

**UNIT AND INTERMEDIATE DIRECT SUPPORT  
MAINTENANCE MANUAL  
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST  
FOR  
CONTAINER, GENERAL CARGO; MILVAN  
NSN 8115-01-220-9527**

Approved for public release. Distribution is unlimited.

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**HEADQUARTERS, DEPARTMENT OF THE ARMY  
20 JUNE 1988**

CHANGE  
NO. 1

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 24 JUNE 1992

Unit and Intermediate Direct Support  
Maintenance Manual  
Including Repair Parts and Special Tools List  
for

**CONTAINER, GENERAL CARGO; MILVAN  
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TM 55-8115-203-23&P, dated 20 June 1988, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
C-11 through C-14 C-17 through C-22	C-11 through C-14 C-17 through C-22

2. Retain this sheet in front of manual for reference purposes.

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**WARNING**

**Do not allow personnel to pass under container when suspended by cables or when lifting for transport or storage.**

**Do not attempt to lift container with fork lift tines.**

**Direct welding flame and heat away from cast and flammable parts.**

**Do not use open flame devices for paint removal.**

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TECHNICAL MANUAL

TM 55-8115-203-23 & P

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, DC 20 June 1988

**UNIT AND INTERMEDIATE DIRECT SUPPORT MAINTENANCE MANUAL  
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)  
CONTAINER, GENERAL CARGO; MILVAN  
NSN 8115-01-220-9527**

**REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS**

**You can help improve this manual. If you find any mistake or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, U.S. Army Troop Support Command, ATTN: AMSTR-MCTS, 4300 Goodfellow Boulevard, St. Louis, MO 63120-1798. A reply will be furnished directly to you.**

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## CHAPTER 1

INTRODUCTION

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## Section I. GENERAL

**1-1. Scope.** This manual is for your use in maintaining the MILVAN cargo containers. All repairs, major and minor, are to be made with the intent of providing a serviceable, weatherproof container.

**1-2. Maintenance Forms and Records.** Maintenance forms and records used by the Army personnel are prescribed by DA Pamphlet 738-750.

**1-3. Administrative Storage.**

- a. Preparation for Storage. Inspect the outer surfaces of the containers for rust. Check the door hardware and document holder for adequate lubrication.
- b. Storage Site. Select the storage site as follows.
  - (1) Separate equipment. Separate equipment to be stored from equipment in use. Clearly mark the area for administrative storage.
  - (2) Covered space. Covered space is preferred.
  - (3) Ground surface. Open sites should be improved hardstand (cement, asphalt or gravel), if available. Unimproved sites should be firm, well drained, and free of excessive vegetation.
- c. Storage Plan. Store containers with the following factors in mind.
  - (1) Access. Equipment should be easily accessible for inspection and maintenance.
  - (2) Harsh weather. Take into account extreme weather conditions.
  - (3) Fire. Establish a fire plan. The fire plan should ensure that adequate numbers of qualified firefighting personnel and equipment are available.
- d. Inspection. Visually inspect all equipment at least once every six months. Equipment exposed to severe weather conditions should be inspected more often. Examine the following items during inspection of stored containers.
  - (1) Container body.
    - (a) Corner fittings. Cracks or damage of any kind is unacceptable. Damaged corner fitting must be replaced.

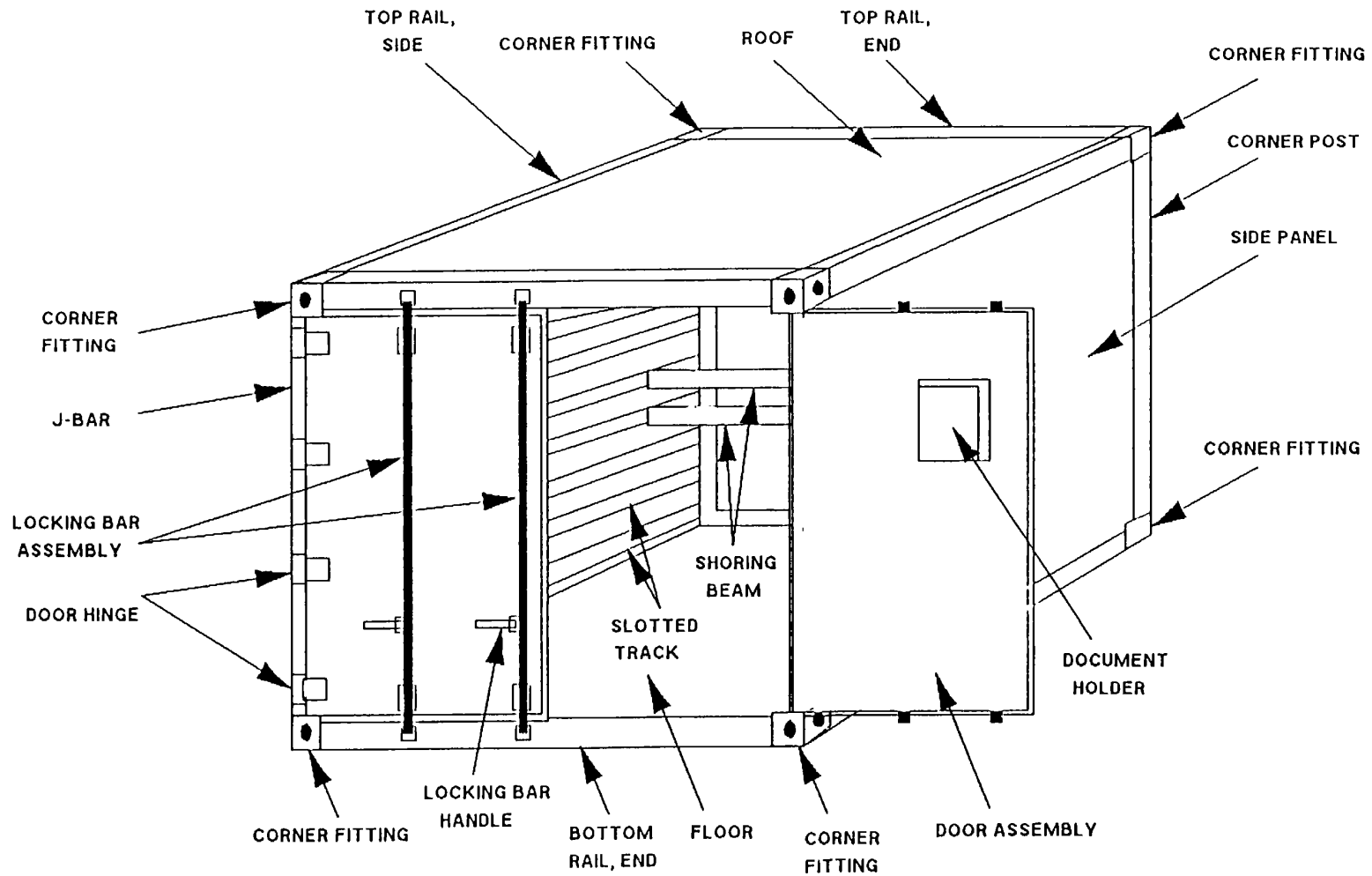


Figure 1-1  
Cargo Container



- (b) Side, roof and end panels. Weatherproofness and denting which would interfere with container handling are the critical concerns.

- 1. Holes or tears must be repaired. Repairs that appear questionable should be tested for weatherproofness using paragraph 2-5.a.

- 2. Panels must not be dented outwardly so that any part of the panel is outside of the cube formed by the outside corners of the corner fittings. See figure 3-1.

- 3. The panel must not be dented more than one inch toward the inside of the container.

- (c) Corner posts and j-bars. Check for cracks or dents more than 1/4 inch in depth.

- (d) Rails. Check for cracks or dents more than 1/4 inch in depth.

(2) Door and document holder.

- (a) Door. Minor bends or dents are acceptable if the door remains fully operational. Test bent or dented containers for waterproofness using paragraph 2.5.a. The door should open, close and be properly securable.

- (b) Door hardware. Door hardware must be completely functional.

- (c) Document holder. The document holder must be openable and closeable by one person without need for a pry bar or other tool. The document holder must be waterproof. Breaks or tears in gasket material should be repaired.

- e. Readiness. Perform necessary maintenance tasks and repairs as quickly and efficiently as possible. Whenever possible, perform all maintenance on site.

- f. Return to Service.

- (1) Restore to normal operating condition.

- (2) Resume the maintenance service schedule in effect at the commencement of storage or service the equipment before the scheduled dates in order to produce a staggered maintenance workload.

**1-4. Extended Storage.**

- a. Place containers at least four inches off the ground on blocks to permit air circulation under the container.
- b. Visually inspect containers every thirty days for damage or deterioration from exposure to severe weather conditions.

**1-5. Reporting of Errors. See Table of Contents.****1-6. Destruction of Army Material to Prevent Enemy Use.**

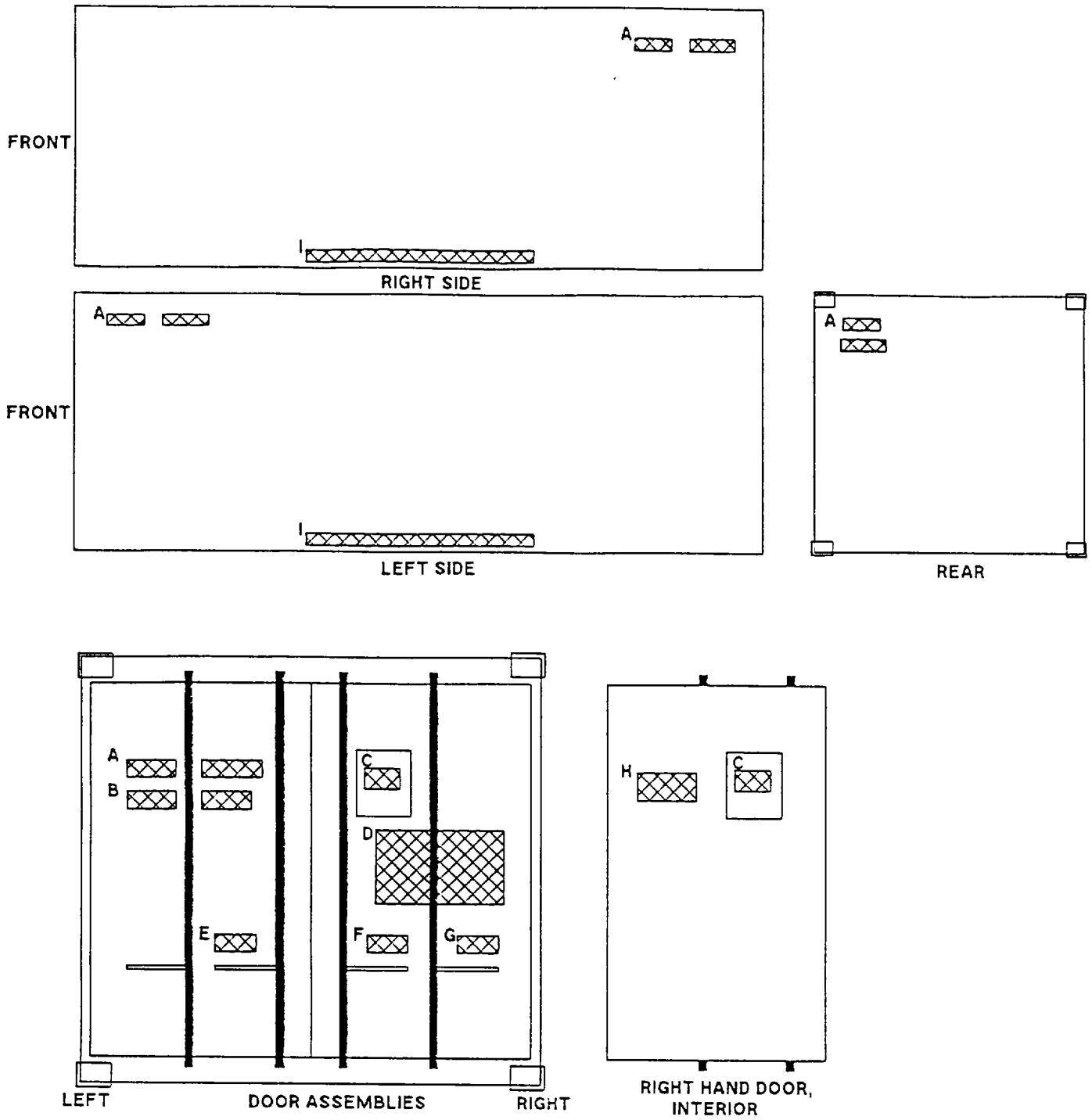
- a. General. Destroy the container and repair parts so that it will be impossible to repair the container while in the combat zone or use any of its parts for repair of other equipment.
- b. Authorization. The authority for ordering the destruction of equipment belongs to the divisional and higher commanders, who may delegate authority when necessary.
- c. Methods of Destruction. Destroy equipment by one of the following methods.
  - (1) Mechanical Destruction. Use an ax, pick, mattock, sledge, or any other heavy tool to damage hinges and locking assemblies.
  - (2) Fire. Use fire to destroy equipment when fuel and flammable materials are available. Pile the equipment together to produce a hotter, more destructive fire. Fires should be lit after mechanical destruction has been accomplished. Fires can be built to produce more heat or more smoke. For destruction, heat is desired but smoke may be useful.
  - (3) Demolition. Attach a 1/2 pound (226.80g) charge to the roof and a 1/2 pound (226.80g) charge to the floor crossmembers.
  - (4) Natural Surroundings. Natural surroundings shall be used as described below.
    - (a) Hide equipment and repair parts underwater (lakes, ponds, bogs, swamps, etc.), underground, or in caves.
    - (b) Scatter equipment and repair parts, preferably into heavy underbrush, to delay use by the enemy. If the area is recaptured, recover the hidden items.

**1-7. Reporting Equipment Improvement Recommendation (EIR).** EIR's will be prepared on Standard Form SF368, Quality Deficiency Report. Instruction for preparing EIR's are provided in DA PAM 738-750, The Army Maintenance Management System. EIR's should be mailed directly to Commander, Headquarters, U.S. Army Troop Support Command, ATTN: AMSTR-QX, 4300 Goodfellow Blvd., St. Louis, MO 63120-1798. A reply will be furnished directly to you.

**Section II. DESCRIPTION AND DATA**

**1-8. Description.** The cargo containers (fig. 1-1) are standard sized 20 foot by eight foot by eight foot-six inch steel units. Each container has a capacity of 20 tons (18.2 metric tons) each.





**Figure 1-2**  
**Marking Locations**

- |                                 |                                      |
|---------------------------------|--------------------------------------|
| A. Serial Number                | F. Container Safety Convention Plate |
| B. Country, Size and Type Codes | G. U.S. Arm) Identification Plate    |
| C. Document Holder Label        | H. Instructions Decal                |
| D. Weight and Dimensions        | I. Warning Decal                     |
| E. TIR Plate                    |                                      |

Overall Length	+0 inch /- 1/4 inch
Overall Width	+0 inch /- 3/16 inch

d. Diagonal Distance Between Opposite Corner Fittings. Check alignment of the container by comparing the diagonal measurements between corner fittings on opposite corners of the container. Allowable differences between the two opposite corner measurements on a single side are listed below. An explanatory diagram and exact measuring procedures are included in figure 3-1.

Ends	+0 - 3/8 inch
Top, bottom, sides	+0 - 3/8 inch

**Section III. REPAIR PARTS, SPECIAL TOOLS AND EQUIPMENT**

**1-10. Special Tools and Equipment.** No special tools or equipment are required.

**1-11. Repair Parts.** Repair parts are listed and illustrated in Appendix C of this manual.

**1-12. Fabricated Tools and Equipment.** No fabricated tools or equipment are required.

**1-7/(1-8 blank)**

## CHAPTER 2

UNIT MAINTENANCE INSTRUCTIONS

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## Section I. SERVICE UPON RECEIPT OF MATERIAL

**2-1. Inspection.** Inspect each container carefully before loading.

- a. Door gaskets. Inspect door gaskets for damage or distortion. If damage is suspected, check for leaks in accordance with paragraph 2-5-a.
- b. Door hardware. Check the doors for loose, worn, or damaged hardware including hinges, latches, levers, bolts, nuts, hinge pins and document holder. Replace damaged hardware in accordance with paragraph 2-7.
- c. Doors and corrugations. Check roof, corrugations and doors for holes, tears and punctures.
  - (1) Enter container and close doors completely.
  - (2) Allow eyes to get used to the dark.
  - (3) Turn on flashlight for orientation only. Do not shine flashlight beam on area you are inspecting.
  - (4) Look for light from pin holes in container.
  - (5) Mark pin hole locations with chalk for repair.
  - (6) With flashlight on and aimed at inspection points, closely examine all welds, particularly where corrugations and door posts join. Mark holes with chalk and refer to direct support for repair.
- d. Mechanical restraint system. Inspect the general condition of the mechanical restraint system. A total of twenty five shoring beam assemblies should be in the container at all times. Inspect welds holding slotted tracks to side panels. Inspect horizontal and vertical tracks for dents or bends preventing proper locking in place of beam assemblies. Inspect shoring beams for dents and bends. Inspect end fittings for proper locking into the slotted tracks. If restraint system does not operate properly, container should be repaired in accordance with paragraph 2-11.
- e. Corner posts, rails, and corner fittings. Inspect the condition of the corner posts, corner fittings, and structural rail members. Containers with distorted or kinked corner posts or rails are not acceptable for use. Broken or cracked fittings are not acceptable for use. Dented corner posts are acceptable if no dent exceeds 1/2 inch in depth or 12 inches in length. If any dent affects the corner post/corner fitting joint the container must be repaired before use. Cracking or damage of any kind to the corner fittings is

unacceptable. Containers with damaged corner posts, rails or corner fittings should be referred to direct support maintenance for repair.

- f. Corrosion. Reject the container for use if a light blow from a welders hammer would be sufficient to puncture any rail, post, or corrugation on the container. This would indicate severe rust or corrosion conditions.
- g. Paint. Inspect painted surfaces for deterioration from damage and extreme exposure. All metal surfaces must be covered with paint to protect against corrosion. If paint covers metal and is protecting against corrosion, do not repaint. Paint will be applied only to protect against rust or corrosion, not to improve the appearance of the container.
- h. Liner. Inspect the interior plywood liners for punctures, splits, and proper fit and alignment. Inspect to see that cargo space is clean and in good condition to prevent damage to loaded materials. Repair damaged plywood liner in accordance with paragraph 2-9.
- i. Floor. Inspect floor to make sure it is tight and free of holes. Inspect the floorboards for warping, looseness, or any damaged condition.
- j. Overall dimensions. If the overall shape of the cargo container appears distorted, check the container dimensions. The overall dimensions and the variation of diagonal distances between opposite corner fittings must be within the tolerances stated in paragraph 1-9.

**2-2. General Cleaning and Decontamination.**

- a. Wash the exterior of the container with any suitable detergent. Thoroughly rinse with fresh water and allow to air dry.

**NOTE**

**Each deck stored container must be washed by using organization after each ocean voyage to retard deterioration.**

- b. For decontamination, procedures required by TM 743-200 shall apply.

**SECTION II. LUBRICATION, PAINTING, UNDERCOATING  
& GENERAL TEST PROCEDURES**

**2-3. Detailed Lubrication Information.**

- a. General. Keep all lubricants in closed containers and store in a clean, dry place away from external heat. Allow no dust, dirt, or other foreign materials to mix with the lubricants. Keep all lubrication equipment clean and ready for use.
- b. Cleaning. Keep all external parts not requiring lubrication clean of lubricants. Before lubricating the equipment, wipe all lubrication points free 2-2

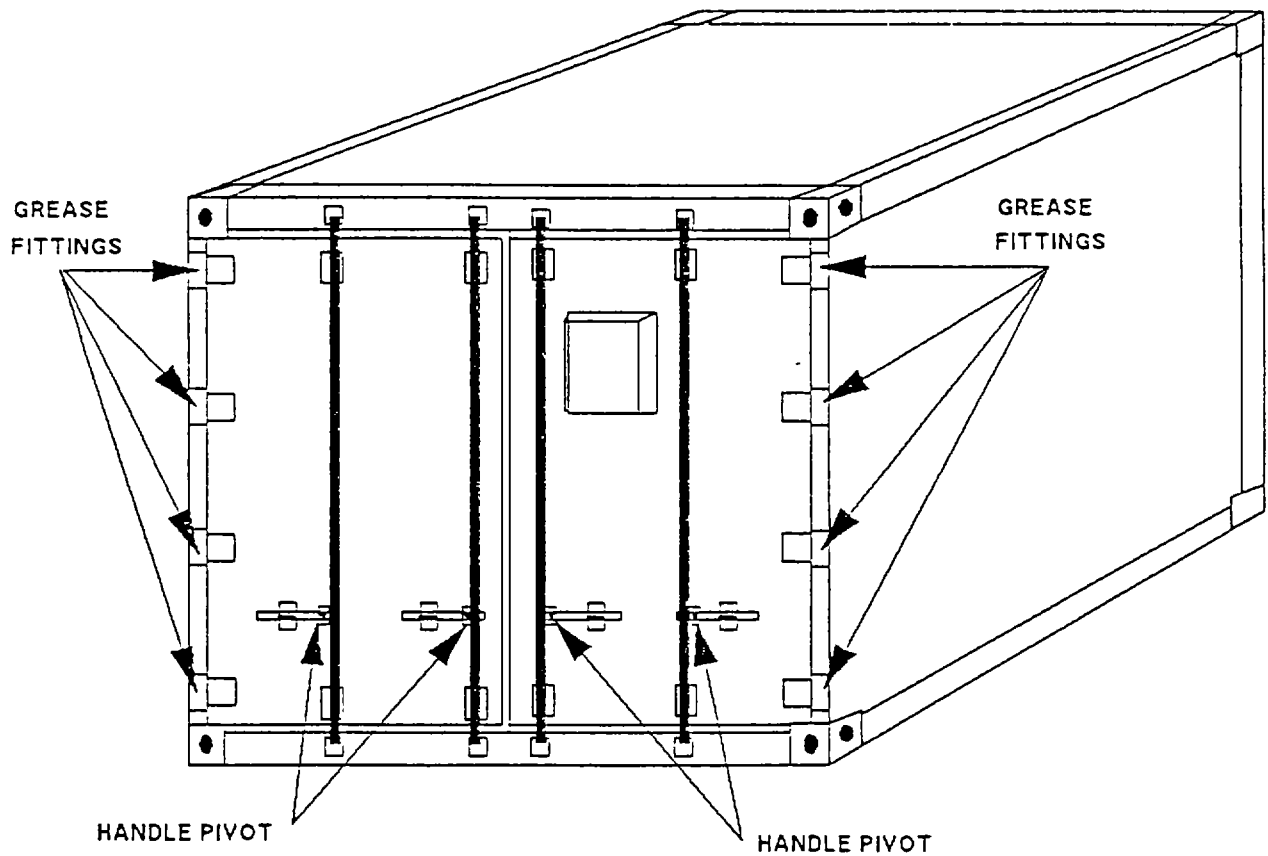
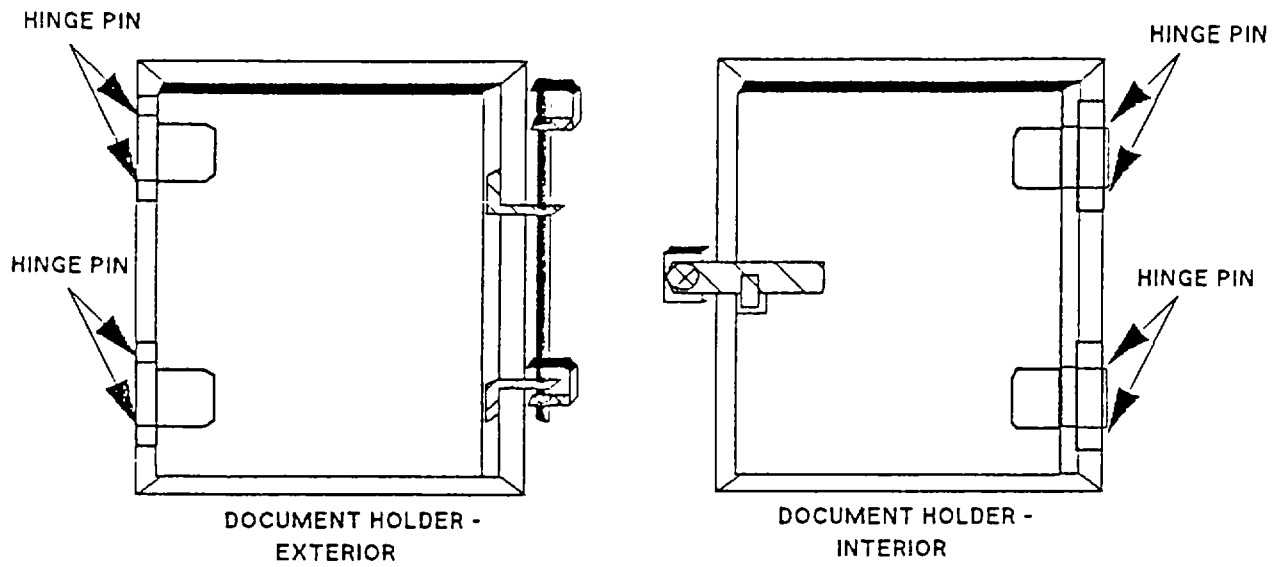


Figure 2-1  
Lubrication Points



of dirt and grease. Clean all lubrication points after lubricating to prevent accumulation of foreign matter.

- c. Points of Lubrication. Lubricate the door hardware with graphite grease, (item 1, App. D). Lubricate at grease fittings, door handle pivots and document holder hinge pins, as shown in Figure 2-1.
- d. Unusual Conditions. The container does not require special maintenance under most abnormal or extreme weather conditions, such as high or low temperatures, continued operation in sand or dust, immersion in water, or exposure to moisture. Do not lubricate as often when containers are not in use.

