

Chapter 57

VG AND WINGTIPS

FBA-2C1, FBA-2C2, FBA-2C3
FBA-2C4, FBA-2C3T, FBA-2C4T

Found Aircraft Canada
Maintenance Program FAC2-M200

INTENTIONALLY LEFT BLANK

LIST OF EFFECTIVE PAGES			
Chapter	Section	Page No.	Date
57	57-Title	1	January 23, 2012
		2	January 23, 2012
	57-LOEP	1	January 23, 2012
		2	January 23, 2012
	57-TOC	1	January 23, 2012
		2	January 23, 2012
	57-00	1	July 28, 2008
		2	July 28, 2008
		3	July 28, 2008
		4	July 28, 2008
	57-10	1	July 28, 2008
		2	July 28, 2008
	57-15	1	August 5, 2010
		2	August 5, 2010
	57-81	1	July 28, 2008
		2	July 28, 2008
		3	July 28, 2008
		4	July 28, 2008
		5	July 28, 2008
		6	July 28, 2008
	57-82	1	July 28, 2008
		2	July 28, 2008
		3	July 28, 2008
		4	July 28, 2008
		5	July 28, 2008
		6	July 28, 2008
		7	July 28, 2008
		8	July 28, 2008
		9	July 28, 2008
		10	July 28, 2008

FBA-2C1, FBA-2C2, FBA-2C3
FBA-2C4, FBA-2C3T, FBA-2C4T

Found Aircraft Canada
Maintenance Program FAC2-M200

INTENTIONALLY LEFT BLANK

FBA-2C1, FBA-2C2, FBA-2C3
FBA-2C4, FBA-2C3T, FBA-2C4T

Found Aircraft Canada
Maintenance Program FAC2-M200

INTENTIONALLY LEFT BLANK

57 WINGS

57-00 GENERAL

The wing is a one piece fully cantilevered aluminum assembly with integral fuel tanks. There is a main spar which runs from tip to tip, a forward spar which runs from the fuselage to rib #9, and a rear spar which runs from the fuselage to the tip. There are fifteen rib locations in each wing. Aluminum skins cover the top and bottom. Stringers, doublers, brackets etc. make up the remainder of the assembly.

57-00-10 Wing Removal and Installation

Removal

Step 1. All fuel is to be drained from the wing tanks and the collector tanks.

Step 2. Disconnect the fuel lines at outboard of rib #1.

Note: Label all wires and pins before disconnecting.

Step 3. Disconnect electrical connections at terminal block on rib #1.

Step 4. Disconnect pitot/static lines at main spar just inboard of rib #3.

Step 5. Disconnect aileron control cables at bellcrank in wing.

Step 6. Remove windshield fairings/wing leading edge.

Step 7. Loosen fasteners on windshield upper keeper strip.

CAUTION: Wing weight with fuel drained and all control surfaces installed is approximately 400 pounds, ensure sling and lifting device are sufficient to lift the weight and control centre of gravity with the wing removed.

Step 8. Connect lifting sling to 3/16 eyebolts located on the main spar just outboard of rib #1.

Step 9. Remove rivets which attach cabin roof to fuselage side skins.

Step 10. See Chapter 53-40-11 for removal of Aft Upper Truss.

Step 11. Remove bolts from Forward Upper Trusses.

Step 12. Remove bolts from front spar attachments.

Step 13. Remove bolts from main wing to fuselage fitting. Wing is now free.

Step 14. Raise wing slowly until it is clear of fuselage.

Step 15. Install fuselage brace tool in fuselage fittings. Ref: Figure 57-00-01.

Installation

Installation of the wing may be accomplished by reversing steps in 57-00-10 and then carrying out the following steps.

Note: New nuts and bolts must be used whenever the wing is removed and installed.

Step 1. Carry out independent inspection of all wing attachment points.

WARNING

CONFIRM AILERON MOVEMENT IN RELATION TO CONTROL WHEEL MOVEMENT.
FAILURE TO CONFIRM COULD RESULT IN LOSS OF CONTROL RESULTING IN
DESTRUCTION OF THE AIRCRAFT AND LOSS OF LIFE.

Step 2. Carry out aileron rigging check. Ref: 27-10-01

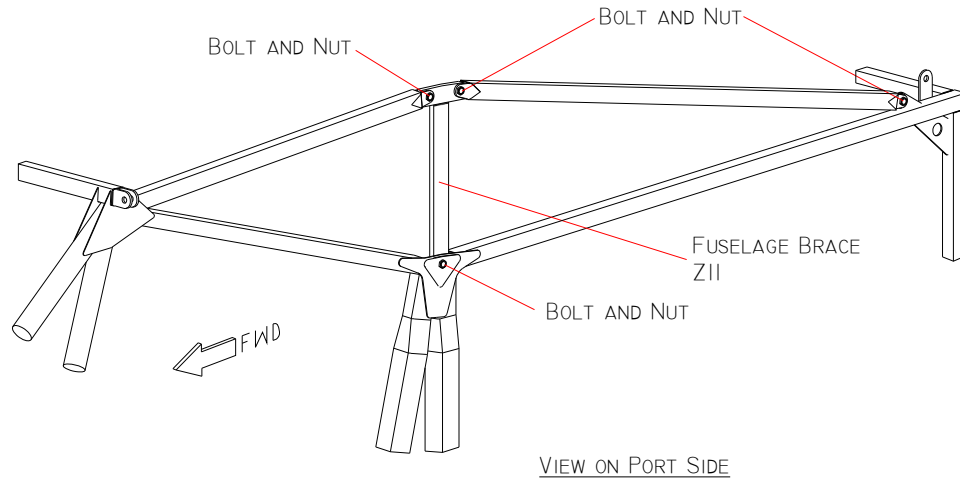
Step 3. Carry out flap operational check. Ref: 05-00-10

Step 4. Carry out navigation light operational check.

Step 5. Carry out pitot/static system leak check.

Step 6. Carry out fuel system leak check with the fuel tanks full.

Step 7. Perform a check flight to ensure flight characteristics have not been degraded.



NOTES:

INSTALL FUSELAGE BRACE ZII, (PORT & STBD. SIDE)
IMMEDIATELY AFTER WING REMOVAL

Figure 57-00-01 Wing Brace Tool

FBA-2C1, FBA-2C2, FBA-2C3
FBA-2C4, FBA-2C3T, FBA-2C4T

Found Aircraft Canada
Maintenance Program FAC2-M200

INTENTIONALLY LEFT BLANK

57-10 WING MAIN FRAME STRUCTURE

The main spar is made up of top and bottom aluminum spar caps riveted to aluminum sheet webs. At each rib position there is a D-nose rib and an In Spar rib which are riveted to the main spar. All of the ribs are tied together with stringers which are riveted to the ribs. All of the fasteners and seams in the fuel tank area are fayed, filleted and top coat sealed to ensure no fuel leaks can occur.

57-10-10 Spars

The main spar is comprised of four aluminum spar caps, the top and bottom aft caps running from rib #9 Port to rib #9 Starboard and the top and bottom forward caps running from rib #5 Port to rib #5 Starboard. The spar caps are joined by aluminum spar webs which run from the aircraft centerline to ribs #9 Port and Starboard.

