



737-800 BCF

**STRUCTURAL REPAIR
MANUAL, RIGID CARGO
BARRIER**

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53-00-01, RIGID CARGO BARRIER

53-00-01 INTRODUCTION

The Ventura Aerospace, Inc. Rigid Cargo Barrier (RCB) is installed on the Boeing 737-800BCF to meet the 14 CFR §25.561 requirement to protect occupants during an emergency landing condition.

The RCB is designed to restrain 53,000 pounds of main deck cargo load. The RCB must be maintained in an airworthy condition. During operation the RCB may sustain damage due to the resulting operations of loading and unloading cargo. Any damage sustained must be evaluated in accordance with this manual. Any damage outside of the scope of this manual must be dispositioned with an FAA approved repair, contact Ventura Aerospace, Inc. engineering.

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53-00-02 USE OF THIS MANUAL

This manual provides FAA approved repair procedures for various types of damage within the specified limits of this manual. The repair procedures defined in this manual must be adhered to completely for the repair to be covered by this manual.

For repairs not defined in this manual or for a repair of damage greater than that defined in this manual, unique repair instruction and FAA approval is required. It is always permissible to replace the damaged part in lieu of repairing it.

If the repair is incompatible with an existing repair either on the aircraft, the RCB itself or another Supplemental Type Certificate (STC) product, contact Ventura Aerospace, Inc. or the STC holder to determine the appropriate repair.

Parts not specifically addressed in this repair manual are no-serviceable and as such, require direct replacement.

Accomplishment of repairs in accordance with this manual are to be carried out by qualified personnel and include in process and final inspection by authorized personnel.

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53-00-03 DAMAGE ASSESSMENT

Continued operation of the aircraft in terms of this SRM is defined henceforth as “flights”. A flight is where the aircraft is used for its main purpose of hauling freight. A flight shall not be counted where the aircraft is not hauling freight and the main cargo deck is empty, this includes ferry flights and relocation flights. The Ventura Aerospace 9g Barrier is only considered primary structure when the aircraft is carrying freight.

When damage is detected either during normal routine inspections or during service, the extent of the damage must be determined. For some minor damage it may be acceptable to defer a repair to a later time. Other damage must be repaired prior to further flight.

Inspect damaged area for size, depth, adjacent part damage, corrosion, and broken, missing or loose fasteners. Document the findings on an appropriate discrepancy report or other appropriate document as defined by the FAA approved / accepted operating procedures.

Using a reasonable common-sense approach, determine if the damage seems to be repairable. If the damage appears to be non-repairable, then either a special repair scheme must be determined along with unique FAA repair approval, or the damaged part must be replaced in its entirety. If the damage is thought to be repairable consult the correct section in this manual to determine that the damage is within repairable limits of this manual and accomplish the repair as defined.

If the damage is minor, such as shallow scratches, minor dents, etc. consult the minor damage section of this manual to determine the extent of the repair necessary, if any. In many cases it is acceptable to continue operating the aircraft for some period of time prior to implementing repairs. Refer to 53-10-00 of this manual for minor damage assessment and repairs.

For more severe damage, repairs will be required. Consult Section 53-20-00 of this manual to determine the appropriate repair scheme. If the damage exceeds the limits defined in 53-00-20 either the damaged part must be replaced or a more specific repair scheme will be required. Specific repair schemes require independent review and FAA approval (DER approval with appropriate delegations is acceptable). Any damage that requires a repair as defined in 53-00-20 must be corrected prior to the next flight.

