

APPROVED BY
 BUREAU OF EXPLOSIVES
J. H. Johnson
 DATE 8/19/84

LOADING AND BRACING (CL & LCL) IN BOX CARS OF PALLETIZED COMPLETE ROUNDS PACKED IN CYLINDRICAL METAL CONTAINERS

T53 SERIES CONTAINER

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THIS OUTLOADING PROCEDURE DRAWING INCLUDES PROCEDURES FOR CONVENTIONAL TYPE BOX CARS, BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES OF VARIOUS DESIGN AND MANUFACTURE, AND CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

THIS DRAWING SUPERSEDES U.S. ARMY MATERIEL COMMAND (AMC) DRAWING 19-48-4079-1-2-5-11-14PM1001, DATED SEPTEMBER 1969, IN PART, AS PERTAINS TO THE CARLOADING OF THE T53 SERIES CONTAINERS ON PAGES 36 THRU 59.

DO NOT SCALE

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			FEBRUARY 1992				
DEV			CLASS	DIVISION	DRAWING	FILE	
DED			19	48	4212/2	5PM 1003	
DE							

GENERAL NOTES

(GENERAL NOTES CONTINUED)

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE FOR THE T53 SERIES COMPLETE ROUND CONTAINER WHEN UNITIZED ON A 40" X 48" PALLET. SEE THE PICTORIAL VIEW ON PAGE 4. REFER TO THE U.S. AMC DRAWING 19-48-4079/2-20PM1002 FOR UNITIZATION PROCEDURES FOR THE T53 SERIES CONTAINER.
- C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOX CARS, FOR SHIPMENTS IN BOX CARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, AND FOR SHIPMENTS IN CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
- D. ALL THE LOADS SHOWN HEREIN ARE TYPICAL. BECAUSE OF THIS FACT, IT IS MOST LIKELY THAT THE ACTUAL QUANTITY TO BE SHIPPED WILL NOT BE DEPICTED IN ANY OF THE LOADING PROCEDURES. A LOAD PLAN SHOULD BE DEVELOPED WHICH WILL BE THE MOST EFFICIENT AS TO THE AMOUNT OF DUNNAGE REQUIRED AND AS TO THE EASE OF LOADING, FOR THE QUANTITY TO BE SHIPPED. THE LOAD PLANNING CHART ON PAGE 22 MAY BE USED IN CONJUNCTION WITH THE DEPICTED LOADING PROCEDURES FOR GUIDANCE.
- E. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF PALLET UNITS OF COMPLETE ROUNDS IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY CARS WHICH HAVE "SOUND" FLOORS AND ARE IN OTHERWISE PROPER CONDITION, IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS, WILL BE SELECTED.
- F. WHEN SELECTING RAIL CARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOX CARS THAT DO NOT HAVE BOWED END WALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN END WALL IS BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. REFER TO PAGE 38 FOR GUIDANCE.
- G. BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS HAVE BEEN SHOWN. HOWEVER, THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH PLUG DOORS. CAUTION: DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, WHETHER AUXILIARY OR MAIN. ALSO, AFTER THE PLUG DOORS ON A CAR ARE CLOSED AND READY FOR THE INSTALLATION OF CAR SEALS, A PIECE OF WIRE OF SUITABLE SIZE WILL BE USED IN ADDITION TO, AND IN CONJUNCTION WITH, EACH CAR SEAL USED TO SEAL THE CAR. THE WIRE WILL BE THREADED THRU THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.
- H. ALTHOUGH EVENLY LOADED, LOADS ARE SHOWN, THE USE OF AN OFFSET LOADING PATTERN WILL FACILITATE LOADING AND UNLOADING OPERATIONS IN THE DOORWAY AREA OF THE CAR. WHEN POSSIBLE TO DO SO, A FULL LOAD SHOULD BE BUILT USING AN OFFSET LOADING PATTERN. FOR INSTANCE, A LOAD CONSISTING OF AN EVEN NUMBER OF LOAD UNITS AND HAVING TWO MORE LOAD UNITS IN ONE END OF THE CAR THAN IN THE OPPOSITE END, OR A LOAD CONSISTING OF AN ODD NUMBER OF LOAD UNITS AND HAVING ONE MORE LOAD UNIT IN ONE END THAN IN THE OTHER IS CONSIDERED TO BE AN OFFSET LOAD.
- J. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH PALLET UNITS OF COMPLETE ROUNDS PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED HEREIN. MIXED ITEMS TO BE SHIPPED IN CARS EQUIPPED WITH MECHANICAL BRACING DEVICES MUST BE SEPARATELY BLOCKED, USING THE PROCEDURES SHOWN FOR THESE CARS AS GUIDANCE.
- K. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE. IF THOSE MEMBERS SPECIFICALLY IDENTIFIED AS "STRUTS" WITHIN THE KEY NUMBERS OF A DEPICTED LOAD ARE SPECIFIED TO BE 4" X 4" MATERIAL, IT IS PERMISSIBLE TO USE TWO LAMINATED PIECES OF 2" X 6" MATERIAL IN LIEU OF EACH 4" X 4" STRUT. DOUBLE 2" X 6" STRUTS WILL BE LAMINATED W/1-10d NAIL EVERY 6".
- L. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OR SIDEWALL OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS OR SIDEWALL BOARDS. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- M. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED CARLOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 2" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENGCO PRODUCTS INCORPORATED. NOTE: STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD-RESTRAINING FLOOR DUNNAGE APPLICATION.
- N. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE (1) SEAL WITH TWO (2) PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 5 FOR GUIDANCE.
- O. THROUGHOUT THIS PROCEDURAL DRAWING, PORTIONS OF THE BLOCKING COMPONENTS AND OF THE DEPICTED CARS, SUCH AS A CAR SIDE WALL, HAVE BEEN OMITTED FROM THE LOAD VIEW FOR CLARITY PURPOSES.
- P. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY TO BE SHIPPED, HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE UNITS. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.
- Q. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOX CARS)

- R. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDE WALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED TO THE NAILING OF THE "DOORWAY BLOCKING" PIECES IN THE FULL LOADS AND TO THE NAILING TO THE CAR FLOOR OF THE LCL BRACES AND KNEE BRACE ASSEMBLIES IN THE LESS THAN FULL LOADS. IF A NAIL SIZE IS NOT SPECIFIED IN THE CAR, 30d NAILS SHOULD BE USED IN LIEU OF THOSE SPECIFIED IN THE APPLICABLE KEY NUMBERS. SEE GENERAL NOTE "L" ABOVE.
- S. NOTICE: WHEN POSITIONING PALLET UNITS IN A CAR THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDE WALL AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE SO AS TO ACHIEVE A TIGHT LOAD. TO AID IN ACHIEVING TIGHTNESS LENGTHWISE IN A FULL LOAD, A LOAD-COMPRESSING JACK MAY BE EMPLOYED IN THE AREA OF THE CENTER GATES TO MOVE THE PALLETIZED UNITS INTO THEIR FINAL SHIPPING POSITION. A HYDRAULIC JACK IS RECOMMENDED FOR THIS OPERATION. CAUTION: WHEN USING A JACK TO COMBACT A LOAD, THE JACK MUST BE USED AGAINST STRONG POINTS OF THE PALLET UNITS. PADDING, OF 2-INCH (2") THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- T. LOAD BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 40. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD-BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUTS AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDERSIDE OF THOSE STRUTS.
- U. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE STRUT WILL BE TOENAILED TO THE ADJACENT CENTER GATE, AS SPECIFIED WITHIN THE KEY NUMBERS FOR A LOAD, IN SUCH A MANNER SO THAT AS NEARLY AS PRACTICAL EQUAL LENGTHS OF A NAIL ARE EMBEDDED IN THE STRUT AND IN THE VERTICAL PIECE OF THE CENTER GATE. SEE THE "BEVEL CUT" DETAIL ON PAGE 40 FOR BEVELING INSTRUCTIONS AND THE "STRUT INSTALLATION" DETAIL ON THAT PAGE FOR A PICTORIAL VIEW SHOWING THE PROPER POSITIONING OF A BEVELED STRUT FOR INSTALLATION. NOTE THAT THE UPPER CORNER NEEDS TO BE BEVELED ONLY IF THE STRUTS ARE VERY SHORT. IF ONLY ONE END IS BEVEL-CUT, THE BEVELED EDGE WILL BE PLACED IN THE DOWNWARD POSITION SO THAT IT WILL ALLOW THE STRUT END TO SLIDE MORE FREELY DOWN THE FACE OF THE VERTICAL PIECE ON THE ADJACENT CENTER GATE AS THE STRUT IS DRIVEN DOWN INTO ITS FINAL BLOCKING POSITION.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

- LUMBER----- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS----- : COMMON, FED SPEC FF-N-105.
- STRAPPING, STEEL----- : ASTM D 3953 ; FLAT STRAPPING, TYPE 1 OR 2, HEAVY DUTY, COATED FINISH (ORGANIC), ZINC-COATED (GRADE 2), OR UNCOATED.
- STRAP SEAL----- : ASTM D 3953 ; CLASS H, FINISH A, 8 (GRADE 2), OR C, TYPE D, STYLE I, II, OR IV.
- STRAP STAPLE----- : COMMERCIAL GRADE.
- PLYWOOD----- : GROUP B, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D, FED SPEC NN-P-530. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- WIRE----- : FED SPEC QQ-W-461.