The outboard wing section spars begin at rib #9 and run to each wing tip. Each outboard spar is a web which is flanged on the bottom and has a flanged doubler on the top.

57-10-20 Ribs

Each of the fifteen rib positions uses two rib sections. D nose ribs are used from the main spar forward to the leading edge. In Spar ribs are used from the main spar aft to the rear spar. The eight inboard ribs also use a D nose section ahead of the forward spar.

All of the ribs have lightening holes in them which also allow for the routing of lines and wires as required.

57-10-30 Stringers

The stringers are all aluminum of various cross-sections.

57-10-40 Skins

All the skins are 2024 aluminum sheet of varying thickness.

FBA-2C1, FBA-2C2, FBA-2C3
FBA-2C4, FBA-2C3T, FBA-2C4T

Found Aircraft Canada
Maintenance Program FAC2-M200

INTENTIONALLY LEFT BLANK

57-15 WING ATTACHMENT FITTINGS

57-15-10 Wing/Fuselage

There are ten wing to fuselage attachment points. There are eight located on the main spar and one located on each of the forward spars. Refer to Figure 57-15-01.

The fittings on the main spar may all be replaced in the field.

Contact manufacturer if replacement of the forward spar attachment fittings is required.

57-15-20 Main Spar Pickup Fittings

The two main pick ups are located on the bottom of the main spar just inboard of rib #1. These fittings are shaped like a 'tuning fork' and are bolted to the spar.

Removal and Installation

The wing must first be removed from the aircraft. The wing needs only be raised about six inches to carry out main attachment fitting replacement. See section 57-00-10 for wing removal.

Remove the three bolts which attach the fitting to the spar. The fitting is now free.

To install fitting first obtain new hardware, and then reverse above steps. Torque for attachment fitting bolts is 30 to 40 in -lbs.

57-15-30 Fail Safe Links

The fail safe links can be replaced without removing the wing from the aircraft.

Gain access to the links by removing the upholstery at the forward wing root. Headset jack panel may be removed to give greater access.

Remove bolt from top of fail safe link.

Remove bolt from bottom of fail safe link. Fail safe link is now free.

To install fail safe link reverse above steps. Torque bolts to 50-70 in-lbs.

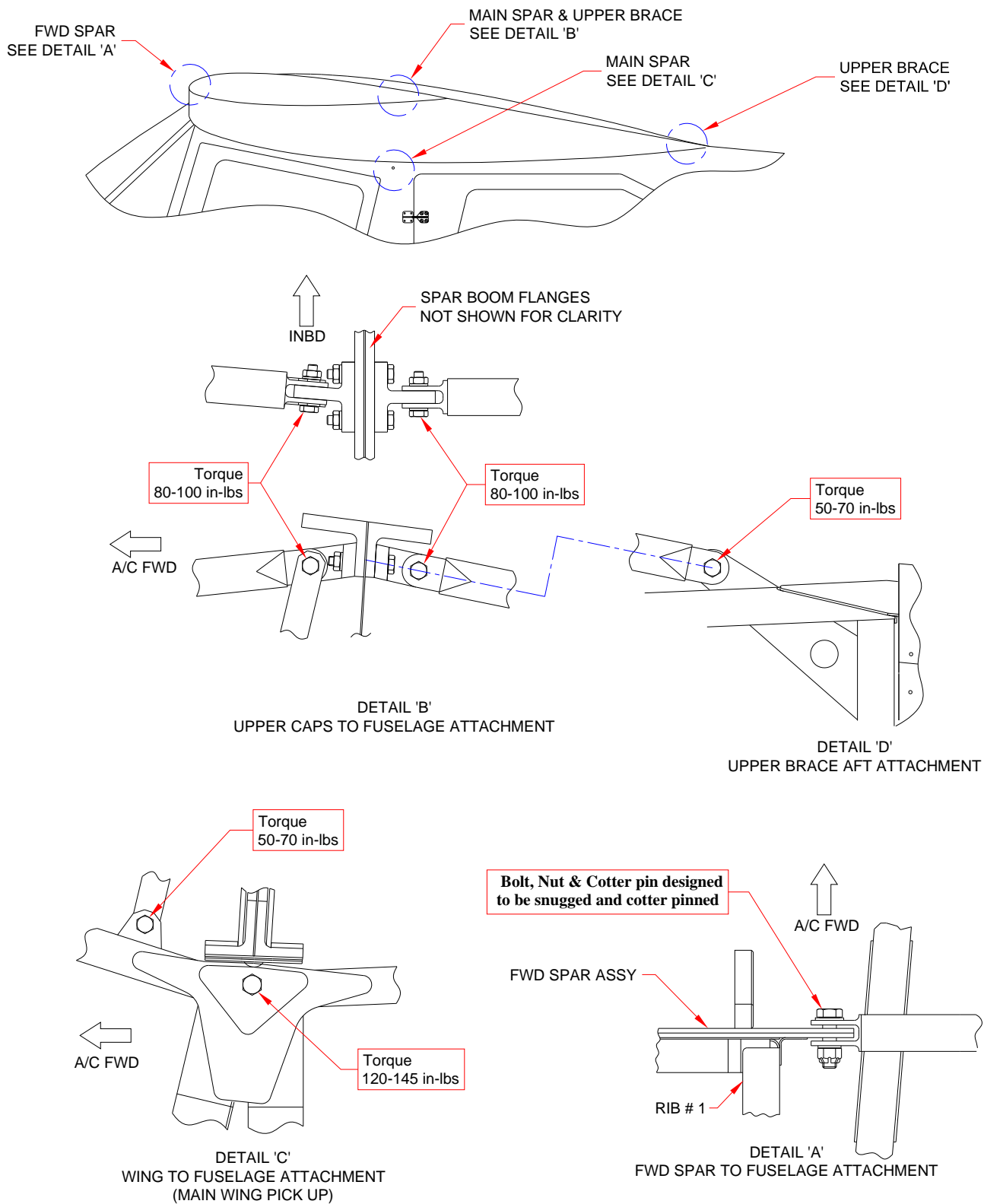


Figure 57-15-02 Wing Installation

57-81 VORTEX GENERATORS (VGS) – 2C1 AND 2C2

Applicable to aircraft S/N 50 onwards.

There are total of 12 (6 per side) vortex generators installed on the port and starboard wing leading edges. The vortex generators are installed to improve the stall characteristics. The installation is designated as Mod 1214.

There is no requirement to remove the VGs for inspection.

The vortex generators (VGs) are bonded to the wing skins and it is possible for one or more VGs to be “missing in action”. A minimum of 4 VGs per wing are required for flight. That is, 4 VGs on the left wing and 4 VGs on the right wing. Missing VGs should be replaced using the following installation instructions. Obtain new VGs from FAC, part number RAP-VG-10C.

Installation of missing VGs

Note: All required templates can be obtained from Found Aircraft Canada.

