INTEGRITY - INSPECTION

A. General

- (1) This task gives the procedures to do the geometric inspection of the static port surrounding plate for flushness and integrity.
- (2) Either GSE 268 or GSE 448 can be used to perform the task.

B. Zones and Accesses

Not Applicable

C. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 268	Data Acquisition Gaging Equipment	To inspect the static port surrounding plate for flushness and integrity	
GSE 448	Data Acquisition, Transmission and Storage equipment	To inspect the static port surrounding plate for flushness and integrity	

D. Auxiliary Items

Not Applicable

E. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
ASTM-D740	Methyl ethyl ketone (MEK)	AR

F. Expandable Parts

Not Applicable

G. Persons Recommended

QTY	FUNCTION	PLACE
1	To do the measurements	Outside the aircraft

H. Preparation

SUBTASK 841-003-A

- (1) Do the steps that follow to inhibit the sensor heating system:
 - (a) On the LH electrical-power control/distribution box, open the circuit breakers:
 - HEATING/TAT 1.
 - HEATING/PITOT 1.
 - HEATING/AOA 1.
 - (b) On the RH electrical-power control/distribution box, open the circuit breakers:

- HEATING/TAT 2.
- HEATING/PITOT 2.
- HEATING/AOA 2.
- PITOT HTG 3.

I. Inspection of Static Port Surrounding Plate for Flushness and Integrity

SUBTASK 280-003-A

- (1) Do the steps that follow for the inspection:
 - (a) Open the IE-130 MSEExcel file.
 - (b) Make a hardcopy of LHS-RHS Spreadsheet ([Figure 615](#)). It will be used to record the test data.
 - (c) Do the zero procedure of the GE-450 Dial Indicator ([Figure 616](#)) as follows:
 - 1 Clean the GE-4 Gaging Assembly, the Gage Block, and the GE-450 Dial Indicator.
 - 2 Put the GE-4 Gaging Assembly on the Gage Block.
 - 3 Set the GE-450 Dial Indicator to read 0.000 in.

NOTE: Make sure that the GE-450 Dial Indicator needle moves clockwise from zero when the plunger is pushed in and counterclockwise from zero when the plunger is extended.

 - 4 Put an adhesive tape to hold the indicator bezel.
 - 5 Remove the GE-4 Gaging Assembly and store the Gage Block.
- (d) Do the static port measurements relative to the surrounding plate as follows:
 - 1 Write the airplane information (Aircraft S/N, Operator, Date and Notes) on the LHS/RHS Step-Height spreadsheet ([Figure 615](#)).
 - 2 Clean with MEK the surface of the flush static port(s) and fuselage in the measurement region. Examine and write possible damage to port(s) on the LHS/RHS Step-Height spreadsheet in the notes/comments field.
 - 3 Put the GE-4 Gaging Assembly onto the static port (upper or lower).

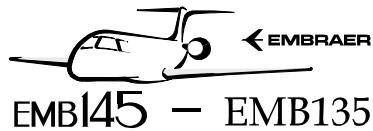
NOTE: The base of the GE-4 Gaging Assembly will be put on the static port and the plunger will touch the surrounding plate.
 - 4 Move to the measurement point, as shown the on LHS/RHS Step-Height spreadsheet ([Figure 615](#)), and write the step height indication on it.

NOTE:

 - The GE-450 Dial Indicator indication is negative when the needle moves clockwise from zero and positive when the needle moves counterclockwise from zero.
 - When the indication is negative, it means that the static port is inboard in relation to the surrounding plate. When the

indication is positive, it means that the static port is outboard in relation to the surrounding plate.