**NOTE**

**A lubricant which is fouled by dust and sand acts as an abrasive mixture and causes rapid wear of parts.**

**2-4. Detailed painting information .** Protection of the container from rust and corrosion depends on proper painting and undercoating of the container. Painting or undercoating is generally performed immediately after repair operations at any maintenance level. All paintings must conform to the guidelines set forth in MILT-704.

Paint only to prevent rust or corrosion, not to improve the appearance of a dingy container. Before applying paint or undercoating material, the area to be painted should be cleaned down to bright metal. The area to be painted should also be free of grease and dirt.

Military Specification

Wash primer:	MIL-P-15328
Primer:	MIL-P-52192
Topcoat paint:	MIL-C-46168
Undercoating type:	MIL-C-83933.

- a. Painting the container. Paint can be applied by brush, roller or spray methods. Use of brushes or rollers should be limited to small areas.
  - 1. Priming. Prime the container with a primer conforming to MIL-P-52192.
  - 2. Topcoat. Paint the container with paint conforming to MIL-C-46168.
  - 3. Stencil painting. Paint container markings with flat white paint.

- b. Undercoating. The bottom of the container must be undercoated after repair. Surfaces which will be undercoated must be primed as with any other container surface. Undercoating should be applied following specific manufacturer instructions.

## 2-5 Detailed Test Procedures.

- a. Water test after repair. After any major repair to an empty container, or when leaking is suspected, stream water from a hose with an 0.5-inch nozzle at 15 psi against all repaired joints and seams for at least five seconds per seam. Water entering the container indicates that the repair or gasket condition is unsatisfactory. Refer a badly repaired container to direct support maintenance. If checking gasket condition, go on to repair procedures in paragraph 2-7.
- b. Light leak test.
- (1) Enter container and close doors completely.
  - (2) Allow eyes to get used to the dark.
  - (3) Turn on flashlight for orientation only. Do not shine flashlight beam on area you are inspecting.
  - (4) Look for light from pin holes in container.
  - (5) Mark pin hole locations with chalk for repair.
  - (6) With flashlight on and aimed at inspection points closely examine all welds, particularly where corrugations and door posts join. Mark holes with chalk and refer to direct support for repair.

## Section III. CARGO CONTAINER REPAIR

**2-6. Container Body.** Inspect corrugations for holes, tears, punctures and dents more than 1/4" deep. Damaged empty containers and containers with holes larger than 144 square inches should be referred to the direct support level. Holes, tears and punctures in the corrugations of a full container may be repaired by patching with fiberglass according to paragraph 2-6.a.

Inspect the condition of the corner posts, corner fittings, and structural rail members. Containers showing damage to the corner posts, side rails or corner fittings should be referred to direct support maintenance. Corner posts having a small vertical dent which does not exceed 1/2 inch in depth and 12 inches in length do not require repair providing the corner post/corner fitting joint is not affected.

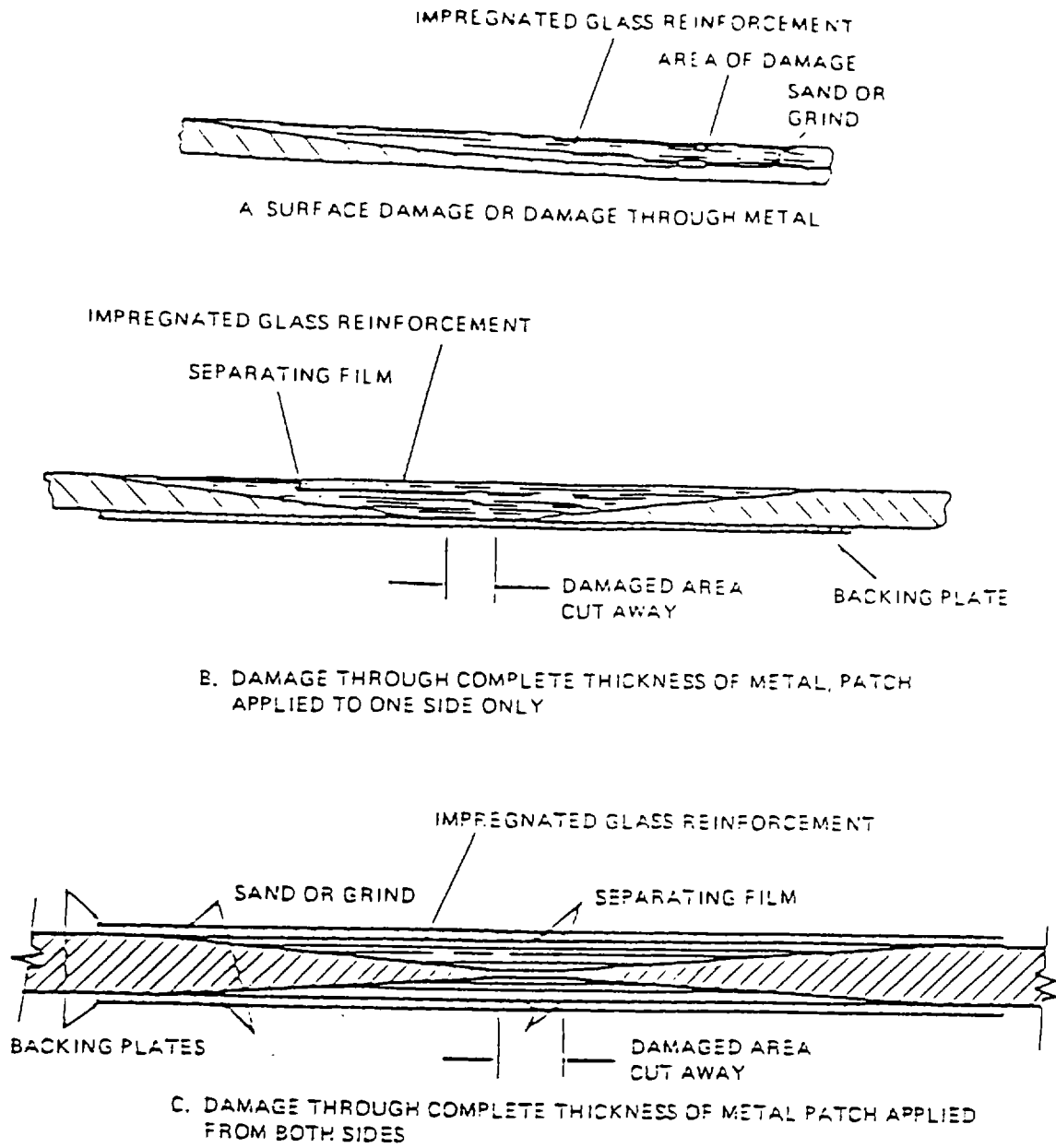


Figure 2-2  
Patching with Repair Kit

If the overall container shape seems distorted, check the container dimensions. The over-all dimensions and the variation of diagonal distances between opposite corner fittings must be within the tolerances indicated in paragraph 1-9.

a. Small corrugation hole repair. Patch small holes and punctures with fiberglass as follows:

- (1) Roughen exterior surface of container around damaged area to remove paint and to improve bonding.
- (2) Using repair kit MIL-R-58047 (CE), or MIL-R-19907C (NSN 2090-00372-6064), apply epoxy as specified.
- (3) Apply tape over the entire patch area and the container is ready for use.

b. Large corrugation hole repair. Patch large holes of up to a square foot in area with fiberglass as follows:

- (1) Remove paint and roughen surface of container around damaged area to improve strength of bond.

**CAUTION**

**Open-flame devices will not be used.**

- (2) Using repair kit MIL-R-58047 (CE) or MIL-R-19907C (NSN 2090-00372-6064), apply the low viscosity epoxy to cloth, nylon, or the like, which has been cut to size at least two to three inches greater in each direction than the hole to be covered.
- (3) Affix patch over the damaged area.
- (4) Tape the patch in vertical and horizontal directions such that the patch will not slip while curing. It will take approximately two hours for the patch to cure.

c. Placard holder replacement. Placard holders are tack welded in place on all four sides of the cargo container. Straighten a bent placard holder without removing it from the container, if possible. If the placard holder cannot be easily repaired by straightening, it should be replaced.

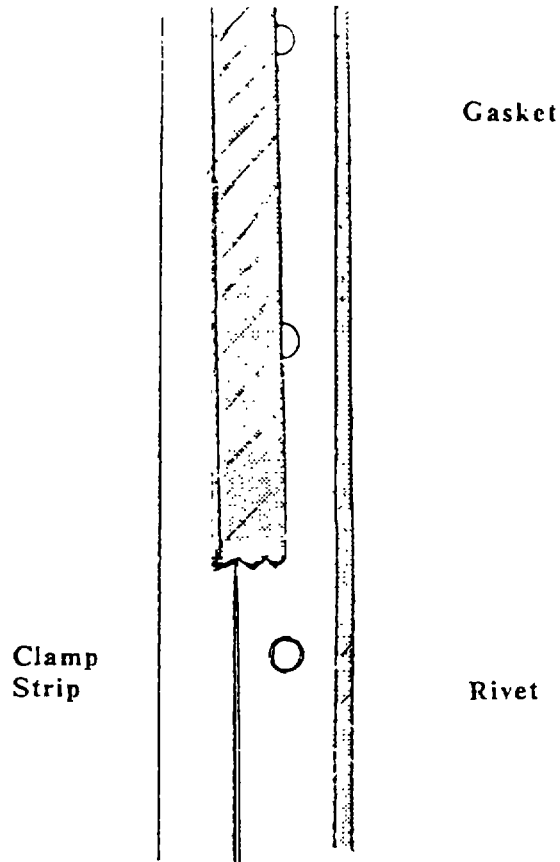
- (1) Remove placards from placard holder.
- (2) Cut placard holder away from container with oxygen acetylene torch.
- (3) Grind excess weld material from container.
- (4) Skip weld the replacement placard holder in position.
- (5) Paint according to paragraph 2-4.

**2-7. Door Assembly.** Organizational maintenance includes inspection, lubrication, replacement and tightening of hardware, and replacement and repair of gaskets.

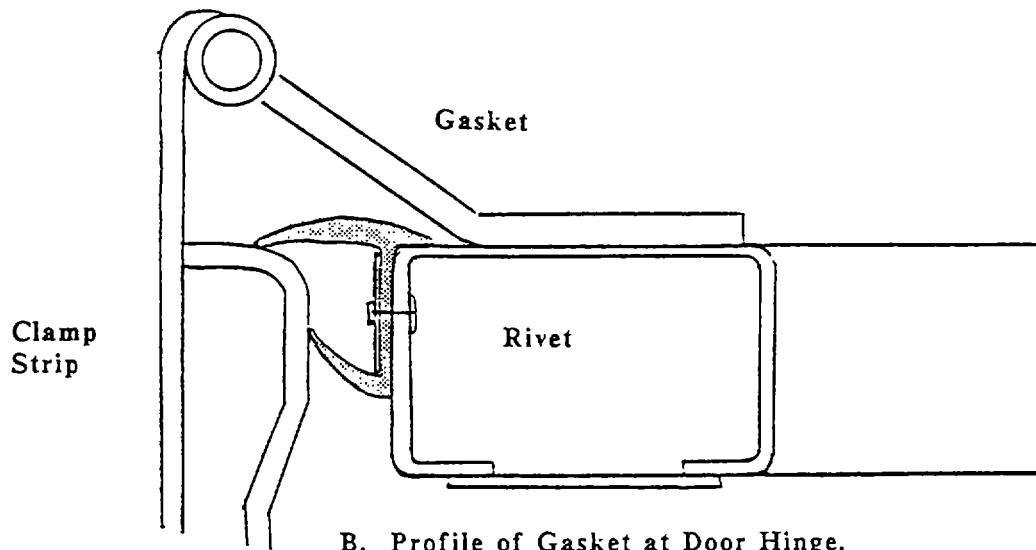
- a. Lubricate door hardware with graphite grease, (item 1, App. D) at the points indicated in figure 2-1.
- b. Replacement of Door Hardware. *The locking rod and handle retainer assemblies are attached to the right and left hand doors with bolts.*
  - (1) Replace locking rod assembly.
    - (a) If bolts holding assembly in place have not corroded, remove with socket wrench.
    - (b) If bolts have corroded, split nut with a cold chisel. Tap bolt out with a hammer, if necessary.
    - (c) Remove old caulking.
    - (d) Remove locking rod assembly.
    - (e) If damage to door becomes evident after hardware is removed, container should be referred to direct support maintenance for repair. In particular, bolt holes which have become badly out of round due to corrosion are cause to refer the container to direct support maintenance.
    - (f) Position replacement locking rod assembly and bolt securely in place.
    - (g) Caulk around bolt holes from inside of container.
    - (h) Test for waterproofness according to paragraph 2-5.a. If necessary, tighten bolts and recaulk.
  - (2) Replace handle container assembly.
    - (a) If bolts holding assembly in place have not corroded, remove with socket wrench.
    - (b) If bolts have corroded, split nut with a cold chisel. If necessary, tap bolt out with a hammer.
    - (c) Remove old caulking.
    - (d) Remove handle retainer assembly.
    - (e) If damage to door becomes evident after hardware is removed, container should be referred to direct support for repair. In particular, bolt holes which have become badly out of round due to corrosion are cause to refer the container to direct support maintenance.

- (f) Position replacement handle retainer assembly in place. Tighten bolts securely.
  - (g) Caulk around bolt holes from inside of the container.
  - (h) Test for weatherproofness in accordance with paragraph 2-5.a. If necessary, tighten bolts and recaulk.
- c. Door Gaskets. Inspect door gaskets for damage or distortion. Water test gaskets which appear damaged using paragraph 2-5. Gaskets which are split at the corner seam, or which leak along the seam edge, may be repaired using the procedures below. Gaskets which cannot be repaired using these procedures must be replaced.
- (1) Repair of split at outside corner of gasket.
    - (a) Using oxygen acetylene torch, heat putty knife until red hot.
    - (b) Pass hot knife between split sections of gasket, then immediately press sections together.
    - (c) Examine repair after 30 minutes. If sections have not rejoined (vulcanized), then replace gasket. If sections have rejoined, perform water test for leaks in paragraph 2-5.
  - (2) Repair of minor damage, or leakage at door gasket seams on inside.
    - (a) Apply generous amounts of silicon caulk (App. D, item 6) to split or separation.
    - (b) Clean off excess caulk.
    - (c) Allow caulk to cure.
    - (d) Perform water test for leaks (paragraph 2-5).
  - (3) Replace a damaged door gasket as follows.
    - (a) Remove riveted clamp strips securing gasket to door edge and remove gasket.
    - (b) Remove any rough edges on door which could damage new gasket.
    - (c) Stretch new gasket over door edge. Make sure the larger lip of gasket faces the outside of the door. New gaskets should be installed at ambient temperatures of 70 degrees F (21 degrees C) or above.
    - (d) Insert new retaining clamp strips into the inside channel of the gasket.

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A. Door Gasket Cut Away to Show Clamp Strip.



B. Profile of Gasket at Door Hinge.

Figure 2-3  
Door Gasket Attachment

- (e) Rivet the clamp strip to the door edge so that the gasket is held in place as shown in figure 2-3.
- (f) Open and close door to make sure that the gasket fits evenly around the door. Reposition gasket if necessary.
- (g) Perform water test for leaks in accordance with paragraph 2-5.

d. Door Replacement.

(1) *Removal.*

- (a) Open door.
- (b) Support door assembly.
- (c) Cut hinge pin caps with cutting torch from interior side of door. Use caution to avoid damaging hinge bushing.
- (d) If necessary, drive hinge pins from hinge assemblies with hammer and drift pin.
- (e) Remove door.

(2) *Installation.*

- (a) Carefully position and support door assembly so that hinge blades align perfectly with hinge bushings.
- (b) Replace washers.
- (c) Insert hinge pins through hinge bushing and blade. If hinges do not fit go to step (e)
- (d) Check for proper alignment of door assembly. Check for proper sealing of door gasket against container. If door is badly out of line check container against dimensional tolerances in paragraph 3-1.
- (e) If hinge blade and bushing do not fit together freely, carefully grind up to 1/16" of metal from upper and/or lower hinge bushing. Recheck for proper alignment.
- (f) Tack weld hinge pin caps to hinge pins.
- (g) Lubricate hinges at grease fittings.

**2-8 Document Holder.** The document holder is mounted on the right-hand door of the container. Inspect and service as follows:



a. Document Holder Inspection.

- (1) Open and close document holder door to check operation.
- (2) Inspect riveted seams for strength and waterproofness. If damage is apparent, test for waterproofness according to paragraph 2-5. Repair in accordance with paragraph 3-11.
- (3) Clean inside of document holder if dirty. Rust on the inside of the document holder indicates that the document holder gasket may be faulty. Remove paint, etc. down to bright metal prime and repaint according to paragraph 2-4. Test for weatherproofness according to paragraph 2-5.
- (4) Inspect holder gasket for breaks and tears which would allow dirt or water into the holder. Water test according to paragraph 2-5. If leaks occur replace gasket strips according to paragraph 2-8.c.

b. Document Holder Lubrication. Lubricate hinge pins and locking pins with graphite grease, (item 1, App. D).

c. Replacement of Document Holder Gasket. If document holder gasket leaks during water test, replace as follows. Gaskets may be prepared from 1/4" neoprene sheet.

- (1) Remove old gasket material. Metal must be clean and free of dirt, oil, or old gasket material.
- (2) Glue replacement gasket strips in place with adhesive (item 7, Appendix D).

**2-9 Plywood Liners and Kickplate.** Inspect the interior plywood liners and kickplate for punctures or splits, and proper fit and alignment. Inspect interior for exposed bolts, nuts, screws, nails, or other inwardly projecting parts which may damage cargo. Replace plywood liners and kickplate as follows.

a. Removal of Plywood Liners and Kickplate.

- (1) Insert a flat steel chisel between each drive rivet and the plywood liner and shear off the drive rivet head. Repeat for all drive rivets.
- (2) Drive out remainder of drilled rivets with driftpin. Work carefully so that the plywood liner can be used as a template to make a replacement liner.
- (3) Remove plywood liner.
- (4) Inspect kickplate for damage. If kickplate is in good condition, remove it as follows:

- (a) The kickplate is glued to the lower plywood liner with adhesive. Remove it from the liner by carefully inserting a screwdriver or wood chisel between the kickplate and the liner.
  - (b) Remove all old cement from kickplate.
  - (c) Save the kickplate to install with new liner.
- b. Preparation of Replacement Plywood Liner. Replacement plywood liners are prepared from 4' x 8' x 1/4" exterior grade fir plywood.
- (1) Set saw blade at 45 degree angle.
  - (2) Cut plywood sheet to 3 ft. 7 5/16 inches wide, 6 ft. 11 5/16 inches long -top measurements. Bottom measurements will be about one quarter inch less each way.
- c. Preparation of Replacement Kickplate. Replacement kickplates may be prepared from 1/16" aluminum sheet metal. Cut aluminum sheet to 6 ft. 11 5/16 inches long by fifteen inches wide.
- d. Installation. If old liner is usable as a template to mark and drill new rivet holes, skip to step 7 of this procedure without drilling new holes in end wall tabs. If using new kickplate, on bottom liner, glue kickplate in place against liner before proceeding.
- (1) Have a helper hold the replacement liner in position against end wall.
  - (2) Mark exact position of liner on end wall -top, bottom and sides.
  - (3) Put liner aside. Measure distance of existing holes in end wall from pencil lines. Transfer measurements to liner, marking location of holes on top side of plywood liner.
  - (4) Examine location of holes in metal tabs on end wall. Determine whether new holes will be drilled above or below existing hole.
  - (5) Measure 3/8 inches up or down from each mark on plywood liner. Mark these spots to be drilled.
  - (6) If this is the bottom liner panel, cement kick plate in place with adhesive (Item 7, Appendix D). Kick plate holes in reused kick plate should line up with marks on panel.
  - (7) With a helper holding liner in position against end wall, drill through liner and end wall tabs at each of the spots marked to be drilled.
  - (8) With a helper holding liner in position against end wall, drive blind rivets through holes with hammer. Make sure liner is tight against end wall when driving rivets.

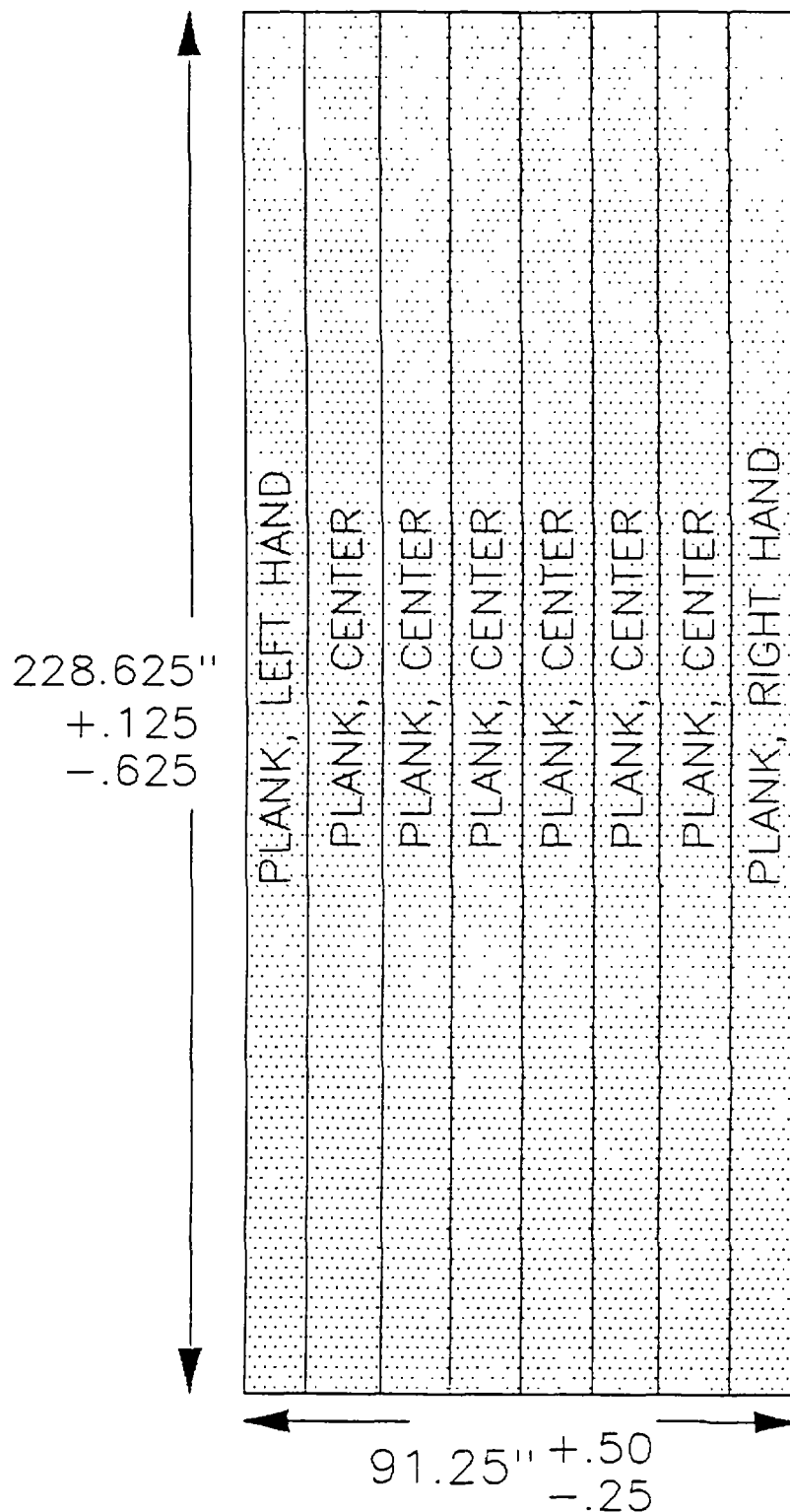


Figure 2-4. Plank Configurations and Dimensions

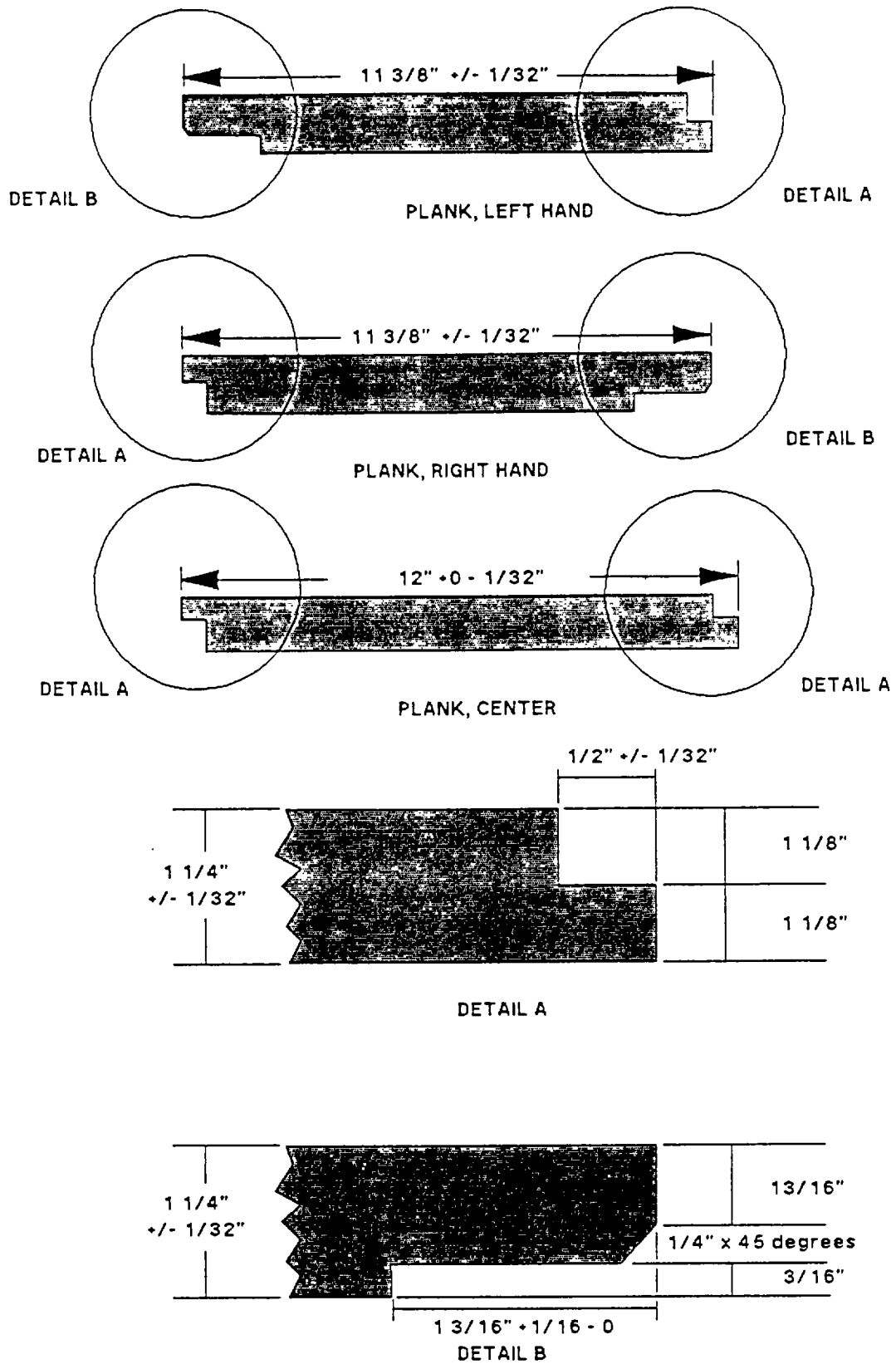


Figure 2-5. Plank Profile Dimensions

**2-10 Floor.** Container floors are made from one of two materials: wood or reinforced fiberglass, known as "Tek-dek". Replacement planks for both Tek-dek and shiplap wood floors should be hardwood, 1 1/4 inches (32 mm) thick by 11 1/2 in. wide (292 mm) (top or bottom measurement).