- Step 1. Clean leading edge area where VGs will be installed with isopropyl alcohol. See Figure 57-81-01 for location.
- Step 2. Using profile template TF1448, mark 2.5” location on the Rib #9 rivet line as shown in Figure 57-81-02.
- Step 3. Using profile template TF1698, mark 2.0” location on the rib #16 rivet line as shown in Figure 57-81-03. If necessary, the tool may be placed on the wing tip just outboard of Rib #16.
- Step 4. Tape a string between the two marks described in Step 2 and Step 3.
- Step 5. Place the rear edge of the VG template, TF1699, along the string. The inboard edge of the template should be ½” inboard of rib #9 rivet line.
- Step 6. Carefully apply VGs using any silicone, urethane or epoxy based adhesive (e.g. “Loctite” 330) The VGs must be installed with the rounded end fwd. A VG set (2 VGs) may be shifted span wise by maximum of one VG width to avoid rivet heads. Keep the VG spacing of 1.5” in a set.
- Step 7. If more than 2 VGs per wing were installed, perform a check flight to ensure flight characteristics have not been degraded

Installation of Missing Placard

Placard, p/n X957, is located in plain view of the pilot. If this placard is missing or illegible install a new placard. Figure 57-81-04 shows an acceptable location for the placard but depending on aircraft configuration this location may be occupied, in this case, select an alternate location that is in plain view of the pilot.

Clean location with soap and water and apply “peel-and-stick” placard P/N X957.

Service and Maintenance

The vortex generators (VGs) do not require any service or maintenance. However, due to the fact the VGs are bonded to the wing skins they should be inspected before each flight for condition, security and quantity. A minimum of 4 VGs per wing is required for flight.

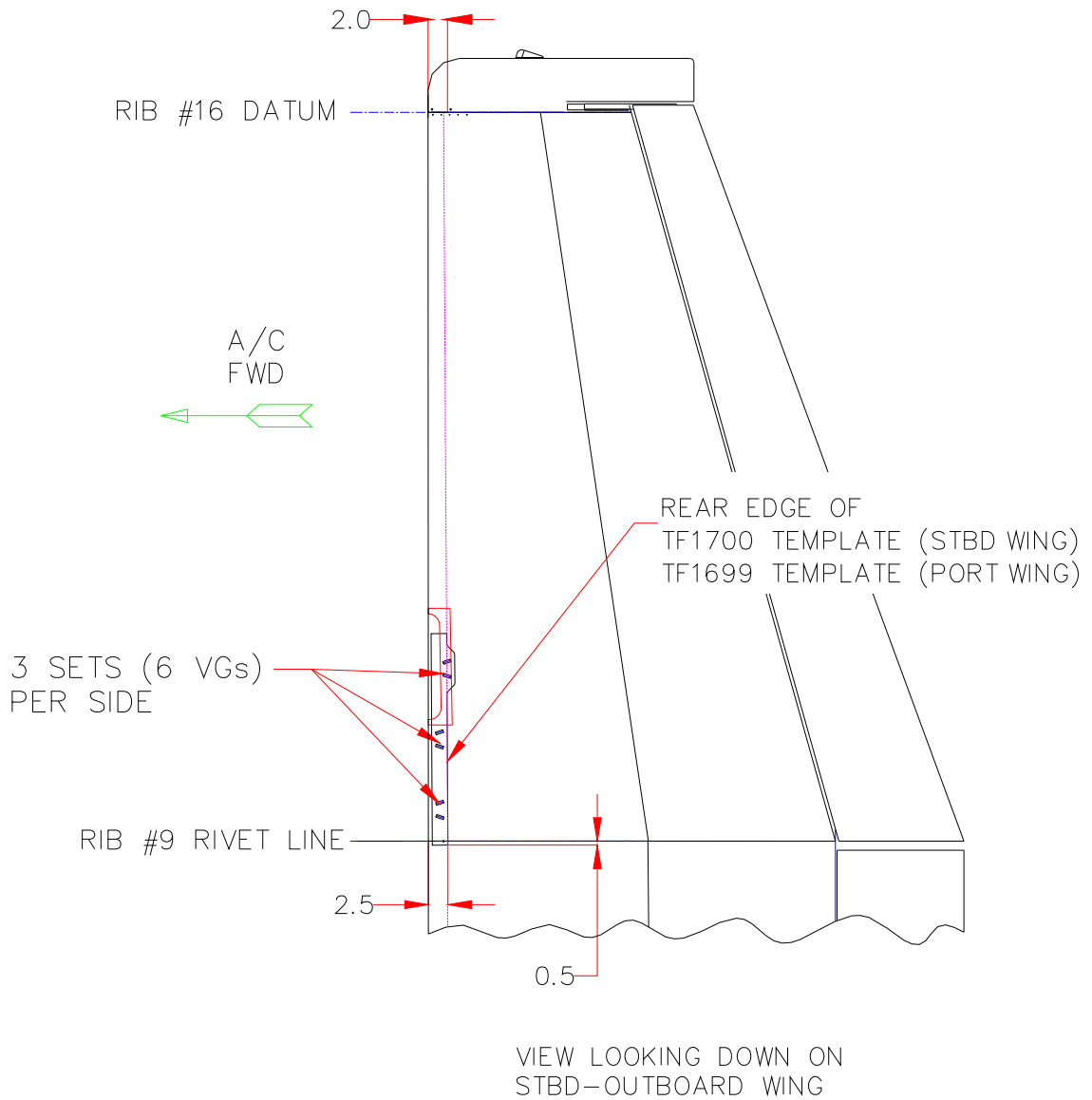
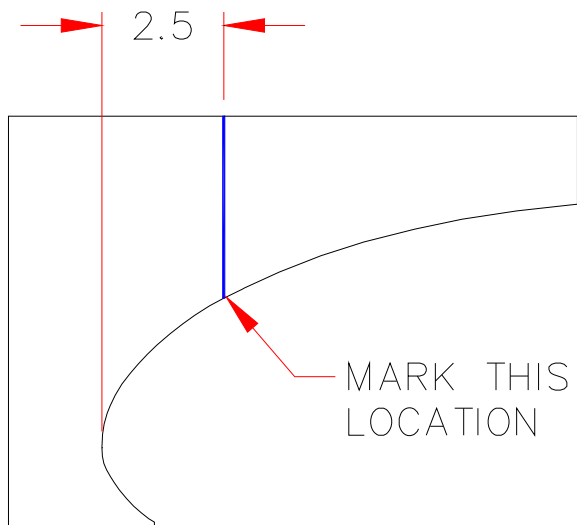
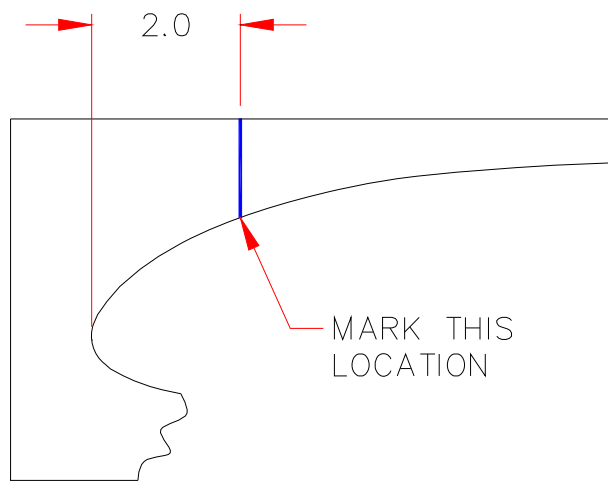