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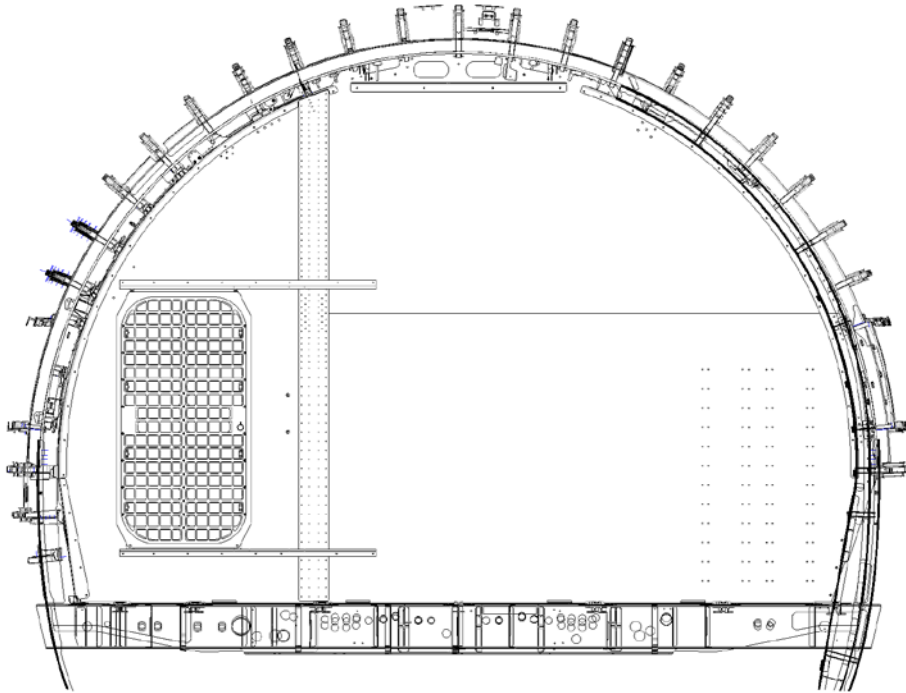