- 5 Do step (d)4 again for each measurement point on the static port (total of 4 measurement points).
 - 6 Do steps (d)3 through (d)5 again for the other static port.
 - 7 Make sure that the collected data are in the specified tolerances shown in [Figure 615](#). If NOT, contact Embraer for repair procedures.
- (e) Do the steps that follow to record the static plate measurements relative to the aircraft skin:
- 1 Put the GE-4 Gaging Assembly in such a position that the base is on the airframe skin and the plunger touches the plate.
 - 2 Move to the measurement point, as shown on the LHS/RHS Step-Height spreadsheet ([Figure 615](#)), and note the step height.
- NOTE:
- When the GE-450 Dial Indicator moves clockwise from zero, it must be recorded on the LHS/RHS Step-Height spreadsheet as a positive value. When the GE-450 Dial Indicator moves counterclockwise from zero, it must be recorded on the LHS/RHS Step-Height spreadsheet as a negative value.
 - When the recorded value is negative, it means that the static plate is inboard in relation to the aircraft skin. When the recorded value is positive, it means that the static plate is outboard in relation to the aircraft skin.
- 3 Do step (e)2 again for each measurement point on the static plate (total of 8 measurement points).
 - 4 Make sure that the collected data are in the specified tolerances shown on [Figure 615](#). If NOT, contact Embraer for repair procedures.
- (f) Do the steps that follow to record the paint step measurements relative to the area free of paint:
- 1 Put the GE-4 Gaging Assembly in such a position that the base is on the area free of paint and the plunger touches the painted area.
 - 2 Move to the measurement points at the 12, 3, 6, and 9 o'clock positions, as shown on the LHS/RHS Step-Height spreadsheet and write the step height indications on it.
- NOTE:
- The GE-450 Dial Indicator indication is negative when the needle moves clockwise from zero and positive when the needle moves counterclockwise from zero.
 - When the indication is negative, it means that the area free of paint is inboard in relation to the painted area. When the



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indication is positive, it means that the area free of paint is outboard in relation to the painted area.

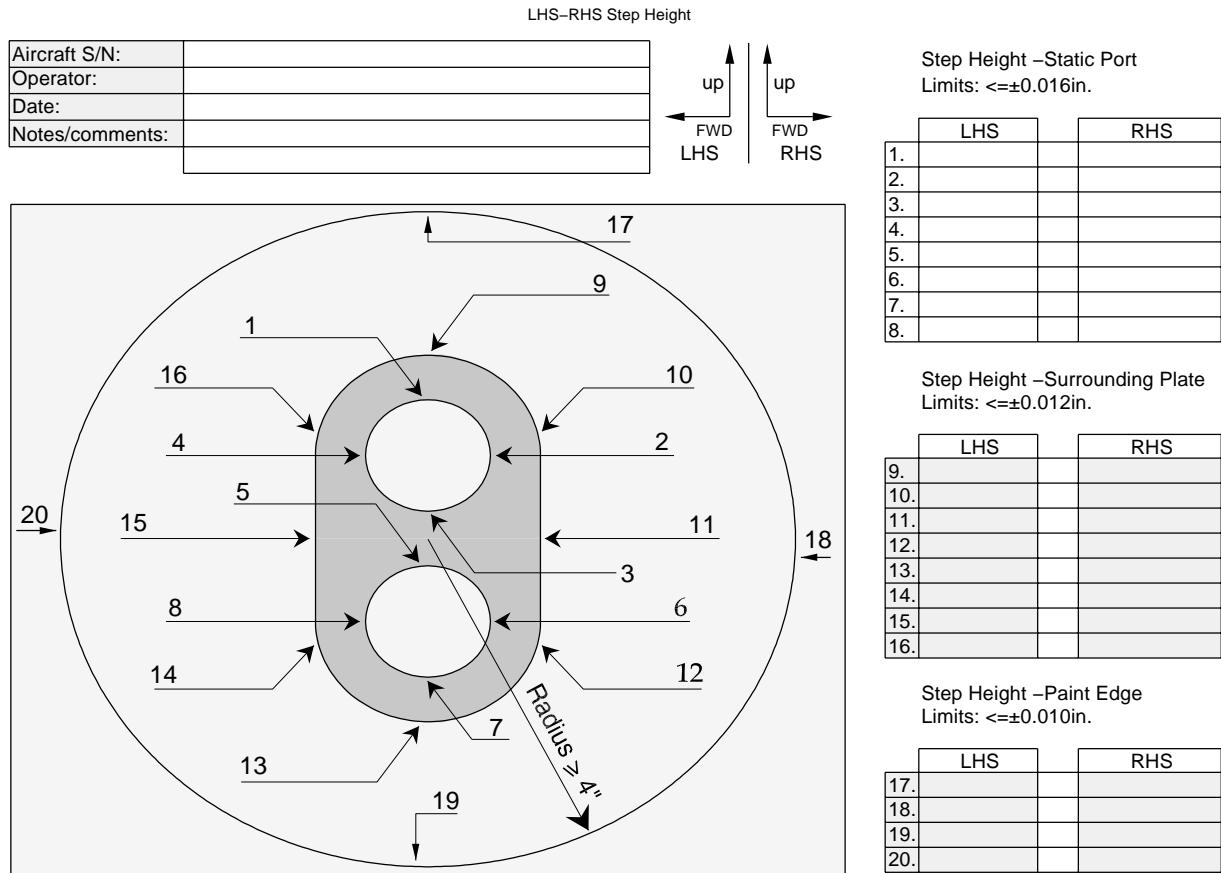
- 3 Do steps (c)2 through (f)2 again for the static ports, on the other side of the aircraft.
- 4 Make sure that the collected data are in the specified tolerances shown in [Figure 615](#). If NOT, contact Embraer for repair procedures.