- a. Preparation of Replacement Planks. Laminated oak planks may be manufactured by qualified woodworkers according to the dimensions and tolerances shown in figure 2-4.
- b. Methods of Repair. Damaged planks may be replaced or spliced, depending on the kind of damage. Except where otherwise noted, the same repair procedures are used with both wood and Tek-dek flooring. Decide whether to replace or splice damaged flooring by applying the following rules.
  - (1) All planks must fit over at least four container crossmembers. Undamaged flooring that does not cover at least four crossmembers should be removed so that a longer repair plank may be spliced in.
  - (2) Floor boards which fit side by side should not end on the same crossmember.
  - (3) Planks must terminate flush with the vertical web of a crossmember. See figure 2-6.
  - (4) Replace complete planks only if splicing is impossible in accordance with the above rules.
- c. Splicing. Repair a plank by splicing as follows.
  - (1) Remove self-tapping screws from damaged flooring.
  - (2) Remove self-tapping screws from flooring within eighteen inches in front or back of the damaged flooring to create working space. See figure 2-4. Loosen floorboard to either side of damaged plank by backing out screws halfway.
  - (3) Pry floorboard above steel crossmembers to permit saw blade clearance. Cut out damaged floorboard at point A as in figure 2-6 so that remaining floorboard on either side of damaged section is even with the vertical web of the crossmember.
  - (4) Carefully weld two pieces of steel angle, 1/8 inch thick by 1 inch by 1 inch, to crossmembers at both ends of cutout area. See figure 2-5. Do not burn flooring already installed.
  - (5) Measure and cut replacement plank to size. Replacement should fit flush with existing planks.
  - (6) Caulk the area where the planks butt against one another. Press new board section in place.

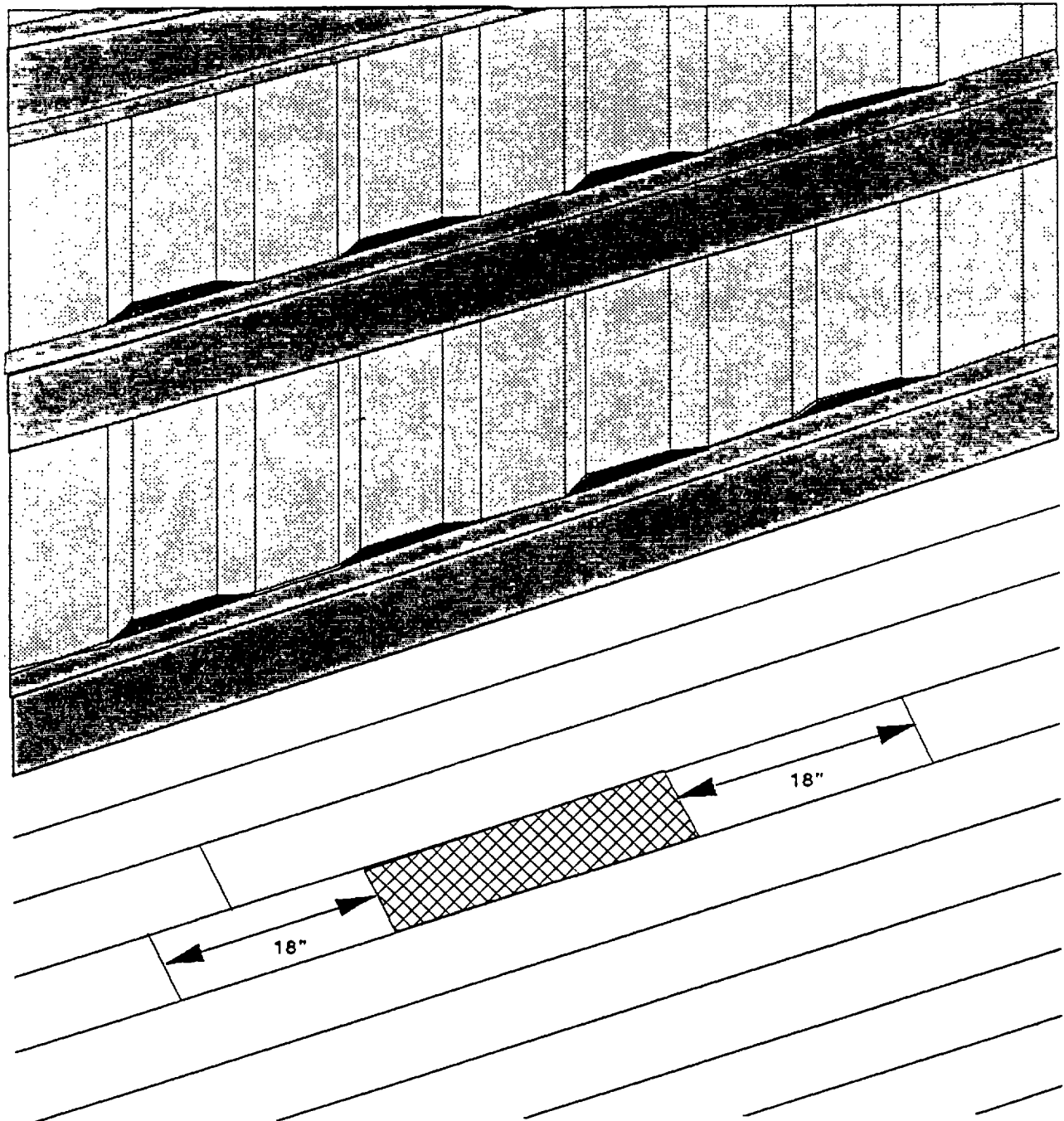


Figure 2-6. Floor Repair Working Space

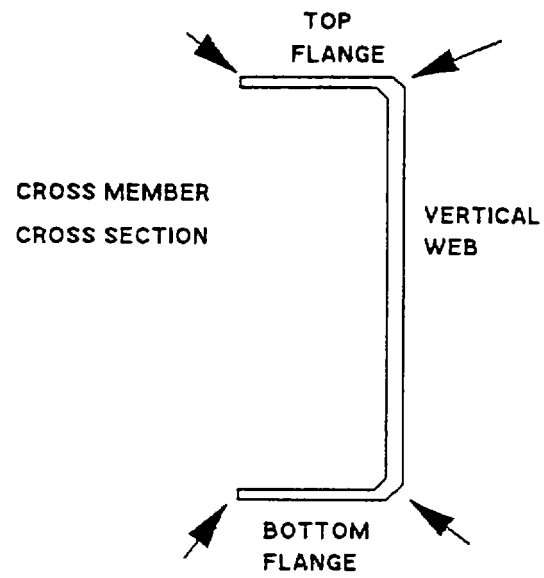
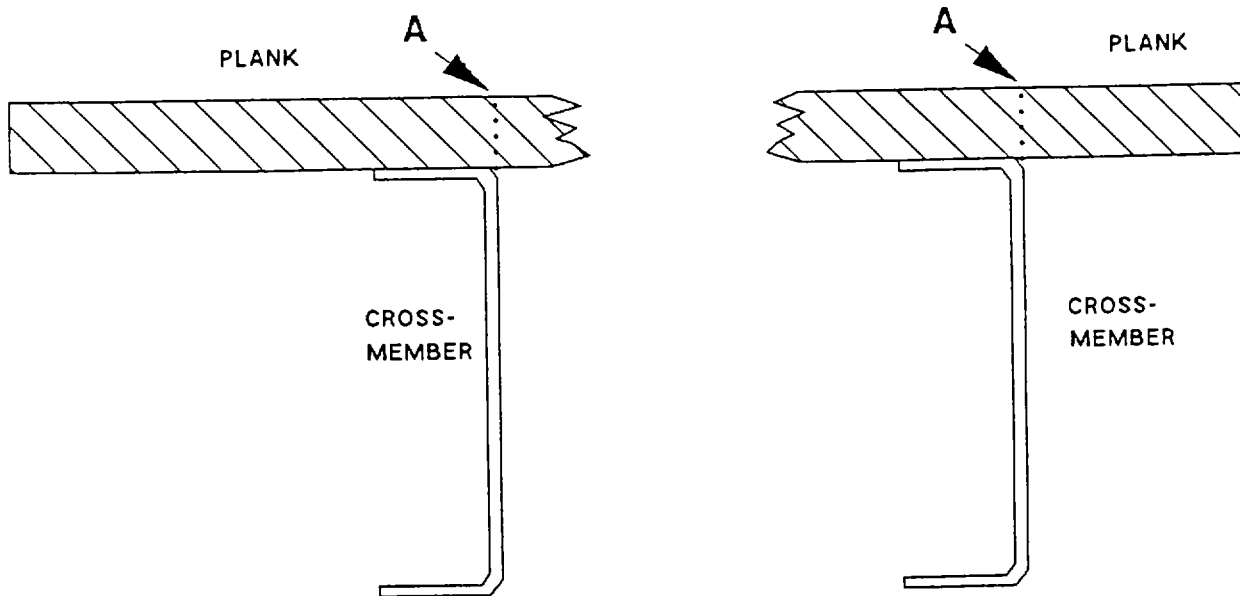
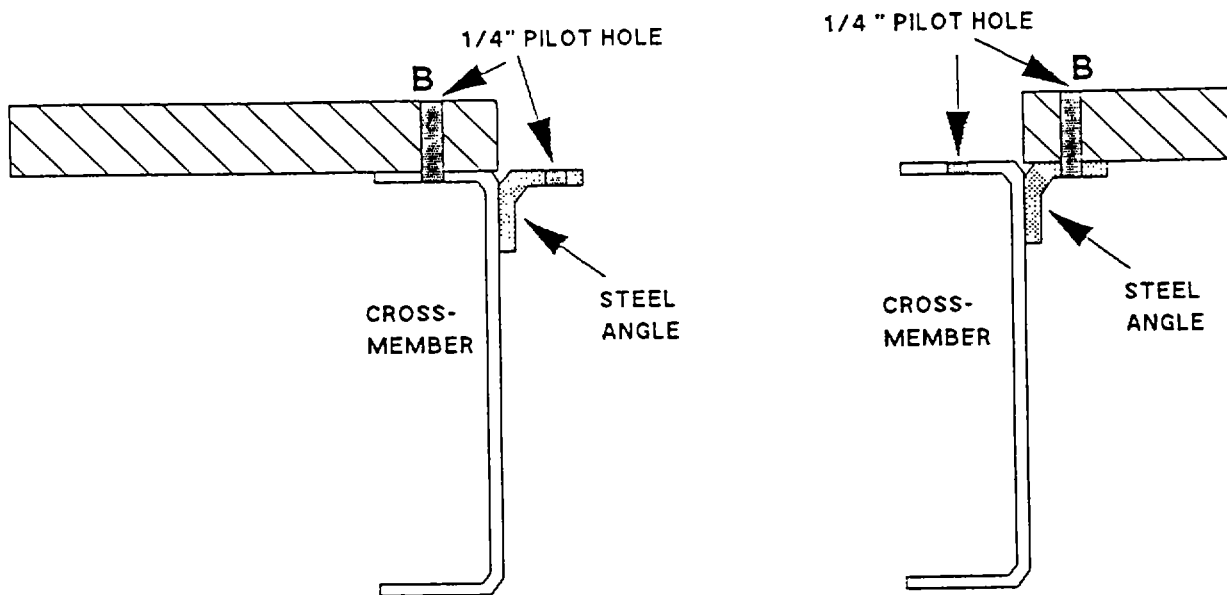


Figure 2-7. Crossmember Cross Section Showing Part Names



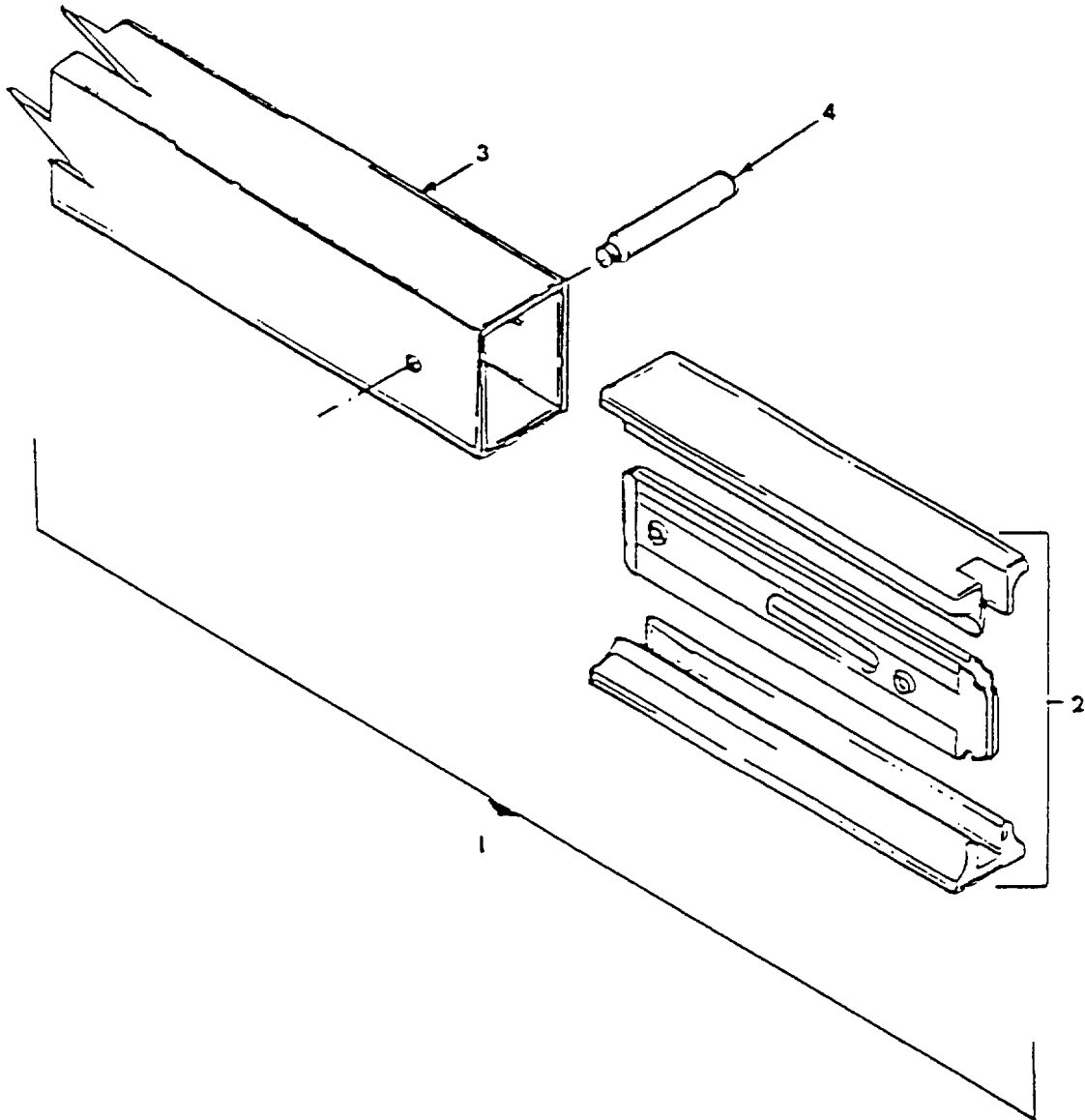
a) Cut flooring flush with vertical web



b) Pilot hole and steel angle mounting locations

Figure 2-8. Floor Repair Cross Section View





**Figure 2-9. Shoring Beam Assembly**

- 1) Shoring Beam Assembly
- 2) End Fitting
- 3) Shoring Beam
- 4) Pin

- (7) Drill 1/4 inch diameter holes through the spliced plank sections and the angle support or crossmember.
- (8) Using self-tapping screws, seat screws in position and drive below floor level.
- (9) Apply undercoating according to paragraph 2-4.

d. Replacement. If it is not possible to splice the plank, replace the plank as follows.

- (1) Unscrew and remove all screws holding down damaged plank.
- (2) Back out screws halfway to loosen adjacent planks.
- (3) Remove damaged plank.
- (4) Remove old caulking and undercoating which may prevent proper seating of new plank.
- (5) Cut replacement plank to fit. Board should fit closely with existing floor on all sides.
- (6) Apply caulking along top of crossmember flange.
- (7) Fit replacement plank in place.
- (8) Drill 1/4 inch diameter holes through the new plank section and the angle support or crossmember.
- (9) Using self-tapping screws, seat screws in position and drive below floor level.
- (10) Apply undercoating according to paragraph 2-4.
- (11) A forklift test as described in paragraph 3-8.e will be applied if, in the judgment of the inspector, any form of damage exists which might indicate that the container floor is unsound.

## 2-11. Mechanical Restraint System

- a. Shoring Beam Repair. Repair of the shoring beam consists of straightening the beam. Straighten by mechanical means only. Do not use heat.
- b. End fitting replacement. Replace end fittings as follows.
  - (1) Using a suitable punch, straighten the crimped end of the pin (See fig. 3-13) and drive the retaining pin from the beam assembly.
  - (2) Remove end fitting from beam.

- (3) If necessary, straighten any damaged area of the beam.
- (4) Install replacement end fitting in beam and install retaining pin.
- (5) Using a punch, peen end of pin to lock into place in beam.
- (6) Install beam assembly into container.

**CHAPTER 3**  
**INTERMEDIATE DIRECT SUPPORT**  
**CARGO CONTAINER REPAIR**

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**Section I. CONTAINER BODY**

All repairs in this section should be performed with the container completely empty unless otherwise noted. Shoring beams should be removed or stowed safely out of the way of repair operations.

In the event of major damage to the container, repair should be planned carefully. Repair should begin with major structural assemblies: Corner posts, end rails, side rails, floor crossmembers and corner fittings. Repairs to side, end and roof panels should follow. The placard holder should be the last repair item considered on the container body.

**NOTE:**

**All welding repairs to structural members must be performed by certified welders.**

**NOTE:**

**All patches, inserts, sections and replacements for panels, rails and crossmembers should be steel conforming to the AISI-409 standard. AISI stands for the American Iron and Steel Institute. This steel is corrosion resistant and has a minimum tensile strength of 65KSI (thousand pounds per square inch).**

Access to the damaged area affects quality of the repair. Structural parts which may need to be replaced, such as side panels, end panels, roof panels, placard holder, floor planking, end liners, or shoring beam tracks, should be removed first to provide maximum access for repair of the major structural assemblies.

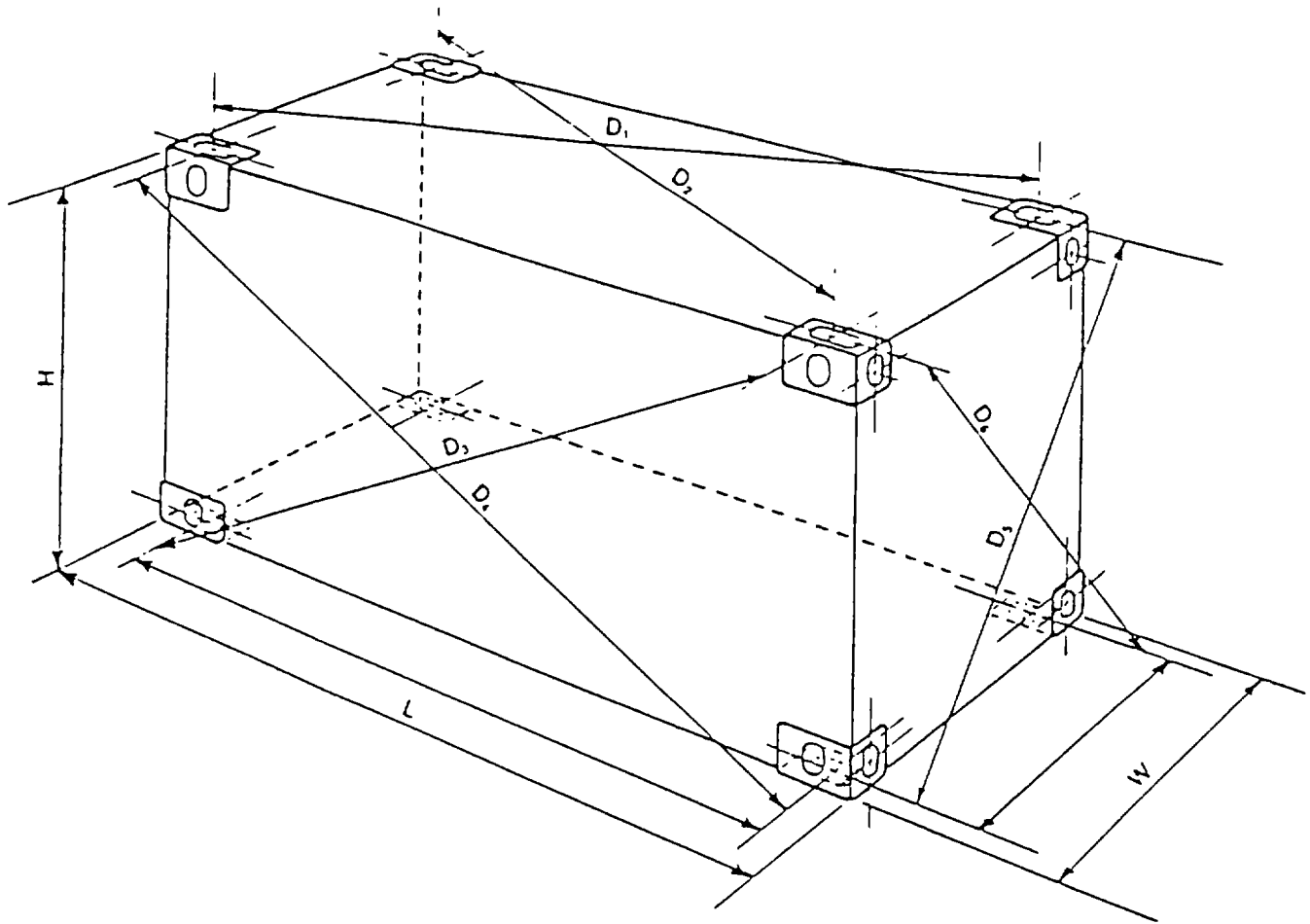
**3-1. Corner Fitting.**

*a. Replacement.*

(1) Cut out damaged corner fitting with oxygen-acetylene torch.

**CAUTION:**

**Direct oxygen acetylene torch away from corner castings, side and end rails, and side and end panels to prevent damage to any of these parts.**



Standard Measurement		Maximum Tolerance
H (Height)	8 ft. 6 in.	+ 0 / -3/16 in.
W (Width)	8 ft. 0 in.	+ 0 / -3/16 in.
L (Length)	19 ft. 10 1/2 in.	+ 0 / -1/4 in.
D <sub>1</sub> - D <sub>2</sub>	0	+/- 1/2 in.
D <sub>3</sub> - D <sub>4</sub>	0	+/- 1/2 in.
D <sub>5</sub> - D <sub>6</sub>	0	+/- 3/8 in.

Figure 3-1. Important Dimensions

- (2) Grind cut-away edges to forty-five degree bevel. This will help to ensure complete weld penetration.
- (3) Position corner fitting as follows:
  - (a) Corner fitting should fit closely, with maximum gap of 5/64 inch between the casting and the end and side rails.
  - (b) Grind rails so that corner fitting fits closely and is on level.
  - (c) Tack weld corner fitting into position.
  - (d) Measure distances  $D_1$ ,  $D_2$ ,  $D_3$ ,  $D_5$ ,  $D_s$ , and  $D_6$  indicated in Figure 3-1. Each of these measurements is made between the exact centers of the corner fitting openings. Subtract  $D_2$  from  $D_1$ ,  $D_4$  from  $D_3$  and  $D_5$  from  $D_6$ . If the results exceed the maximum tolerances listed in Figure 3-1, reposition the corner fitting.
  - (e) Measure the overall length and width of the container. Measurements must be within the maximum tolerances listed in Figure 3-1.
  - (f) Adjust corner fitting position to meet maximum tolerances. Remeasure and adjust as necessary.
- (4) Continuously weld corner fitting in place using low hydrogen welding rod. Welds must be uniform, free of scale, pin and blow holes, and with full penetration.