(GENERAL NOTES FOR CONVENTIONAL TYPE BOX CARS CONTINUED)

- V. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

(FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

- W. THE OUTLOADING PROCEDURES FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES MAY BE ADAPTED AS REQUIRED TO FACILITATE THE USE OF BOX CARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES. HOWEVER, FIXED OR ADJUSTABLE WALL MEMBERS AND DOORWAY MEMBERS WITHIN THESE CARS MUST PROVIDE FOR THE INSTALLATION OF LOAD BLOCKING CROSS MEMBERS AT THE HEIGHTS SPECIFIED. **CAUTION:** BOX CARS EQUIPPED WITH MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.
1. FOR BLOCKING THE LOADS WHICH ARE DEPICTED, A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE LADING ON EITHER SIDE THAN AS SHOWN. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM AND CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE SPACING OF THE LOCKING HOLES IN THE WALL MEMBERS PERMIT. LOCKING BARS (LEVER JACKS) SHOULD BE USED FOR THIS PURPOSE. AN ADDITIONAL 1/2" OF ADJUSTMENT CAN BE MADE BY TURNING A CROSS MEMBER END-FOR-END WHEN LOCKING PINS ON THE MEMBER ARE OFF-CENTER. **NOTE:** IT IS RECOMMENDED THAT EACH CROSS MEMBER BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHTS AND AT EQUAL DISTANCES FROM THE END OF THE CAR).
 2. **CAUTION:** ALL BLOCKING AND BRACING COMPONENTS IN EMPTY CARS AND ALL UNUSED COMPONENTS IN LOADED CARS MUST BE "SECURED" FOR SHIPMENT--ADJUSTABLE WALL MEMBERS TO VERTICAL WALL ATTACHMENT RAILS, AND CROSS MEMBERS TO ADJUSTABLE WALL MEMBERS OR TO FIXED HORIZONTAL WALL MEMBERS OR TO DOORWAY MEMBERS, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.
- X. IN A CAR EQUIPPED WITH ADJUSTABLE WALL MEMBERS, PROVIDING THE FIXED WALL MEMBERS WHICH ARE PRESENT IN SOME "ADJUSTABLE" CARS ARE NOT PROPERLY POSITIONED TO PROVIDE SIDE BEARING SURFACES BETWEEN THE UNITS AND THE CAR SIDEWALLS, ADJUSTABLE WALL MEMBERS (AS REQUIRED) MUST BE INSTALLED TO PROVIDE A MINIMUM OF ONE SURFACE AREA FOR SIDE BEARING AT SOME LOCATION WITHIN THE UPPER HALF OF EACH UNIT.
- Y. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

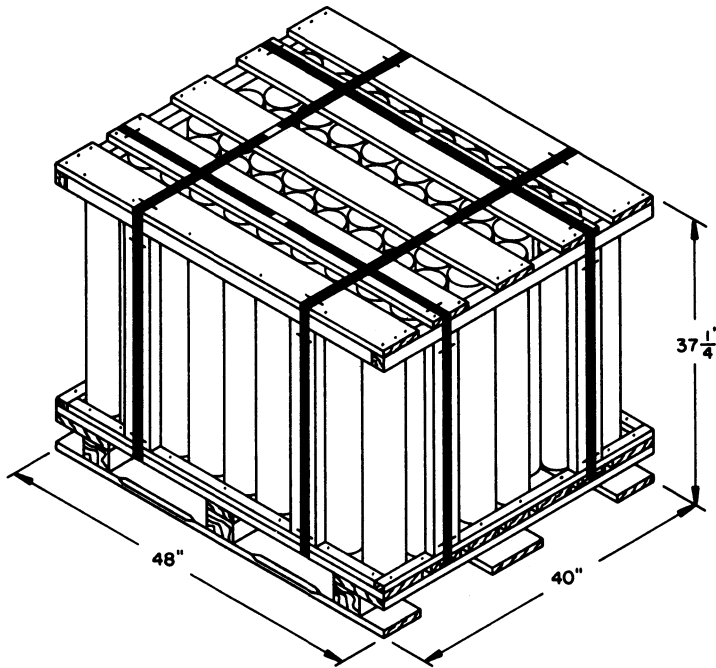
(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- AA. **CAUTION:** FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIPCO, OR PRECO MAY BE USED. LOAD DIVIDERS MANUFACTURED BY TRANSCO ARE NOT ACCEPTABLE, WHETHER OF ALUMINUM OR STEEL CONSTRUCTION. THE DEPICTED PROCEDURES ARE APPLICABLE FOR CARS OF VARIOUS LENGTHS AND WIDTHS. THE AAR MECHANICAL DESIGNATION CLASS FOR THESE CARS, AS IDENTIFIED IN "THE OFFICIAL RAILWAY EQUIPMENT REGISTER", WILL BE RBL, XL, OR XLI.
- BB. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS, AND GATE HOLD DOWNS (WHEN APPLICABLE) WHICH ARE REQUIRED IN CONVENTIONAL BOX CAR LOADS. THIS WILL ACCOUNT FOR A CONSIDERABLE SAVING IN MATERIAL AND LABOR COSTS. THEREFORE, EVERY EFFORT SHOULD BE MADE TO ACQUIRE CUSHIONED CARS EQUIPPED WITH LOAD DIVIDERS FOR SHIPMENT OF COMPLETE ROUNDS. **NOTE:** ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONING DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST FIFTEEN INCHES (15") OF TRAVEL ARE ACCEPTABLE.
- CC. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOX CARS EQUIPPED WITH ADJUSTABLE SIDE FILLERS THAT HAVE 3/8" OR THICKER PANELS MAY BE USED, HOWEVER, THESE SIDE FILLERS MUST NOT BE USED FOR LATERAL BLOCKING; THEY MUST BE RETRACTED AND LOCKED AGAINST THE CAR SIDEWALL. A "FILL PIECE" MUST BE INSTALLED IN THE VOID BETWEEN THE CAR SIDEWALL AND THE SIDE FILLER PANEL. SEE THE "TYPICAL TYPE A" VIEW ON PAGE 46 FOR GUIDANCE. IF THE BACK OF THE SIDE FILLER PANELS ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN THE "TYPICAL TYPE B" VIEW ON PAGE 46 THE "FILL PIECE" MATERIAL IS NOT REQUIRED.
- DD. **NOTICE:** AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, THE LINKAGE MECHANISM WILL BE ADJUSTED AS REQUIRED SO THAT THE PINS WILL BE FULLY SEATED INTO THE LOCKING HOLES OF THE LOWER RAILS. IF PRESENT, DEBRIS MUST BE REMOVED FROM BENEATH THE LOCKING HOLES WHICH HAVE BEEN SELECTED FOR SECURING A LOAD DIVIDER BULKHEAD.
- EE. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS CLASS A OR CLASS B EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES. **NOTE:** THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR B EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "FF-2" AT RIGHT. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 45.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

- FF. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR END WALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF PALLET UNITS WHICH ARE IN ONE LOAD UNIT. A LOAD UNIT IS DEFINED AS A STACK OF CONTAINERS WHICH IS FULL CAR WIDTH BY FULL LOAD HEIGHT BY ONE UNIT IN LENGTH. IF THE QUANTITY TO BE SHIPPED CANNOT BE ATTAINED BY ADJUSTING THE NUMBER OF TIERS IN ONE OR BOTH ENDS OF A CAR, OR BY ADJUSTING THE NUMBER OF LOAD UNITS IN EITHER END OF THE CAR, ONE OF THE FOLLOWING PROCEDURES MUST BE USED IN ORDER TO OBTAIN THE DESIRED QUANTITY.
1. THE "GATES AND STRUTS" METHOD OF OMITTING A PALLET UNIT MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT. SEE THE PROCEDURES ON PAGES 24 AND 25 FOR GUIDANCE.
 2. AT LOCATION (5) WHERE K-BRACES MIGHT NORMALLY BE USED IN A LOAD IN A CONVENTIONAL CAR, LOAD DIVIDER BULKHEADS CAN BE POSITIONED. LOADING CAN THEN CONTINUE TOWARD THE CENTER OF THE CAR FROM EACH INSTALLED LOAD DIVIDER BULKHEAD, IN EVEN LAYERS WHICH ARE ONE OR MORE LESS IN HEIGHT THAN THE LOAD IN THE ENDS OF THE CAR. INSTALL CENTER GATES, STRUTS AND GATE HOLD DOWNS AS SHOWN IN THE APPLICABLE CONVENTIONAL BOX CAR DRAWING HEREIN, TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.
 3. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH FLOORLINE BLOCKING AS SHOWN ON PAGE 36 OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 32.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.



PALLET UNIT

CONTAINER T53 SERIES----- 70 EACH @ 30 LBS (APPROX)
CUBE ----- 41.4 CUBIC FEET (APPROX)
GROSS WEIGHT----- 2,248 LBS (APPROX)



ONE SEAL WITH
TWO PAIR OF
NOTCHES.

STRAP JOINT A

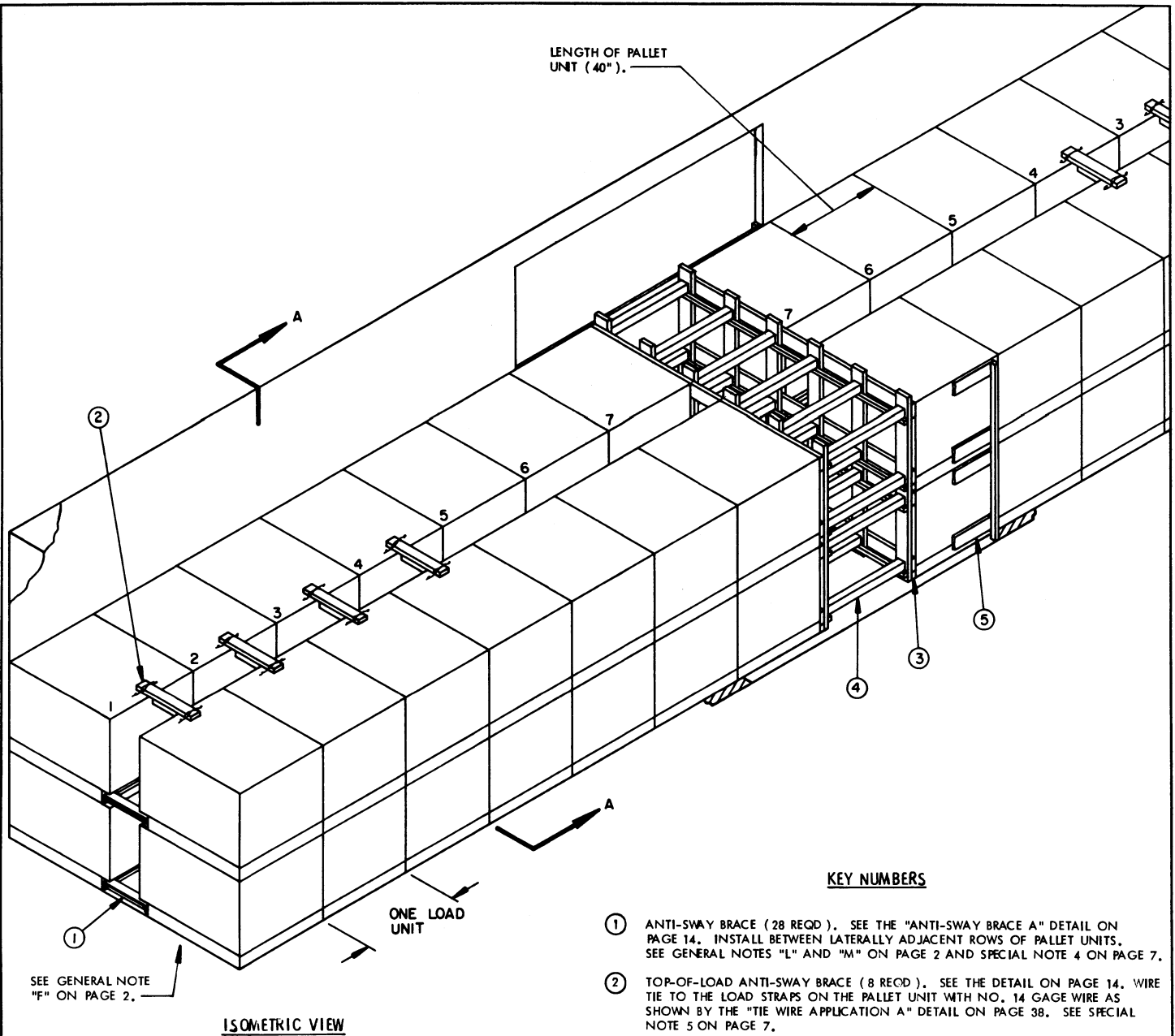
METHOD OF SECURING A
STRAP JOINT WHEN USING
A NOTCH-TYPE SEALER.



