

Bill of Materials:

RAC0012 Green Wing Aerodynamic Skirt Kit			
Item	Part Number	Description	Quantity
1	RMC0218	Gen 2 Trailer Skirt Roadside	1
2	RMC0219	Gen 2 Trailer Skirt Curbside	1
3	RMC0300	Trailer Skirt V-Brace (Slotted)	14
4	RPC0026	Gen 2 Cross-member Clamp	28
5	RPC0021	5/16"-18 x 1 1/4" G5 Hex Head Bolt	56
6	RPC0053	5/16"-18 Large Flange Lock Nut	84
7	RPC0056	5/16"-18 x 1" Truss Head Torx T40 Bolt	28
9	RMC0220	Straight Pattern Drill Template	1
10	RMC0221	RS & CS Angled Pattern Drill Template	1

*This bill of materials is for the standard installation kit and may differ depending on the trailer model and accessories needed

Tool List:

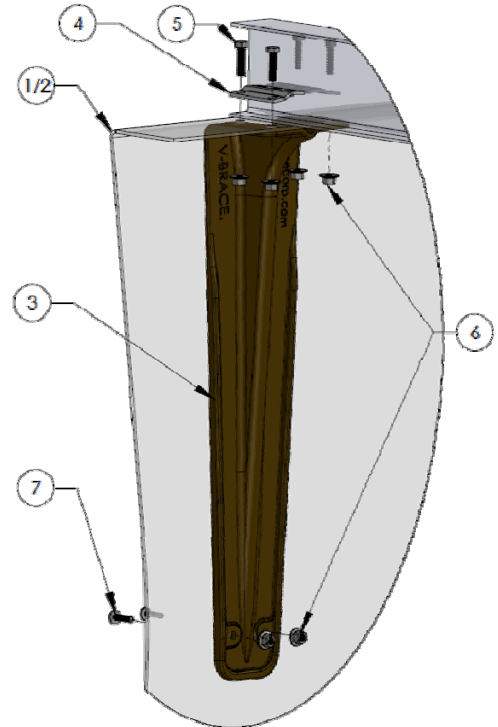
Supplied by Installer:

- Torque wrench (20 ft-lb range)
- (4) Medium sized C-clamps or vise grips
- Jig saw with metal blade (recommended)
- Straight edge (for skirt alignment with baserail)
- Pneumatic (preferred) or battery drill
- Pneumatic or battery impact wrench or ratchet wrench
- 1/2" deep socket
- Torx T40 driver (T-handle preferred)
- 21/64" drill bit (preferred) or 5/16" drill bit
- 3/8" drill bit
- 1/2" open end wrench
- Shop air line with disconnect (2)
- Pencil/marker
- Tape measure

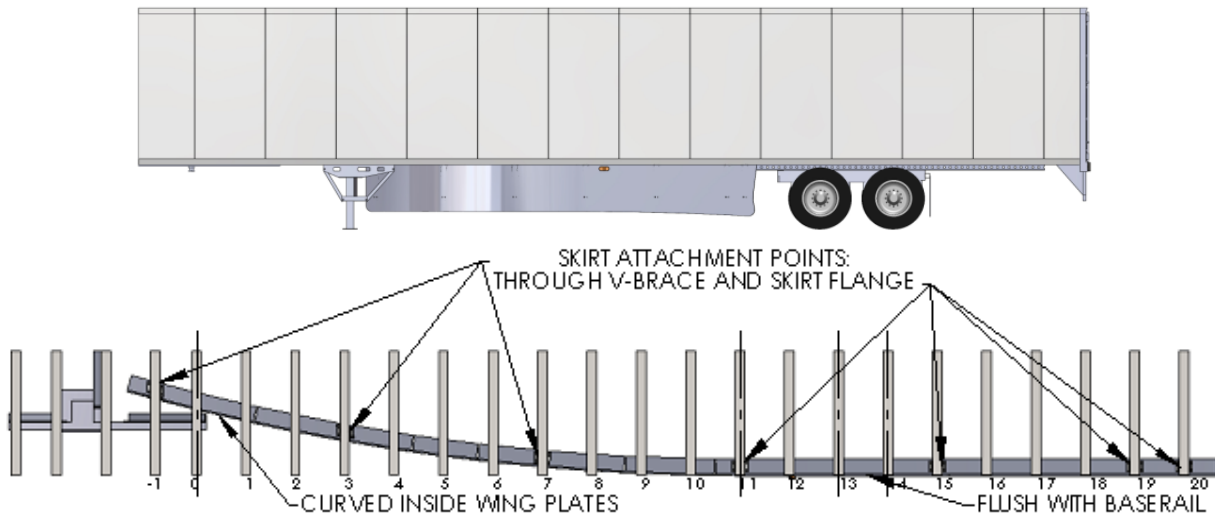
Optional:

- File for edge clean up
- Additional shop air line
- Hole saws (up to 8" & 3" for reefer fuel tank & 2 1/2" for most light hole cut-outs)
- Bowls or parts apron to hold fasteners
- Torx T40 drive (for alternate V-brace to skirt fastening)
- 4-wheel rolling creeper seat