### 3-2. Side, End and Roof Panels.

- a. *Method of Repair.* Repair damage to side, end and roof panels in one of four ways, depending on the kind of damage. Holes may be repaired by filling with weld metal, patching, filling the hole with an insert, or replacing the panel. Temporary repairs to loaded containers may be made with fiberglass patches according to procedures in paragraph 2-6.
  - (1) Fill holes less than one quarter inch in diameter with weld metal.
  - (2) Patch holes larger than a quarter inch in diameter which occur on a flat surface. Damaged surfaces which can be returned to their original shape should be smoothed out and patched.
  - (3) Use an insert instead of a patch whenever the hole is not limited to a single flat surface, and/or when denting is so severe that the metal could not be reshaped to its original profile.
  - (4) Replace the side or end panel when an insert of identical corrugation shape and depth is not available for repair of a damaged section. The shape of the corrugation is not as critical when replacing complete panels, as long as the number and depth of the corrugations on the panel is the same. Replace the panel if damage has affected more than fifty percent of the panel.

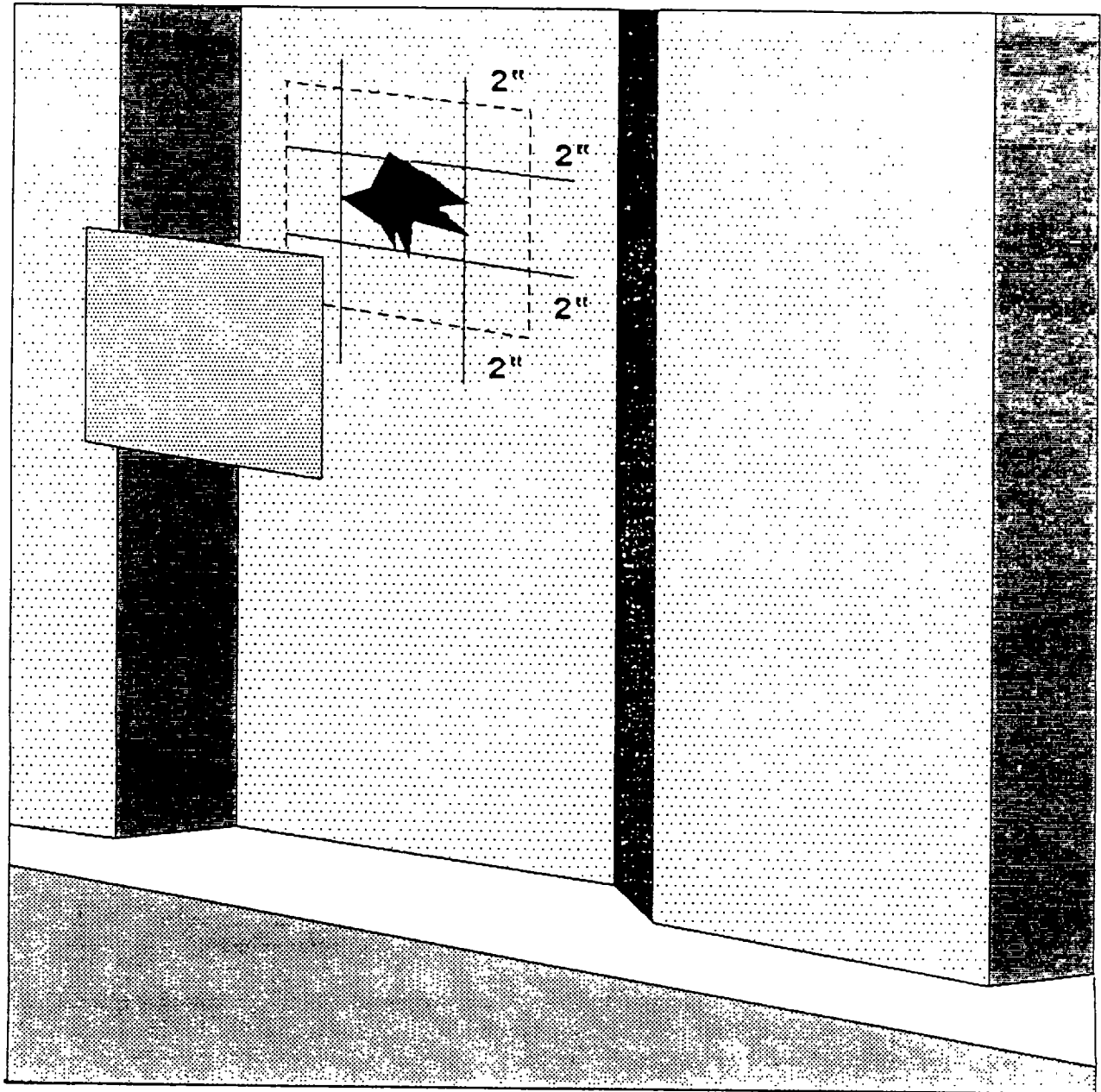


Figure 3-2. Patch Overlap

as long as the number and depth of the corrugations on the panel is the same. Replace the panel if damage has affected more than fifty percent of the panel.

- (5) Loaded containers which have been punctured but not significantly dented can be patched with fiberglass according to paragraph 2-6.

**NOTE:**

**All patches, inserts, sections and replacements for panels, rails and crossmembers should be steel conforming to the AISI-409 standard. AISI stands for the American Iron and Steel Institute. This steel is corrosion resistant and has a minimum tensile strength of 65KSI (thousand pounds per square inch).**

**CAUTION:**

**Direct oxygen acetylene torch away from front corner castings, side and end rails, and side and end panels to prevent damage to any of these parts.**

- b. Filling with weld metal. Repair small holes or cracks in a side or end panel as follows: (1) Remove paint from damaged area. Straighten metal which has been dented.
  - (2) Before welding side or end panels shield shoring beam horizontal and vertical tracks from welding heat. If panel being repaired is an end panel, thoroughly wet down plywood liners before welding to avoid fire.
  - (3) Weld the crack or small tear with stainless steel electrode (item 9, Appendix D).
  - (4) Paint repaired area. Use painting procedure in paragraph 2-4.

() If used, remove shielding from shoring beam tracks.

- c. Patching. Patch large holes in side or end panels as follows:

- (1) Remove paint from damaged area.
- (2) Before welding side or end panels shield horizontal and vertical shoring beam tracks to protect from damage during welding. If panel being repaired is an end panel, remove the adjacent plywood liner using procedures in paragraph 2-9.
- (3) Carefully flatten damaged metal with hammer, returning metal to original shape as much as possible.
- (4) Cut out any badly damaged metal so that a piece of metal can be closely fitted over the damaged area.



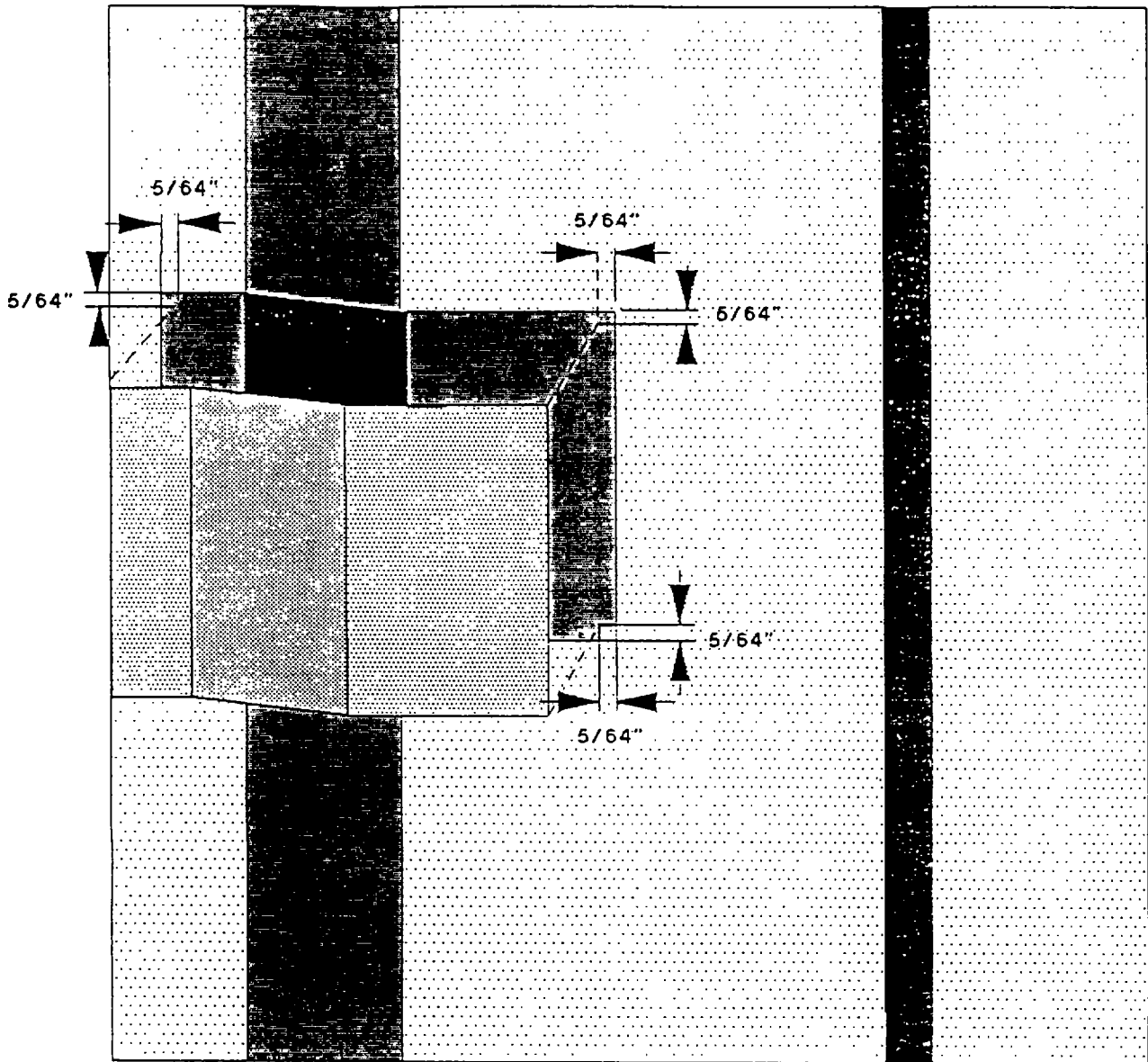


Figure 3-3. Insert Clearance

- (5) Cut patch to fit over damaged area. Allow at least a two inch overlap all around the damaged area. The steel used for patching should be at least 14 gauge. See figure 3-2.
- (6) Grind smooth the cut edges of the patch and the panel being repaired. Grind down to bare metal around the hole to be patched, leaving three quarters of an inch of bare metal around the damaged area. This will provide a clean, smooth surface for the exterior patch weld.
- (7) Carefully fit and tack weld the patch in position.
- (8) Continuously weld the patch to the outside of the container. Continuously weld or skip weld the patch from the inside of the container.
- (9) Paint repaired area according to paragraph 2-4.
- (10) Caulk inside patch seams, where patch was not continuously welded.
- (11) Perform weathertightness test following the procedure in paragraph 2-5.
- (12) Remove shielding if used. If the plywood liner has been removed, replace it according to the procedure in paragraph 2-9.

d. Repairing with insert. Repair damaged areas with an insert as follows:

- (1) Remove paint from damaged area.
- (2) Shield affected shoring beam tracks to protect from heat. If panel being repaired is an end panel, remove plywood liner according to the procedure in paragraph 2-9.
- (3) Carefully flatten damaged metal with hammer, returning metal to original shape as much as possible.
- (4) Cut out badly damaged metal so that a corrugated insert can be closely fitted within the damaged area.
- (5) Cut sheet metal insert to "nest" within damaged area, allowing no more than 5/64 inch gap between the insert and the panel being repaired. See figure 3-3. The insert must be cut from a panel with corrugations identical to the original being repaired. Insert material must be at least 14 gage steel.
- (6) Grind smooth the cut edges of the insert and the panel being repaired.
- (7) Carefully fit and tack weld the insert into place.
- (8) Continuously weld the insert into place from the outside.
- (9) Paint repaired area according to paragraph 2-4.
- (10) Perform weathertightness test according to paragraph 2-5.

- (11) Caulk seam from inside of container if seam leaks. Retest.
  - (12) Remove shielding if used. If the panel is an end panel, install plywood liner in accordance with paragraph 2-9.
- e. Replace Corrugated Panel. When replacing panels it is possible to distort the overall dimensions and squareness of the container. These measurements are most likely to be affected when replacing more than one panel at a time. Check measurements against those shown in figure 3-1.
- (1) Measure panel height, width and approximate depth of corrugation to determine replacement dimensions.
  - (2) Shield shoring beam tracks and floor planking if they will be exposed to welding heat. For replacement of end panel, remove plywood liners.
  - (3) Separate panel from container at all attachment points. Carefully use oxygen acetylene torch to flush away weld metal joining the panel to the rest of the container. Carelessness will result in damage to the structure of container. To avoid this danger, the less experienced welder should cut the panel from the container, leaving a strip of panel attached to the container rails.
  - (4) Detach the panel from adjacent panels by cutting through the weld seam.
  - (5) Remove damaged panel.
  - (6) Grind away any remaining weld and panel material.
  - (7) Grind edges smooth where panel has been cut away.
  - (8) Prepare replacement panel. Panel must be at least 14 gage metal.
    - (a) *Chemically clean or sandblast panel.*
    - (b) Check panel for fit.
    - (c) Grind edges smooth.
  - (9) Tack weld replacement panel in place, checking and adjusting alignment if necessary. Butt welded joints between the replacement and existing panels are best. Allow no more than 5/64 inch between buttjointed panels. If necessary, lap joints between panels may also be used. The replacement panel must overlap at least one half inch if a lap joint is used.
  - (10 ) Continuously weld new panel in place from the outside of the container. If lap joints are used, it is also necessary to skip weld or continuously weld the panel from the inside of the container.

- (11) Light leak test the welds according to paragraph 2-5.
- (12) Clean, mask and prime inside and outside of the repaired area according to paragraph 2-4. Apply top coat to the outside only.
- (13) If the replacement panel is lap jointed to the container, caulk the inside seams where they are not continuously welded.
- (14) Remove shielding if used. If plywood liner has been removed, replace it according to paragraph 2-9.

**3-3. Corner Post.** Use repair procedures in the following order of preference: Welding repair with inserts, and replacement of the corner post.

**CAUTION:**

**Direct oxygen acetylene torch away from corner castings, side and end rails, and side and end panels to prevent damage to any of these parts.**

- a. *Inserting.* If damage cannot be repaired by straightening, it may be possible to replace the damaged area with an insert.
  - (1) Restrictions for insert repair of corner posts are as follows: (a) Do not use more than two inserts on a single corner post. This does not include inserts used to repair the J-bars on the front corner posts. There is no limit to the number of times inserts may be used to repair J-bars. See figure 3-4, example A.
  - (b) Do not use an insert to replace a damaged corner post section when an insert has already been used on another side of the same section. See figure 3-4, example B.
  - (c) Do not use inserts closer than six inches apart. If the damaged area is closer than six inches to an existing insert, the new insert must be extended and butt welded against the existing insert. If the existing insert is diamond or oval shaped, the new insert must extend around the narrow part of the old insert so that both inserts are welded together at the widest point of the narrower insert. See figure 3-4, example C.
  - (d) Do not use an insert when the damaged area extends over more than twelve inches of the exposed corner post cross section. See figure 3-4, example D.
  - (e) Do not use a second butt-welded insert when the total width of the two inserts across the corner post cross section will exceed twelve inches. See figure 3-4, example D.
  - (f) Do not use an insert less than six inches long. See figure 3-4, example E.

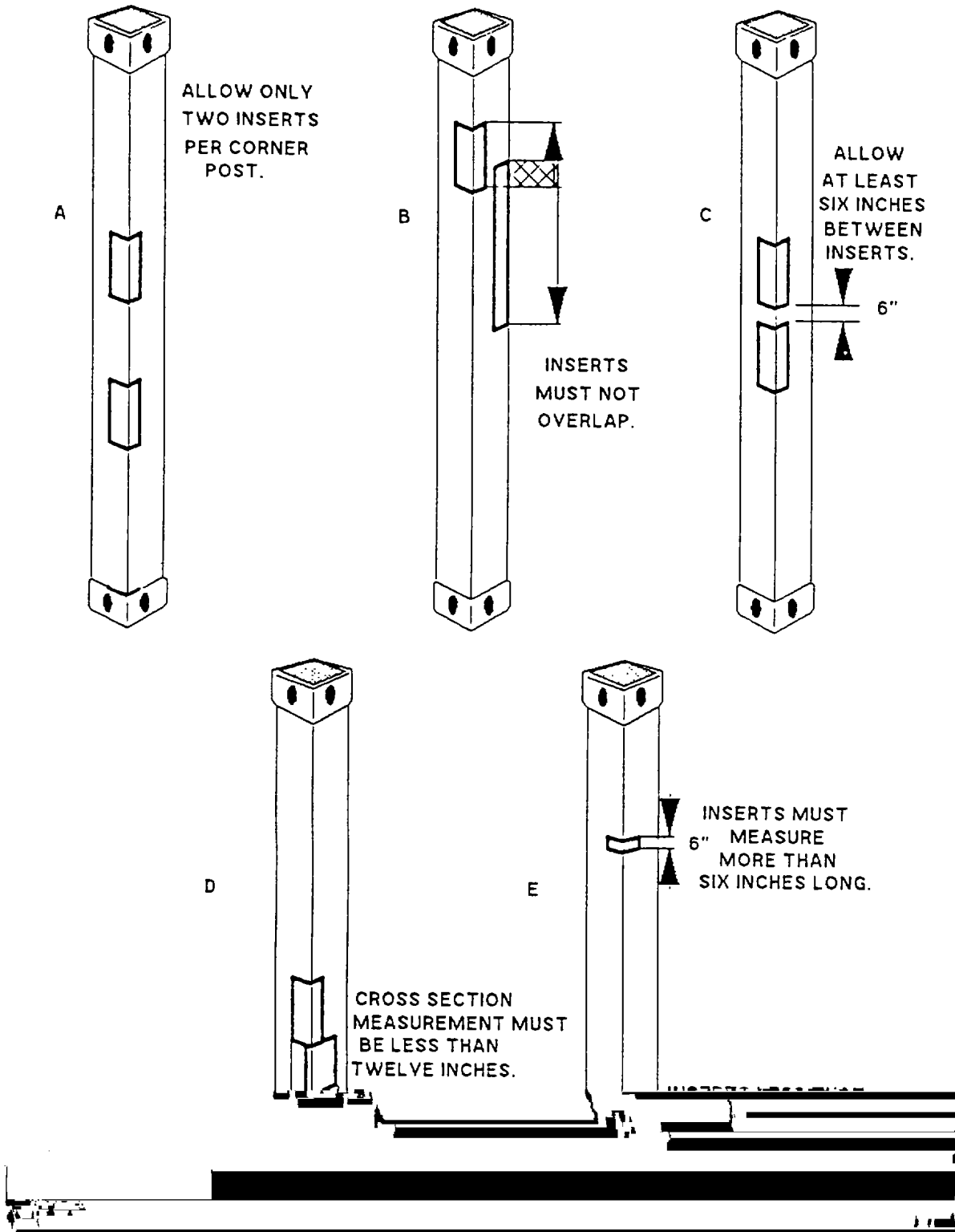
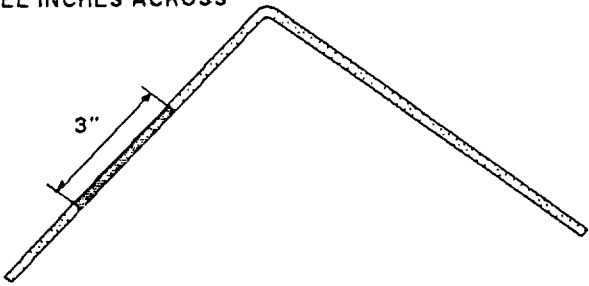


Figure 3-4. Examples of Incorrect Corner Post Inserts

INSERT MUST MEASURE  
GREATER THAN  
THREE INCHES ACROSS

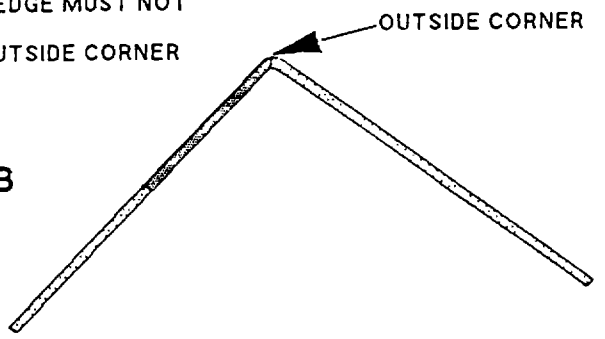
A

3"



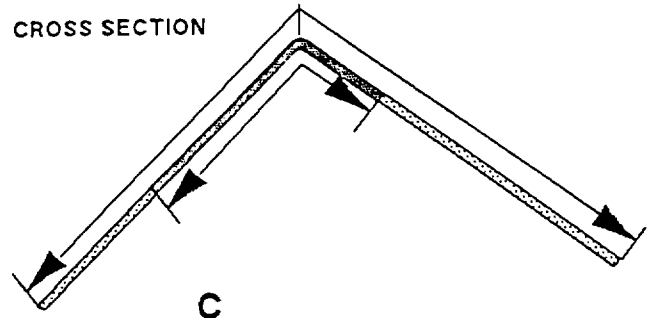
INSERT EDGE MUST NOT  
MEET OUTSIDE CORNER

B



LENGTH OF THE INSERT CROSS SECTION  
MUST NOT EXCEED LENGTH  
OF THE CORNER POST  
CROSS SECTION

C



INSERT MUST FIT  
FLUSH WITH CORNER POST.

D

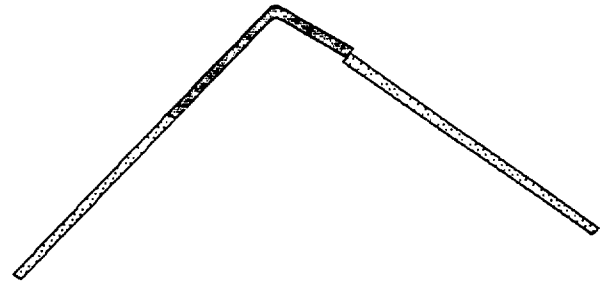


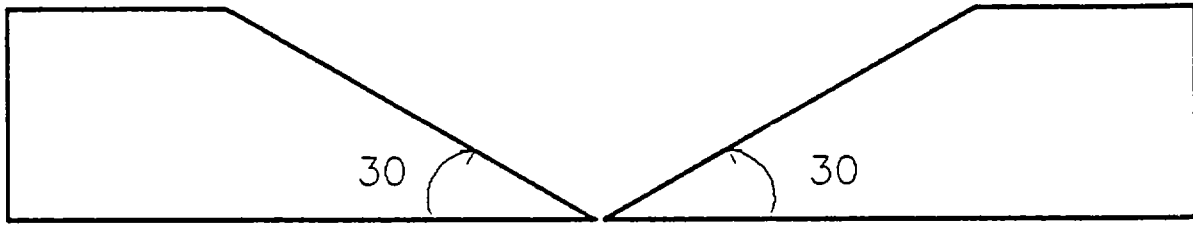
Figure 3-5. Examples of Incorrect Corner Post Inserts (Cross Section)

- (g) Do not position an insert so that its upper or lower edge is closer than twelve inches from the corner fitting. See figure 3.4, example E. Instead, extend the insert all the way to the corner fitting. An insert which butts against the corner fitting must be at least twelve inches long.
  - (h) Do not use an insert which will extend over less than three inches of the exposed corner post cross section. See figure 3.5, example A.
  - (i) Do not position an insert so that its vertical edge is on the outside corner of the corner post. See figure 3.5, example B.
  - (j) Do not use an insert which extends across more than half of the corner post cross section. See figure 3.5, example C.
  - (k) Inserts must not stick out from the corner post. See figure 3.5, example D.
- (2) Remove damaged portion of corner post and prepare for inserting.
- (a) Mark around the damaged area with chalk or scribe. Mark a rectangular, oval, or diamond shape depending on the general shape of the damaged area. A rectangular shape will be easiest to work with.
  - (b) Tack weld guide bars in place to ensure straight cuts with an oxygen acetylene torch. Even, accurate cutting will eliminate wide gaps between the corner post and the new insert.
  - (c) Cut out the damaged area with an oxygen acetylene torch.

**CAUTION**

**Direct oxygen acetylene torch away from corner castings, side and end rails, and side and end panels to prevent damage to any of these Darts.**

- (d) Grind smooth all cut edges.
- (3) Cut insert.
- (a) Using guide bars, cut a replacement insert to the exact shape of the damaged area. The insert material must be rolled steel with at least 110 lbs/sq. in. (50 kg/sq. mm) minimum tensile strength.
  - (b) Grind smooth cut edges of insert.
- (4) Fit and weld insert in place.
- (a) Place insert to determine fit. Insert should be flush against the corner post edges on all sides.
  - (b) Bevel edges of the insert and corner post cutout area to a thirty degree angle (See Figure 3-6).
  - (c) Tack weld insert in place.
  - (d) Continuously weld insert to corner post.



EDGES BEVELED TO THIRTY DEGREE ANGLE

Figure 3-6. Beveling Before Weld



b. Corner post replacement. Replace the corner post if repair by straightening or inserting is not possible. The replacement corner post should be identical in shape and length. It should be made of rolled steel with a minimum tensile strength of 110 lbs/sq. in. (50 kg/sq. mm.), at least 1/4 in. (6 mm) thick.

(1) Remove or shield parts from corner post to be replaced: (a) For front corner posts:

1 Remove or shield floorboards which could be damaged by welding heat.

2 Cut J-bar away from the corner post and corner fitting with oxygen-acetylene torch. Remove door according to paragraph 2-7. Avoid damaging J-bar or hinges with torch.

(b) For rear corner posts:

1 Remove both plywood liners following procedure 2-9.

2 Remove or shield floorboards which could be damaged by welding heat.

#### CAUTION

**Direct oxygen-acetylene torch away from corner fittings, side and end rails, and side and end panels to prevent damage to any of these parts.**

(2) Use oxygen acetylene torch to cut out damaged post from rest of container.