TWO SEALS, BUTTED
TOGETHER, WITH
TWO PAIR OF CRIMPS
EACH SEAL.

STRAP JOINT B

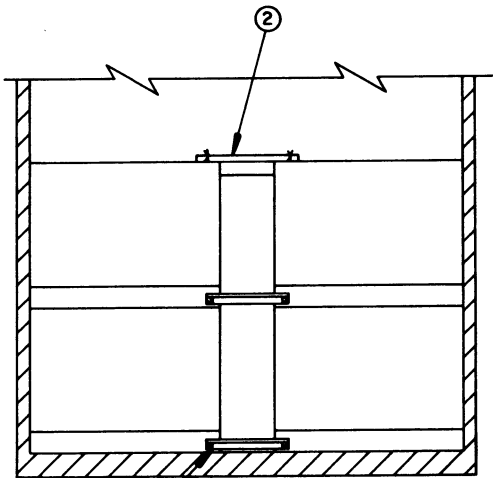
METHOD OF SECURING A
STRAP JOINT WHEN USING
A CRIMP-TYPE SEALER.



ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (28 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 7.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 14. WIRE TIE TO THE LOAD STRAPS ON THE PALLET UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 38. SEE SPECIAL NOTE 5 ON PAGE 7.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 14. SEE SPECIAL NOTES 6 THRU 8 ON PAGE 7.
- ④ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 40") (24 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U" ON PAGE 2.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 15. NAIL TO THE DOOR POST W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 7.



SECTION A-A

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. A MAXIMUM OF FORTY-FOUR (44) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 98,912 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR USING THE DEPICTED PROCEDURES. A CAR HAVING A LOAD LIMIT OF AT LEAST 108,500 POUNDS WILL BE REQUIRED FOR A FULL LOAD. IF A 60'-8" LONG CAR IS FURNISHED FOR LOADING, A MAXIMUM OF SIXTY-EIGHT (68) UNITS CAN BE LOADED FOR AN APPROXIMATE LADING WEIGHT OF 152,864 POUNDS. THE LOADING PROCEDURES SPECIFIED FOR A 50'-6" LONG CAR WILL APPLY EXCEPT THAT DOUBLED 2" X 6" STRUTS MUST BE USED IN LIEU OF 4" X 4" STRUTS. LAMINATE THE TOP PIECE TO THE LOWER PIECE W/1-10d NAIL EVERY 6" AND TOENAIL EACH END TO THE VERTICAL PIECES OF THE CENTER GATES W/2-12d NAILS AT EACH END. NOTE THAT A 60'-8" LONG CAR HAVING A LOAD LIMIT OF AT LEAST 162,600 POUNDS WILL BE REQUIRED FOR A FULL LOAD.
3. IF DESIRED, A LOAD IN A 50'-6" LONG CAR MAY BE LOADED SO THERE ARE EIGHT (8) LOAD UNITS IN ONE END AND SIX (6) IN THE OPPOSITE. THE DEPICTED CENTER BLOCKING WILL BE ADEQUATE. A CAR HAVING A LOAD LIMIT OF AT LEAST 133,800 POUNDS WILL BE REQUIRED.
4. IF THE DOORWAY PROTECTION PROCEDURES SHOWN ON PAGE 12 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (5), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH ON EITHER SIDE OF THE CAR. SEE SPECIAL NOTE 9 BELOW.
5. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 6, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A LOAD STRAP WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 38. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN 40' AND 50' LONG CARS, FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' LONG CAR.
6. CENTER GATE "A" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 39 FOR GUIDANCE.
7. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE A", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 6, INSTALL TWO (2) "CENTER GATES E" AS SHOWN ON PAGE 16. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 39.
8. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" MATERIAL NAILED TO CENTER GATE "A", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE "ALTERNATIVE GATE HOLD DOWN" DETAIL ON PAGE 41 FOR GUIDANCE.
9. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (5) IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 42 THRU 44 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED (3) THRU (6) ON PAGE 12 FOR GUIDANCE. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.
10. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. NOTE THAT STRUT BRACING WILL BE REQUIRED WHEN A LOAD UNIT IS OMITTED. SEE THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 40 FOR GUIDANCE. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGE 20 THRU 36 FOR GUIDANCE.
11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 37 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	97	33
1" X 6"	80	40
2" X 2"	259	87
2" X 3"	39	20
2" X 4"	126	84
2" X 6"	153	153
4" X 4"	80	107
NAILS	NO. REQD	POUNDS
6d (2")	440	2-3/4
10d (3")	536	8-1/4
12d (3-1/4")	64	1-1/4
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE	80' REQD	1/2 LBS

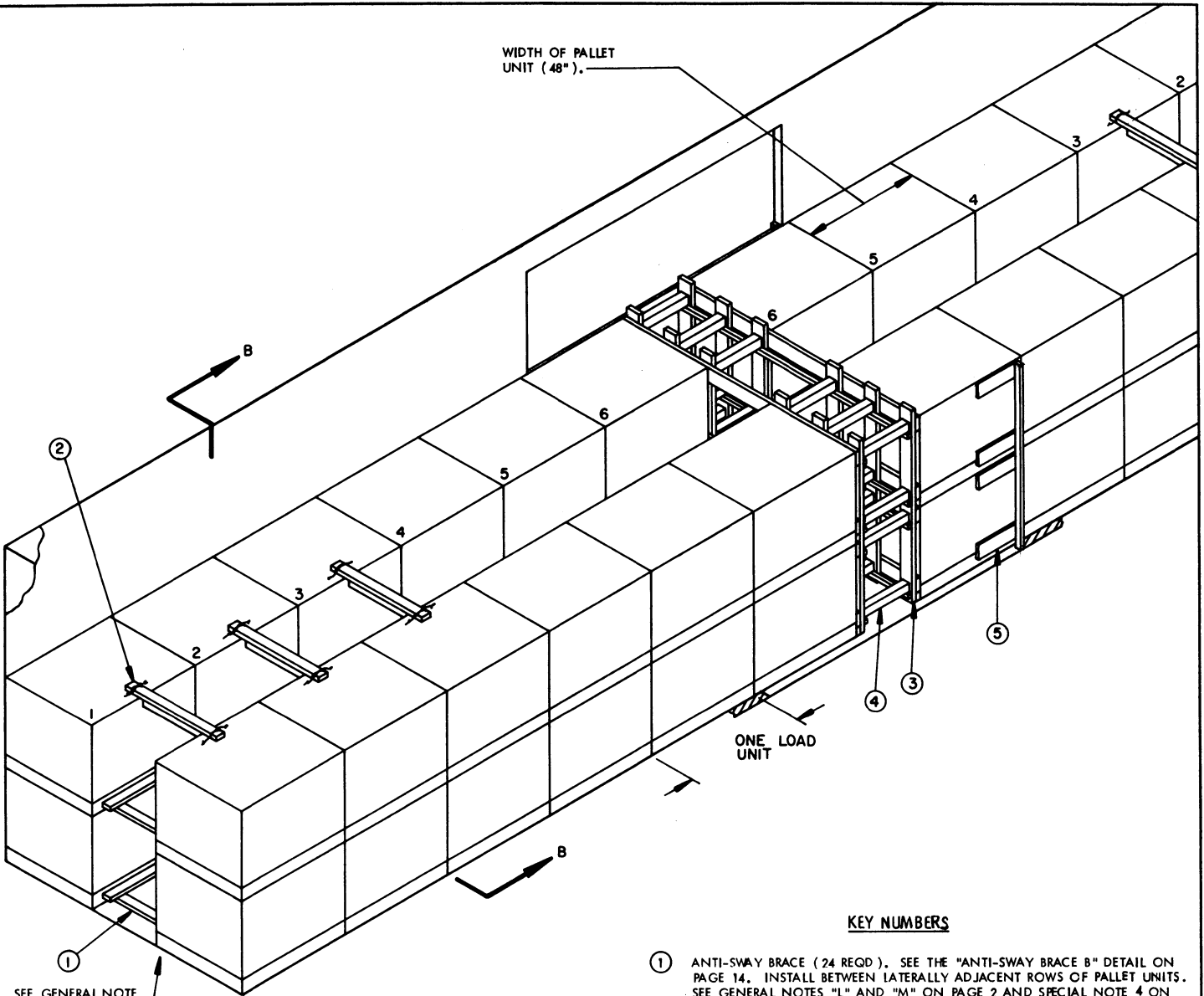
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	56	125,888 LBS
DUNNAGE		1,064 LBS

TOTAL WEIGHT-----126,952 LBS (APPROX)

56-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

WIDTH OF PALLET UNIT (48").