FIGURE 53-00-03-1: VIEW LOOKING FORWARD AT RCB

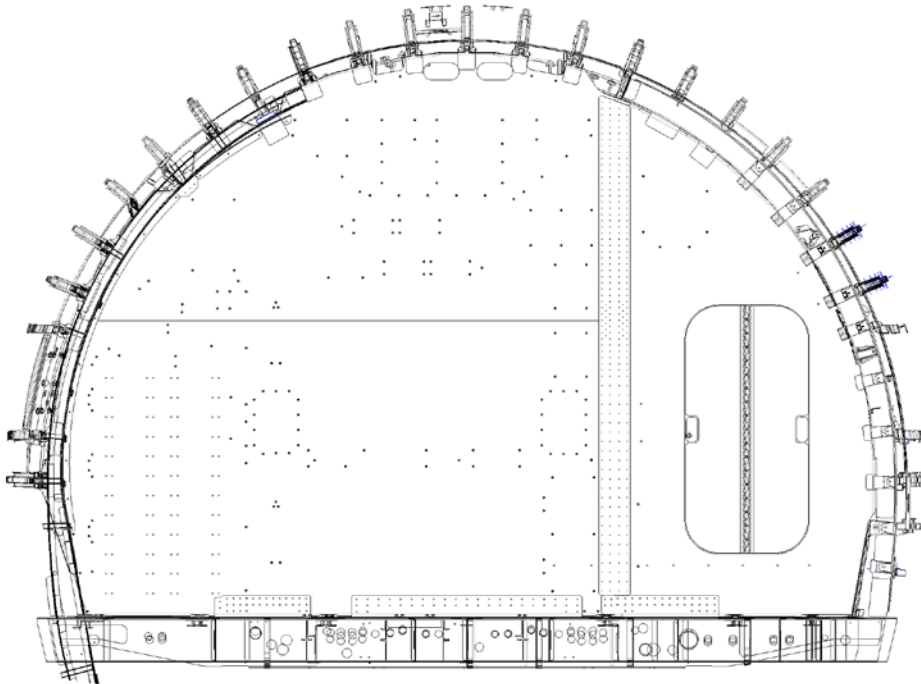


FIGURE 53-00-03-2: VIEW LOOKING FORWARD AT RCB

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53-10-00 MINOR DAMAGE

53-10-01 RCB PANELS

A. SCRATCHES AND GOUGES

Scratches in the Main Barrier Panel face sheets on either the front side or the aft side that are less than .030 inch deep must be repaired by blending out the scratch in a 10:1 pattern, width of the area in 10 times the depth of the scratch. Repair of minor scratches, as defined above, in the main barrier panel may be deferred up to 10 flights. Repair may be deferred up to 25 flights if the main deck payload is reduced to 1000 pounds. After blending, clean the area and re-finish in accordance with the finish notes found in 53-30-00 of this manual. Scratches greater than that defined here must be repaired in accordance with Section 53-20-00

B. DENTS

Dents in the Main Barrier Panel that are less than .050 inch deep and fit within a 1.0 inch diameter circle may be left un-repaired as long as the dent is smooth and has no sharp features caused by sharp corner impact. If the dent has crease or sharp edge, consult Section 53-20-00 of this report for the repair. Dents deeper than .050 inch or greater than 1.0 inch in diameter must be repaired as defined in Section 53-20-00 of this manual.

C. CORROSION

Where corrosion is found, remove the corroded area using appropriate tools. Measure the depth and area of the final configuration. Where the removal area is less than .025 inch deep and has not affected the bond between the core and the face sheets, nor has the core itself become corroded, it is permissible to re-finish the area in accordance with 53-30-00 of this manual. Corrosion in excess of that defined here must be repaired in accordance with Section 53-20-00. If corrosion is found in the core material of the panel, the panel must be replaced prior to the next flight.

D. CRACKS

Any crack found in the Main Barrier Panel that is less than .25 inch in length and within 1.0 inch of a fastener must be repaired in accordance with 53-20-00 within 10 flights from discovery. Repair of any crack less than .25 inch in the main barrier panel may be deferred up to 25 flights if the main deck load is reduced to 5000 pounds. Any crack in excess of .25 inch must be evaluated immediately in accordance with 53-20-00. During repair deferment the crack must be sealed using cargo liner tape. This is to prevent possible entry of excess moisture into the panel.

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53-10-02 SLIDING DOOR

The Sliding Door rollers are sealed roller bearings and do not require lubrication. Damage to the rollers requires replacement of the component(s). See the Illustrated Parts Catalog for part numbers.

The seal should be kept clean at all times and may be wiped down with a light silicone-based lubricant such as LPS Dry Film Silicone Lubricant or similar to ensure smooth operation of the door. Nicks and cuts, less than 1.5 inch long, in the seal may be repaired using Dow Corning 3145 silicone adhesive if repair adequately restores the seal. Otherwise the entire seal must be replaced. See the Illustrated Parts Catalog for part numbers.

A. SCRATCHES AND GOUGES

Scratches in the Barrier Door, Vent Panel and Blowout Panel on either the front side or the aft side that are less than .060 inch deep must be repaired by blending out the scratch in a 10:1 pattern, width of the area is 10 times the depth of the scratch. Repair of minor scratches, as defined above may be deferred up to 10 flights. After blending, clean the area and re-finish in accordance with the finish notes found in 53-30-00 REPAIR NOTES of this manual. Scratches greater than that defined here must be repaired in accordance with Section 53-20-00.

B. DENTS

Dents in the Barrier Door, Vent Panel and Blowout Panel that are less than .050 inch deep and fit within a 1.0 inch diameter circle may be left un-repaired as long as the dent is smooth and has no sharp features caused by sharp corner impact. If the dent has crease or sharp edge, consult Section 53-20-00 of this report for the repair. Dents deeper than .050 inch or greater than 1.0 inch in diameter must be repaired as defined in Section 53-20-00 of this manual.

C. CORROSION

Where corrosion is found, remove the corroded area using appropriate tools. Measure the depth and area of the final configuration. Where the removal area is less than .050 inch deep it is permissible to re-finish the area in accordance with 53-20-00 of this manual. Corrosion in excess of that defined here must be repaired in accordance with Section 53-20-00.