*****READ INSTRUCTIONS THOROUGHLY BEFORE BEGINNING*****

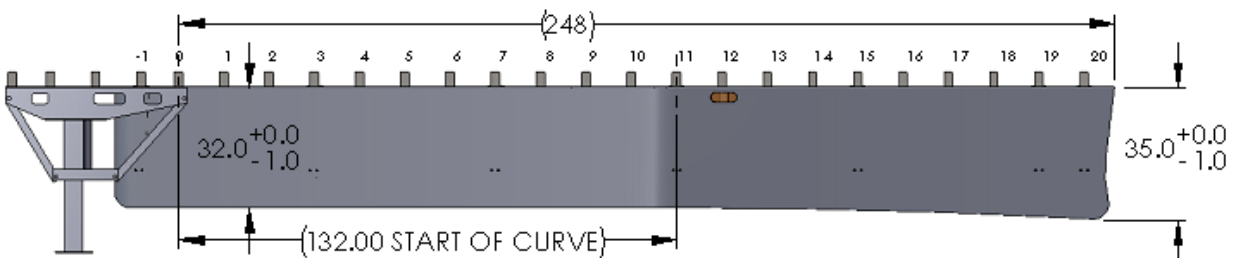


Installation Layout:



Ridge Corporation GreenWing® Aerodynamic Side Skirts install between the landing gear and the rear wheels in the California legal position (40', kingpin to rear axle). The leading edge of the skirt transitions in the shape of a large radius ending just inside the landing gear legs. The rear of the skirt ends short of the slider pin pull location allowing for enough room for the driver access*.

*Note: Generation 2 skirts fit most trailers with 216" or shorter rails. For some installations, it may be necessary to move or add a locator (stop) bar on the slider rail to prevent the tandem from moving too far forward and damaging the skirt.



Most GreenWing® Generation 2 skirts install 248" from cross-member #0 (last cross-member above the wing plate). The curved portion of the layout begins at cross-member #11 (or the cross-member nearest to 132") and continues towards the front of the skirt, inside the wing plates. The skirt is installed flush to the baserail from cross-member #11 and back towards the rear of the skirt. Skirt and V-Brace attachment points are required on consecutive cross-members at rear of the skirt (cross-members #19 and #20). A V-brace should always be placed at the start of the curve (#11). Remaining attachment points should be as equally spaced as possible, and not to exceed 48" (or 50" for 10" spacing). Plan accordingly for side marker light mounting, so there is not interference between the light hole and the V-Brace.

Make adjustments based upon the particular trailer the skirt is being installed upon using the above guidelines. The figures presented in these instructions may not fit all applications or layouts.

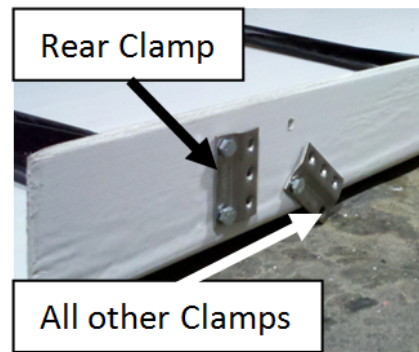
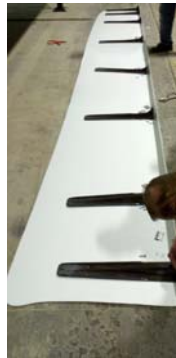
Predrilled Skirt Installation Instructions:

Depending on the order, your GreenWing® Generation 2 skirt may come pre-drilled with a standard 12" cross-member spacing hole patterns that accommodate most standard OEM trailers, or completely undrilled. These pre-drilled skirts can also accommodate cross-member #1 to 0 spacings of 9", 10" and 12". The installation drawing is located at the end of this instruction manual. Some pre-drilled skirts may not fit up to some trailer layouts exactly, but installation time can be saved if a portion of the predrilled holes are used. **If your skirt has a pre-drilled pattern, follow the steps on this page. For undrilled skirts and V-brace locations that did not work with the pre-drilled pattern, skip to page 4.**

1. **Finish Relief Cuts:** The pre-drilled skirt panels also have partial pre-cut reliefs in the skirt flange. These cuts need to be finished before installing on trailer. To do this, simply insert a jigsaw blade into the relief slot, and making two cuts per relief, finish the cut to the edge of the mounting flange.

2. **Pre-Assemble Skirt:** For ease of installation, the skirt may be preassembled with the mounting hardware partially attached to the skirt panel.

- a. Remove the protective film
- b. Assemble the mounting clamps and V-Braces onto the skirt panel flange with one bolt and one hand-tightened nut in the holes closest to the outer face of the panel as shown. The rear-most clamp should be installed with two bolts and nuts.



3. **Hang skirt:**

- a. **Position Skirt:** Locate the cross-member where the rear-most attachment point will be. For the 12" cross-member spacing aftermarket drill pattern, this will be cross-member #20, or the cross-member located 248" from cross-member #0.
- b. **Lift skirt:** Using at least two people, hoist skirt panel up to cross-members, hooking the rear clamp onto cross-member #20 and making sure the front of the skirt is inside of the landing gear wing plate.
- c. **Install Remaining fasteners:** Swing the pre-assembled mounting clamps into place and insert remaining nuts and bolts.