Figure 57-81-01: VG Installation



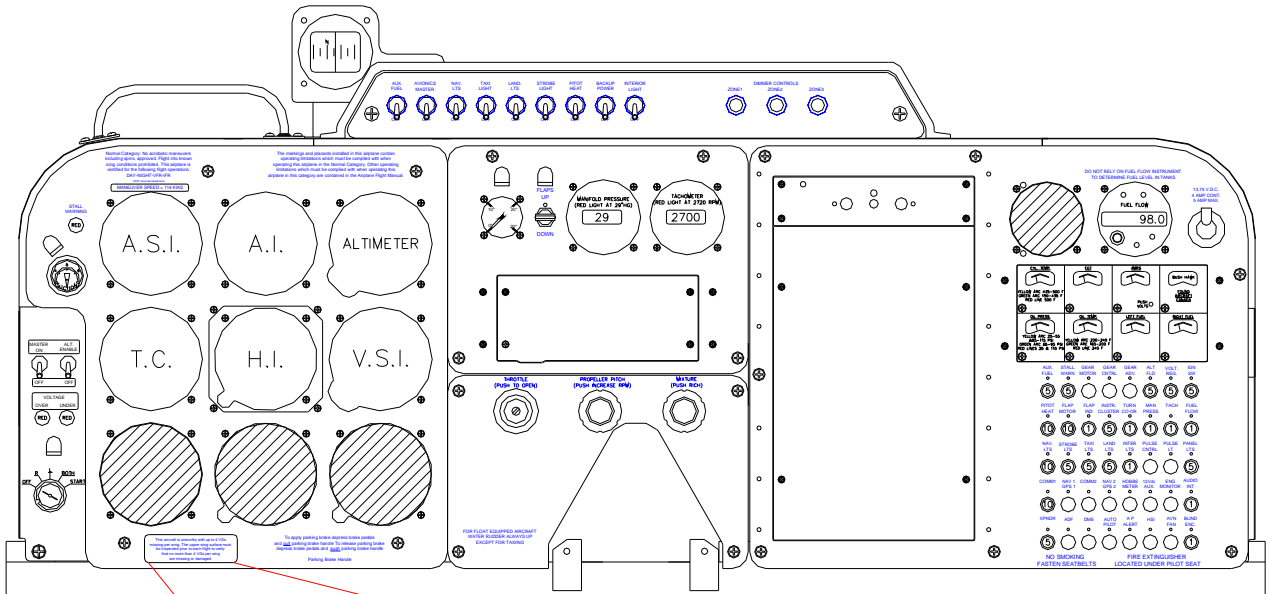
VIEW AT RIB #9

Figure 57-81-02: VG Installation



VIEW AT RIB #16

Figure 57-81-03: VG Installation



This aircraft is airworthy with at least 4 VGs installed per wing. The upper wing surface must be inspected prior to each flight to verify at least 4 VGs per wing are attached and undamaged.

Figure 57-81-04: VG Placard Installation

FBA-2C1, FBA-2C2, FBA-2C3
FBA-2C4, FBA-2C3T, FBA-2C4T

Found Aircraft Canada
Maintenance Program FAC2-M200

INTENTIONALLY LEFT BLANK

57-82 FULL SPAN VORTEX GENERATORS (VGS)

Applicable to 2C1 and 2C2 aircraft with Mod 1215 or SI-57-01 incorporated and all 2C3 and 2C4 aircraft.

There is a series of vortex generators (VGs) on the upper surface of the wing and swept wing tips. The VGs start at the Rib #3 and run outboard to the tip.

A total of 72 vortex generators are installed on the port and starboard wing leading edges.

There is no requirement to remove the VGs for inspection.

The vortex generators (VGs) are bonded to the wing skins and it is possible for one or more VGs to be “missing in action”. A minimum of 32 VGs per wing are required for flight. That is, 32 VGs on the left wing and 32 VGs on the right wing. Missing VGs should be replaced using the following installation instructions. Obtain new VGs from FAC, part number RAP-VG-10C (2C1 & 2C2) or RAP-VG-15C12 (2C3 & 2C4).

Installation of Missing VGs

Note: All required templates can be obtained from Found Aircraft Canada. Alternatively, they can be manufactured from stick-on decal material or self adhesive paper/tape.

- Step 1. Clean leading edge area where VGs will be installed with isopropyl alcohol. See Figure 57-82-01 (2C1 & 2C2) or Figure 57-82-04 (2C3 & 2C4) for complete set location.
- Step 2. If less than four VGs are missing in a row, use a VG template, TF1709 (2C1 & 2C2), or TF1711 (2C3 & 2C4) to determine where the missing VG should be installed. Use the nearest VG or nearest VG set from the missing VG to correctly locate (align) the “peel-and-stick” template. Ensure that the VG template is laid down neatly and reasonably straight. Jump to Step 9 after applying the template.
- Step 3. If more than three sets of the VGs are missing follow the steps shown in Step 4 to Step 11.
- Step 4. 2C1 & 2C2 - Using detail A, mark 2.5” location near the Rib #3 as shown in Figure 57-82-01.
2C3 & 2C4 - Using detail A, mark 6.75” location near the Rib #3 as shown in Figure 57-82-04.
- Step 5. 2C1 & 2C2 - Using detail B, mark 2.5” location near the Rib #9 as shown in Figure 57-82-01.
2C3 & 2C4 - Using detail B, mark 6.75” location near the Rib #9 as shown in Figure 57-82-04.
- Step 6. 2C1 & 2C2 - Using detail C, mark 2.0” location near the Rib #16 as shown in Figure 57-82-01.
2C3 & 2C4 - Using detail C, mark 4.86” location near the Rib #16 as shown in Figure 57-82-04.

- Step 7. Tape a string along the three marks. Ensure that the string is tight.
- Step 8. Place the rear edge of the VG template, TF1709, TF1699, and TF1700 (2C1 & 2C2), or TF1711 (2C3 & 2C4), along the string. Apply the VG template as shown in Figure 57-82-02 (2C1 & 2C2) or 57-82-05 (2C3 & 2C4). Start laying the templates from 0.5" inboard of Rib #9 rivet line and go outboard or inboard.
- Step 9. Lightly mark the VG positions.
- Step 10. Remove the VG templates carefully before applying permanent adhesive.
- Step 11. Carefully apply VGs using any silicone, urethane or epoxy based adhesive (e.g. "Loctite" 330). The VGs must be installed with the rounded end forward. A VG set (2 VGs) may be shifted span wise by maximum of one VG width to avoid rivet heads. Keep the VG spacing of 1.5" in a set.
- Step 12. If more than 4 VGs per wing were installed, perform a check flight to ensure flight characteristics have not been degraded.

Installation of Missing Placard

Placard, p/n X969, is located in plain view of the pilot. If this placard is missing or illegible install a new placard. Figure 57-82-03 shows an acceptable location for the placard but depending on aircraft configuration this location may be occupied, in this case, select an alternate location that is in plain view of the pilot.