J. Follow-on

SUBTASK 842-003-A

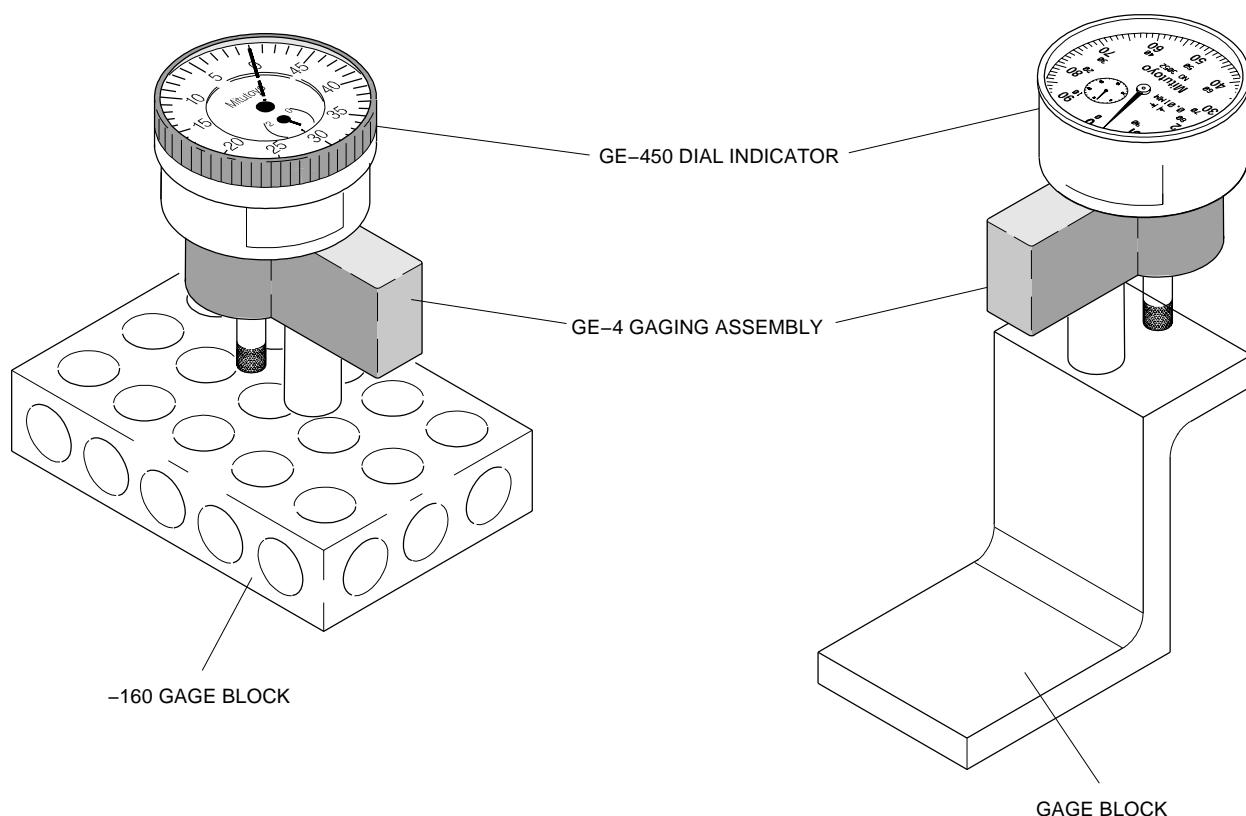
- (1) On the LH electrical-power control/distribution box, close these circuit breakers:
 - HEATING/TAT 1.
 - HEATING/PITOT 1.
 - HEATING/AOA 1.
- (2) On the RH electrical-power control/distribution box, close these circuit breakers:
 - HEATING/TAT 2.
 - HEATING/PITOT 2.
 - HEATING/AOA 2.
 - PITOT HTG 3.
- (3) Do the steps that follow to enter the results of the Flushness test in the IE-130 MSEExcel file:
 - (a) On the Step-Height spreadsheet, type the airplane information (Aircraft S/N, Operator, Date and Notes).
 - (b) On the Step-Height spreadsheet, type the measured values.
 - (c) On the IE-130 MSEExcel, click on the File menu and select Save as. The file name is the aircraft serial number.
 - (d) Close the excel file and IE-130 MSEExcel.
 - (e) Turn the power off on the computer.