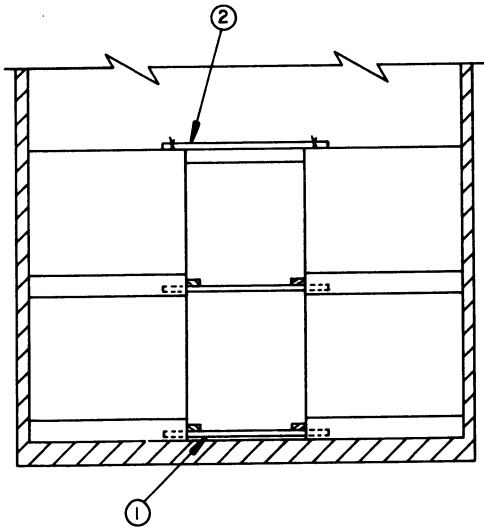


ISOMETRIC VIEW

SEE GENERAL NOTE "F" ON PAGE 2.

KEY NUMBERS

- ① ANTI-SWAY BRACE (24 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 9.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (4 REQD). SEE THE DETAIL ON PAGE 14. WIRE TIE TO THE TIEDOWN STRAPS ON THE PALLET UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 38. SEE SPECIAL NOTE 5 ON PAGE 9.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 15. SEE SPECIAL NOTES 6, 7 AND 8 ON PAGE 9.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 24") (24 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U" ON PAGE 2.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 15. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 9.



SECTION B-B

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. A MAXIMUM OF FIFTY-SIX (56) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 125,888 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES. A CAR HAVING A LOAD LIMIT OF AT LEAST 126,900 POUNDS WILL BE REQUIRED IF A FULL LOAD OF 56 UNITS IS TO BE POSITIONED WITH AN EQUAL NUMBER OF UNITS IN EACH END OF THE CAR. A LOAD LIMIT OF AT LEAST 133,600 POUNDS WILL BE REQUIRED WHEN LOADING IN AN OFFSET LOADING PATTERN. NOTE THAT STRUT BRACING MUST BE APPLIED TO THE STRUTS IN A 60'-8" LONG CAR LOAD. THIRTY-SIX (36) UNITS, FOR AN APPROXIMATE WEIGHT OF 80,928 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR HAVING A LOAD LIMIT OF AT LEAST 90,600 POUNDS.
3. IF DESIRED, A LOAD IN A 50'-6" LONG CAR MAY BE LOADED SO THERE ARE SEVEN (7) LOAD UNITS IN ONE END AND FIVE (5) LOAD UNITS IN THE OPPOSITE END. THE DEPICTED CENTER BLOCKING WILL BE ADEQUATE. A CAR HAVING A LOAD LIMIT OF AT LEAST 130,300 POUNDS WILL BE REQUIRED.
4. IF THE DOORWAY PROTECTION PROCEDURES SHOWN ON PAGE 12 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (5), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE HALF OR MORE OF THE STACK WIDTH ON EITHER SIDE OF THE CAR. SEE SPECIAL NOTE 9 BELOW.
5. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 8, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A TIEDOWN STRAP WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 38. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD IN 40' AND 50' LONG CARS. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60' LONG CAR.
6. CENTER GATE "B" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 39 FOR GUIDANCE.
7. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE B", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 8, INSTALL TWO (2) "CENTER GATES F" AS SHOWN ON PAGE 16. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 39.
8. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO THE CENTER GATE "B", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE "ALTERNATIVE GATE HOLD DOWN" DETAIL ON PAGE 41 FOR GUIDANCE.
9. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (5) IN THE LOAD ON PAGE 8, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 42 THRU 44 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SEE PIECES MARKED (3) THRU (6) ON PAGE 12 FOR GUIDANCE. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.
10. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. NOTE THAT STRUT BRACING WILL BE REQUIRED WHEN A LOAD UNIT IS OMITTED. SEE THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 40 FOR GUIDANCE. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 20 THRU 36 FOR GUIDANCE.
11. IF A FULL LOAD IS TO BE SHIPPED IN A 60'-8" OR A 40'-6" LONG CAR, HORIZONTAL AND VERTICAL STRUT BRACING WILL BE REQUIRED. SEE THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 40 FOR GUIDANCE.
12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 37 FOR GUIDANCE.

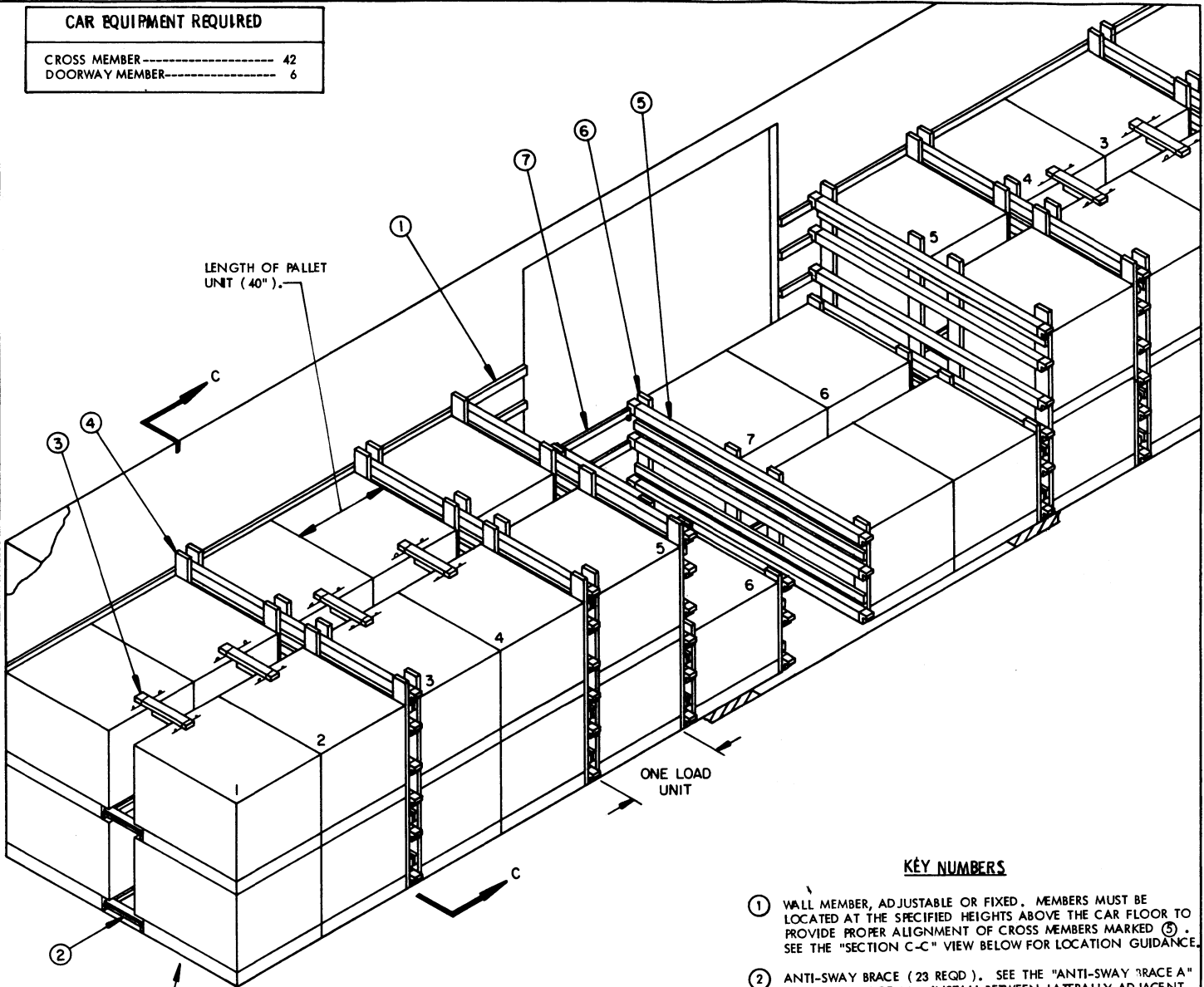
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	73	25
2" X 4"	374	250
2" X 6"	153	153
4" X 4"	48	64
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	568	8-3/4
12d (3-1/4")	54	1
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE-----60' REQD-----1 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	48-----	107,904 LBS
DUNNAGE-----	-----	1,078 LBS
TOTAL WEIGHT-----		108,982 LBS (APPROX)

CAR EQUIPMENT REQUIRED

CROSS MEMBER----- 42
DOORWAY MEMBER----- 6



LENGTH OF PALLET UNIT (40").

ONE LOAD UNIT

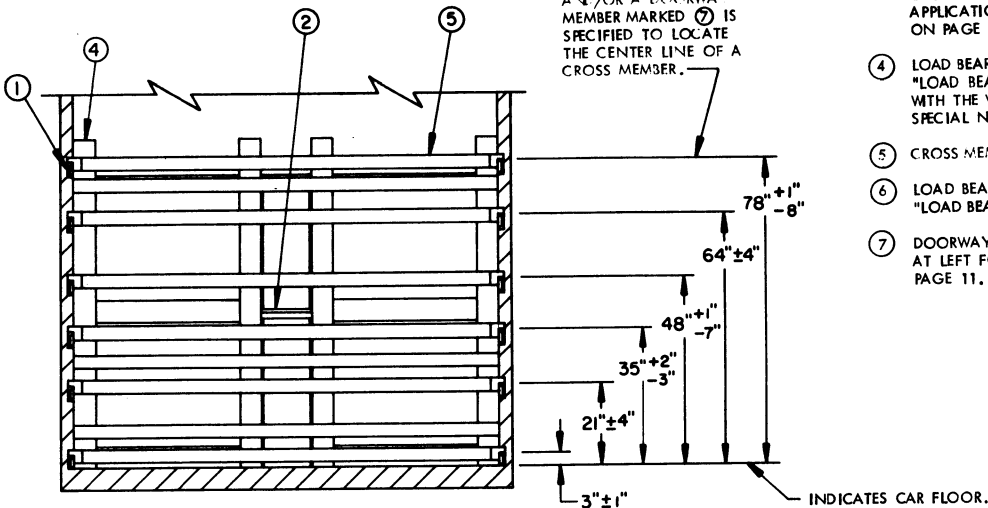
ISOMETRIC VIEW

SEE GENERAL NOTE "E" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 11.

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED ① AND/OR A DOORWAY MEMBER MARKED ⑦ IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER.

KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤. SEE THE "SECTION C-C" VIEW BELOW FOR LOCATION GUIDANCE.
- ② ANTI-SWAY BRACE (23 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 14. WIRE TIE TO THE LOAD STRAPS ON THE PALLET UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 38. SEE SPECIAL NOTE 4 ON PAGE 11.
- ④ LOAD BEARING GATE FOR 2-HIGH LOAD (10 REQD). SEE THE "LOAD BEARING GATE A" DETAIL ON PAGE 16. POSITION WITH THE VERTICAL PIECES AGAINST THE PALLET UNITS. SEE SPECIAL NOTE 6 ON PAGE 11.
- ⑤ CROSS MEMBER (42 REQD). SEE GENERAL NOTE "W" ON PAGE 3.
- ⑥ LOAD BEARING GATE FOR 1-HIGH LOAD (4 REQD). SEE THE "LOAD BEARING GATE A" DETAIL ON PAGE 16.
- ⑦ DOORWAY MEMBER (6 REQD). SEE THE "SECTION C-C" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 5 ON PAGE 11.



SECTION C-C

INDICATES CAR FLOOR.

SPECIAL NOTES:

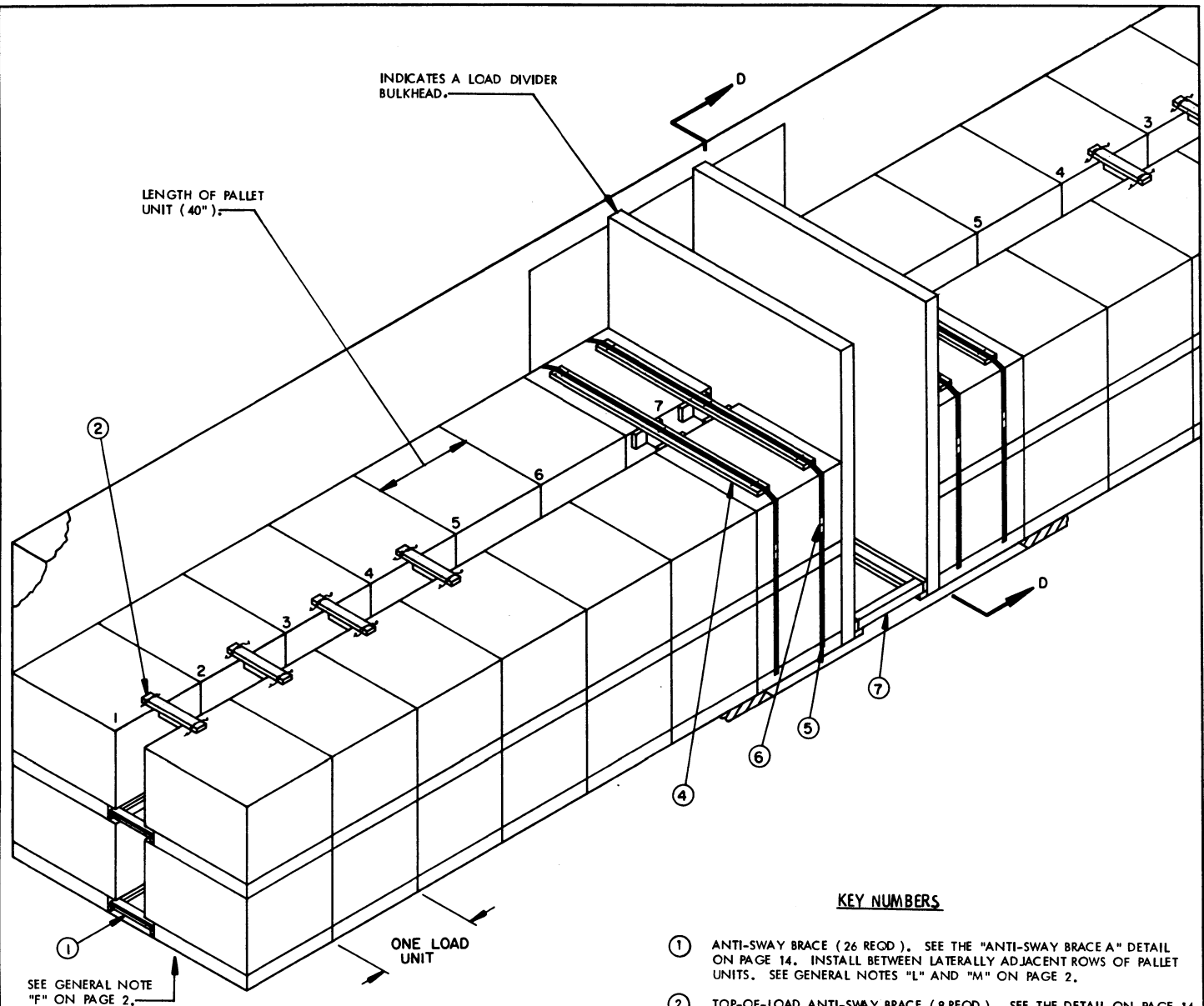
1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. A CAR HAVING A LOAD LIMIT OF AT LEAST 109,500 POUNDS IS REQUIRED FOR THE DEPICTED LOAD. IF THE CAR HAS DOOR OPENINGS OF 7'-0" WIDE OR LESS, AN ADDITIONAL 4 PALLET UNITS CAN BE LOADED FOR AN APPROXIMATE LADING WEIGHT OF 112,400 POUNDS. A CAR HAVING A LOAD LIMIT OF AT LEAST 118,400 POUNDS WILL THEN BE REQUIRED.
2. A MAXIMUM OF THIRTY-EIGHT (38) OF THESE UNITS FOR AN APPROXIMATE LADING WEIGHT OF 85,424 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR. A CAR HAVING A LOAD LIMIT OF AT LEAST 91,000 POUNDS WILL BE REQUIRED FOR A FULL LOAD. IF A 60'-8" LONG CAR IS FURNISHED FOR LOADING, SIXTY (60) PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 134,880 POUNDS, CAN BE LOADED IN A CAR HAVING 9'-0" OR NARROWER DOOR OPENINGS. A LOAD LIMIT OF AT LEAST 136,800 POUNDS WILL BE REQUIRED FOR 60-UNITS. FIFTY-SIX (56) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 125,988 POUNDS, CAN BE LOADED IN A CAR HAVING 10'-0" WIDE DOOR OPENINGS AND HAVING A LOAD LIMIT OF AT LEAST 127,500 POUNDS.
3. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "F" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 10, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 38. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 40'-6" OR 50'-6" LONG CAR. FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60'-8" LONG CAR.
5. IF A CAR BEING LOADED IS EQUIPPED WITH AT LEAST TWELVE (12) DOORWAY MEMBERS, ADDITIONAL PALLET UNITS CAN BE LOADED. FORTY-FOUR (44) PALLET UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 98,912 POUNDS; A LOAD LIMIT OF AT LEAST 104,300 POUNDS IS REQUIRED. FIFTY-TWO (52) PALLET UNITS CAN BE LOADED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 116,896 POUNDS; A LOAD LIMIT OF AT LEAST 127,600 POUNDS IS REQUIRED. SIXTY-FOUR (64) PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 143,872 POUNDS, CAN BE LOADED IN A 60' CAR; A LOAD LIMIT OF AT LEAST 145,700 POUNDS IS REQUIRED.
6. THE BASIC WALL MEMBER LOCATIONS SHOWN BY THE "SECTION C-C" VIEW ARE THE SAME AS THOSE IN THE MOST COMMON 9-BELT CAR. WHEN USING CARS WITH THE WALL MEMBERS AT THOSE LOCATIONS, LOAD BEARING GATES, SHOWN AS PIECES MARKED ④ AND ⑤, MUST BE USED. IF A CAR HAVING ADJUSTABLE WALL MEMBERS IS FURNISHED FOR LOADING, CROSS MEMBERS WILL BE INSTALLED ON WALL MEMBERS AT 3" (5" IF POSSIBLE), 36", 42", AND 71". THE LOAD BEARING GATES WILL THEN NOT BE REQUIRED. CAUTION: ONLY FOUR (4) PALLET UNITS WILL BE POSITIONED IN A BAY. FOUR (4) CROSS MEMBERS ARE NOT ADEQUATE TO RETAIN MORE THAN FOUR PALLET UNITS. A MAXIMUM OF FIFTY-TWO PALLET UNITS CAN BE LOADED IN A 50'-6" LONG CAR IF FIFTY-TWO (52) CROSS MEMBERS AND EIGHT (8) DOORWAY MEMBERS ARE AVAILABLE. A LOAD LIMIT OF AT LEAST 126,300 POUNDS IS REQUIRED FOR A 52-UNIT LOAD. SEE SPECIAL NOTE 9.
7. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY OMITTING LATERALLY ADJACENT UNITS FROM THE CENTER PORTION OF THE CAR, OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 18 AND 19 FOR GUIDANCE.
8. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 37 FOR GUIDANCE.
9. IF THE CAR BEING LOADED IS EQUIPPED WITH ADJUSTABLE WALL MEMBERS AND THE LOAD BEARING GATES, PIECES MARKED ④ AND ⑤ ARE OMITTED AS PERMITTED BY SPECIAL NOTE 6, PROVISIONS MUST BE MADE TO PREVENT DISLODGE-MENT OF THE ANTI-SWAY BRACES, PIECE MARKED ②. THIS CAN BE ACCOMPLISHED BY POSITIONING 1" X 4" X 54" MATERIAL VERTICALLY ON EACH LOAD SIDE OF A CROSS MEMBER BLOCKING STATION SO AS TO BE CENTERED ON THE ANTI-SWAY BRACES. ON THE SIDE OF THE BLOCKING STATION TOWARD THE CAR END, ANTI-SWAY BRACES CAN BE SECURED BY NAILING THE 1" X 4" INTO THE CROSS BRACES OF EACH ASSEMBLY W/2-6d NAILS. ON THE SIDE TOWARD THE CENTER OF THE CAR, SECURE THE 1" X 4" TO AN UPPER AND A LOWER CROSS MEMBER WITH NO. 14 GAGE WIRE PRIOR TO LOADING THE ADJACENT PALLET UNITS. FOR THE 1-HIGH PORTION OF THE LOAD, WIRE TIE 1" X 4" X 30" PIECES AT EACH LOAD SIDE OF A BLOCKING STATION.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	80	27
2" X 2"	153	51
2" X 4"	436	291
2" X 6"	334	334
NAILS	NO. REQD	POUNDS
6d (2")	322	2
10d (3")	640	10
12d (3-1/4")	40	3/4
WIRE, NO. 14 GAGE-----80' REQD-----1-1/2 LBS		