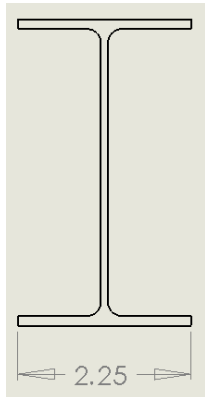
4. **Tighten Parts:**

- a. **Straight Section:** Align skirt to the baserail at the rear four attachment points using a straight edge, and then tighten fasteners using an impact with a 1/2" deep socket and 1/2" open-end wrench. **Tighten to 14-20 ft-lbs.**
- b. **Curved Section:** Using the dimensions on 'Sheet 2' of The Drawing titled 'RAC0012_RTS6-223' as a guideline, position the attachment points and tighten fasteners using an impact with a 1/2" deep socket and 1/2" open-end wrench. **Tighten to 14-20 ft-lbs.**



5. **Skip to Step 9 on page 6 for the remainder of the installation instructions**

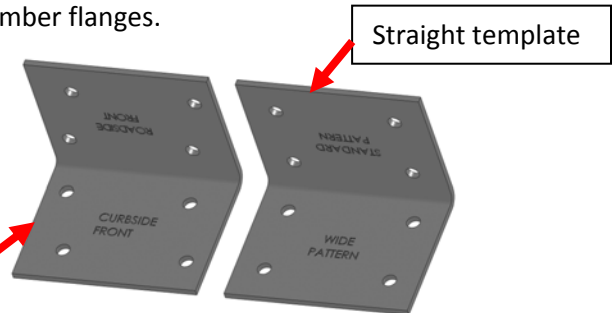
Cross-members and Drill Templates:



Green Wing® Generation 2 skirt kits include drill templates and V-braces to accommodate up to 2.75" wide cross-member flanges.

Flange Width	Pattern Width
2.25" & less	3.313
Up to 2.75"	3.500

Angular Front Template

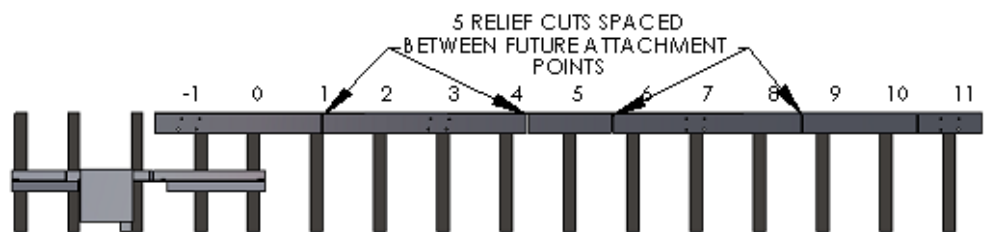


Some trailers, especially refrigerated trailers, transition from shorter cross-members to taller cross-members in the bay of the trailer. For example, above the slide rails there may be 4" steel cross-members, and in the bay there are 5" Aluminum cross-members. This can also happen above the landing gear assembly. If this is the case, then a RAC0006 spacer block assembly is needed to effectively attach the skirt to the shorter cross-members (Contact your dealer or Ridge Corporation for kits. See refrigerated section of these installation instructions for more detail).

Installation Steps:

- Determine the layout:** Using the guidelines on the previous page, determine how and where the skirt will mount.
- Prepare trailer for skirt installation:** Mark on the baserail where the end of the skirt will be positioned (248" from the center of cross-member #0). Remove or reposition all items that may interfere with the skirt such as tire carriers, fuel tanks, side marker light brackets, lock boxes, etc.
- Temporary mounting to determine curve relief-cut locations:** Since the skirt installs with a curve at the front, 3/8" wide relief-cuts need to be cut into the skirt flange in order to allow the panel to bend and install properly.

- Lift skirt:** Hoist skirt panel up to cross-members, near the baserail. Use a minimum of 2 people for this step.
- Position skirt:** Align skirt such that the rear is positioned at the 248" end mark and flush with the baserail.
- Clamp skirt:** Using a minimum of 3 C-Clamps or vise grips, clamp skirt flange to cross-members.
- Mark relief-cut locations:** Mark relief-cut locations close to the positions shown above. They are



- Remove skirt:** Unclamp skirt from trailer.

4. Make relief-cuts: Using the 3/8" drill bit and a jig saw complete the following steps.

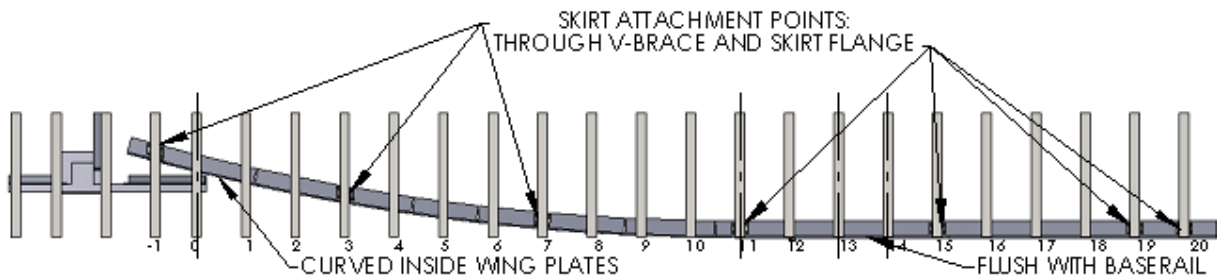
- a. Using a 3/8" drill bit, drill a hole tight to the bend in the skirt flange at the positions located in the previous step.
- b. Using a jigsaw, cut even slots from the hole to the outside of the skirt flange.
- c. Complete for all necessary relief-cuts.
- d. Measure relief-cut locations and translate to skirt on opposite side and repeat the above steps.