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
LHS-RHS Spreadsheet
Figure 615



EM145AMM340360A.DGN

EFFECTIVITY:: RVSM COMPLIANT AIRCRAFT
GE-450 Dial Indicator Calibration
Figure 616



EM145AMM340363C.DGN



AIRCRAFT
MAINTENANCE MANUAL

TASK 34-13-04-200-803-A

EFFECTIVITY: AIRCRAFT WITH OXYGEN SERVICING PANEL CLOSED WITH SCREWS

4. OXYGEN SERVICING PANEL SURROUNDING FLUSHNESS AND INTEGRITY - INSPECTION

A. General

- (1) This task gives the procedures to do the geometric inspection of the Oxygen Servicing Panel surrounding for flushness and integrity.
- (2) Either GSE 268 or GSE 448 can be used to perform the task.

B. Zones and Accesses

Not Applicable

C. Tools and Equipment

ITEM	DESCRIPTION	PURPOSE	QTY
GSE 268	Data Acquisition Gaging Equipment	To inspect the Oxygen Servicing Panel surrounding for flushness and integrity	
GSE 448	Data Acquisition, Transmission and Storage equipment	To inspect the static port surrounding plate for flushness and integrity	

D. Auxiliary Items

Not Applicable

E. Consumable Materials

SPECIFICATION (BRAND)	DESCRIPTION	QTY
ASTM-D740	Methyl ethyl ketone (MEK)	AR

F. Expandable Parts

Not Applicable

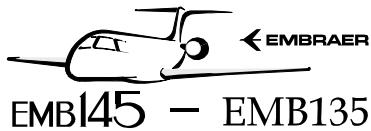
G. Persons Recommended

QTY	FUNCTION	PLACE
1	To do the measurements	Outside the aircraft

H. Preparation

SUBTASK 841-004-A

- (1) Do the steps that follow to inhibit the sensor heating system:
 - (a) On the LH electrical-power control/distribution box, open the circuit breakers:
 - HEATING/TAT 1.
 - HEATING/PITOT 1.
 - HEATING/AOA 1.
 - (b) On the RH electrical-power control/distribution box, open the circuit breakers:



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- HEATING/TAT 2.
- HEATING/PITOT 2.
- HEATING/AOA 2.
- PITOT HTG 3.