(3) Remove corner post from container.

(4) Grind smooth all cut edges on container and J-bars.

(5) Grind forty-five degree bevel on upper and lower edges of the replacement corner post. This will allow full weld penetration at corner post joint.

(6) Tack weld corner post in position.

(7) Check standard measurements for proper alignment (see Figure 3-1). Reposition corner post if necessary.

(8) Continuously weld new corner post to adjoining structural parts of container. Make adjustments as necessary to maintain allowable tolerances shown in figure 3-1.

(9) Replacement of parts after front corner post replacement only:

- (a) Tack weld J-bar and door in place. Check for proper door clearances. Reposition if necessary.
  - (b) Continuously weld J-bar in place.
- (10) Paint replacement post and welded area according to paragraph 2-4.
- (11) Replacement of parts after rear corner post replacement only. Replace plywood liners according to paragraph 2-9.
- (12) Replace floorboards (after front or rear corner post replacement), according to paragraph 2-10.

### 3-4. J-bar Repair.

**CAUTION:**

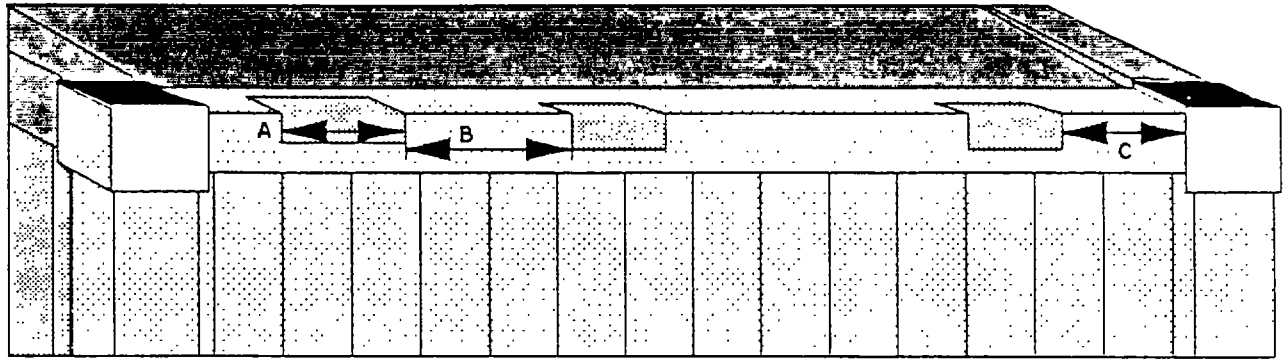
**Direct oxygen acetylene torch away from corner castings, side and end rails, and side and end panels to prevent damage to any of these parts.**

- a. Repair of small cracks and tears. Small cracks and tears less than two inches in length should be filled with weld metal. Any dents or distortions should be straightened before welding.
- (1) Carefully smooth ragged edges of tear with file or hammer before welding.
  - (2) Grind along length of crack. Grind crack to depth of 3/16 in. (5 mm) to ensure full weld penetration.
  - (3) Continuously weld along length of crack.
  - (4) Paint according to paragraph 2-4.
- b. Inserting. If the damaged J-bar cannot be repaired by gouging and welding, the J-bar may be repaired by inserting. The minimum length of J-bar inserts is three inches. Restrictions for corner post inserts do not apply for J-bars.

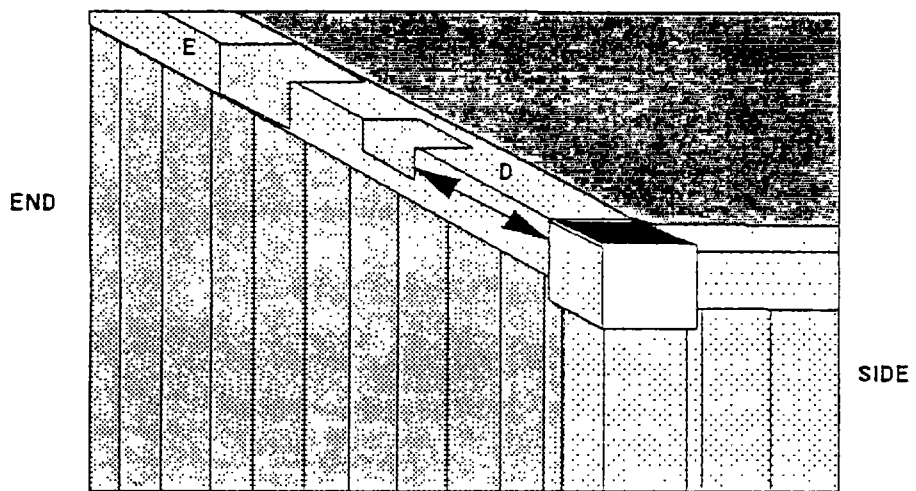
**NOTE**

**All patches, inserts, sections and replacements for panels, rails and crossmembers should be steel conforming to the AISI-409 standard. AISI stands for the American Iron and Steel Institute. This steel is corrosion resistant and has a minimum tensile strength of 65KSI (thousand pounds per square inch).**

- (1) Remove damaged portion of the J-bar and prepare for inserting.



SIDE



END

SIDE

Figure 3-7. Top Rail Inserts

- (a) Mark around the damaged area with chalk or scribe. Mark a rectangular, oval, or diamond shape depending on the general shape of the damaged area. A rectangular shape will usually be easiest to work with.

**CAUTION**

**Direct oxygen-acetylene torch away from corner fittings, side and end rails, and side and end panels to prevent damage to any of these parts.**

- (b) Tack weld guide bars in place to ensure straight cuts with an oxygen acetylene torch. Even, accurate cutting will eliminate wide gaps between the J-bar and the new insert.
- (c) Cut out the damaged area with an oxygen acetylene torch.
- (d) Grind smooth all cut edges.

(2) Cut insert.

- (a) Using guide bars, cut a replacement insert to the exact shape of the damaged area.
- (b) Grind smooth cut edges of insert.

(3) Fit and weld insert in place.

- (a) Fit insert in place. Insert should be flush against the J-bar edges on all sides.
- (b) Bevel edges of the insert and J-bar cutout area to a thirty degree angle. See Figure 3-6.
- (c) Tack weld insert in place.
- (d) Continuously weld insert to J-bar.

c. Replacement of J-bar.

- (1) Remove door from container following procedure 2-7.
- (2) Cut J-bar from corner post and corner fitting with oxygen-acetylene torch.
- (3) Grind smooth edges on corner post and corner fitting. Remove all excess weld metal.
- (4) Check replacement J-bar for exact fit. Cut or grind to proper size if necessary.
- (5) Bevel the edges of the replacement J-bar to thirty degrees with grinder to ensure full weld penetration.
- (6) Tack weld the replacement J-bar in place. Fit door in place, check for proper alignment. Reposition the J-bar if necessary. Remove door.

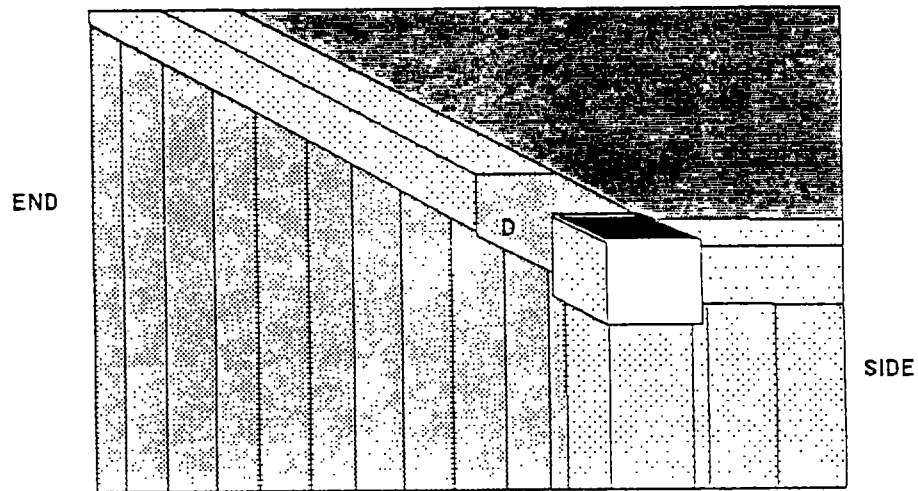
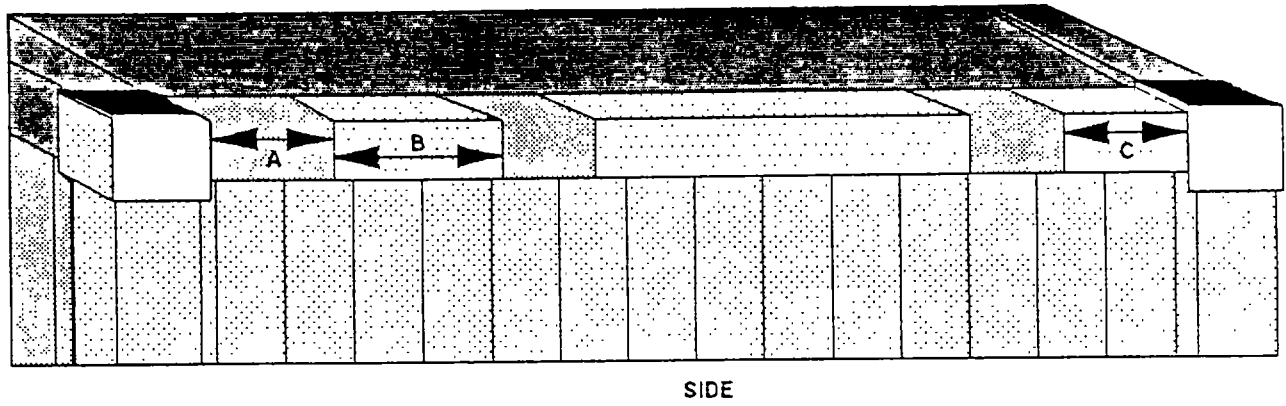


Figure 3-8. Top Rail Sectioning

- (7) Continuously weld the J-bar in place.
- (8) Paint the repaired area according to paragraph 2-4.
- (9) Replace door according to paragraph 2-7.

**3-5. Top Rail.** Use repair procedures in the following order of preference: Filling with weld metal, welding repair with inserts, sectioning, and replacing the top rail.

**CAUTION:**

**Direct oxygen acetylene torch away from corner castings, side and end rails, and side and end panels to prevent damage to any of these parts.**

- a. Repair of small cracks and tears. Small cracks and tears less than two inches in length should be filled with weld metal.
  - (1) Carefully smooth ragged edges of tear with file or hammer before welding.
  - (2) Grind along length of crack. Grind crack to depth of 3/16 in. (5 mm or 5/6 of metal thickness) to ensure full weld penetration.
  - (3) Continuously weld along length of crack.
  - (4) Paint according to paragraph 2-4.
- b. Inserting. If the damaged top rail cannot be repaired by gouging and welding the top rail may be repaired by inserting.

**NOTE:**

**All patches, inserts, sections and replacements for panels, rails and crossmembers should be steel conforming to the AISI-409 standard. AISI stands for the American Iron and Steel Institute. This steel is corrosion resistant and has a minimum tensile strength of 65KSI (thousand pounds per square inch).**

- (1) Restrictions for insert repair of top rails are as follows.
  - (a) The insert must be at least six inches long. See figure 3-7, example A.
  - (b) New inserts must end at least six inches from existing inserts or other vertical welded seams. If the area to be repaired is closer than six inches to an existing vertical welded seam, the insert must extend to meet the existing vertical welded seam. See figure 3-7, example B.

- (c) For top side rails only: If any part of the area to be repaired is within twelve inches of the corner fitting, the insert must butt against the corner fitting.
- (d) For top end rails only: If any part of the area to be repaired is within six inches of the corner fitting, the insert must butt against the corner fitting.
- (e) Inserts which extend across the full profile of the top rail are considered sections rather than inserts. See figure 3.7, example E. Follow the procedure below for sectioning.

(2) Remove damaged portion of top rail and prepare for inserting.

- (a) Mark around the damaged area with chalk or scribe. Mark a rectangular, oval, or diamond shape depending on the general shape of the damaged area. A rectangular shape will be easiest to work with.

**CAUTION**

**Direct oxygen-acetylene torch away from corner fittings, side and end rails, and side and end panels to prevent damage to any of these parts.**

- (b) Tack weld guide bars in place to ensure straight cuts with an oxygen acetylene torch. Even, accurate cutting will eliminate wide gaps between the rail and the new insert.
- (c) Cut out the damaged area with an oxygen acetylene torch.
- (d) Grind smooth all cut edges.

(3) Cut insert.

- (a) Using guide bars, cut a replacement insert to the exact shape of the damaged area.
- (b) Grind smooth cut edges of insert.

(4) Fit and weld insert in place.

- (a) Fit insert in place. Insert should be flush against the top rail edges on all sides.
- (b) Bevel edges of the insert and top rail cutout area to a thirty degree angle. See figure 3-6.
- (c) Tack weld insert in place.
- (d) Continuously weld insert to top rail.
- (e) Clean and paint according to paragraph 2-4.

- c. Sectioning. If inserting does not cover the damaged area, it may be repaired by replacing a complete section of rail. The replacement section must be identical to the damaged rail in length and profile.

(1) Restrictions for repair by sectioning are as follows:

- (a) Sections must be at least six inches long.
- (b) A section which would end within six inches of an existing insert or section repair must be extended to butt against the existing insert or repair.
- (c) For side rails only: If any part of the area to be repaired is within twelve inches of a corner fitting, the section must butt against the corner fitting.
- (d) For end rails only: If any part of the area to be repaired is within six inches of a corner fitting, the section must butt against the corner fitting.

(2) Remove damaged section of top rail and prepare to install replacement section.

- (a) Mark the damaged area to be replaced with chalk or scribe.
- (b) Tack weld guide bars in place to ensure straight cuts with an oxygen acetylene torch. Even, accurate cutting will eliminate wide gaps between the rail and the new insert.
- (c) Cut the weld holding the roof panel to the top rail where it is being replaced. Cut twelve inches farther in each direction than the rail being replaced so that the panel can be wedged away from the area being worked on.
- (d) Cut the weld holding the side or end panel to the top rail section being replaced.
- (e) Insert wedges between the roof and the top rail at either end of the section to be cut away.
- (f) Cut out the damaged top rail section.
- (g) Grind smooth all cut edges.

(3) Cut replacement section.

- (a) Using guide bars, cut a section to the exact size of the damaged area. The section material must be rolled steel with at least 110 lbs/sq. in. (50 kg/sq.mm) minimum tensile strength.
- (b) Grind smooth cut edges of the section.

(4) Fit and weld section in place.

- (a) Fit section in place. There should be no more than 5/64 in. gap at any point between the section and the edges of the top rail and panels.



- (b) Bevel edges of the section and top rail cutout area to a thirty degree angle (See figure 3-6).
- (c) Tack weld section in place making sure there is a flush fit. Check to be sure that standard measurements shown in figure 3-1 remain within the listed tolerances.
- (d) Continuously butt weld section to top rail edges.
- (e) Grind away any excess weld material on top or bottom edge of top rail which interferes with fit of roof and side or end panels.
- (f) Remove wedges and continuously weld roof and side or end panels to top rail.
- (g) Clean and paint according to paragraph 2-4.
- (h) Test for weatherproofness according to paragraph 2-5, caulk if necessary.

d. Replacement. Replace the top rail if it cannot be repaired by straightening, inserting or sectioning. The replacement top rail must be identical to the damaged rail in length and profile.

- (1) Measure standard dimensions indicated in figure 3-1. Measure between corner posts for dimensions of replacement top rail. If standard dimensions are out of tolerance, be careful to obtain measurements for replacement top rails reflecting correct standard dimensions.
- (2) Use oxygen acetylene torch to cut welds holding the top rail to the corner fittings, roof panels and side or end panels.

**CAUTION**

**Direct oxygen-acetylene torch away from corner fittings, corner posts and side and end panels to prevent damage to an), of these parts.**

- (3) Remove the damaged rail.
- (4) Grind smooth all cut edges.
- (5) Remove old caulking which would interfere with installation of new rail.
- (6) Measure and cut replacement rail to exact length.
- (7) Fit replacement rail in place. There should be no more than 5/64 in. gap between the rail edges, the corner fittings, and the roof and side or end panels.

- (8) Bevel to a thirty degree angle the rail edges which will butt against the corner fittings.
- (9) Tack weld the replacement rail in place. Check standard dimensions according to figure 3.1 and adjust as necessary.
- (10) Continuously weld the rail to the corner fittings, roof panels and side or end panels.
- (11) Paint the replacement area according to procedure 2-4.
- (12) Test for weatherproofness using procedure 2-5. Caulk if necessary.

**3-6. Bottom Rail.** Avoid using heat when repairing the bottom rail. Use repair procedures in the following order of preference: Filling with weld metal welding repair with inserts, sectioning and replacement of the rail.

**NOTE:**

**All patches, inserts, sections and replacements for panels, rails and crossmembers should be steel conforming to the AISI-409 standard. AISI stands for the American Iron and Steel Institute. This steel is corrosion resistant and has a minimum tensile strength of 65KSI (thousand pounds per square inch).**

a. Repair of small cracks and tears. Small cracks and tears less than two inches in length should be filled with weld metal.

- (1) Carefully smooth ragged edges of tear with file or hammer before welding.
- (2) Grind along length of crack. Grind crack to depth of 3/16 in. (5 mm or 5/6 of metal thickness) to ensure full weld penetration.
- (3) Continuously weld along length of crack.
- (4) Paint according to procedure 2-4.

b. Inserting. If the damaged bottom rail cannot be repaired by gouging and welding the bottom rail may be repaired by inserting. The minimum length of bottom rail inserts is six inches.

- (1) Restrictions for insert repair of bottom rails are as follows.
  - (a) The insert must be at least six inches long. See figure 3-9, example A.
  - (b) New inserts must end at least six inches from existing inserts or other vertical welded seams. If the area to be repaired is closer than six inches to an existing vertical welded seam, the insert must extend to meet the existing vertical welded seam. See figure 3-9, example B.

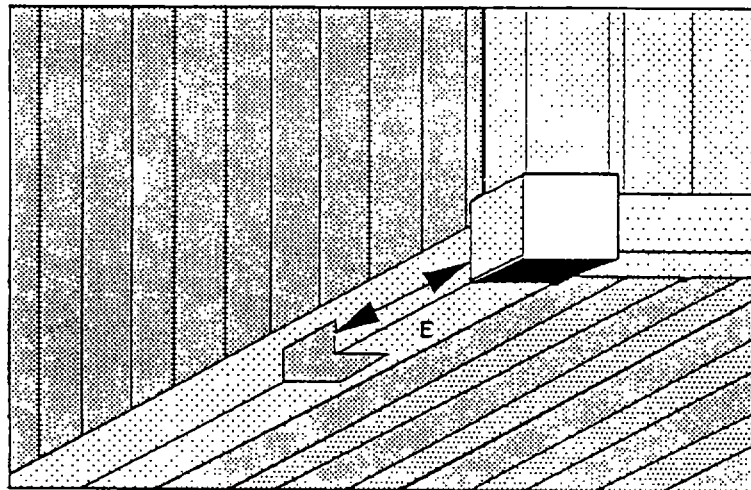
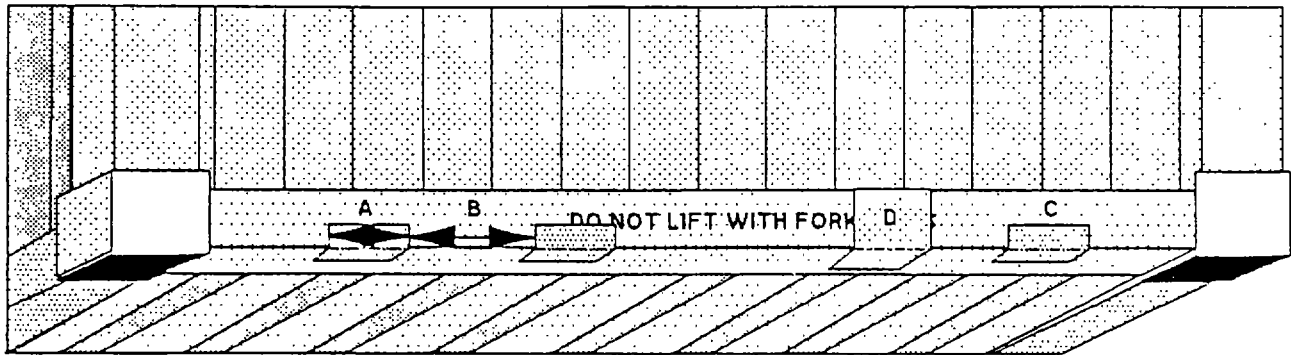


Figure 3-9. Bottom Rail Inserts

(c) For bottom side rails only: If the area to be repaired is within twelve inches of the corner fitting, the insert must butt against the corner fitting.

(d) For bottom end rails only: If the area to be repaired is within six inches of the corner fitting, the insert must butt against the corner fitting.

(e) Inserts which extend across the full profile of the bottom rail are considered sections. Follow the procedure below for sectioning.

(2) Remove damaged portion of bottom rail and prepare for inserting.

(a) Mark around the damaged area with chalk or scribe. Mark a rectangular, oval, or diamond shape depending on the general shape of the damaged area. A rectangular shape will be easiest to work with.

**CAUTION**

**Direct oxygen-acetylene torch away from corner fittings, corner posts and side and end panels to prevent damage to any of these parts.**

(b) Tack weld guide bars in place to ensure straight cuts with an oxygen acetylene torch. Even, accurate, cutting will eliminate wide gaps between the rail and the new insert.

(c) Cut out the damaged area with an oxygen acetylene torch.

(d) Grind smooth all cut edges.

(3) Cut insert.

(a) Using guide bars, cut a replacement insert with the exact shape and thickness of the of cutout metal.

(b) Grind smooth cut edges of insert.

(4) Fit and weld insert in place.

(a) Fit insert in place. Insert should be flush against the bottom rail edges on all sides.

(b) Bevel edges of the insert and bottom rail cutout area to a thirty degree angle (See figure 3-6).

(c) Tack weld insert in place.

(d) Continuously weld insert to bottom rail.

(e) Clean and paint according to procedure 2.4.

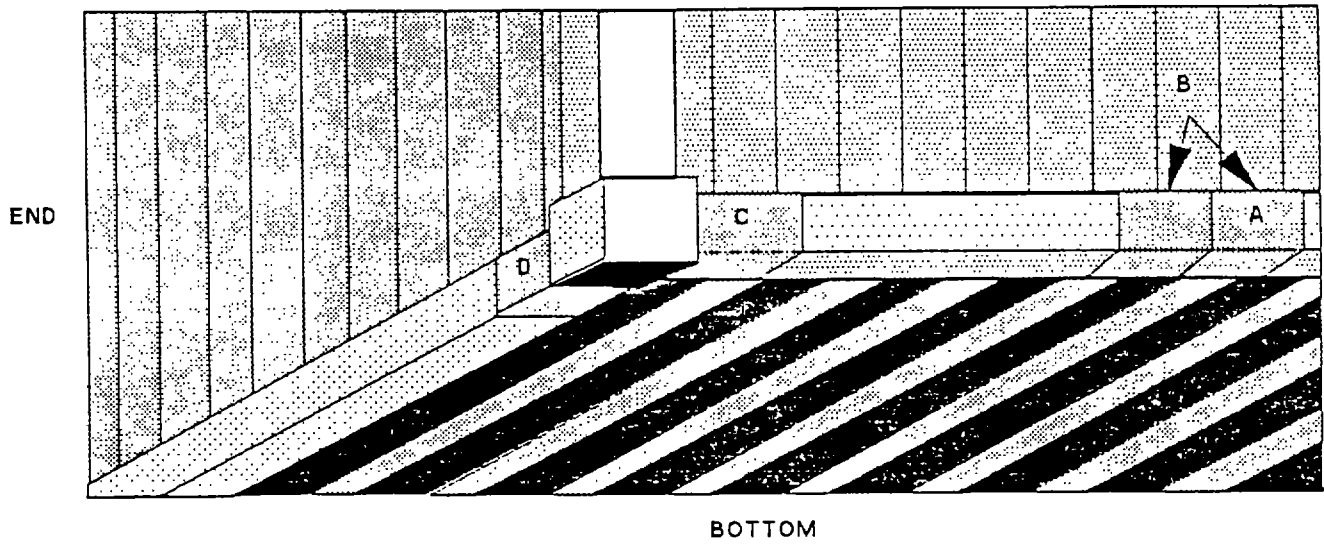


Figure 3-10. Bottom Rail Sectioning

c. Sectioning. If inserting does not cover the damaged area, it may be repaired by replacing a complete section of rail. The replacement section must be identical to the damaged rail in length and profile.

(1) Restrictions for repair by sectioning are as follows:

(a) Sections must be at least six inches long.

(b) A section which would end within six inches of an existing insert or section repair must be extended to butt against the existing insert or repair.

(c) For side rails only: If any part of the area to be repaired is within twelve inches of a corner fitting, the section must butt against the corner fitting.

(d) For end rails only: If any part of the area to be repaired is within six inches of a corner fitting, the section must butt against the corner fitting.

(2) Remove damaged section of bottom rail and prepare to install replacement section.

(a) Remove flooring next to the damaged rail using procedure 2-10.

(b) For rear end rail only: Remove lower plywood liner according to procedure 2-9.

(c) Mark the damaged area to be replaced with chalk or scribe.

(d) Tack weld guide bars in place to ensure straight cuts with an oxygen acetylene torch. Even, accurate cutting will eliminate wide gaps between the rail and the new insert.

(e) Cut welds joining damaged section to crossmembers.

(f) Cut the weld seam joining the side or end panel to the damaged rail section.

(g) Cut out the damaged rail section.

(h) Grind smooth all cut edges.

(3) Cut replacement section.

(a) Using guide bars, cut a section to the exact dimensions of the damaged area.

(b) Grind smooth cut edges of the section.

(4) Fit and weld section in place.