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D. CRACKS

BARRIER DOOR:

No cracks in the barrier door are allowed.

VENT PANEL AND BLOWOUT PANEL:

Any individual cracked web in the Vent Panel must be stop drilled using a .062 diameter drill. Exercise caution to get the complete end of the crack inside the drilled hole. No more than 6 webs total and no more than two adjacent webs may be stop drilled. Components damaged beyond these criteria must be referred to Ventura Aerospace for engineering disposition. These conditions must be repaired within 10 flights from discovery.

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53-10-03 UPPER AND LOWER DOOR TRACKS

A. SCRATCHES AND GOUGES

Scratches and gouges in the Upper or Lower Door Track that are less than .090 deep and .100 wide must be repaired by blending out the scratch in a 10:1 pattern, width of the area is 10 times the depth of the scratch. Repair of minor scratches, as defined above, may be deferred up to 10 flights. After blending, clean area and refinish in accordance with the notes found in 53-30-00. Damage beyond these limits may require replacement of the affected component, but may be deferred up to 10 flights, so long as proper operation of the door is not affected. Contact Ventura Aerospace for engineering disposition. Any damage that affects proper operation or sealing of the sliding door must be repaired before the next flight.

B. DENTS

Dents in the Upper and Lower Door Track that are less than .090 inch deep and fit within a 1.0 inch diameter circle may be left un-repaired as long as the dent is smooth and does not prevent the sliding door from operating properly.

Bent track that does not affect smooth and proper operation of the door may be left as is. Bent track that does affect smooth and proper operation of the door must be repaired by straightening. If track cannot be straightened to provide smooth and proper operation of the door the affected track must be replaced. See the Illustrated Parts Catalog for part numbers. Any damage that affects proper operation or sealing of the sliding door must be repaired before the next flight.

C. CORROSION

Where corrosion is found, remove the corroded area using appropriate tools. Measure the depth and area of the final configuration. Where the removal area is less than .025 inch deep, it is permissible to re-finish the area in accordance with 53-30-00 of this manual. Corrosion in excess of that defined here must be repaired in accordance with Section 53-20-00. Any damage that affects proper operation or sealing of the sliding door must be repaired before the next flight.

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53-10-04 RCB ATTACHMENT STRUCTURE

The attachment structure such as flexures, intercostals, stringer reinforcements are not typically repairable, as such contact Ventura Aerospace, Inc. engineering for disposition.

53-10-04 LOOSE, BROKEN OR MISSING HARDWARE

A. LOOSE FASTENERS

Loose fasteners are to be tightened or replaced when detected. A detailed visual inspection of the local area must be conducted to determine any apparent cause of the looseness. If any structural deformation of RCB components is found, repair in accordance with the information in Section 53-30-00 of this manual.

B. BROKEN OR MISSING FASTENERS

Replace broken or missing fasteners with fasteners defined on the applicable installation drawing or illustrated parts catalog. A detailed visual inspection of the local area must be conducted to determine any apparent cause of the missing fasteners. If any structural deformation of RCB components is found contact Ventura Aerospace, Inc. engineering for disposition

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53-20-00 MAJOR DAMAGE

53-20-00 MAJOR DAMAGE

Major damage is any damage that does not fall into the definitions of minor damage as defined by Section 53-10-00.

Repair procedures for major damage are defined in Section 53-20-10.

For some types of major damage which are not covered part replacement or a special repair may be necessary, contact Ventura Aerospace, Inc. engineering for disposition.