I. Inspection of the Oxygen Servicing Panel Surrounding for Flushness and Integrity

SUBTASK 280-004-A

(1) Do the steps that follow for the inspection:

- (a) Open the IE-130 MSEExcel file.
- (b) Make a hardcopy of OXYGEN DOOR Spreadsheet ([Figure 617](#)). It will be used to record the test data.
- (c) Do the zero procedure of the GE-450 Dial Indicator ([Figure 616](#)) as follows:

- 1 Clean the GE-4 Gaging Assembly, the Gage Block, and the GE-450 Dial Indicator.
- 2 Put the GE-4 Gaging Assembly on the Gage Block.
- 3 Set the GE-450 Dial Indicator to read 0.000 in.

NOTE: Make sure that the GE-450 Dial Indicator needle moves clockwise from zero when the plunger is pushed in and counterclockwise from zero when the plunger is extended.

- 4 Put an adhesive tape to hold the indicator bezel.
- 5 Remove the GE-4 Gaging Assembly and store the Gage Block.

(d) Do the Oxygen Servicing Panel measurements relative to the aircraft skin as follows:

- 1 Write the airplane information (Aircraft S/N, Operator, Date and Notes) on the OXYGEN DOOR Step-Height spreadsheet ([Figure 617](#)).
- 2 Clean with MEK the surface of the Oxygen Servicing Panel and fuselage in the measurement region. Examine and write possible damage to the panel on the OXYGEN DOOR Step-Height spreadsheet in the notes/comments field.
- 3 Put the GE-4 Gaging Assembly onto the Oxygen Servicing Panel .

NOTE: The base of the GE-4 Gaging Assembly must be placed on the airframe skin and the plunger must touch the panel.

- 4 Move to the measurement point, as shown the on OXYGEN DOOR Step-Height spreadsheet ([Figure 617](#)), and write the step height indication on it.

NOTE: • When the GE-450 Dial Indicator moves clockwise from zero, it must be recorded on the OXYGEN DOOR Step-Height spreadsheet as a positive value. When the GE-450 Dial

Indicator moves counterclockwise from zero, it must be recorded on the OXYGEN DOOR Step-Height spreadsheet as a negative value.

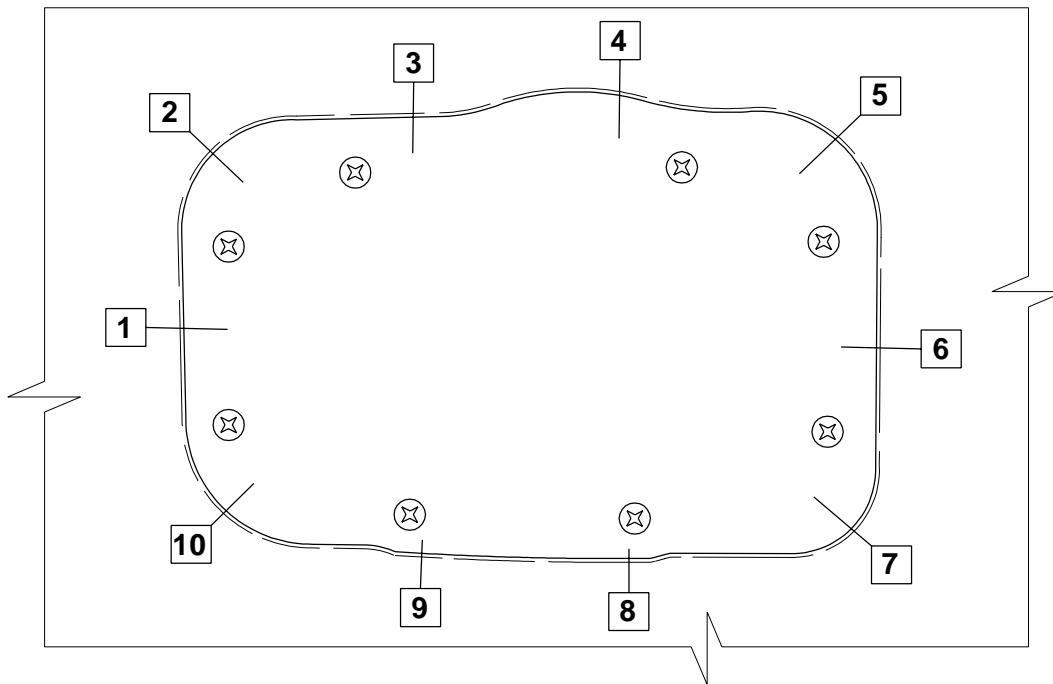
- When the recorded value is positive, it means that the panel is inboard in relation to the aircraft skin. When the value is negative, it means that the panel is outboard in relation to the aircraft skin.