- (a) Fit section in place. There should be no more than 5/64 in. gap at any point between the section, the bottom rail edges, and the side or end panels.
- (b) Bevel edges of the replacement section and existing rail to a thirty degree angle (See Figure 3-6).
- (c) Tack weld section in place. Check to be sure that standard measurements shown in figure 3-1 remain correct. Adjust if necessary.
- (d) Continuously butt weld section to rail edges.
- (e) Grind away any excess weld material on top or bottom edge of top rail which interferes with fit of side or end panels.
- (f) Weld side or end panels to bottom rail.
- (g) Clean and paint according to paragraph 2-4.
- (h) Replace floorboards according to paragraph 2-10.
- (i) Install lower plywood liner according to paragraph 2-9.

d. **Replacement.** Replace the bottom rail if it cannot be repaired by inserting or sectioning. The replacement rail must be identical to the damaged rail in length and profile.

- (1) Measure standard dimensions indicated in figure 3-1. Measure between corner posts for dimensions of replacement rail. If standard dimensions are out of tolerance, be careful to obtain measurements for the replacement bottom rail reflecting correct standard dimensions.
- (2) Remove adjacent floorboards to allow working space, according to paragraph 2-10.
- (3) Remove lower plywood panel according to paragraph 2-9.
- (4) Use oxygen acetylene torch to cut welds holding the rail to the corner fittings, side or end panels, and crossmembers.

**CAUTION**

**Direct oxygen acetylene torch away from corner fittings, corner posts, floor, and side and end panels to prevent damage to any of these parts.**

- (5) Remove the damaged rail.
- (6) Grind smooth all cut edges.

- (7) Remove old caulking which would interfere with installation of new rail.
- (8) Measure and cut replacement rail to exact length.
- (9) Fit replacement rail in place. There should be no more than 5/64 in. gap between the rail edges, crossmember ends, corner fittings, and side or end panels.
- (10) Bevel to a thirty degree angle the end edges of the replacement rail according to figure 3-6.
- (11) Tack weld the replacement rail in place. Check standard dimensions according to figure 3.1 and adjust as necessary.
- (12) Continuously weld the rail to the corner fittings, crossmembers and side or end panels.
- (13) Paint the replacement area according to paragraph 2-4.
- (14) Replace floorboards according to paragraph 2-10.
- (15) Replace lower plywood liner according to paragraph 2-9.

**3-7. Floor Crossmembers.** Use repair procedures in the following order of preference: Fill with weld metal, welding repair with inserts, patching with a full length overlapping angle and replacement of the complete floor crossmember.

**NOTE:**

**All patches, inserts, sections and replacements for panels, rails and crossmembers should be of steel conforming to the AISI-409 standard. AISI stands for the American Iron and Steel Institute. This steel is corrosion resistant and has a minimum tensile strength of 65 KSI (thousand pounds per square inch).**

a. Repair of Small Cracks and Tears. Small cracks and tears less than two inches in length should be filled with weld metal.

- (1) Carefully smooth ragged edges of tear with file or hammer before welding.
- (2) Grind along length of crack. Grind crack to depth 3/16 in. (5 mm or 5/6 of metal thickness) to ensure full weld penetration.
- (3) Continuously weld along length of crack.
- (4) Paint according to paragraph 2-4.



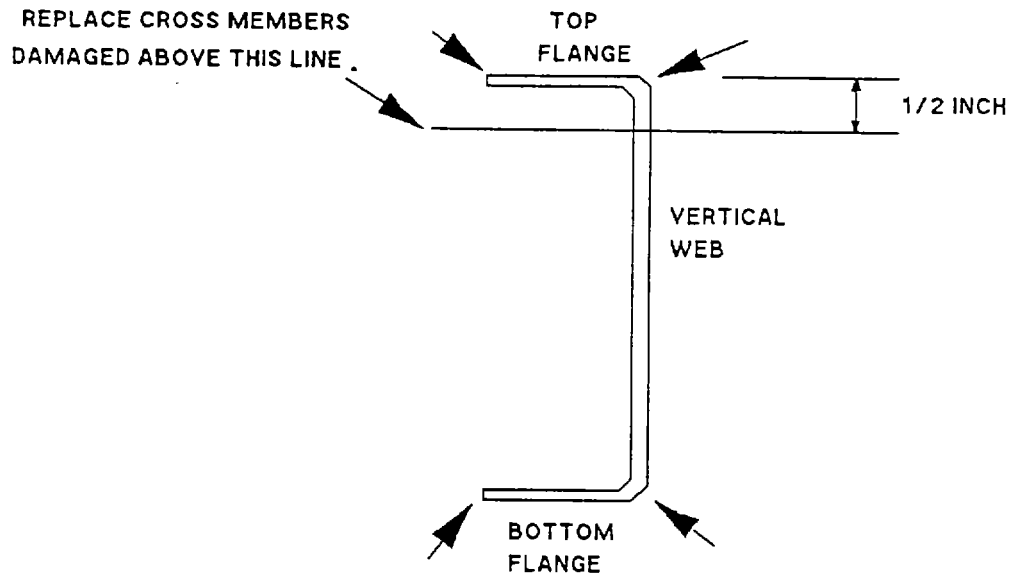


Figure 3-11. Crossmember Inserts (Cross Section)

*b. Inserting.* If the damaged crossmember cannot be repaired by gouging and welding, repair the crossmember by inserting.

(1) Restrictions for insert repair of crossmembers are as follows.

(a) Do not use insert to repair damage to the top flange of the crossmember or the upper one half inch of the vertical web. See figure 3-11.

(b) If damaged area is within six inches of an existing welded repair, the insert must butt up against the existing weld. See figure 3-12, example A.

(c) If damaged area is within six inches of the bottom side rail, the insert must butt up against the rail. See figure 3-12, example B.

(2) Remove damaged portion of crossmember and prepare for inserting.

(a) Remove undercoating from damaged area.

(b) Mark around the damaged area with chalk or scribe. Mark a rectangular, oval, or diamond shape depending on the general shape of the damaged area. A rectangular shape will be easiest to work with.

(c) Remove flooring next to damaged area in accordance with paragraph 2-10.

(d) Tack weld guide bars in place to ensure straight cuts with an oxygen acetylene torch. Even, accurate cutting will eliminate wide gaps between the crossmember and the new insert.

(e) Cut out the damaged area with an oxygen acetylene torch.

(f) Grind smooth all cut edges.

(3) Cut insert.

(a) Using guide bars, cut a replacement insert to the exact shape of the damaged area.

(b) Grind smooth cut edges of insert.

(4) Fit and weld insert in place.

(a) Fit insert in place. Insert should be flush against the crossmember edges on all sides.

(b) Bevel edges of the insert and crossmember cutout area to a thirty degree angle (See figure 3-6).

(c) Tack weld insert in place.

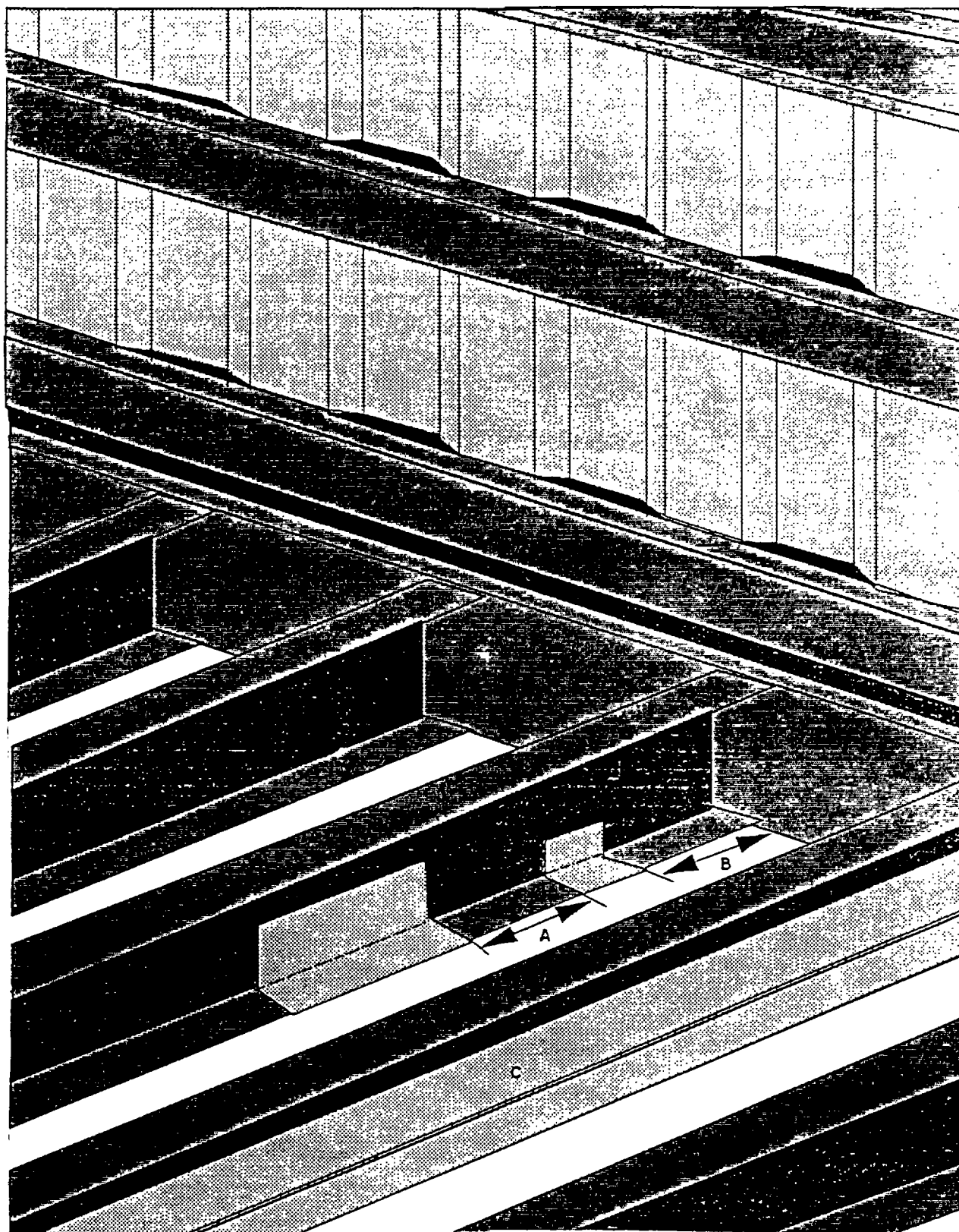
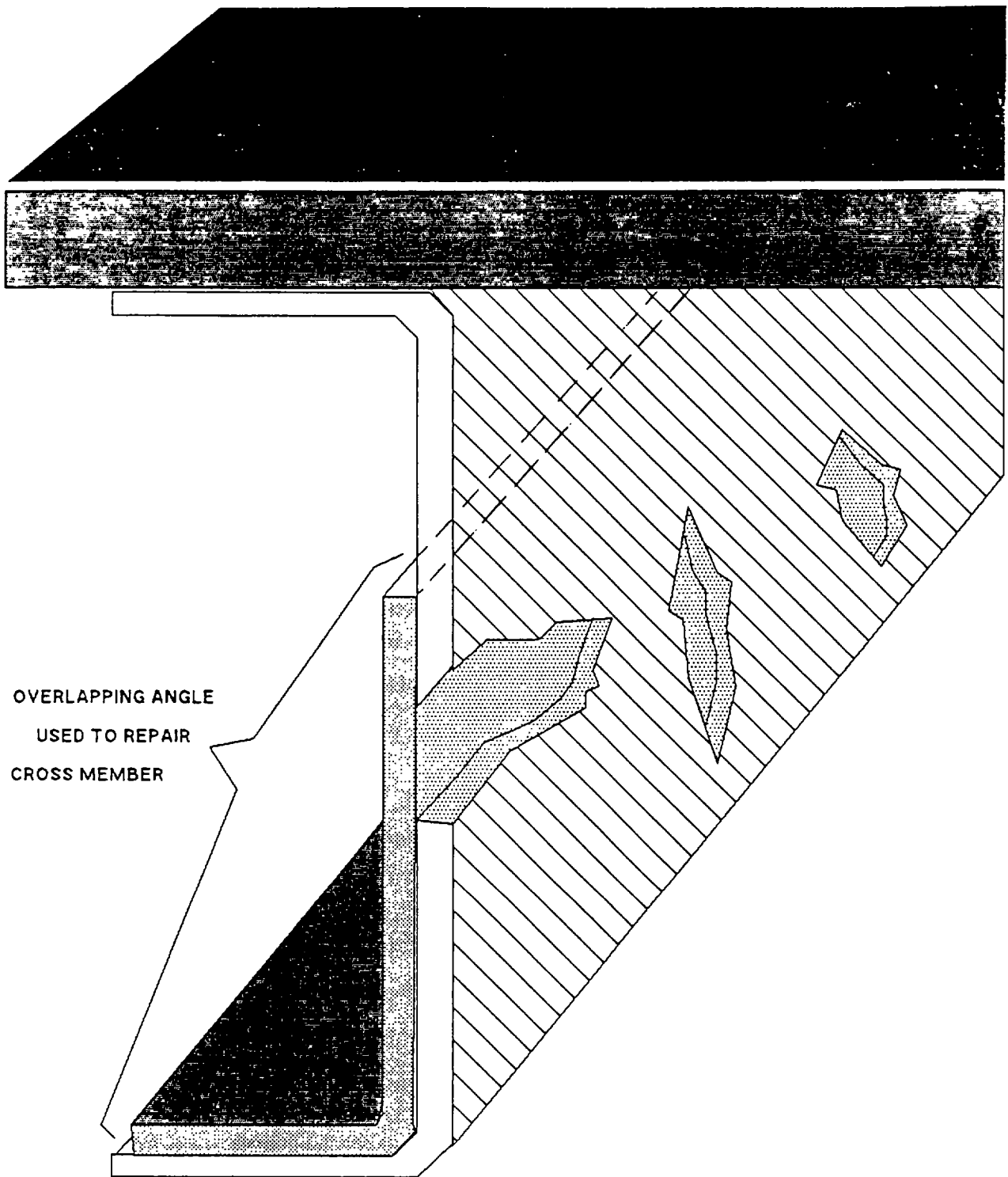


Figure 3-12. Crossmember Inserts and Overlapping Angle



OVERLAPPING ANGLE  
USED TO REPAIR  
CROSS MEMBER

Figure 3-13. Cutaway View of Full Length Overlapping Angle

(d) Continuously weld insert to crossmember.

(5) Replace flooring according to paragraph 2-10.

(6) Clean and reapply undercoating according to paragraph 2-4.

c. Patching With Full Length Overlapping Angle. If the top flange and top one inch of the crossmember vertical web is undamaged, damage along the full length of the crossmember may be repaired with a full length overlapping angle, see example C, figure 3-12.

(1) Elevate container.

(2) Shield flooring next to area being repaired.

**CAUTION**

**Direct oxygen-acetylene torch away from corner fittings, corner posts and side and end panels to prevent damage to any of these parts.**

(3) Measure dimensions for replacement angle. Replacement angle must overlap existing angle by at least one half inch. Cut replacement angle to size with oxygen acetylene torch.

(4) Grind smooth cut edges of the replacement angle. Bevel the end edges to a thirty degree angle to ensure a strong butt weld to the bottom side rails, see Figure 3-6.

(5) Tack weld the replacement angle in place.

(6) Continuously weld the replacement angle on top and bottom of the overlapping angle. Continuously weld the angle butting against the bottom side rails, see Figure 3-13.

(7) Clean and undercoat according to procedure 2-4.

d. Replacement. Replace crossmembers which cannot be repaired by welding, inserting, patching, or replacing with and overlapping angle.

(1) Elevate container to allow removal of crossmember from under container.

(2) Remove floor planks adjoining wall on right and left side of container, over crossmember to be removed.

(3) Remove screws holding remaining flooring to damaged crossmember.

**CAUTION**

**Direct oxygen-acetylene torch away from corner fittings, corner posts and side and end panels to prevent damage to any of these parts.**

- (4) Cut crossmember from side rails with oxygen-acetylene torch.
- (5) Grind away excess weld material.
- (6) Tack weld replacement crossmember into place.
- (7) Continuously weld crossmember to side rails.
- (8) Grind away excess weld material which would interfere with seating of floor planks.
- (9) Drill new holes through planks and new crossmember. Fill old holes with caulk.
- (10) Replace screws.

e. Forklift Test. Test the floor as follows after repair or whenever there is reason to question the structural soundness of the floor.

- (1) Support the empty MILVAN Container on its four corner posts so that all crossmembers are off the ground at least four inches.
- (2) Securely load a 4000 lb (1814 kg) lowmast forklift with a 4000 lb (1814 kg) weight.
- (3) Drive the forklift down the center line of the container to the end wall and back out. Drive the forklift down the right and left sides of the container.
- (4) If there is no failure of the flooring or crossmembers, the container is considered acceptable.

**3-8. Horizontal and Vertical Slotted Tracks.** Cracked or badly distorted horizontal and vertical tracks may cause failure of the mechanical restraint system under load conditions.

a. Repair of Minor Cracks and Tears.

- (1) Grind along length of crack, enlarging crack to ensure full weld penetration.
- (2) Continuously weld with oxygen acetylene torch along length of crack until completely filled.
- (3) Grind away excess weld metal which might interfere with shoring beam operation.
- (4) Paint according to procedure 2-4.

b. Sectioning. If the slotted track is damaged over a section less than half the length of the track, then only the damaged section should be replaced.

(1) Remove damaged section to be replaced.

(a) Mark the section to be replaced. Extend horizontal track sections to be removed, if necessary, so that each end of the section is in contact with the side corrugated panel.

(b) Tack weld guide bars in place along marks to ensure straight cuts with an oxygen acetylene torch. Even, accurate cutting eliminates wide gaps between the existing track and the new section. Be careful to avoid cutting through the side panel.

(c) Carefully cut welds holding damaged section of track to corrugated panel. Less experienced (or more cautious) welders should cut through damaged track rather than weld attachment, then grind away excess metal with grinder.

(2) Measure and cut to size replacement track section. Track profile and slot size must be identical to original.

(3) Fit and weld section in place. Gap between original and replacement sections should be no more than 5/64 in. at any point.

(4) Clean and paint according to paragraph 2-4.

c. Replacement. Replace the full length of slotted track if it is damaged over more than half the area of the track.

(1) Remove track.

(a) Carefully cut track away from container with oxygen acetylene torch. Cut cautiously to avoid cutting through corrugated panels or corner posts.

(b) Grind away excess metal with grinder.

(2) Fit and weld replacement section in place.

(3) Clean and paint in accordance with paragraph 2-4.

## Section II. DOOR AND DOCUMENT HOLDER REPAIR

### 3-9. Door and Door Hardware.

a. Door Repair.

(1) To repair sheet metal panels of the door when a crack, tear or hole of less than a quarter inch in diameter has occurred, without significant denting:

(a) Remove paint from damaged area.

- (b) Weld the crack or small tear with stainless steel electrode.
- (c) Grind repair area to remove excess weld material.
- (d) Paint repaired area according to procedure 2.4.

(2) To repair sheet metal panels of the door when the damage is major:

- (a) Remove paint from damaged area.
- (b) Carefully flatten damaged metal with hammer, returning metal to original shape as much as possible.
- (c) If necessary, remove any badly distorted or weakened metal so that a metal patch can be welded over the damaged area.
- (d) If resulting gap in metal is greater than 1/4" at any point, a metal patch should be cut to fit over the entire damaged area allowing at least two inch overlap all the way around (Refer to figure 3-2).
- (e) Weld patch into place, or, if no patch was used, fill and weld separations in door metal.
- (f) Grind repair area to remove excess weld material.
- (g) Paint repaired area according to procedure 2-4.

*b. Water Test After Repair.* After any major repair to an empty container, a stream of water from half-inch nozzle at 15 psi shall be applied to all joints and seams for at least five seconds. No water entry into container is permissible after repair.

**3-10. Document Holder.** The document holder is attached to the right side door assembly with fifteen rivets. It is welded to the door along the hinge side of the document holder. To prevent water leakage into the container, the riveted seam is sealed with caulk.

Repair dents and holes in the document holder using the procedures for door repair in paragraph 3-9.

Removal and replacement of document holder gaskets is explained in paragraph 2-8.



**APPENDIX A**

**REFERENCES**

**A-1. SCOPE.**

This appendix lists all forms, field manuals, technical manuals and miscellaneous publications.

**A-2. FORMS.**

SF 361 ..... Transportation Discrepancy Report  
DA Form 2408-1 ..... Equipment Log Assembly Record  
DA Form 2404 ..... Equipment Inspection and Maintenance Work Sheet  
DA Form 2407 ..... Maintenance Request  
SF 368 ..... Product Quality Deficiency Report  
DA Form 2028 ..... Recommended Changes to Publications and Blank Forms  
DD 314 ..... Preventive Maintenance Schedule and Record

**A-3. TECHNICAL MANUALS.**

DA Pamphlet 738-750 ..... The Army Maintenance Management System  
TM 750-244-3 ..... Procedures for Destruction of Equipment to Prevent Enemy Use  
TM 740-90-1 ..... Administrative Storage of Equipment  
TM 743-200 ..... Storage and Materials Handling

**A-4. OTHER PUBLICATIONS.**

AR 750-17 ..... Maintenance of CONVEX/MILVAN Equipment  
MIL-C-52661B(ME) ..... Military Specification: Containers, Cargo  
MIL-T-704 ..... Treatment and Painting of Material  
FM 43-2 ..... Metal Body Repair and Related Operations

**A-1/(A-2 blank)**

**APPENDIX B  
MAINTENANCE ALLOCATION CHART**

---

**Section I. INTRODUCTION**

**B-1. General.**

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions on explanatory notes for particular maintenance function.

**B-2. Maintenance Functions.**

a. *Inspect.* To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. *Test.* To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. *Service.* Operations required periodically to keep an item in proper operating condition, i.e. to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. *Adjust.* To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. *Align.* To adjust specified variable elements of an item to bring about optimum or desired performance.

f. *Calibrate.* To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. *Install.* The act of emplacing, seating, or fixing into position an item, part of module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

*h. Replace.* The act of substituting a serviceable, like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

*i. Repair.* The application of maintenance services (inspect, test, service, adjust, align, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, re-machining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), and item or system.

*j. Overhaul.* That maintenance effort (services/actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

*k. Rebuild.* Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation included the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

### **B-3. Column Entries Used in the MAC.**

*a. Column 1, Group Number.* Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

*b. Column 2, Component/Assembly.* Column 2 contains the name of components, assemblies, subassemblies and modules for which maintenance is authorized.

*c. Column 3, Maintenance Functions.* Column 2 lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see para B-2).

*d. Column 4, Maintenance Level.* Column 4 specified, by the listing of a work time figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform the maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be shown for each level. The number of manhours specified by the work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as followed:

C	Operator or crew
O	Organization maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

e. *Column 5, Tools and Equipment.* Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. *Column 6, Remarks.* This column shall contain a letter code in alphabetic order which shall be keyed to the remarks contained in Section IV,

**B-4. Column Entries Used in Tool and Test Equipment Requirements.**

a. *Column 1, Tool or Test Equipment Reference Code.* The tool and test equipment reference code correlates with a maintenance function on the identified end item or component.

b. *Column 2, Maintenance Level.* The lowest level of maintenance authorized to use the tool or test equipment.

c. *Column 3, Nomenclature.* Name of identification of the tool or test equipment.

d. *Column 4, National/NATO Stock Number.* The National or NATO Stock Number of the tool or test equipment.

e. *Column 5, Tool Number.* The manufacturer's part number.

**B-5. Explanation of Columns in Section IV.**

a. *Reference Code.* The code scheme recorded in column 6, Section II.

b. *Remarks.* This column lists information pertinent to the maintenance function being performed as indicated on the MAC, Section II.

**Section I Maintenance Allocation Chart**

NOMENCLATURE OF END ITEMS: CONTAINER, CARGO

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT	(6) REMARKS	
			UNIT		INTERMEDIATE	DEPOT				
			C	O	F	H	D			
001	CONTAINER BODY	INSPECT SERVICE		0.1 0.5				1		
	FITTING, CORNER	INSPECT REPLACE		0.1	3.0			2		
	PANEL, SIDE & END	INSPECT REPLACE REPAIR		0.1	3.0 3.0			1,2 1,2		
	PLACARD HOLDER	REPLACE		1.0				1,2		
	PANEL, ROOF	INSPECT REPLACE REPAIR		0.1	3.0 3.0			1,2 1,2		
	POST, CORNER	INSPECT REPLACE REPAIR		0.1	4.0 3.0			1,2 1,2		
	J-BAR	INSPECT REPLACE REPAIR		0.1	4.0 3.0					
	RAIL, TOP	INSPECT REPLACE REPAIR		0.1	4.0 1.5			1,2 1,2		
	RAIL, BOTTOM	INSPECT REPLACE REPAIR		0.1	6.0 3.0			1,2 1,2		
	CROSS MEMBER, FLOOR	INSPECT REPLACE REPAIR		0.1	3.0 1.5			1,2 1,2		
	TRACK, HORIZONTAL & VERTICAL, SLOTTED	INSPECT REPLACE REPAIR		0.1	3.0 3.0					
	002	DOOR ASSEMBLY	INSPECT SERVICE REPLACE REPAIR		0.1 0.1 2.0	3.0			1 1,2 1,2	
		DOOR GASKET, LEFT & RIGHT	INSPECT REPLACE REPAIR		0.1 1.0 1.0				1 1	
		DOOR HARDWARE	INSPECT SERVICE REPLACE		0.1 0.5 0.5				1 1	
DOCUMENT HOLDER		INSPECT SERVICE REPAIR		0.1 0.5	1.5			1,2		
003	GASKET	INSPECT REPLACE		0.1 0.3				1		
	004	REAR ASSEMBLY--								
LINER, PLYWOOD		INSPECT REPLACE		0.1 1.0				1,2,3		
KICK PLATE		INSPECT REPLACE REPAIR		0.1 0.5 0.5				1,2,3 1,2,3		

## Section I Maintenance Allocation Chart

NOMENCLATURE OF END ITEMS: CONTAINER, CARGO

(1) GROUP NUMBER	(2) COMPONENT / ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			UNIT		INTERMEDIATE		DEPOT		
			C	O	F	H	D		
005	FLOOR ASSEMBLY--  PLANKING	INSPECT		0.1				1,3 1,3	
		REPLACE		1.0					
		REPAIR		1.0					
006	MECHANICAL RESTRAINT SYSTEM--  BEAM, SHORING	INSPECT		0.1				1 1	
		REPLACE		1.0					
		REPAIR		1.0					
	END FITTING	INSPECT		0.1				1	
		REPLACE		0.5					

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Refer- ence Code	(2) Mainte- nance Level	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
1	O,F	TOOL KIT, GENERAL, MECHANIC'S	5130000-177-7083	
2	F	TOOL KIT, WELDER'S	5130000-754-0661	
3	F	TOOL KIT, CARPENTER'S	5130000-293-2875	

**APPENDIX C  
UNIT AND INTERMEDIATE DIRECT SUPPORT  
MAINTENANCE  
REPAIR PARTS AND SPECIAL TOOLS LIST**

---

**Section I. INTRODUCTION**

**C-1. Scope.**

This appendix lists spares and repair parts; special tools; special test, measurement and diagnostic equipment (TMDE); and other special support equipment required for performance of organizational, direct support, and general support maintenance of the Container, MILVAN. It authorizes the requisitioning and issue of spares and repair parts as indicated by the source and maintenance codes.