LOAD AS SHOWN

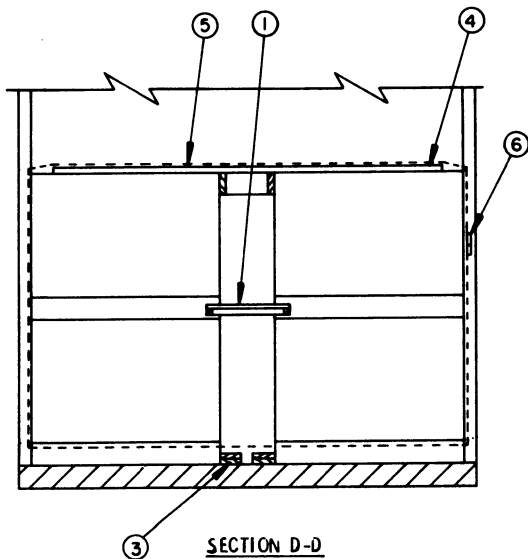
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	46	103,408 LBS
DUNNAGE-----		1,421 LBS
TOTAL WEIGHT-----		104,829 LBS (APPROX)



ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (26 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 14. WIRE TIE TO THE LOAD STRAPS ON THE PALLET UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 38. SEE SPECIAL NOTE 3 ON PAGE 13.
- ③ SIDE BLOCKING, 2" X 6" X 40" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "R" ON PAGE 2.
- ④ SPACER ASSEMBLY (4 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 15.
- ⑤ DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 32'-0" LONG STEEL STRAPPING (4 REQD). STAPLE TO A SPACER ASSEMBLY W/3 STAPLES. SEE SPECIAL NOTE 4 ON PAGE 13.
- ⑥ SEAL FOR 1-1/4" STRAP (8 REQD, 2 PER STRAP). SEE GENERAL NOTE "N" ON PAGE 2.
- ⑦ STRUT ASSEMBLY FOR 1-PIECE BULKHEADS (1 REQD). SEE THE DETAIL ON PAGE 45. SEE SPECIAL NOTE 5 ON PAGE 13.



SECTION D-D

(SPECIAL NOTES CONTINUED)

8. WHEN THE LENGTH OF THE PALLET UNIT IS POSITIONED ACROSS THE WIDTH OF THE CAR, FIFTY-SIX (56) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 125,888 POUNDS CAN BE LOADED IN A 60'-8" LONG CAR. A LOAD LIMIT OF AT LEAST 126,300 POUNDS WILL BE REQUIRED. FORTY-EIGHT (48) UNITS WEIGHING APPROXIMATELY 107,904 POUNDS CAN BE LOADED IN A 50'-6" LONG CAR HAVING A LOAD LIMIT OF AT LEAST 108,300 POUNDS. THIRTY-SIX (36) UNITS FOR AN APPROXIMATE WEIGHT OF 90,720 POUNDS CAN BE LOADED IN A 40'-6" LONG CAR HAVING A LOAD LIMIT OF AT LEAST 90,300 POUNDS. A STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑦ IN THE LOAD ON PAGE 12, WILL BE REQUIRED IN 60' AND 50' LONG CARS. NOTE THAT THREE (3) TOP-OF-LOAD ANTI-SWAY BRACES WILL BE REQUIRED IN EACH END OF 40' AND 50' LONG CARS AND FOUR (4) BRACES WILL BE REQUIRED IN EACH END OF A 60' LONG CAR. ALSO NOTE THAT IN ORDER TO LOAD FORTY-EIGHT (48) UNITS IN A 50'-6" LONG CAR THE LOAD DIVIDER BULKHEADS MUST BE EQUIPPED WITH THE OPERATING MECHANISM LOCATED ON THE EDGE OF THE BULKHEAD. THERE WILL BE INSUFFICIENT SPACE BETWEEN THE BULKHEADS TO OPERATE THE LOCKING MECHANISM FOR THOSE BULKHEADS EQUIPPED WITH THE HANDLE IN THE CENTER. ADDITIONALLY, ANTI-SWAY BRACE "B" WILL BE USED IN LIEU OF ANTI-SWAY BRACE "A". SEE THE DETAIL ON PAGE 14.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 3.
2. A MAXIMUM OF SIXTY-EIGHT (68) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 152,864 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES; A CAR HAVING A LOAD LIMIT OF AT LEAST 162,400 POUNDS WILL BE REQUIRED. FORTY-FOUR (44) UNITS, FOR AN APPROXIMATE WEIGHT OF 98,912 POUNDS CAN BE LOADED IN A 40'-6" LONG CAR; A CAR HAVING A LOAD LIMIT OF AT LEAST 108,300 POUNDS WILL BE REQUIRED. SEE SPECIAL NOTE 8 FOR GUIDANCE WHEN THE LENGTH OF THE PALLET UNIT IS POSITIONED ACROSS THE CAR.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 12, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 38. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN A 40' OR 50' LONG CAR; FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' LONG CAR.
4. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH OR LENGTH. THE FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS, PIECES MARKED ③ AND ⑤ IN THE LOAD ON PAGE 12, ARE APPLICABLE AS DOORWAY PROTECTION FOR CARS EQUIPPED WITH PLUG TYPE DOORS. TWO STRAPS ARE REQUIRED FOR EACH PALLET STACK WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST 6" OF CAR SIDEWALL. ONE (1) STRAP IS REQUIRED FOR EACH PALLET STACK WHICH IS RETAINED BY FROM 6" TO ONE-HALF OF THE PALLET UNIT LENGTH OR WIDTH. WHEN USING THIS METHOD, OMIT THE ANTI-SWAY BRACES AT THE FLOOR LEVEL IN THE DOORWAY. THE WOODEN GATE TYPE OF DOORWAY PROTECTION SHOWN AS PIECE MARKED ⑤ ON PAGE 6 AND/OR 8, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 42 THRU 44 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.
5. A STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑦ IN THE LOAD ON PAGE 12, IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS REGARDLESS OF THE CAR LENGTH, WHEN LENGTH OF PALLET UNIT IS LENGTHWISE IN THE CAR.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 21 THRU 25 AND 32 THRU 36 FOR GUIDANCE.
7. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 37 FOR GUIDANCE.

(CONTINUED AT LEFT)

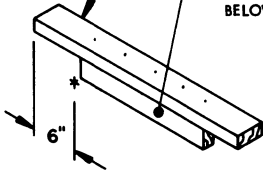
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	90	30
1" X 8"	17	12
2" X 2"	173	58
2" X 4"	139	93
2" X 6"	73	73
4" X 4"	11	15
NAILS	NO. REQ'D	POUNDS
6d (2")	382	2-1/4
10d (3")	228	3-1/2
12d (3-1/4")	108	2
16d (3-1/2")	40	1
WIRE, NO. 14 GAGE-----80' REQD-----1-1/2 LBS		
STRAPPING, 1-1/4" X .031" OR .035" ---128' REQD-----19 LBS		
SEALS FOR 1-1/4" STRAPPING-----8 REQD-----NIL		
STAPLES-----12 REQD-----NIL		

LOAD AS SHOWN

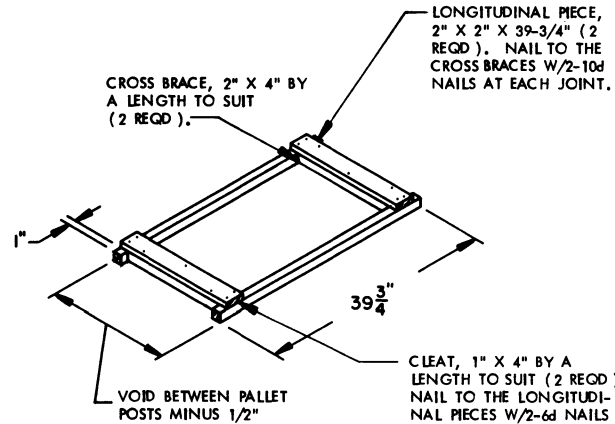
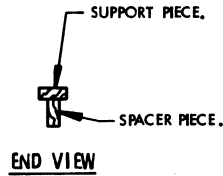
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	56	125,888 LBS
DUNNAGE-----		592 LBS
TOTAL WEIGHT-----		126,480 LBS (APPROX)

SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE SPACER PIECE W/5-12d NAILS.

SPACER PIECE, 2" X 4" BY CUT TO FIT BETWEEN LATERALLY ADJACENT PALLET UNITS MINUS 1/4" (1 REQD). POSITION SO AS TO BE CENTERED UNDER THE SUPPORT PIECE. SEE THE "END VIEW" BELOW.

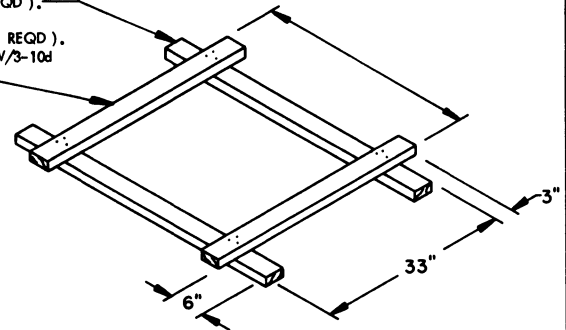


TOP-OF-LOAD ANTI-SWAY BRACE



ANTI-SWAY BRACE A

RETAINER PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD).
 BUFFER PIECE, 2" X 4" X 39" (2 REQD). NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.