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53-20-10 REPAIR PROCEDURES FOR RCB PANEL

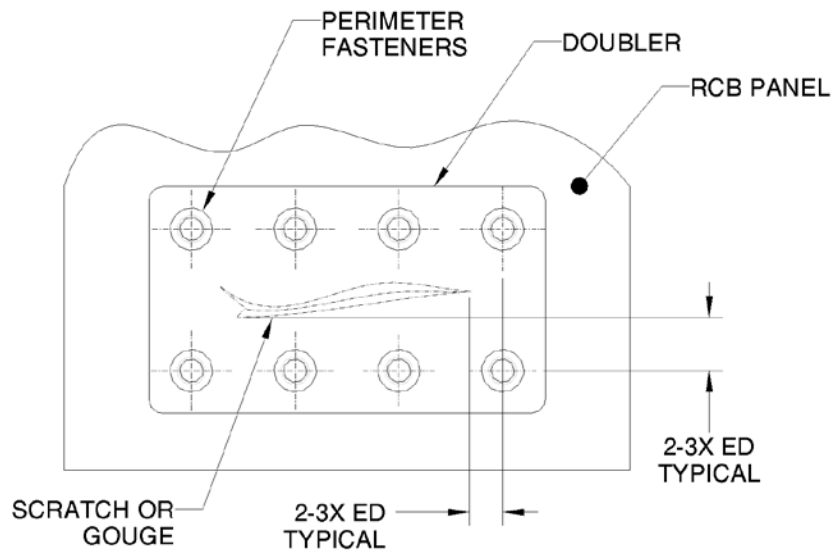
53-20-10 REPAIR PROCEDURES FOR RCB PANEL

A. SCRATCHES AND GOUGES

Scratches and gouges greater than those defined in Section 53-10-00 must be repaired prior to the next flight.

NOTE: SCRATCHES AND GOUGES IN EXCESS OF 3.00 INCHES IN LENGTH MUST HAVE AN FAA APPROVED REPAIR DEFINED SPECIFICALLY FOR THAT DAMAGE. CONTACT VENTURA AEROSPACE ENGINEERING FOR DISPOSITION.

Install a .160 thick 7075-T6 Aluminum Doubler over the affected area in accordance with Figure 53-20-00-1 below. Remove all paint and clean the affected area of the scratch or gouge extending out at least 3.0 inches. Layout the Doubler shape by measuring 1.0 inch beyond the scratch or gouge. Allow for additional material for fasteners in accordance with notes in 53-30-00. After Doubler dimensions are determined and fastener holes are drilled, de-burr the Doubler. Apply Hysol EA9394 between the Doubler and the Barrier Panel. Install using CR3523-5-() Cherrymax Rivets (grip will vary based on barrier face sheet thickness at specific location). Alternate, through bolt using: NAS6204-() Bolts, NAS1149F0463P Washers and MS21042L4 Nuts. Minimum quantity of 4 fasteners required. The fastener pitch is to be no greater than 1.5" spacing CL to CL. If the repair is restricted by adjacent components a unique repair is required, contact Ventura Aerospace, Inc. for engineering disposition.



Figure, 53-20-10-1, Major Scratch and Gouge Repair

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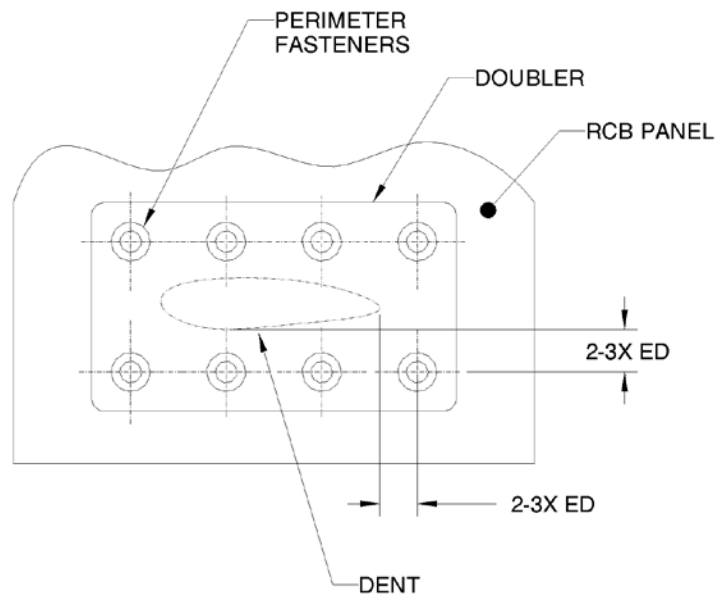


B. DENTS

Dents greater than those defined in Section 53-10-00 MINOR DAMAGE must be repaired prior to the next flight.