Clean location with soap and water and apply "peel-and-stick" placard P/N X969.

Service and Maintenance

The vortex generators (VGs) do not require any service or maintenance. However, due to the fact that the VGs are bonded to the wing skins they should be inspected prior to each flight for condition, security and quantity. A minimum of 32 VGs per wing is required for flight.

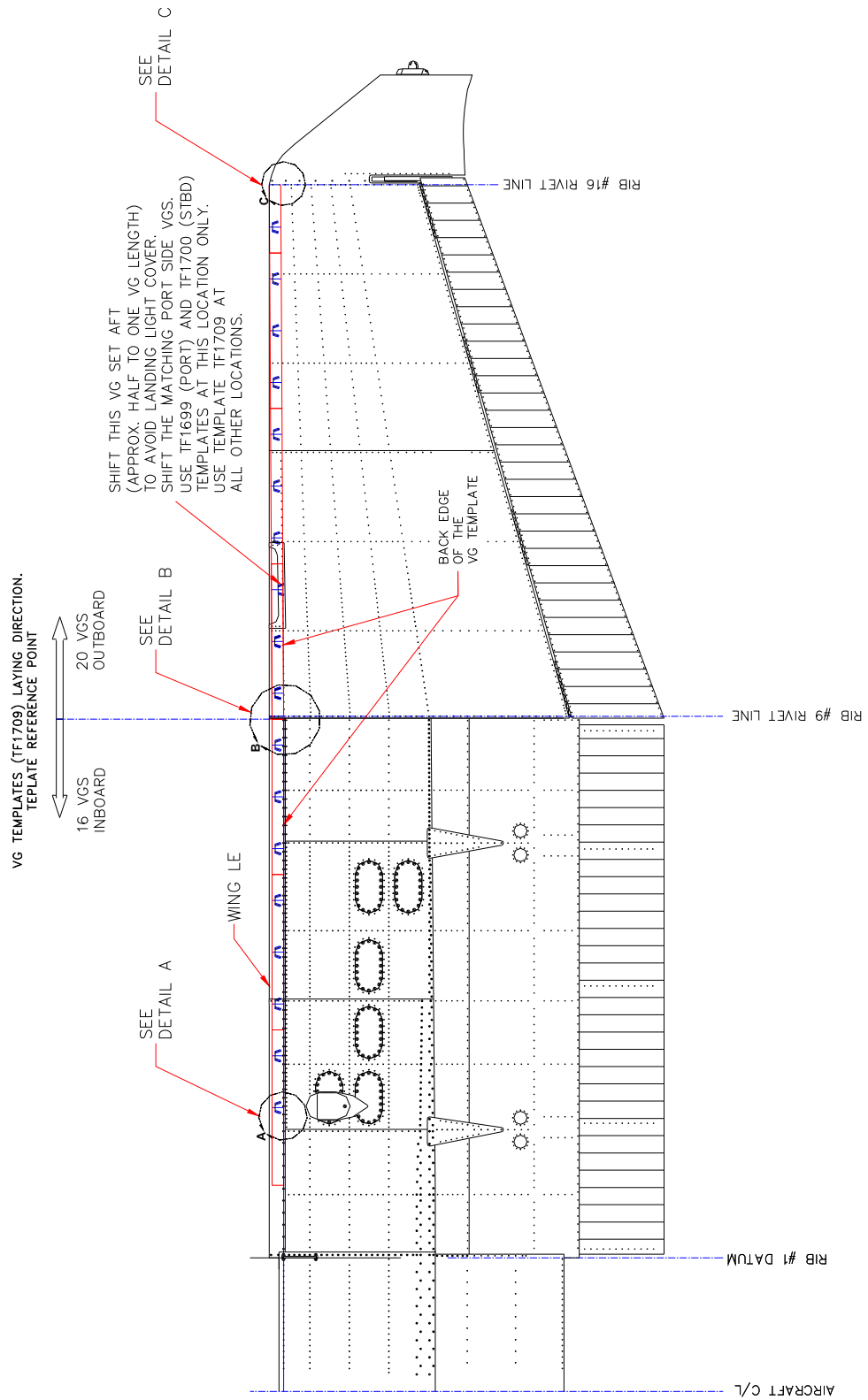


Figure 57-82-01 (Sheet 1 of 3): VG Installation (2C1 & 2C2)

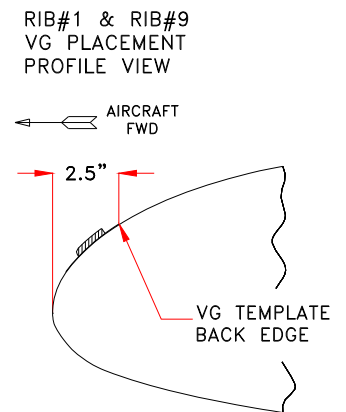
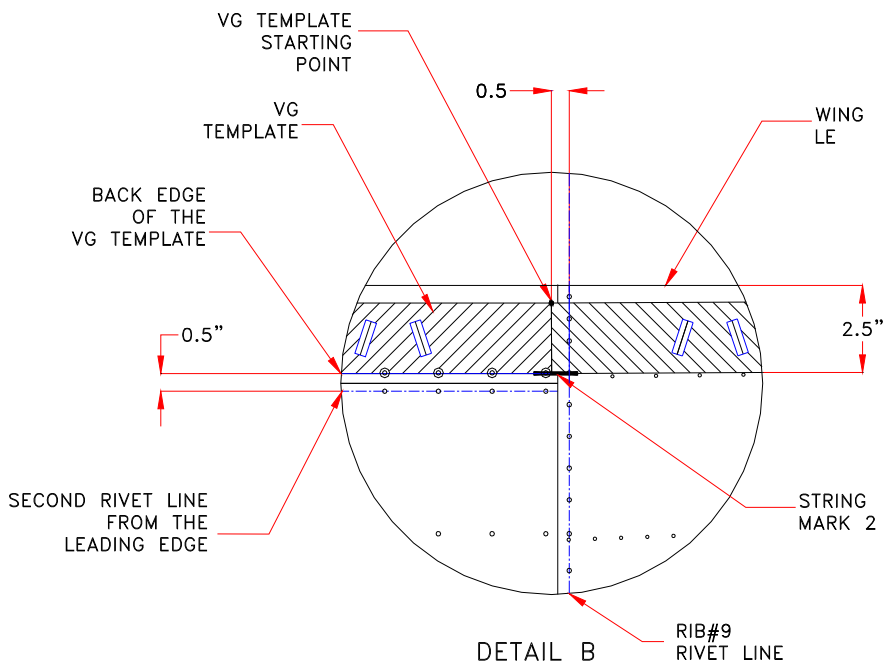
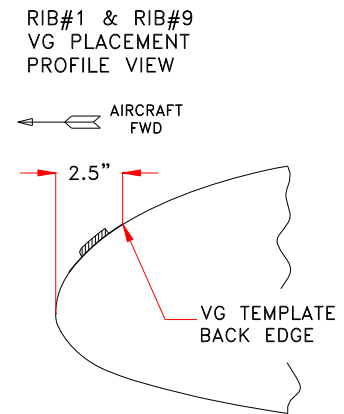
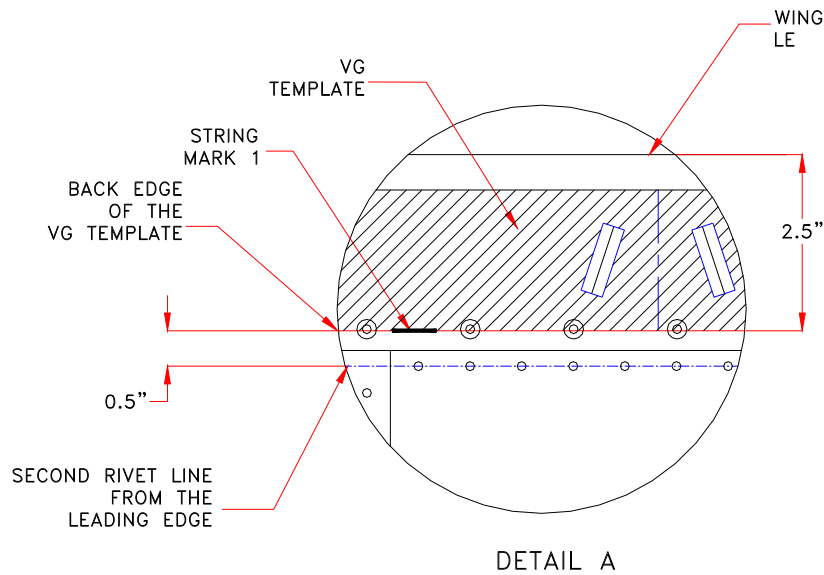