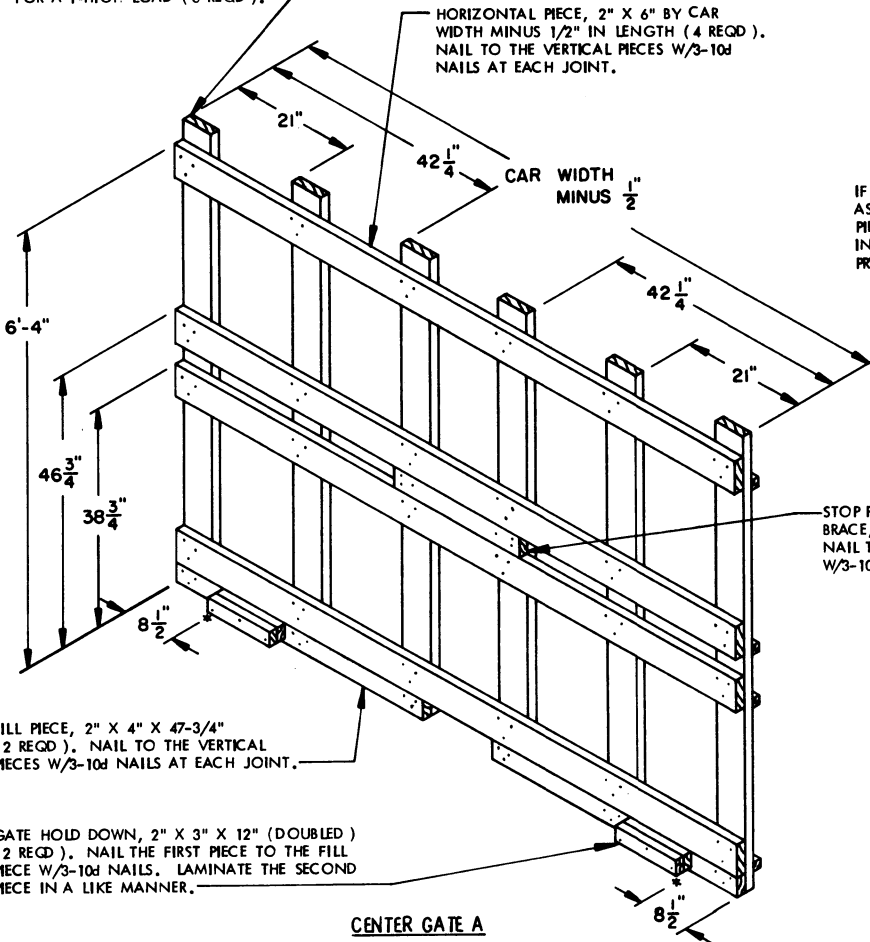


ANTI-SWAY BRACE B

IF DESIRED, THE ANTI-SWAY BRACE CAN BE PARTIALLY PRE-ASSEMBLED; ONE BUFFER PIECE CAN BE NAILED TO BOTH RETAINER PIECES. THE LONG ENDS OF THE ASSEMBLY CAN THEN BE INSTALLED INTO THE FORK LIFT OPENINGS OF A LOADED PALLET PRIOR TO POSITIONING THE LATERALLY ADJACENT PALLET.

VERTICAL PIECE, 2" X 6" X 6'-8" FOR A 2-HIGH LOAD, 43" FOR A 1-HIGH LOAD (6 REQD).

HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH MINUS 1/2" IN LENGTH (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.



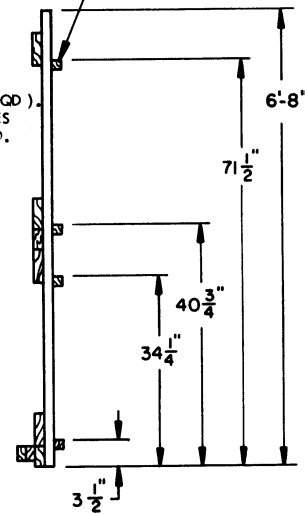
CENTER GATE A

THIS GATE IS FOR USE IN THE LOAD SHOWN ON PAGE 6.

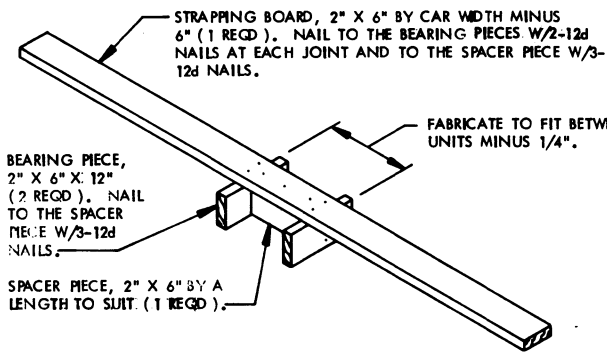
DETAILS

STOP PIECE FOR ANTI-SWAY BRACE, 2" X 3" X 29" (1 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.

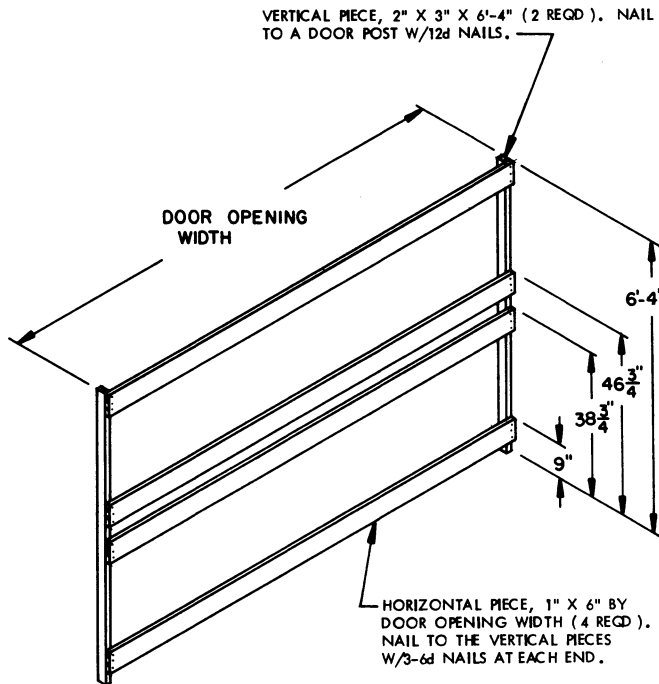
STRUT LEDGER, 2" X 2" OR 2" X 4" BY CAR WIDTH MINUS 1/2" IN LENGTH (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



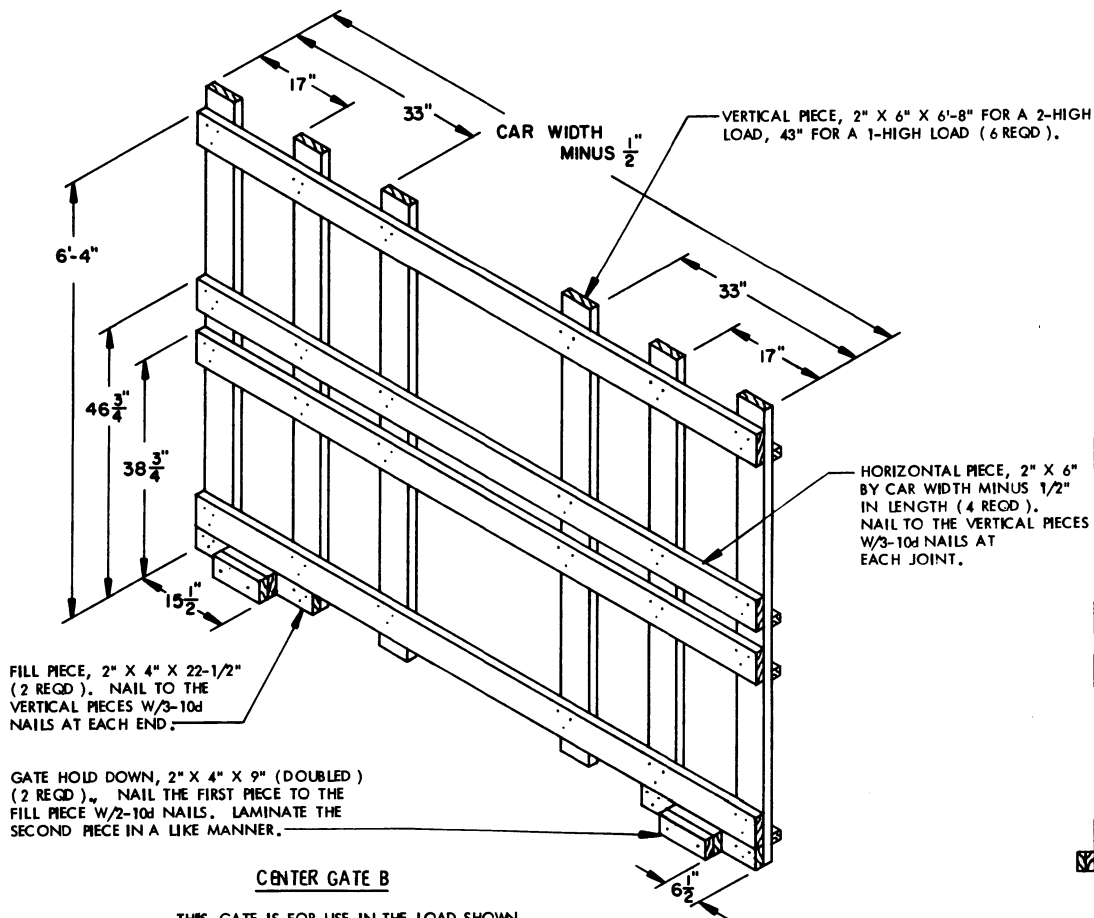
END VIEW



SPACER ASSEMBLY A



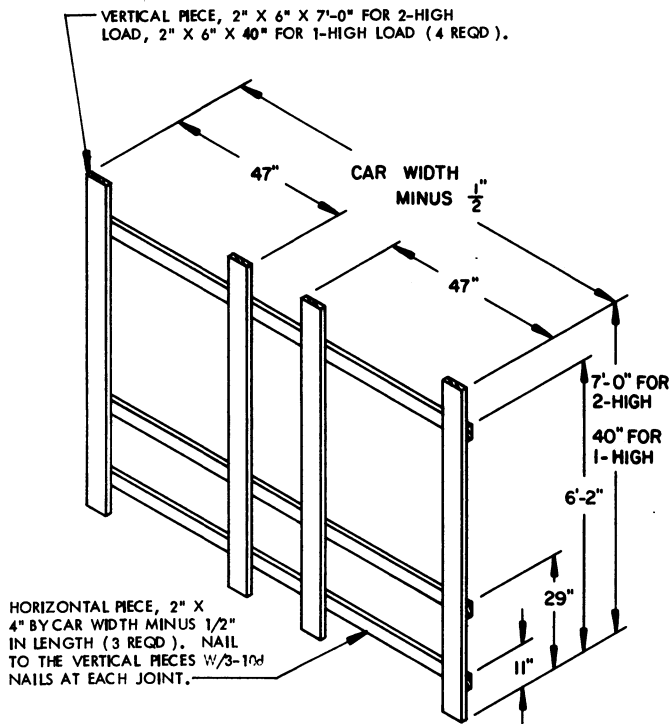
DOORWAY PROTECTION



THIS GATE IS FOR USE IN THE LOAD SHOWN ON PAGE 8.