NOTE: DENTS IN EXCESS OF 3.00 INCHES IN ANY DIRECTION MUST HAVE AN FAA APPROVED REPAIR DEFINED SPECIFICALLY FOR THAT DAMAGE. CONTACT VENTURA AEROSPACE ENGINEERING FOR DISPOSITION.

Install a .160 thick 7075-T6 Aluminum Doubler over the affected area in accordance with Figure 53-00-21-2 below. Remove all paint and clean the affected area of the dent extending out at least 3.0 inches. Layout the Doubler shape by measuring 1.0 inch beyond the dent. Allow for additional material for fasteners in accordance with notes in 53-30-00 REPAIR NOTES. After Doubler dimensions are determined and fastener holes are drilled, de-burr the Doubler. Apply Hysol EA9394 between the Doubler and the Barrier Panel. Install using CR3523-5-(XX) Cherrymax Rivets (grip will vary based on barrier face sheet thickness at specific location). Alternately, you may through bolt using: NAS6204-(84) Bolts, NAS1149F0463P Washers and MS21042L4 Nuts. Minimum quantity of 4 fasteners required. The fastener pitch is to be no greater than 1.5" spacing CL to CL. If the repair is restricted by adjacent components, a unique repair is required, contact Ventura Aerospace for engineering disposition. Dents greater than .10 deep and covering an area greater than 4.0 in² require the replacement of the RCB panel.



Figure, 53-20-10-2, Major Dent Repair

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C. CORROSION

Corrosion greater than that defined in Section 53-10-00 MINOR DAMAGE, must be repaired prior to the next flight.

NOTE: CORROSION IN EXCESS OF 3.00 INCHES IN ANY DIRECTION MUST HAVE AN FAA APPROVED REPAIR DEFINED SPECIFICALLY FOR THAT DAMAGE. CONTACT VENTURA AEROSPACE ENGINEERING FOR DISPOSITION.

Install a .160 thick 7075-T6 Aluminum Doubler over the affected area in accordance with Figure 53-00-21-3 below. Remove all paint and clean the affected area of the corrosion extending out at least 3.0 inches. Layout the Doubler shape by measuring 1.0 inch beyond the corrosion. Allow for additional material for fasteners in accordance with notes in 53-30-00 REPAIR NOTES. After Doubler dimensions are determined and fastener holes are drilled, de-burr the Doubler. Apply Hysol EA9394 between the Doubler and the Barrier Panel. Install using CR3523-5-() Cherrymax Rivets (grip will vary based on barrier face sheet thickness at specific location). Alternately, you may through bolt using: NAS6204-() Bolts, NAS1149F0463P Washers and MS21042L4 Nuts. Minimum quantity of 4 fasteners required. The fastener pitch is to be no greater than 1.5" spacing CL to CL. If the repair is restricted by adjacent components, a unique repair is required, contact Ventura Aerospace for engineering disposition. Corrosion in the core material of the Main Barrier Panel is not repairable. If corrosion is found in the core material the panel must be replaced, as there is no practical means to repair the core material. Where corrosion extends deeper than the .040 with a total area exceeding 3.0 in² or covers a total area greater than 64 in² the Barrier Panel must be replaced.