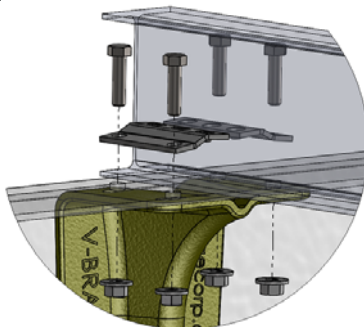
5. Hoist skirt into mounting position:

- a. **Remove film:** Remove the protective film from the flange of the skirt so it does not get trapped between the cross members and the skirt. The film may be left on the face temporarily to protect it from dirt and scuffing during installation.
- b. **Lift skirt:** Hoist skirt panel up to cross-members, near the baserail. Use a minimum of 2 people for this step.
- c. **Position skirt:** Align skirt such that the rear is positioned at the 248" mark and flush with the baserail, with the front curved and positioned inside of the wing plates.
- d. **Clamp skirt:** Using a minimum of 3 C-Clamps or vise grips, clamp skirt flange to cross members.

6. Fastening straight portion of the skirt: Follow these steps to fasten the portion of the skirt that is flush with the base-rail.

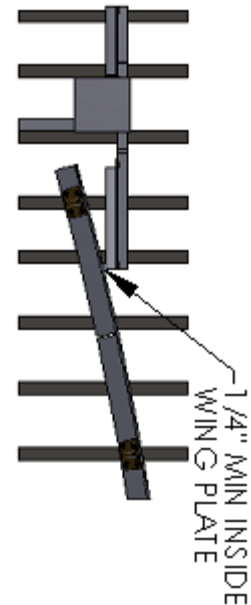


- a. **Mark Hole Locations:** At the recommended skirt and V-brace attachment points above (11, 15, 19, & 20), use the appropriate straight hole pattern template (RMC0220) for marking the hole patterns on the skirt flange.
- b. **Drill Holes:** Using a 3/8" drill bit, drill holes at marked locations
- c. **Assemble Parts:** Assemble V-Brace, cross-member clamps, bolts, and lock nuts as shown below at each location. Bolts must be placed down through the cross member clamps.
- d. **Tighten Parts:** Align skirt to the baserail using a straight edge, and then tighten fasteners using an impact with a 1/2" deep socket and 1/2" open-up wrench. **Tighten to 14-20 ft-lbs.**
- e. **Repeat for additional attachment points flush with the baserail.**

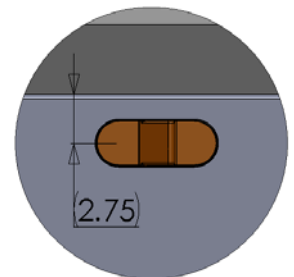
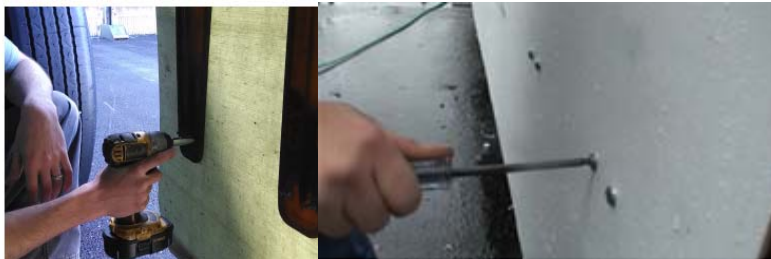


Align the skirt to the base-rail with a straight edge. A rubber or plastic non-marring mallet may be used to adjust the skirt's position only when a single bolt is snugged. *Adjusting a skirt with a mallet that has been fully clamped down may cause damage to the skirt or cross-member clamps.*

7. **Fastening curved portion of the skirt:** Follow these steps to fasten the front portion of the skirt that curves in from the baserail to inside the wing plates, ending just inside the landing gear legs.
- Position Desired Curve:** The curve should be gradual, sweeping just inside the wing plates with a **minimum clearance of 1/4" from any interference**. The relief-cuts from step 4, allow the skirt to position as such. The leading edge of the skirt should be just inside the landing gear leg. Use C-Clamps to hold skirt in the desired shape. Mark attachment point locations (7,3, & -1).
 - Mark Hole Locations:** At the recommended skirt and V-brace attachment points above, use the angled drill pattern template (RMC0221) to mark the hole-pattern, centered under the cross-member flange. (Roadside & Curbside are different patterns)
 - Drill Holes:** Using a 3/8" drill bit, drill holes at marked locations
 - Assemble Parts:** Assemble V-Brace, cross-member clamps, bolts, and lock nuts as shown on the previous page, at each location.
 - Tighten Parts:** Align skirt to the baserail using a straight edge, and tighten fasteners using an impact with a 1/2" deep socket and 1/2" open end wrench. **Tighten to 14-20 ft-lbs.**
 - Repeat for additional attachment point in the curve.**