**C-2. General.**

This Repair Parts and Special Tools List is divided into the following sections:

*a. Section II. Repair Parts List.* A list of spares and repair parts authorized for use in the performance of maintenance. The list also includes part which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in numeric sequence, with the parts in each group listed in figure and item number sequence. Bulk materials are listed in NSN sequence.

*b. Section III. Special Tools List.* A list of special tools, special TMDE, and other special support equipment authorized for the performance of maintenance.

*c. Section IV. National Stock Number and Part Number Index.* A list, in National Item Identification Number (NIIN) sequence of all National Stock Numbers (NSN) appearing in the listings, followed by a list, in alphameric sequence, of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance. This index is followed by a cross-reference list of reference designators to figure and item numbers.

**C-3. Explanation of Columns.**

*a. Illustration.* This column is divided as follows:

(1) *Figure Number.* Indicates the figure number of the illustration on which the item is shown.

(2) *Item Number.* The number used to identify each item called out in the illustration.



*b. Source, Maintenance and Recoverability (SMR) Codes*

(1) *Source Code.* Source codes indicate the manner of acquiring support items for maintenance, repair or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

<i>Code</i>	<i>Definition</i>
PA _____	Item procured and stocked for anticipated or known usage.
PB _____	Item procured and stocked for insurance purpose because essentiality dictates that a minimum quantity be available in the supply systems.
PC _____	Item procured and stocked and which otherwise would be coded PA except that it is deteriorative in nature.
PD _____	Support item, excluding support equipment, procured for initial issue or outfitting and stocked only for subsequent or additional initial issues or outfittings. Not subject to automatic replenishment.
PE _____	Support equipment procured and stocked for initial issue or outfitting to specified maintenance repair activities.
PF _____	Support equipment which will not be stocked but which will be centrally procured on demand.
PG _____	Item procured and stocked to provide for sustained support for the life of the equipment. It is applied to an item peculiar to the equipment which, because of probable discontinuance or shutdown of production facilities, would prove uneconomical to reproduce at a later time.
KD _____	An item of a depot overhaul/repair kit and not purchased separately. Depot Kit defined as a kit that provides items required at the time of overhaul or repair.
KF _____	An item of a maintenance kit and not purchases separately. Maintenance kit defined as a kit that provides an item that can be replaced at organizational or intermediate levels of maintenance.
KB _____	Item included in both a depot overhaul/repair kit and maintenance kit.
MO _____	Item to be manufactured or fabricated at organizational level.
MF _____	Item to be manufactured or fabricated at the direct support maintenance level.
MH _____	Item to be manufactured or fabricated at the general support maintenance level.

<i>Code</i>	<i>Definition</i>
MD _____	Item to be manufactured or fabricated at the depot maintenance level.
AO _____	Item to be assembled at organizational level.
AF _____	Item to be assembled at direct support maintenance level.
AH _____	Item to be assembled at general support maintenance level.
AD _____	Item to be assembled at depot maintenance level.
XA _____	Item is not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.
XB _____	Item is not procured or stocked. If not available through salvage, requisition.
XC _____	Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
XD _____	A support item that is not stocked. When required, item will be procured through normal supply channels.

**NOTE**

**Cannibalization or salvage may be used as a source of supply for any items source coded above except those coded XA and aircraft support items as restricted b), AR700-42.**

(2) *Maintenance Code.* Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

<i>Code</i>	<i>Application/Explanation</i>
C _____	Crew or operator maintenance performed within organizational maintenance.
O _____	Support item is removed, replaced, used at the organizational level.
F _____	Support item is removed, replaced, used at the direct support level.

H \_\_\_\_\_ Support item is removed, replaced, used at the general support level.

D \_\_\_\_\_ Support items that are removed, replaced, used at depot, mobile depot, specialized repair activity only.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes:

<i>Code</i>	<i>Application/Explanation</i>
O _____	The lowest maintenance level capable of complete repair of the support item is the organizational level.
F _____	The lowest maintenance level capable of complete repair of the support item is the direct support level.
H _____	The lowest maintenance level capable of complete repair of the support item is the general support level.
D _____	The lowest maintenance level capable of complete repair of the support item is the depot level.
L _____	Repair restricted to Specialized Repair Activity.
Z _____	Nonreparable. No repair is authorized.
B _____	No repair is authorized. The item may be reconditioned by adjusting, lubricating, etc., at the user level. No parts or special tools are procured for the maintenance of this item.

(3) *Recoverability Code.* Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

<i>Recoverability Code</i>	<i>Definition</i>
Z _____	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
O _____	Reparable item. When uneconomically reparable, condemn and dispose at organizational level.
F _____	Reparable item. When uneconomically reparable, condemn and dispose at the direct support level.
H _____	Reparable item. When uneconomically reparable, condemn and dispose at the general support level.

- D \_\_\_\_      Repairable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.
- L \_\_\_\_      Repairable item. Repair, condemnation, and disposal not authorized below depot/specialized repair activity level.

*Recoverability  
Code*

*Definition*

- A \_\_\_\_      Item requires special handling or condemnation procedures because of specific reasons (i.e., precious metal content, high dollar value, critical material or hazardous material). Refer to appropriate manuals/directives for specific instructions.

c. *National Stock Number.* Indicates the National stock number assigned to the item and which will be used for requisitioning.

d. *Part Number.* Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards and inspection requirements, to identify an item or range of items.

**NOTE**

**When a stock numbered item is requisitioned, the item received may have a different part number than the part being replaced.**

e. *Federal Supply Code for Manufacturer (FSCA).* The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. *Description.* Indicates the Federal item name and, if required, a minimum description to identify the item.

g. *Unit of Measure (U/M).* Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. *Quantity Incorporated in Unit.* Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable (e.g, shims, spacers, etc.).

**C-4. Special Information.**

a. Usable on codes are shown in the description column. Uncoded items are applicable to all models. Identification of the usable codes used in this publication are:

<i>Code</i>	<i>Used On</i>
CYA	General Cargo Container
CYB	Container w/Mechanical Load Bracing

b. Repair parts kits and gasket sets appear as the last entries in the repair parts listing for the figure in which its parts are listed as repair parts.

**C-5. How to Locate Repair Parts.**

a. *When National Stock Number or Part Number is Unknown.*

- (1) *First.* Using the table of contents, determine the functional group within which the item belongs. This is necessary since illustrations are prepared for functional groups and listings are divided into the same groups.
- (2) *Second.* Find the illustration covering the functional group to which the item belongs.
- (3) *Third.* Identify the item on the illustration and note the illustration figure and item number of the item.
- (4) *Fourth.* Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. *When National Stock Number or Part Number is Known.*

- (1) *First.* Using the Index of National Stock Numbers and Part Numbers, find the pertinent National stock number or part number. This index is in ascending NIIN sequence followed by a list of part numbers in alphameric sequence, cross-referenced to the illustration figure number and item number.
- (2) *Second.* After finding the figure and item number, locate the figure and item number in the repair parts list.

**C-6. Abbreviations.** Not Applicable.

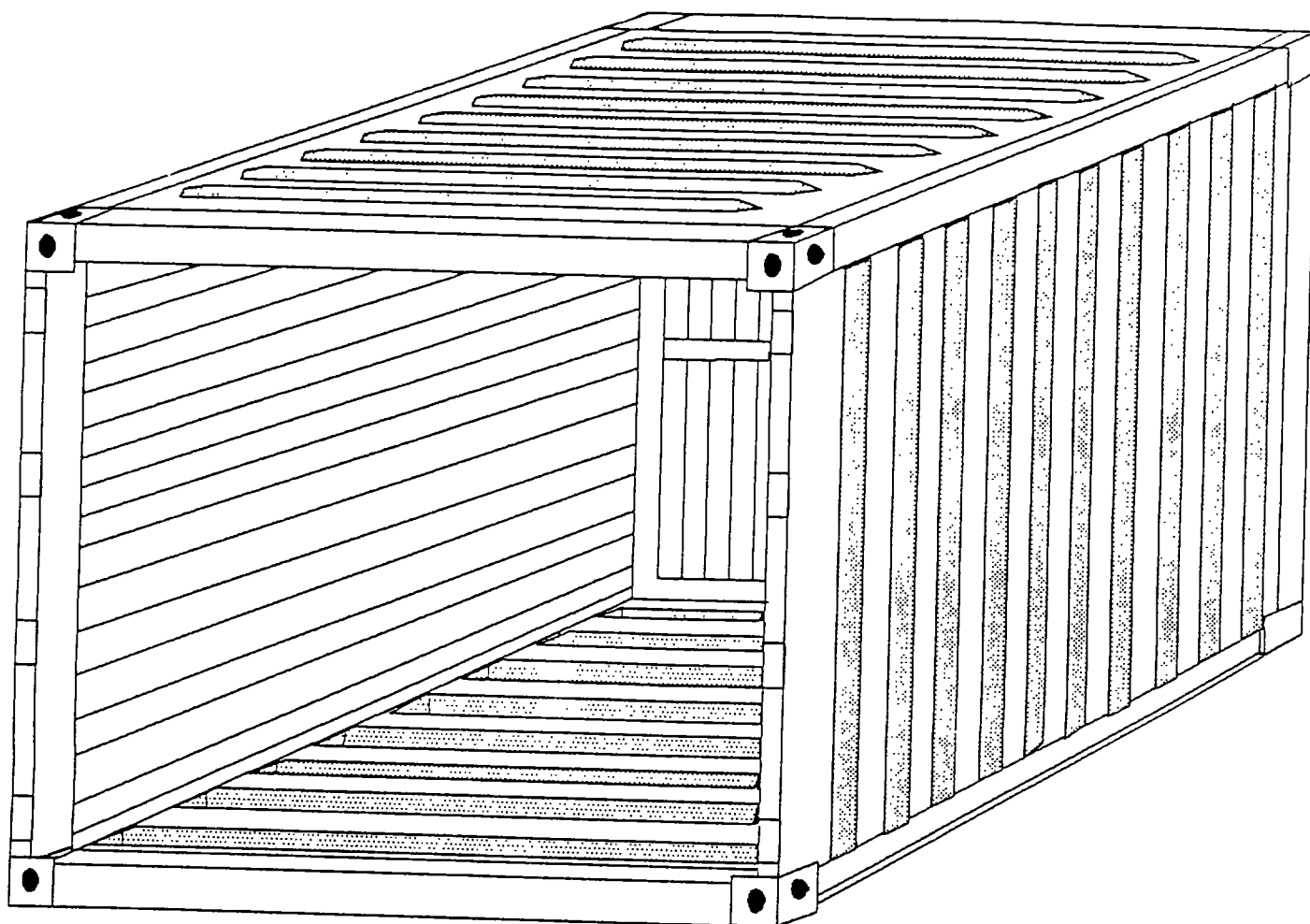


Figure C-1

Container Weldment

(C-7 blank)/C-8

ITEM NO	SMR CODE	FSCM	PART NUMBER	DESCRIPTION (USABLE ON CODE FOR ALL ITEMS IS EAF)	QTY
				GROUP 01:U WELDMENT, CONTAINER FIGURE C-1 WELDMENT, CONTAINER	
1	XAFFF	66603	JSD-CC85-WLDMT	WELDMENT, CONTAINER .....	1

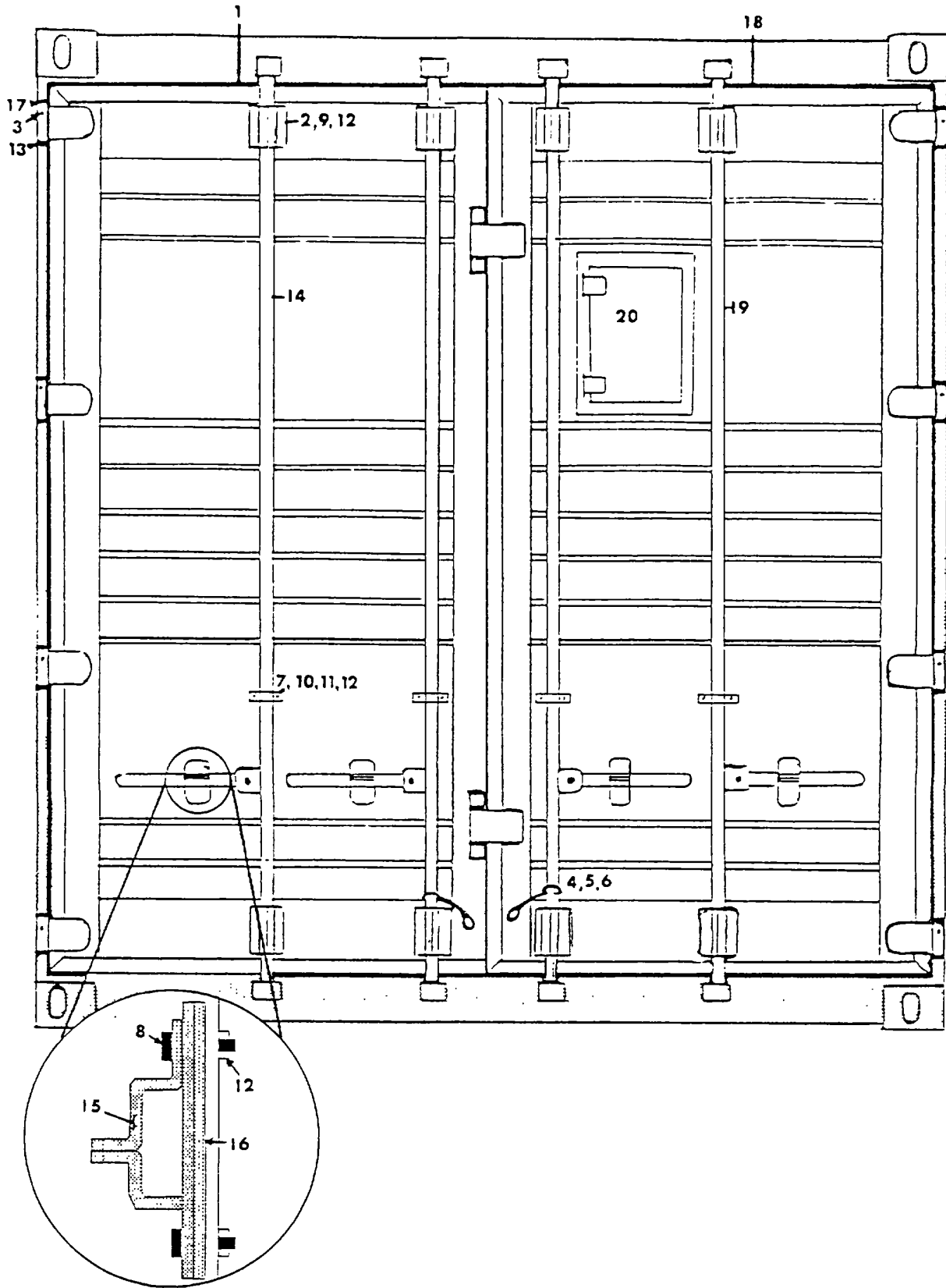
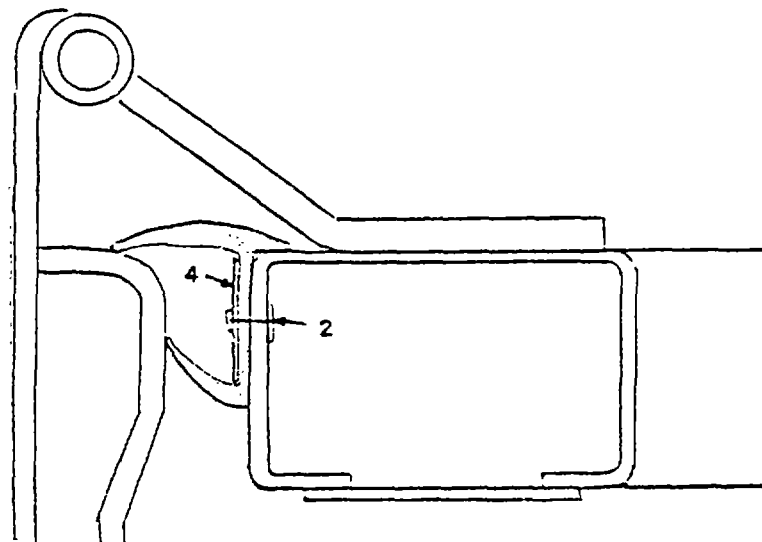
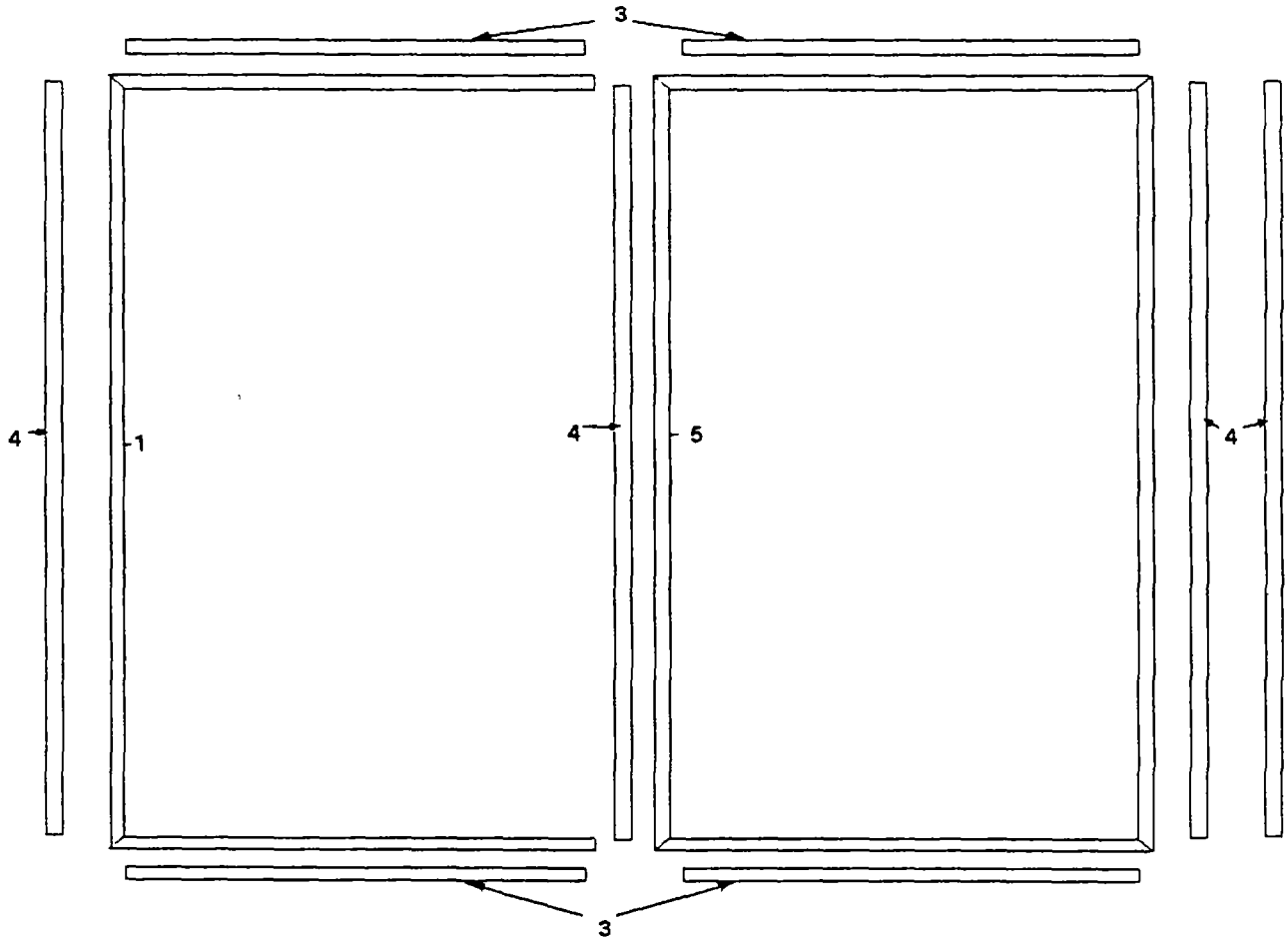


Figure C-2  
Door Assemblies



ITEM NO	SMR CODE	FSCM	PART NUMBER	DESCRIPTION (USABLE ON CODE FOR ALL ITEMS IS EAF)	QTY
GROUP 02: DOOR ASSEMBLIES, R & L FIGURE C-2: DOOR ASSEMBLIES, R & L					
1	XBOFF	66603	105-11330-L	DOOR ASSEMBLY, LEFT HAND .....	1
2	PAOZZ	96906	MS35297-58	SCREW, CAP, HEX, 3/8-16 .....	32
				ZINC COATED	
3	XBOZZ	39428	1103K2	FITTING, GREASE .....	8
4	AOOOZ	66603	105-1330-19	RESTRAINT, DOOR .....	2
5	MOOOZ	66603	105-1330-19A	ROPE, NYLON, 1/4 IN.....	2
				(15 IN REQUIRED)	
6	XBOZZ	39428	3928T15	CLAMP, ROPE .....	2
7	PAOZZ	96906	MS35297-60	SCREW, CAP, HEXAGON 3/8-16X1 IN L.....	12
8	PAOZZ	96906	MS35297-62	SCREW, CAP, HEXAGON .....	4
				3/8-16X1 1/4 IN L	
9	XBOZZ	66603	105-11330-20	FITTING, LARGE BRACKET .....	8
10	XBOZZ	66603	105-11330-21	FITTING, SMALL BRACKET .....	4
11	XBOZZ	66603	105-11330-22	SPACER, SMALL BRACKET.....	4
12	PAOZZ	96906	MS51922-2	NUT, LOCKING, 3/8-16.....	48
				ZINC COATED	
13	PAOZZ	88044	AN960B816	WASHER, FLAT, 1/2 ID .....	8
14	XBOZZ	66603	105-11330-23	ROD ASSY, LOCKING, LH .....	2
15	XBOZZ	66603	105-11330-25	RETAINER ASSEMBLY, HANDLE .....	4
16	XBOZZ	66603	105-11330-26	SPACER, HANDLE RETAINER.....	4
				3.2X46X130 4 MM	
17	MOOZZ	66603	105-11330-31	PIN, HINGE .....	8
18	XBOFF	66603	105-11330-35	DOORASSEMBLY, RIGHT HAND.....	1
19	XBOZZ	66603	105-11330-24	ROD ASSEMBLY, LOCKING, RH . .....	2
20	XDOOO	66603	105-11331	HOLDER ASSEMBLY, DOCUMENT .....	1



**Figure C-3**  
**Door Gaskets and Attaching Hardware**

ITEM NO	SMR CODE	FSCM	PART NUMBER	DESCRIPTION (USABLE ON CODE FOR ALL ITEMS IS EAF)	QTY
GROUP 02: DOOR ASSEMBLIES, R & L FIGURE C-3: GASKETS AND ATTACHING HARDWARE					
1	XBOZZ	66603	105-11330-37	GASKET, RUBBER, LH, DOOR.....	1
2	XBOZZ	39428	97525A032	RIVET, BLIND, SS, 3/16 IN .....	42
3	XBOZZ	66603	105-11330-35	STRIP, CLAMP, HORIZONTAL .....	4
4	XBOZZ	66603	105-11330-36	STRIP, CLAMP, VERTICAL .....	3
5	XBOZZ	66603	105-11330-38	GASKET, RUBBER, RH, DOOR .....	1