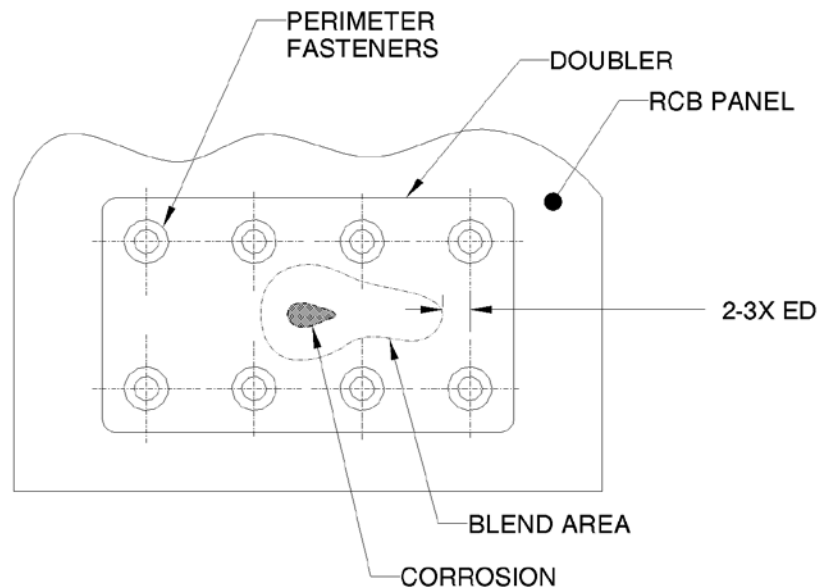


Figure 53-20-10-3, Major Corrosion Repair

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D. CRACKS

Cracks in excess of those defined in Section 53-10-00 MINOR DAMAGE, must be repaired prior to the next flight.

NOTE: CRACKS IN EXCESS OF 3.00 INCHES IN LENGTH MUST HAVE AN FAA APPROVED REPAIR DEFINED SPECIFICALLY FOR THAT DAMAGE. CONTACT VENTURA AEROSPACE ENGINEERING FOR DISPOSITION.

Install a .160 thick 7075-T6 Aluminum Doubler over the affected area in accordance with Figure 53-00-21-4 below. Remove all paint and clean the affected area of the crack extending out at least 3.0 inches. Stop drill using a .125 diameter drill on both ends of the crack. Exercise caution to get the complete end of the crack inside the drilled hole. Layout the Doubler shape by measuring 1.0 inch beyond ends of the crack. Allow for additional material for fasteners in accordance with notes in 53-30-00 REPAIR NOTES. After Doubler dimensions are determined and fastener holes are drilled, de-burr the Doubler. Apply Hysol EA9394 between the Doubler and the Barrier Panel. Install using CR3523-5-() Cherrymax Rivets (grip will vary based on barrier face sheet thickness at specific location). Alternately, you may through bolt using: NAS6204-() Bolts, NAS1149F0463P Washers and MS21042L4 Nuts. Minimum quantity of 4 fasteners required. The fastener pitch is to be no greater than 1.5" spacing CL to CL. If the repair is restricted by adjacent components a unique repair is required, contact Ventura Aerospace for engineering disposition. If a crack is in excess of 2.5 inches in length, the Barrier Panel must be replaced.