8. **Attaching V-Braces to skirt:** Now that the skirt is attached to the trailer and tightened down, the V-Braces need fastened to the skirt panels. Using a drill, T40 driver and impact, follow these steps:
- Drill holes:** Using pre-drilled holes in the V-Brace as the template, drill through the V-Brace into the skirt with a 21/64" bit. Take care not to bend the skirt out of plane when drilling the holes.
 - Remove Remaining Film:** Remove the remaining film from the face of the skirt to keep it from being trapped between the fasteners and the skirt.
 - Assemble Fasteners:** Place 5/16" Truss Head bolts in from the outside of the skirt. Assemble the 5/16" lock nuts on the inside.
 - Tighten Fasteners:** Using an impact with a 1/2" deep socket with a torx T40 driver on the outside, tighten fasteners. **Tighten to 9-14 ft-lbs.** Excessive torque will result in breakage of fasteners. For a more controlled installation, use a clutched drill with a torx T40 bit with a 1/2" back-up wrench on the inside to tighten fasteners to torque.



- Repeat for additional V-Braces.**
9. **Installation of side marker lights:** The Green Wing skirt panel is sufficient to use with grommet and flange mounted side marker lights. Use an existing bracket as a template for cutting out the slot. It is recommended that the center of the slot be located at least 2 3/4" from the top of the skirt.
10. **Repeat for opposite side installation.**

Installation Notes:

1. **Do not fasten skirt to the wing plate:** The Green Wing product is designed to deflect to the inside and outside of the trailer to avoid some objects. Attaching to the wing plate will reduce the amount the skirt can deflect, thus potentially causing damage.
2. **Cleaning the skirt:** Use standard cleaning chemicals to clean the skirt panels off. Take care around the Green Wing stamp because some cleaning chemicals may smear the coloring.
3. **Use care when handling skirt panels:** Careless handling of the skirt panel, especially once the relief cuts have been made, can cause damage and cracking of the material around the relief cuts. Take care when handling and do not allow the skirt to bend opposite of how it is intended to install or over bend it.
4. **Other skirt modifications:** Contact us to discuss allowable skirt modifications for CARB compliance.
5. **Check Interferences** - Verify Skirt panel does not Interfere with trailer structures. The skirt should be positioned a minimum of 1/4" from the landing gear wing plate and other items. V-braces should not be located on the leading edge of a fuel tank, because the hardware may be able to come in contact with the fuel tank when in use or when under deflection.

Repair & Accessory Kit Information:

Part Number	Name	Description
RAC0023	Green Wing® V-Brace Replacement Kit	This kit includes a single V-Brace and hardware for replacement
RAC0024	Green Wing® V-Brace Replacement Kit Box	This kit includes 14 V-Braces and hardware for replacement of all braces for a single skirt kit.
RRK000100	Standard Repair Kit	This kit includes heat patch material to repair minor damage to skirt panels.
RAC0006	Green Wing® Reefer Spacer Kit	This kit is needed for installing a skirt with a 1/2" - 1" cross-member height difference.

Pictures of Some Typical Green Wing® Installations:



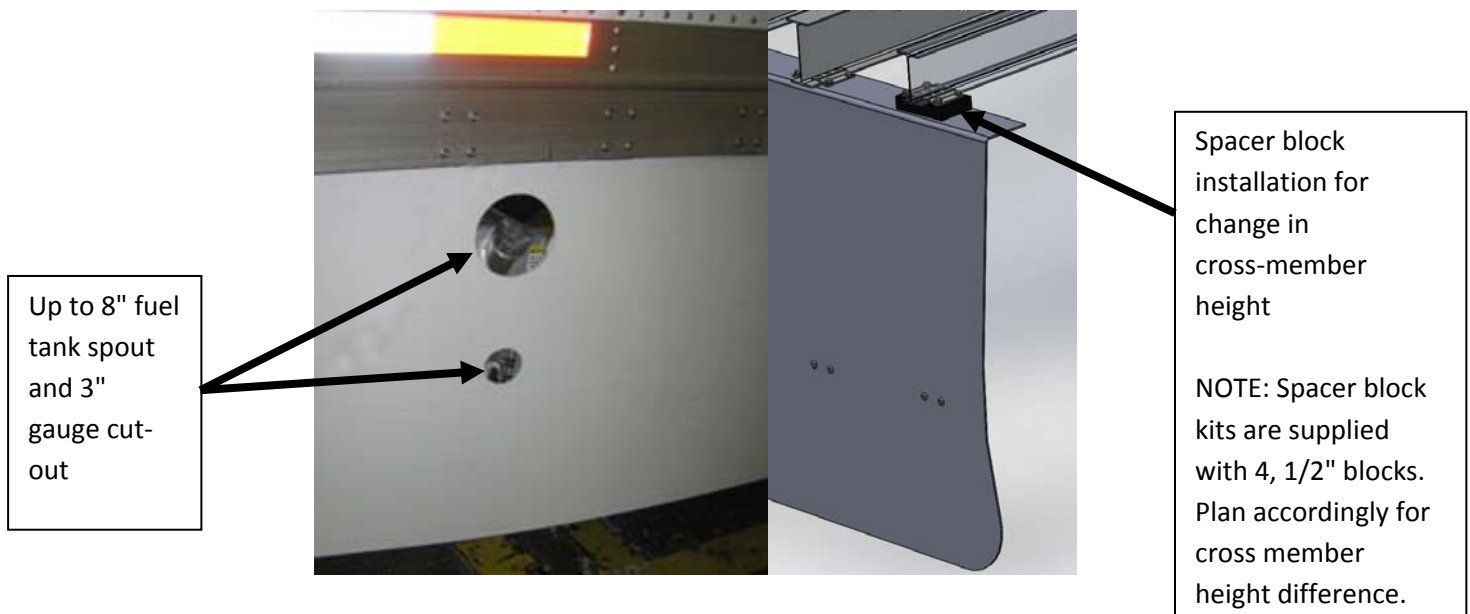
Green Wing® Installations for Refrigerated Trailers:

Green Wing® Side Skirts will install normally on refrigerated trailers. If the trailer is equipped with taller 5" aluminum cross-members in the bay of the trailer, and has standard 4" cross-members above the landing gear and slider rails, then a Green Wing® Reefer Install Kit (RAC0006) must be used. Continue with the standard layout instructions. Determine how many skirt attachment points are on the shorter cross-members. This is how many spacers will be needed per side. Install the spacers in between the cross-member and the skirt flange. Place the longer bolt through the skirt, spacer, and normal cross-member clamps, and follow the standard mounting instructions. Tighten to **14-20 ft-lbs**.

RAC0006 Spacer block kits are supplied predrilled to fit both the standard straight and angular drill patterns. The kits are supplied for use with a 1" cross member height difference. Each block is 1/2" thick, therefore for height differences of 1 1/2" one additional kit is needed per cross member. The hardware contained in the kit can accommodate up to a 1 1/2" height difference.

The skirt should wrap around the fuel tank. Using an 8" (maximum) hole saw, place a clearance hole near the tank filling spout, and if necessary, a 3" (maximum) hole around the fuel tank gage. The V-Braces in the curved portion of the skirt may need to be adjusted to avoid interference with the tank or the tank mounting bracket and hardware. If necessary, move the V-Brace and skirt attachments to avoid the tank assembly, or if possible, move the fuel tank. (The maximum spacing between V-Braces is 50").

If the tank location cannot be adjusted to fit up with the normal installation of the skirt, then adjust the curvature of the skirt such that it makes the tank accessible. Drill holes and assemble fasteners according to the standard procedure at the custom curve layout. **Do not place V-braces on the leading edge of the tank. This avoids interference between the V-brace, hardware, and fuel tank during road use or under deflection.**

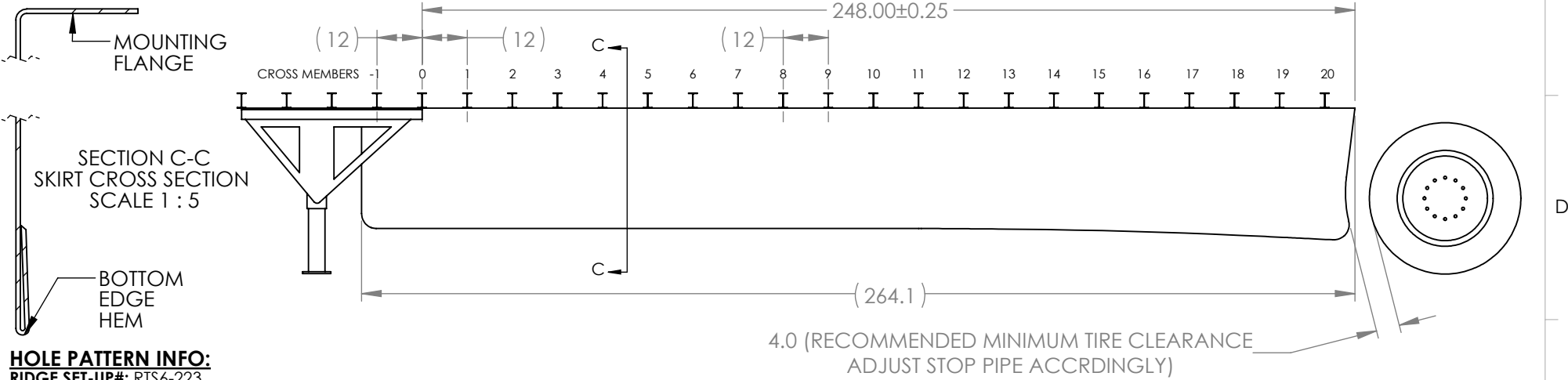


PRE-DRILLED SKIRT NOTES:

IN ORDER TO REDUCE AFTERMARKET SKIRT INSTALLATION TIMES, THIS DRILL PATTERN WAS CREATED TO FIT MULTIPLE STANDARD TRAILER MODELS WITH 12" CROSS MEMBER CENTERS. THE HOLE PATTERN WIDTH WAS DESIGNED FOR UP TO 2.5" I-BEAM FLANGE WIDTHS. ADDITIONAL DRILLING OR SLOTTING MAY BE REQUIRED FOR CROSS MEMBER CENTERS OTHER THAN 12", OR IF THE PATTERN DOES NOT FIT THE APPLICATION.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	RELEASED	3/30/2012	CJG
B	ADDED HEM	11/5/2012	CJG
C	CHANGED 1/4-20 NUT P/N. WAS RPC0052	04/08/2013	CJG
D	BOM & TORQUE RATING CHANGE	04/25/2014	CJG
E	VBRACE & BOM UPDATE	10/02/14	CXH