Change 1 C-13

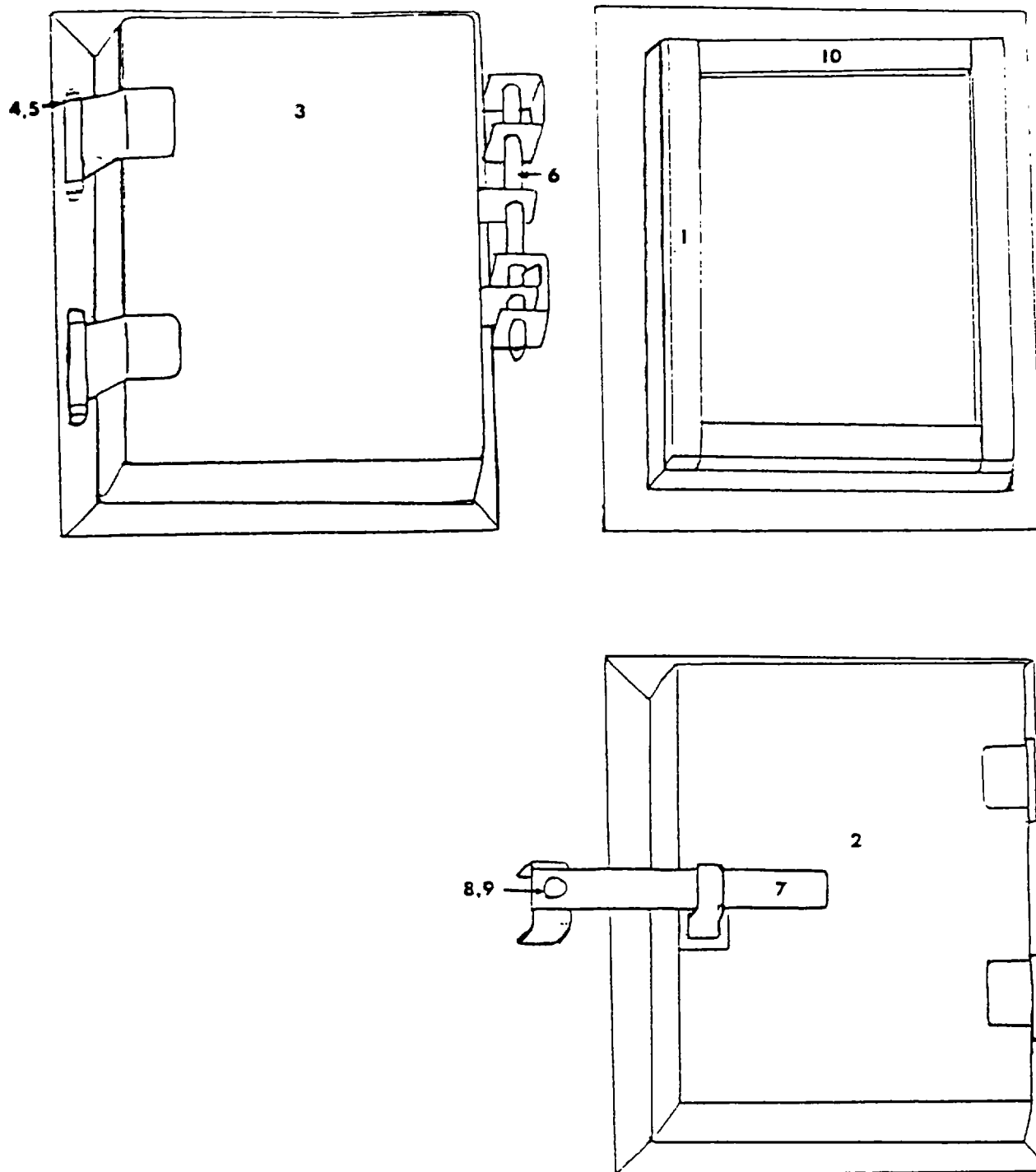


Figure C-4  
Document Holder Assembly

ITEM NO	SMR CODE	FSCM	PART NUMBER	DESCRIPTION (USABLE ON CODE FOR ALL ITEMS IS EAF)	QTY
GROUP 03: DOCUMENT HOLDER ASSEMBLY FIGURE C-4: DOCUMENT HOLDER ASSEMBLY					
1	MOOZZ	66603	JDBB197GSKT1	GASKET, VERTICAL STRIP 3/8XIX10 IN.....	4
2	XBOZZ	66603	105-11331-1-4-13	DOOR ASSEMBLY, INNER, DH .....	1
3	XBOZZ	66603	105-11331-1-4-8-9	DOOR ASSEMBLY, OUTER, DH .....	1
4	MOOZZ	66603	105-11331-5	PIN, HINGE, DH .....	4
5	PAOZZ	88044	AN96OB516	WASHER, FLAT, 5/16 ID .....	8
6	XDOZZ	66603	105-11331-7	PIN ASSEMBLY, LOCKING .....	1
7	XBOZZ	66603	105-11331-12	HANDLE, LOCKING .....	1
8	XDOZZ	66603	105-11331-15	RIVET, HANDLE .....	1
9	XDOZZ	66603	105-11331-16	BUSHING, HANDLE .....	1
10	MOOZZ	66603	JDBB197GSKT1	GASKET, HORIZONTAL STRIP .....	4
				3/8X1X9 IN.....	

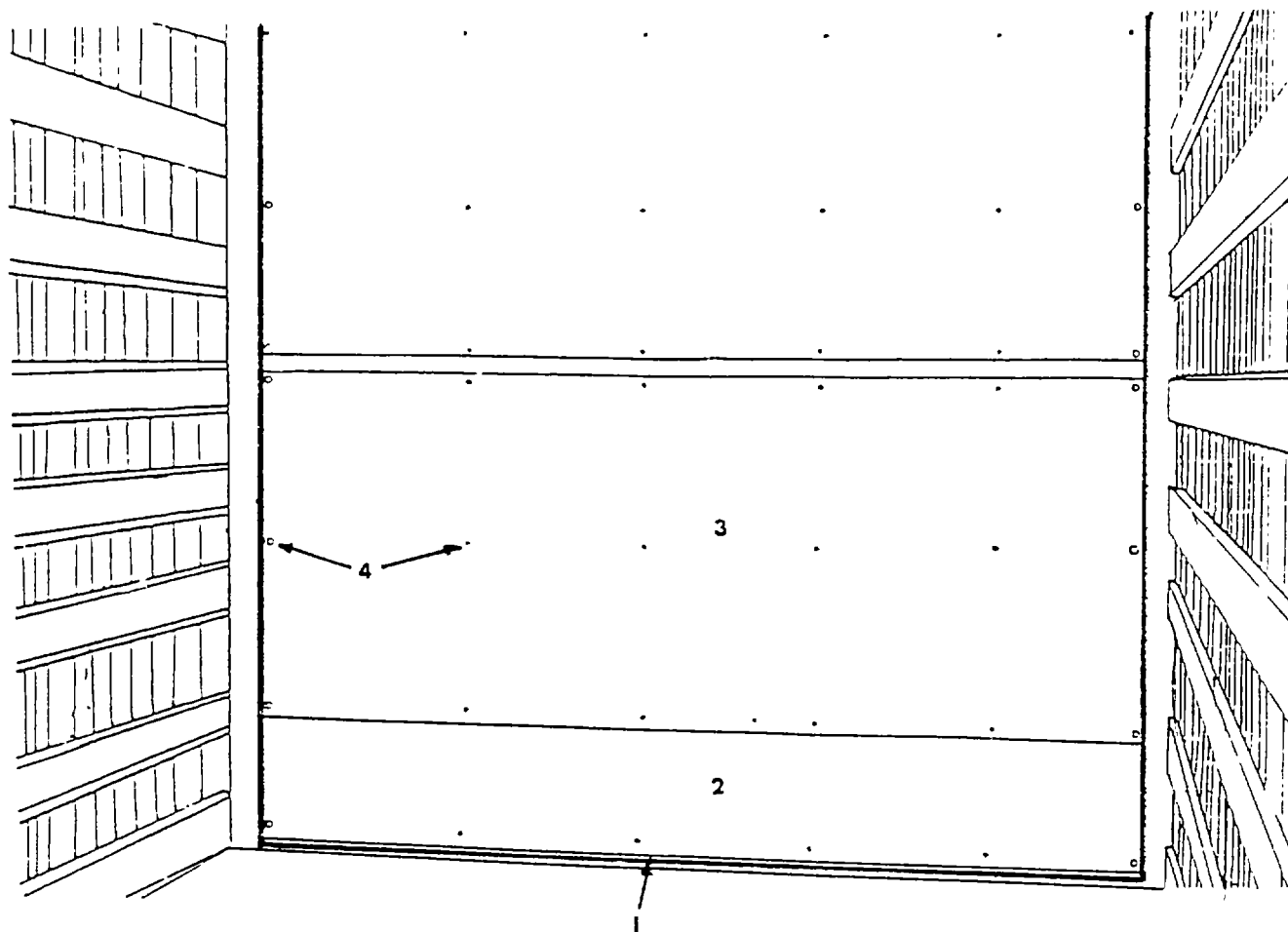


Figure C-5. Rear Assembly

C-16

ITEM NO	SMR CODE	FSCM	PART NUMBER	DESCRIPTION (USABLE ON CODE FOR ALL ITEMS IS EAF)	QTY
GROUP 04: REAR ASSEMBLY					
FIGURE C-5: REAR ASSEMBLY					
1	AOOOO	66603	105-11320	REARASSEMBLY .....	1
2	MOOZZ	66603	105-11320-14	PLATE, KICK 1/16X12X77.25 IN .....	1
3	MOOZZ	66603	105-11320-11	LINER, PLYWOOD, 1/4X43, 31X83.31 IN .....	2
4	XBOZZ	94222	10-99-108-13	RIVET, DRIVE 3/16" DIA .....	48

Change 1 C-17

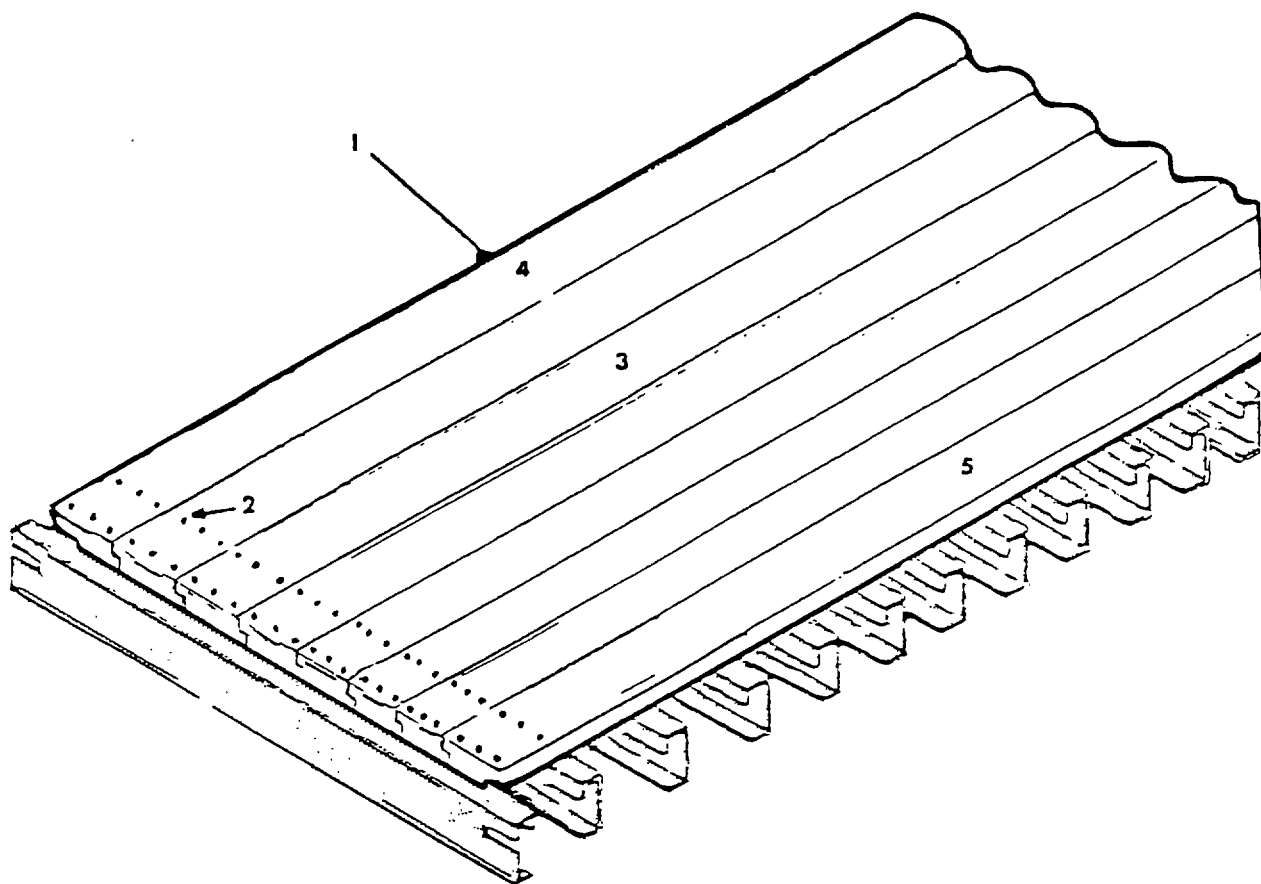


Figure C-6. Floor Assembly

C-18



ITEM NO	SMR CODE	FSCM	PART NUMBER	DESCRIPTION (USABLE ON CODE FOR ALL ITEMS IS EAF)	QTY
GROUP 05: FLOOR ASSEMBLY					
FIGURE C-6: FLOOR ASSEMBLY					
1	AOOOO	66603	105-11310-4-5-6	FLOOR ASSEMBLY.....	1
2	XBOZZ	39428	90006A323	SCREW, FLOOR, ZINC NO.14, 3 IN.....	624
3	MOOOO	66603	105-11310-5	FLOORING, WOOD, CTR.....	6
				1 1/8 X 11 1/2 X 19'5/8".....	
4	MOOOO	66603	105-11310-4	FLOORING, WOOD, LH.....	1
				1 1/8 X 11 5/8 X 19'5/8".....	
5	MOOOO	66603	105-11310-6	FLOORING, WOOD, RH.....	1
				1 1/8 X 11 5/8 X19'5/8".....	

Change 1 C-19

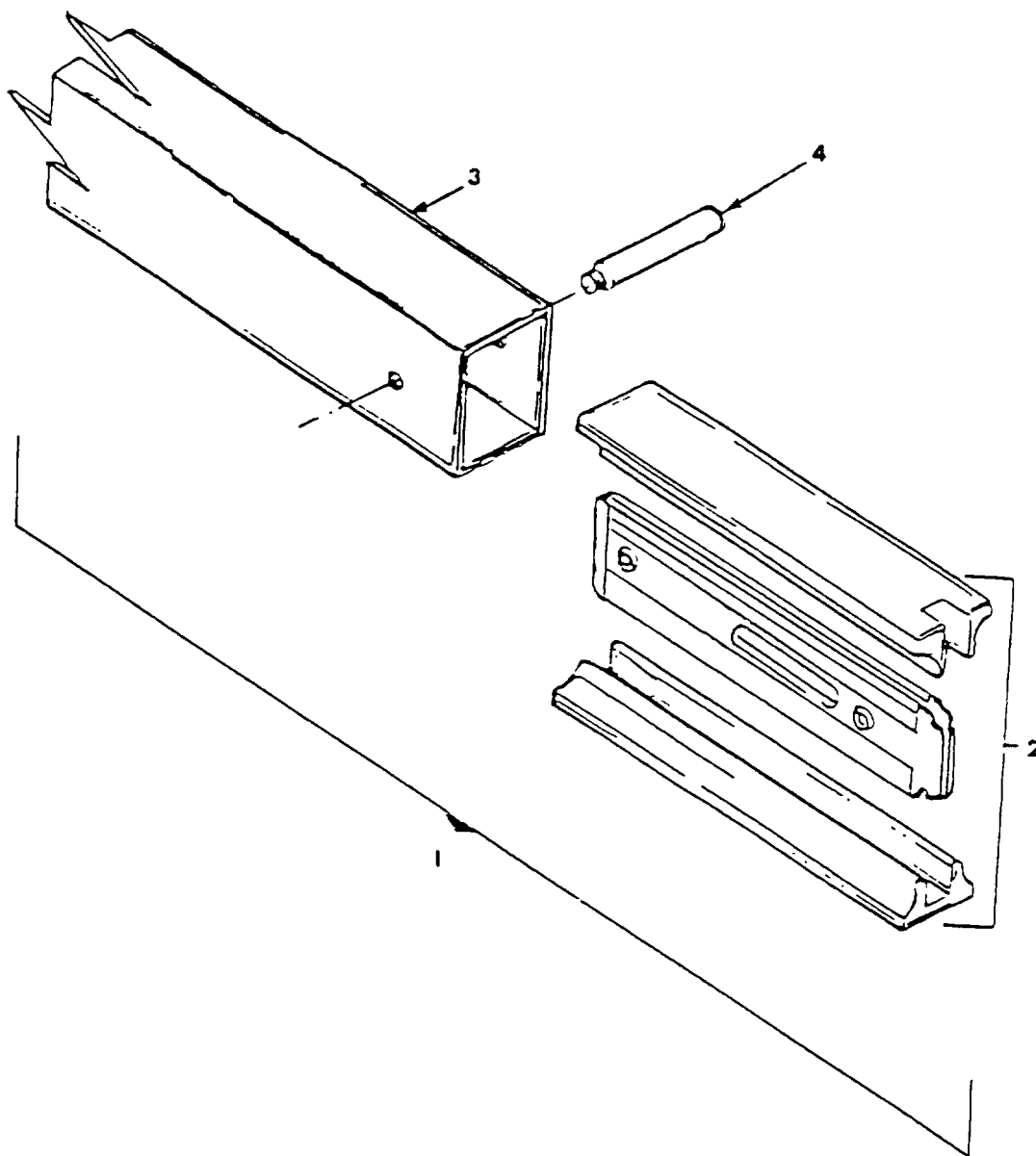


Figure C-7. Shoring Beam Assembly

ITEM NO	SMR CODE	FSCM	PART NUMBER	DESCRIPTION (USABLE ON CODE FOR ALL ITEMS IS EAF)	QTY
GROUP 06: SHORING BEAM ASSEMBLY					
FIGURE C-7: SHORING BEAM ASSEMBLY					
1	PBOOO	97403	13219E0039	BEAM, SHORING .....	25
2	PAOZZ	97403	13219E0039-1	FITTING, END .....	50
3	PAOOO	97403	13219E0039-2	BEAM .....	25
4	PAOZZ	97403	13219E0039-3	PIN .....	50

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ITEM NO	SMR CODE	FSCM	PART NUMBER	DESCRIPTION (USABLE ON CODE FOR ALL ITEMS IS EAF)	QTY
GROUP 07: BULK MATERIALS					
1	XBFZZ	39428	27T15	ROPE, 1/4 IN, NYLON .....	BULK
2	XBOZZ	39428	8570K13	NEOPRENE SHEET, 36 X 12 X 1/4".....	BULK
3	XBOZZ	81348	NN-P-530 4X8'	PLYWOOD SHEET, 1/4", AC, PLUGGED .....	BULK
4	XBOZZ	81348	QQ-A-250 11F, 4X8'	ALUMINUM SHEET, 1/16" .....	BULK
5	PAOZZ	81349	MIL-L-2037	OAK FLOORING .....	BULK

PIN: 064442-001

C-22 Change 1

**APPENDIX D**  
**EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST**

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**Section I. INTRODUCTION**

**D-1. Scope.** This appendix lists expendable supplies and materials you will need to operate and maintain the General Cargo Container. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

**D-2. Explanation of Columns.**

a. *Column 1 - Item Number.* This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., Use cleaning compound, item 5, App. D).

b. *Column 2 - Level.* This column identifies the lowest level of maintenance that requires listed item.

*(enter as applicable)*

C - Operator/Crew

O - Organizational Maintenance

F - Direct Support Maintenance

H - General Support Maintenance

c. *Column 3 - National Stock Number.* This is the National Stock Number assigned to the item; use it to request or requisition the item.

d. *Column 4 - Description.* Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. *Column 5 - Unit of Measure, (U/M).* Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

## Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	0	9150-00-235-5568	Graphite Grease Spec VV-G-671 Grade 1	QT
2	0		Primer, MIL-P-52192	QT
3	0		Topcoat Paint MIL-C-46168	QT
4	0	8030-00-965-2397	Sealing Compound Spec TT-S-230	GL
5	0		Fiberglass Repair Kit MIL-R-58047(CE)	EA
6	0	2090-00-372-6064	Fiberglass Repair Kit MIL-R-19907C	EA
7	0	8040-00-281-1974	Adhesive	QT
8	0	7510-00-550-6498	Tape, Pressure Sensitive PVC (Scotchrap)	RL
10	0		Undercoating MIL-C-83933	GL
9	0		Electrode, Stainless Steel	EA

**GLOSSARY**

**Bevel** - To cut or grind an edge at an angle other than ninety degrees.

**Continuous weld** - A weld extending the full length of a seam, without any break (or skip).

**Corrugation** - Steel panel folded in a regular pattern for maximum structural strength.

**Crossmember** - A C-beam supporting the container floor.

**Flange** - The horizontal section of a C-beam.

**Horizontal** - Side to side.

**J-bar** - Part of each front corner post to which door hinges are attached.

**Kickplate** - Aluminum plate inside container which protects plywood liner.

**Pin hole** - Very small hole which may form in a bad weld.

**Placard** - Hazard warning sign kept in place on the container by a placard holder.

**Shielding** - In welding, any material used to protect heat sensitive materials from the welding flame or arc.

**Skip weld** - Method of welding in which the seam is welded for an inch, not welded, (or skipped) for an inch, welded, skipped, and so on.

**Tek-dek** - Reinforced fiberglass material installed as flooring on many of the cargo containers.

**Vertical** - Up and down.

**Vertical web** - Up and down portion of the cross member.

**Glossary 1/(Glossary 2 blank)**

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By Order of the Secretary of the Army:

**CARL E. VUONO**  
*General, United States Army*  
*Chief of Staff*

Official:

**R. L. DILWORTH**  
*Brigadier General, United States Army*  
*The Adjutant General*

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- (1) Restrictions for repair by sectioning are as follows:
  - (a) Sections must be at least six inches long.
  - (b) A section which would end within six inches of an existing insert or section repair must be extended to butt against the existing insert or repair.
  - (c) For side rails only: If any part of the area to be repaired is within twelve inches of a corner fitting, the section must butt against the corner fitting.
  - (d) For end rails only: If any part of the area to be repaired is within six inches of a corner fitting, the section must butt against the corner fitting.
  
- (2) Remove damaged section of top rail and prepare to install replacement section.
  - (a) Mark the damaged area to be replaced with chalk or scribe.
  - (b) Tack weld guide bars in place to ensure straight cuts with an oxygen acetylene torch. Even, accurate cutting will eliminate wide gaps between the rail and the new insert.
  - (c) Cut the weld holding the roof panel to the top rail where it is being replaced. Cut twelve inches farther in each direction than the rail being replaced so that the panel can be wedged away from the area being worked on.
  - (d) Cut the weld holding the side or end panel to the top rail section being replaced.
  - (e) Insert wedges between the roof and the top rail at either end of the section to be cut away.
  - (f) Cutout the damaged top rail section.
  - (g) Grind smooth all cut edges.
  
- (3) Cut replacement section.
  - (a) Using guide bars, cut a section to the exact size of the damaged area. The section material must be rolled steel with at least 110 lbs/sq. in. (50 kg/sq. mm) minimum tensile strength.
  - (b) Grind smooth cut edges of the section.
  
- (4) Fit and weld section in place.
  - (a) Fit section in place. There should be no more than 5/64 in. gap at any point between the section and the edges of the top rail and panels.

- (b) Bevel edges of the section and top rail cutout area to a thirty degree angle(See figure 3-6).
- (c) Tack weld section in place making sure there is a flush fit. Check to be sure that standard measurements shown in figure 3-1 remain within the listed tolerances.
- (d) Continuously butt weld section to top rail edges.
- (e) Grind away any excess weld material on top or bottom edge of top rail which interferes with fit of roof and side or end panels.
- (f) Remove wedges and continuously weld roof and side or end panels to top rail.
- (g) Clean and paint according to paragraph 2-4.
- (h) Test for weatherproofness according to paragraph 2-5, caulk if necessary.

d. Replacement. Replace the top rail if it cannot be repaired by straightening, inserting or sectioning. The replacement top rail must be identical to the damaged rail in length and profile.

- (1) Measure standard dimensions indicated in figure 3-1. Measure between corner posts for dimensions of replacement top rail. If standard dimensions are out of tolerance, be careful to obtain measurements for replacement top rails reflecting correct standard dimensions.
- (2) Use oxygen acetylene torch to cut welds holding the top rail to the corner fittings, roof panels and side or end panels.

#### **CAUTION**

**Direct oxygen-acetylene torch away from corner fittings, corner posts and side and end panels to prevent damage to any of these parts.**

- (3) Remove the damaged rail.
- (4) Grind smooth all cut edges.
- (5) Remove old caulking which would interfere with installation of new rail.
- (6) Measure and cut replacement rail to exact length.
- (7) Fit replacement rail in place. There should be no more than 5/64 in. gap between the rail edges, the corner fittings, and the roof and side or end panels.

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## The Metric System and Equivalents

### *Linear Measure*

1 centimeter = 10 millimeters = .39 inch  
 1 decimeter = 10 centimeters = 3.94 inches  
 1 meter = 10 decimeters = 39.37 inches  
 1 dekameter = 10 meters = 32.8 feet  
 1 hectometer = 10 dekameters = 328.08 feet  
 1 kilometer = 10 hectometers = 3,280.8 feet

### *Weights*

1 centigram = 10 milligrams = .15 grain  
 1 decigram = 10 centigrams = 1.54 grains  
 1 gram = 10 decigrams = .035 ounce  
 1 decagram = 10 grams = .35 ounce  
 acres  
 1 hectogram = 10 decagrams = 3.52 ounces  
 1 kilogram = 10 hectograms = 2.2 pounds  
 1 quintal = 100 kilograms = 220.46 pounds  
 1 metric ton = 10 quintals = 1.1 short tons

### *Liquid Measure*

1 centiliter = 10 milliliters = .34 fl. ounce  
 1 deciliter = 10 centiliters = 3.38 fl. ounces  
 1 liter = 10 deciliters = 33.81 fl. ounces  
 1 dekaliter = 10 liters = 2.64 gallons  
 1 hectoliter = 10 dekaliters = 26.42 gallons  
 1 kiloliter = 10 hectoliters = 264.18 gallons

### *Square Measure*

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch  
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches  
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet  
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet  
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47  
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

### *Cubic Measure*

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch  
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches  
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

## Approximate Conversion Factors

<i>To change</i>	<i>To</i>	<i>Multiply by</i>	<i>To change</i>	<i>To</i>	<i>Multiply by</i>
inches	centimeters	2.540	ounce-inches	Newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29,573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	Newton-meters	1.356	metric tons	short tons	1.102
pound-inches	Newton-meters	.11296			

## Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C
----	------------------------	----------------------------	---------------------	----