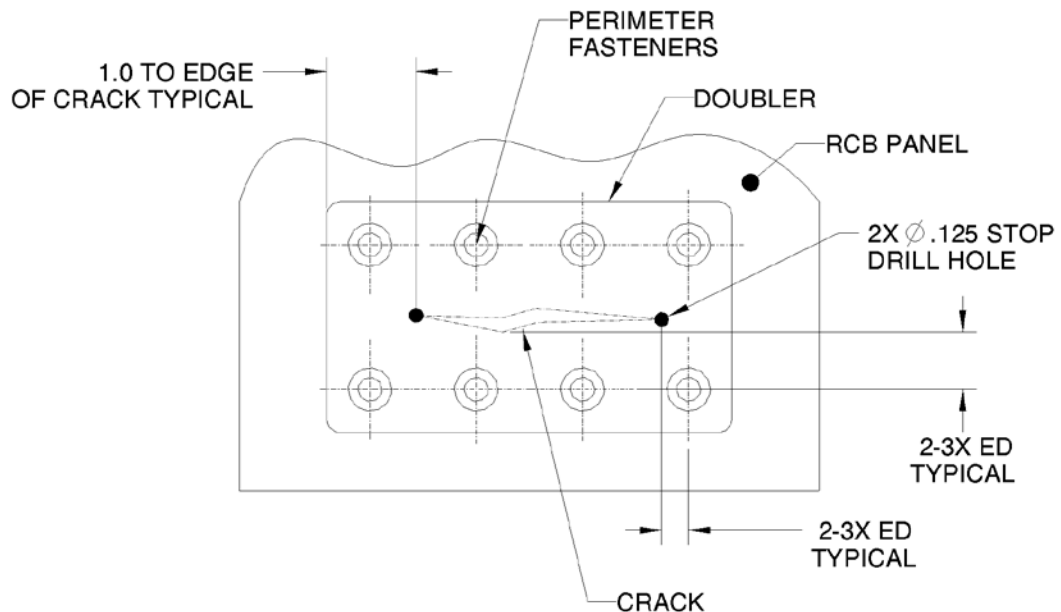


Figure 53-20-10-4, Major Crack Repair

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53-30-00 REPAIR NOTES

53-30-00 REPAIR NOTES

REMOVE BURRS AND BREAK ALL SHARP EDGES .010 MAXIMUM.

PREPARATION FOR AND INSTALLATION OF RIVETS AND SCREWS IN ACCORDANCE WITH MIL-STD-403C.

FASTENER EDGE DISTANCE TO BE 2 TIME FASTENER DIAMETER $+.06/-0.03$, MEASURED FROM EDGE OF PART TO FASTENER CENTERLINE.

EQUALLY SPACED FASTENERS TO BE LOCATED WITHIN $\pm.06$, TOLERANCE NONCUMULATIVE.

FASTENER SPACING TO BE 4-6 TIMES THE FASTENER DIAMETER.

STOP DRILL EXISTING CRACKS PRIOR TO INSTALLATION OF DOUBLER IN ACCORDANCE WITH APPLICABLE SECTION OF AC 43.13.

FINISH IN ACCORDANCE WITH MIL-T-704K, TYPE A-1, USING CHEMICAL CONVERSION COAT IN ACCORDANCE WITH AMS-C-5541, CLASS 1A.

AFTER REPAIR IS COMPLETED FINISH WITH ONE COAT OF PRIMER IN ACCORDANCE WITH MIL-PRF-23377, TYPE I, CLASS C OR N. ALTERNATE PRIMER IN ACCORDANCE WITH BMS 10-IV, TYPE 1, CLASS A, GRADE E.

IF TOP COAT IS REQUIRED, FINISH WITH ONE COAT OF PAINT IN ACCORDANCE WITH MIL-PRF-22750, TYPE II, COLOR TO MATCH.

DOUBLERS ARE TO HAVE A PERIMETER EDGE CHAMFER THAT IS EQUAL TO 75% OF DOUBLER THICKNESS (.160 THICK DOUBLER HAS A .12 X .12 EDGE CHAMFER)

RESTORE TOP COAT TO ALL APPLICABLE SURFACES IN ACCORDANCE WITH MIL-T-704K, TYPE A-1, USING MIL-PRF-22750 PAINT, COLOR NO. 27875 (WHITE) IN ACCORDANCE WITH FED-STD-595.

PREPARATION OF SURFACE PRIOR TO THE APPLICATION OF HYSOL EA9394 IS TO FOLLOW THESE STEPS

1. REMOVE ALL PAINT, PRIMER AND CORROSION USING A SANDING DISC WITH A GRIT VALUE BETWEEN 80-150
2. CLEAN SURFACE WITH METHYL ETHYL KETONE
3. ROUGHEN MATING SURFACE OF DOUBLER USING A SANDING DISC WITH A GRIT VALUE BETWEEN 80-150

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