Figure 57-82-01 (Sheet 2 of 3): VG Installation – Detail A, B (2C1 & 2C2)

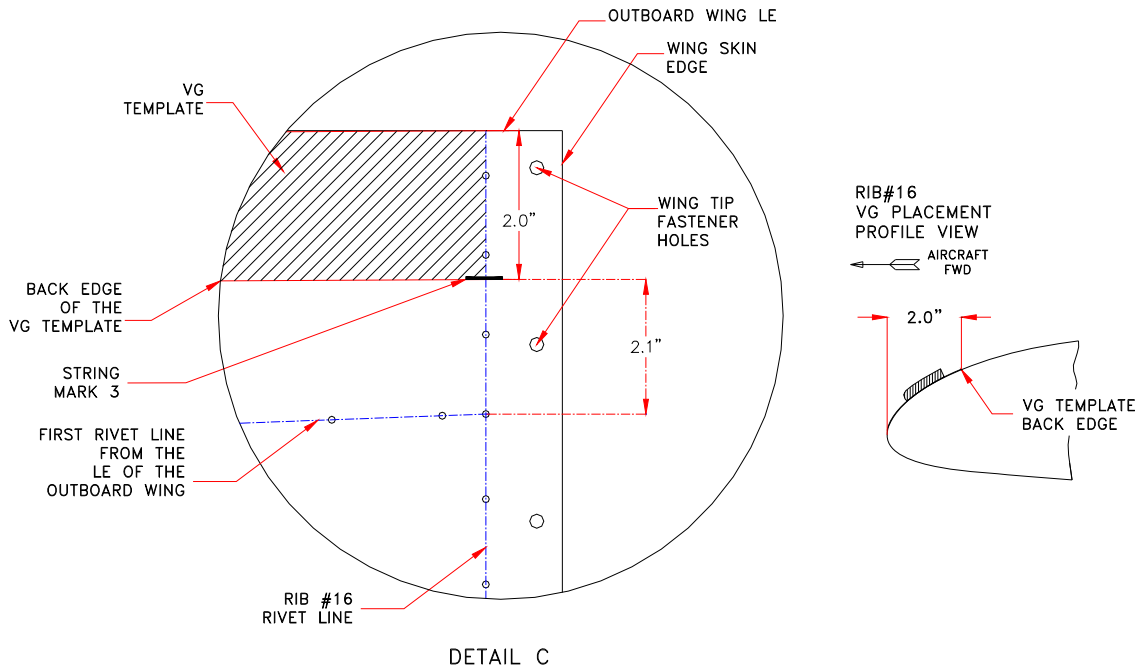


Figure 57-82-01 (Sheet 3 of 3): VG Installation – Detail C

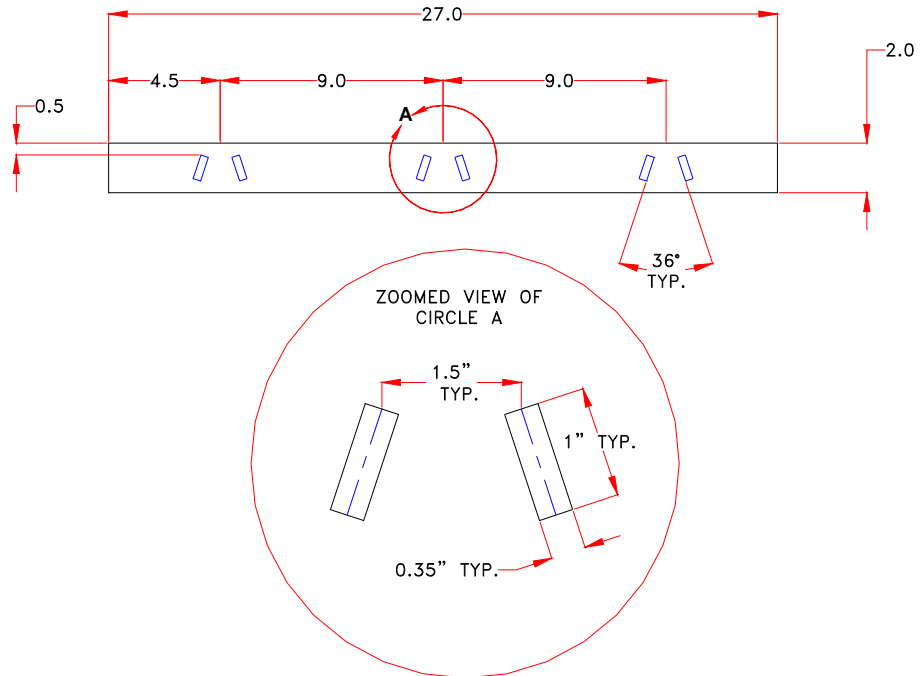
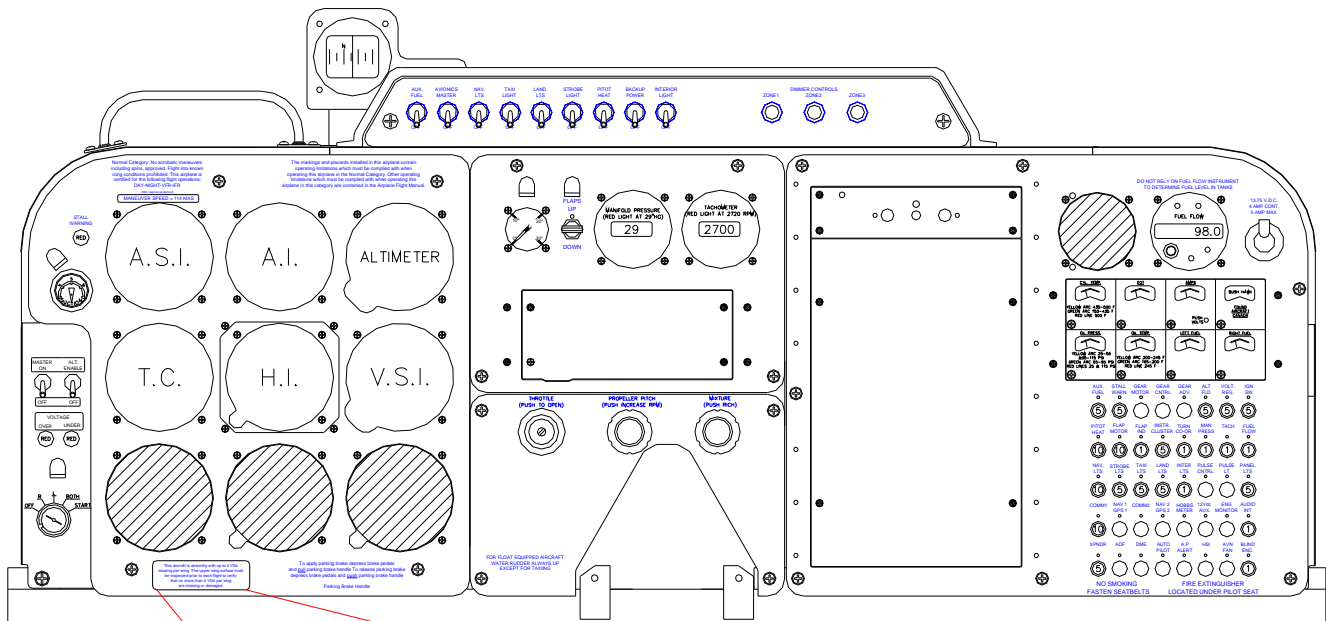