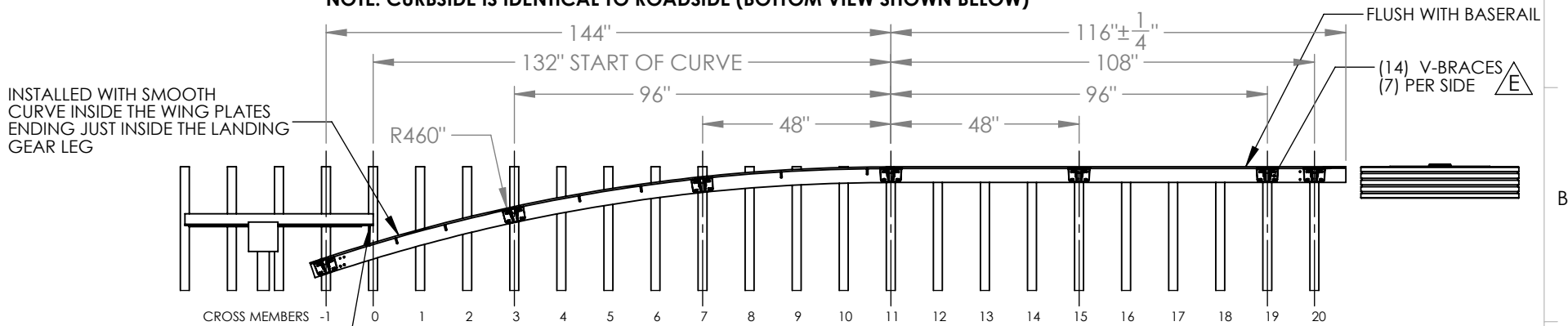
PLEASE USE THE STANDARD INSTALLATION INSTRUCTIONS DOCUMENT FOR INSTALLATION PRACTICES. USE THIS DRAWING AS A REFERENCE FOR LOCATING A PREDRILLED SKIRT.



HOLE PATTERN INFO:

RIDGE SET-UP#: RTS6-223
 HOLE PATTERN TOLERANCE: ± 1/8"
 FOR CROSS MEMBERS LOCATED ± 1/8"
 HOLE PATTERN WIDTH: 3 5/16"

TORQUE 5/16" HEX-HEAD FASTENERS TO: 14-20 FT-LBS
TORQUE 5/16" TRUSS-HEAD FASTNERS TO: MINIMUM 9-14 FT-LBS $\triangle D$
 NOTE: CURBSIDE IS IDENTICAL TO ROADSIDE (BOTTOM VIEW SHOWN BELOW)



1/4" MINIMUM WING PLATE CLEARANCE

ALL UNITS ARE IN INCHES

TOLERANCES ARE:
 X.XX ± 0.03 FRACTIONS ± 1/16
 X.XXX ± 0.005 ANGLES ± 1/2°

UNLESS OTHERWISE STATED ON DRAWING

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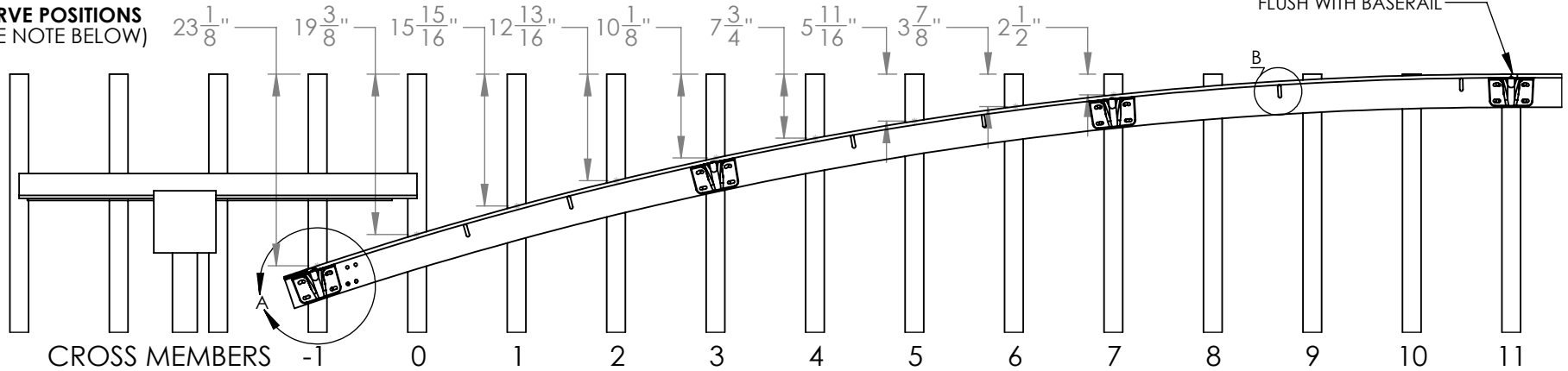
APPROVED BY: **CJG**
 DRAWN BY: **BJM**
 APP. DATE: 03/30/12
 DATE: 02/24/12
 STATUS: RELEASED
 SCALE: 1:40