- 5 Do step (c)4 again for each measurement point on the panel (total of 10 measurement points).
- 6 Make sure that the collected data are in the specified tolerances shown in [Figure 617](#). If NOT, contact Embraer for repair procedures.

J. Follow-on

SUBTASK 842-004-A

- (1) On the LH electrical-power control/distribution box, close these circuit breakers:
 - HEATING/TAT 1.
 - HEATING/PITOT 1.
 - HEATING/AOA 1.
- (2) On the RH electrical-power control/distribution box, close these circuit breakers:
 - HEATING/TAT 2.
 - HEATING/PITOT 2.
 - HEATING/AOA 2.
 - PITOT HTG 3.
- (3) Do the steps that follow to enter the results of the Flushness test in the IE-130 MSExcel file:
 - (a) Select the OXYGEN DOOR Spreadsheet.
 - (b) On the OXYGEN DOOR Step-Height spreadsheet, type the airplane information (Aircraft S/N, Operator, Date and Notes).
 - (c) On the OXYGEN DOOR Step-Height spreadsheet, type the measured values.
 - (d) On the MSExcel, click on the File menu and select Save as. The file name is the aircraft serial number.
 - (e) Close the excel file and MSExcel.
 - (f) Turn the power off on the computer.

EFFECTIVITY:: AIRCRAFT WITH OXYGEN SERVICING PANEL CLOSED WITH SCREWS
OXYGEN DOOR Spreadsheet
Figure 617

LIMITS: $<= \pm 0.030$ in.

AIRPLANE INFORMATION	
MODEL :	
SERIAL No :	
OPERATOR :	
DATE :	
FLIGHT HOURS :	
FLIGHT CYCLES :	
GENERAL NOTES :	

MEASUREMENT (INCHES)	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

- NOTE :**
- THE GE- 4 GAGE ASSEMBLY BASE MUST BE PLACED ON THE AIRFRAME SKIN, IN THE OXYGEN SERVICING PANEL, AND THE PLUNGER MUST TOUCH THE DOOR.
 - THE GE- 450 DIAL INDICATOR READING IS POSITIVE WHEN THE NEEDLE MOVES CLOCKWISE FROM ZERO AND NEGATIVE WHEN THE NEEDLE MOVES COUNTERCLOCKWISE FROM ZERO
 - WHEN THE INDICATION IS POSITIVE, IT MEANS THAT THE DOOR PORT IS INBOARD IN RELATION TO THE AIRFRAME SKIN. WHEN THE INDICATION IS NEGATIVE, IT MEANS THAT THE DOOR IS OUTBOARD IN RELATION TO THE AIRFRAME SKIN.

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