Figure 57-82-02: VG Template – TF1709 (2C1 & 2C2)



This aircraft is airworthy with up to 4 VGs missing per wing. The upper wing surface must be inspected prior to each flight to verify that no more than 4 VGs per wing are missing or damaged.

Figure 57-82-03: Full Span VG Placard – X969

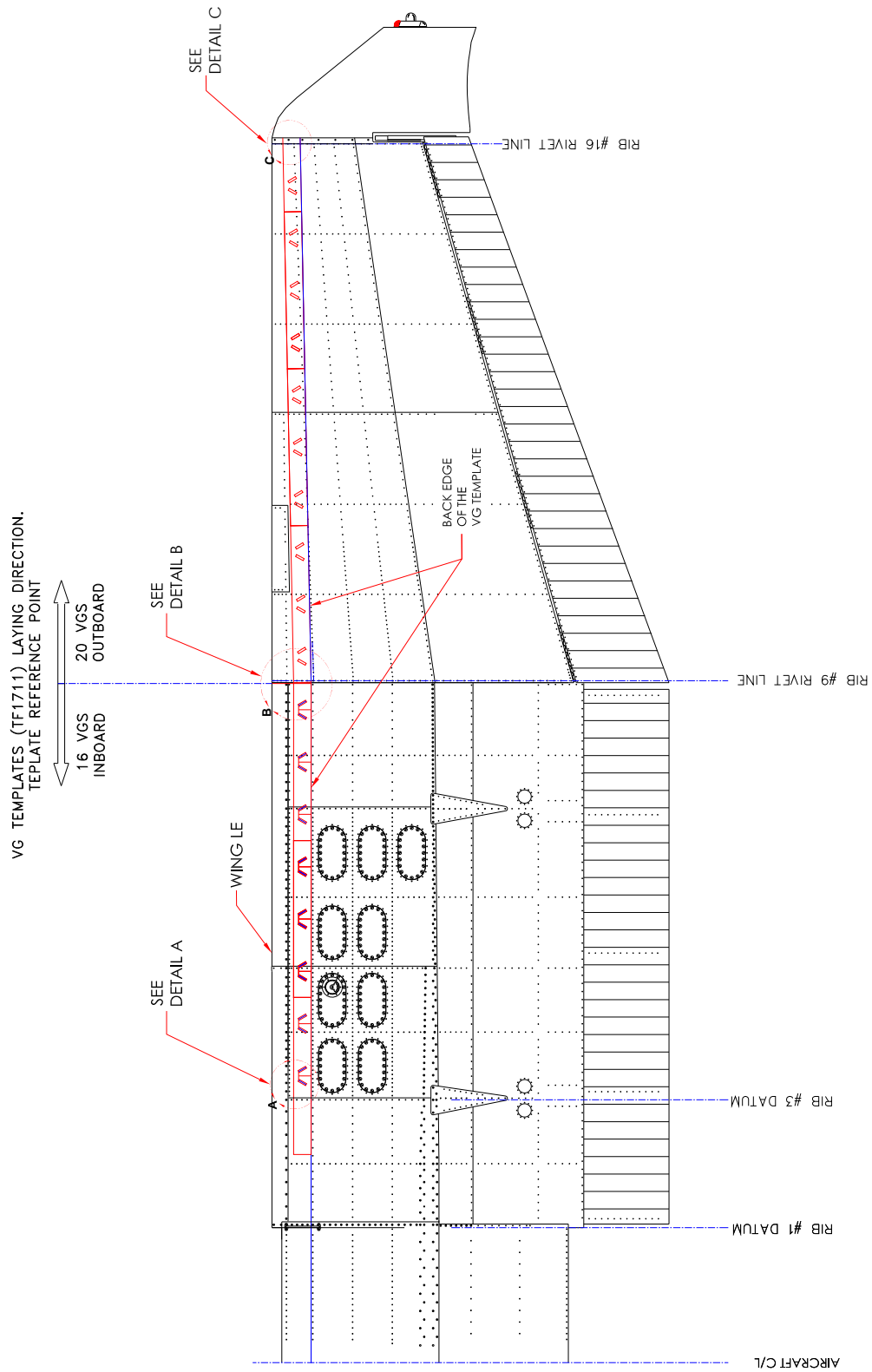


Figure 57-82-04 (Sheet 1 of 2): VG Installation (2C3 & 2C4)