TITLE: **GREEN WING UNIVERSAL SKIRT LAYOUT**

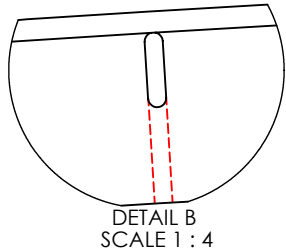
CUST REV: DRAWING NUMBER: **RAC0012_RTS6-223**
 REV: **E**

TORQUE 5/16" HEX-HEAD FASTENERS TO: 14-20 FT-LBS
TORQUE 5/16" TRUSS-HEAD FASTENERS TO: 9-14 FT-LBS

CURVE POSITIONS
 (SEE NOTE BELOW)

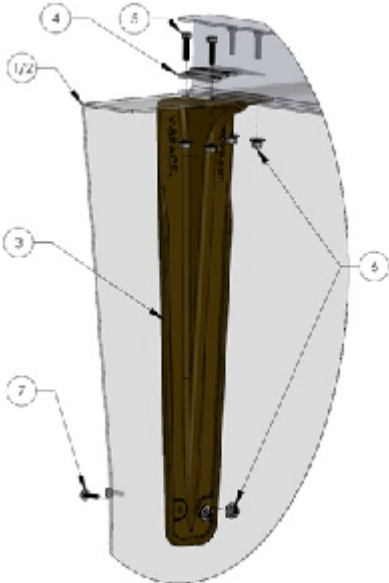
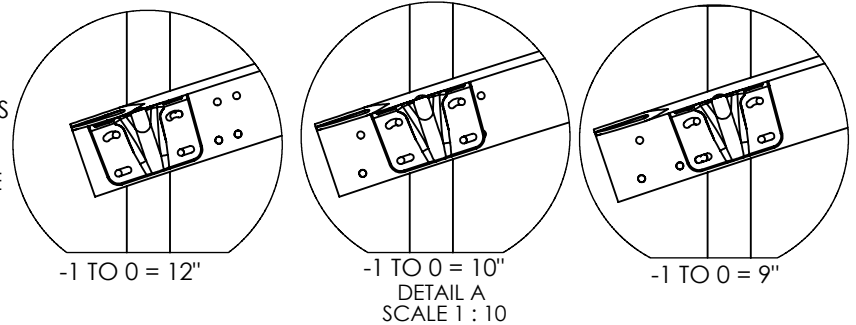


CURVE POSITION INFORMATION: THE ABOVE DIMENSIONS ARE APPROXIMATE LOCATIONS OF THE SKIRT AT EACH 12" ON CENTER CROSS MEMBER, FOR THE PROVIDED UNIVERSAL DRILL PATTERN. IF CURVE POSITION IS UNSATISFACTORY, PLEASE FOLLOW THE STANDARD INSTALLATION INSTRUCTIONS AND REPOSITION AND REDRILL HOLE PATTERNS TO FIT THE APPLICATION.



PRE-NOTCHED RELIEF CUTS:
 RELIEF CUTS SUPPLIED PARTIALLY CUT TO PROTECT SKIRT DURING TRANSPORTATION. PRIOR TO INSTALLATION, FINISH CUTTING RELIEFS SO THE SKIRT CAN BE INSTALLED WITH THE PROPER CURVE.

UNIVERSAL FRONT HOLE PATTERNS:
 THE DETAIL DRAWINGS TO THE RIGHT ILLUSTRATE WHICH HOLE PATTERN TO USE FOR CROSS MEMBER (-1) TO (0) SPACING SCENARIOS.



*ADDITIONAL PARTS MAY BE NECESSARY, SEE INSTALLATION INSTRUCTIONS DOCUMENT FOR AVAILABLE KITS.

BILL OF MATERIALS			
ITEM	PART NUMBER	QUANTITY	DESCRIPTION
1	RMC0218	1	TRAILER SKIRT ROADSIDE
2	RMC0219	1	TRAILER SKIRT CURBSIDE
3	RMC0300	14	TRAILER SKIRT V-BRACE (SLOTTED)
4	RPC0026	28	S.S. CROSS MEMBER CLAMP
5	RPC0021	56	5/16-18 X 1 1/4" G5 HEX HEAD BOLT
6	RPC0053	84	5/16-18 LARGE FLANGE LOCK NUT
7	RPC0056	28	5/16-18 X 1" T40 TRUSS HEAD BOLT
TOTAL SKIRT WEIGHT: 159 LBS			

RIDGE CORPORATION

ALL UNITS ARE IN INCHES

TOLERANCES ARE:
 X.XX ±0.03 FRACTIONS ±1/16
 X.XXX ±0.005 ANGLES ±1/2°

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APPROVED BY: **CJG**
 DRAWN BY: **BJM**
 APP. DATE: **03/30/12**
 DATE: **02/24/12**
 STATUS: **RELEASED**
 SCALE: **1:20**

TITLE:
GREEN WING UNIVERSAL SKIRT LAYOUT

CUST REV: **DRAWING NUMBER: RAC0012_RTS6-223**
 REV: **E**

SHEET 2: CURVE DETAIL & B.O.M.
 SMARTWAY VERIFIED SKIRT MODEL RAC0012