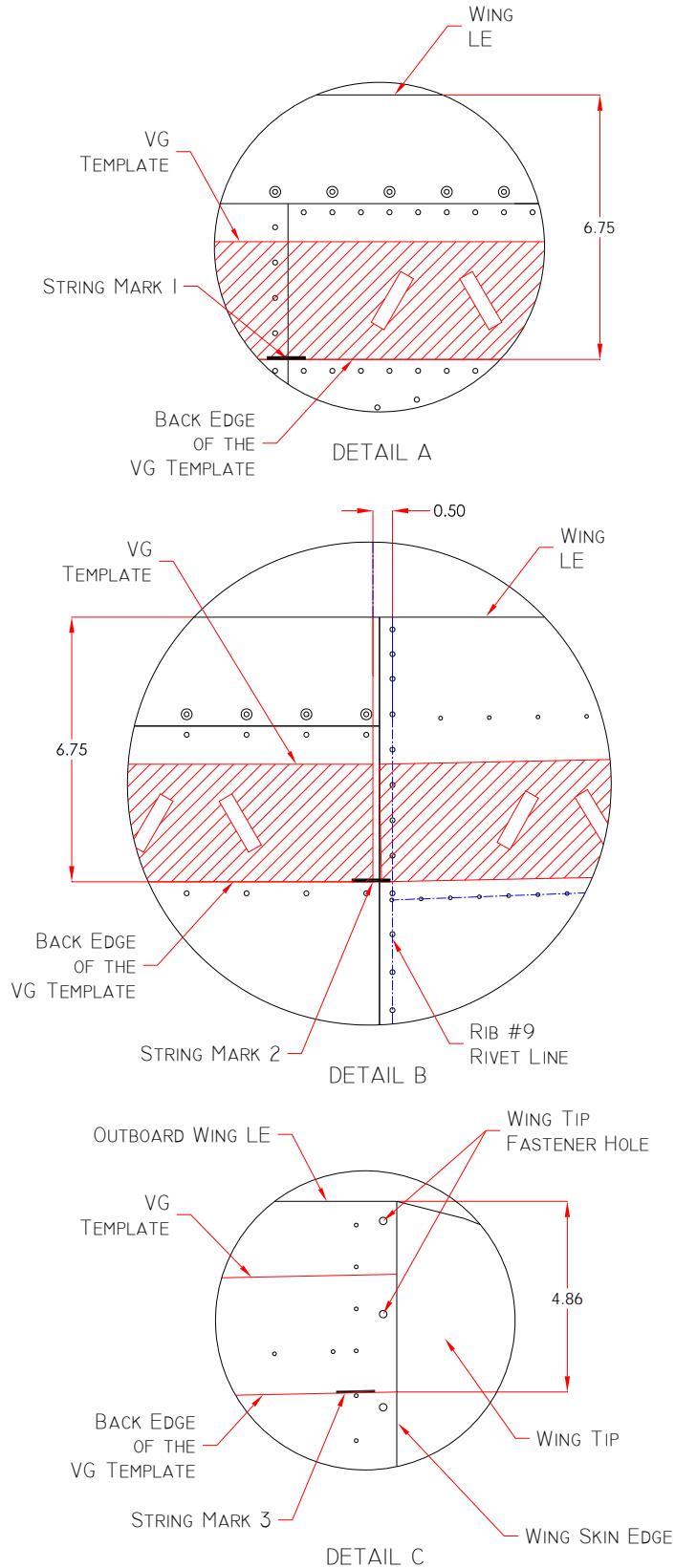


Figure 57-82-04 (Sheet 2 of 2): VG Installation (2C3 & 2C4)

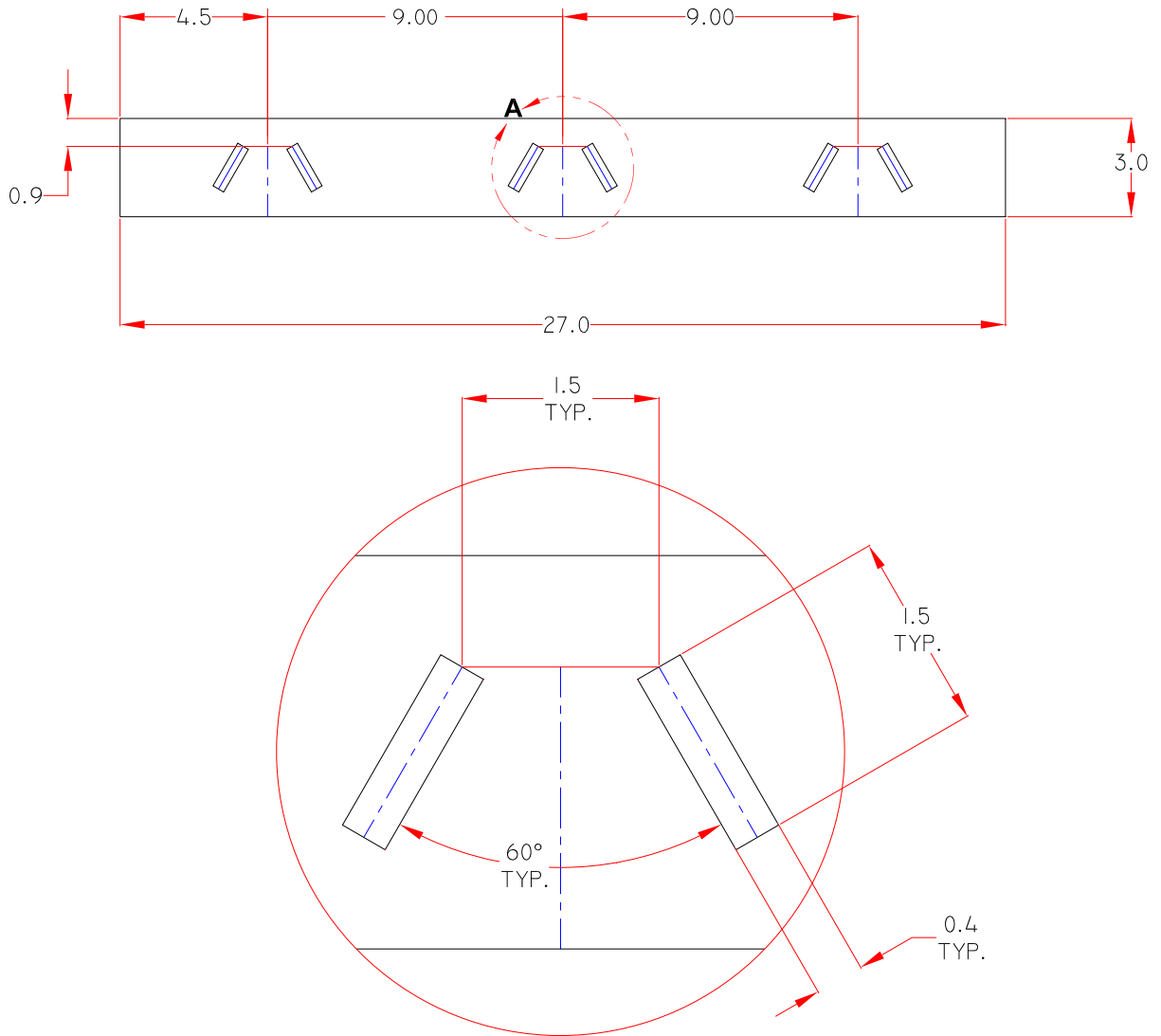


Figure 57-82-05: VG Template TF1711 (2C3 & 2C4)

FBA-2C1, FBA-2C2, FBA-2C3
FBA-2C4, FBA-2C3T, FBA-2C4T

Found Aircraft Canada
Maintenance Program FAC2-M200

INTENTIONALLY LEFT BLANK