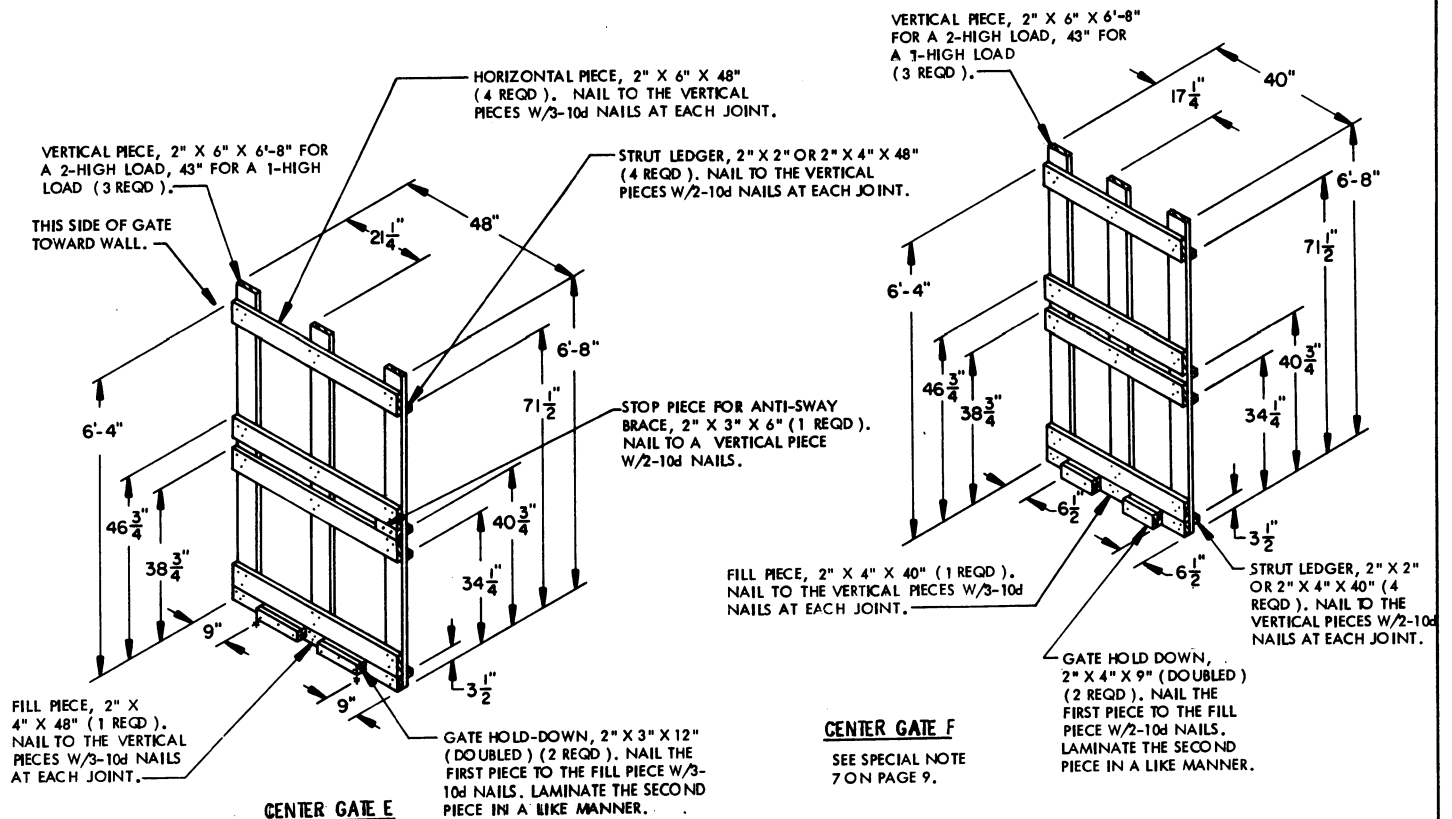
END VIEW

DETAILS



LOAD BEARING GATE A

ADJUST HEIGHTS OF HORIZONTAL PIECES AS NECESSARY TO PROVIDE FOR CLEARANCE OF CROSS MEMBERS.



CENTER GATE E

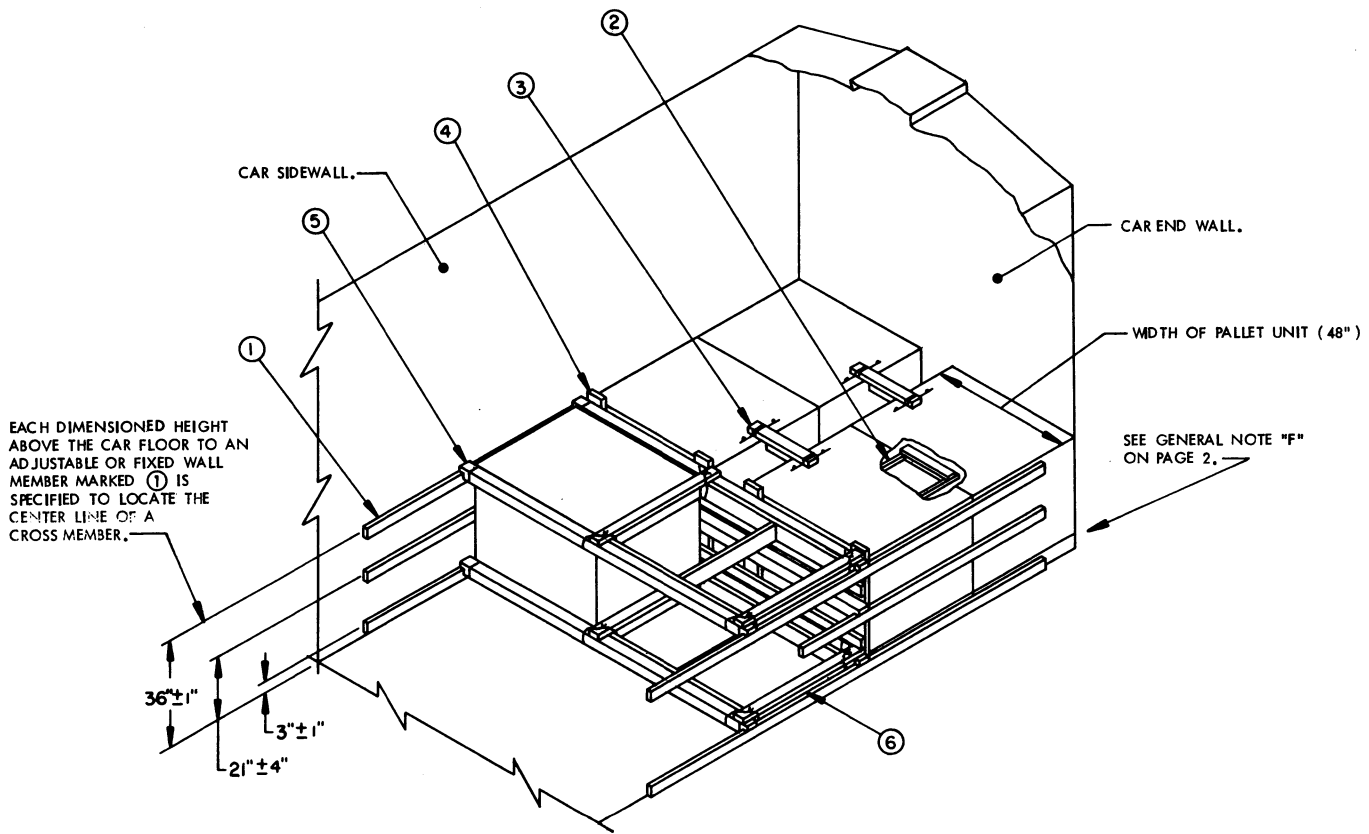
SEE SPECIAL NOTE 7 ON PAGE 7. ONE LEFT HAND AND ONE RIGHT HAND GATE REQUIRED.

CENTER GATE F

SEE SPECIAL NOTE 7 ON PAGE 9.

DETAILS

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ISOMETRIC VIEW

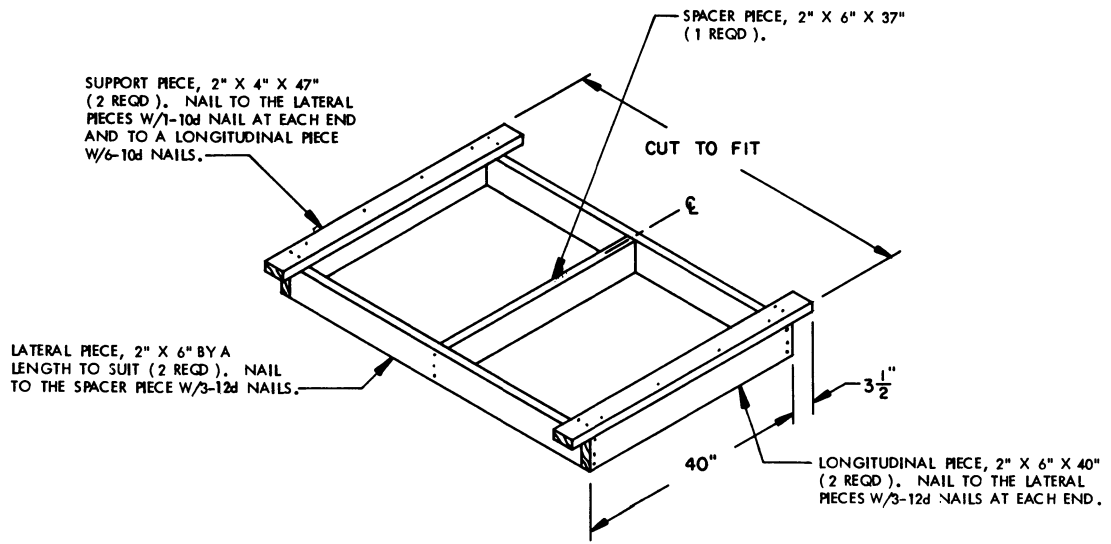
SPECIAL NOTES:

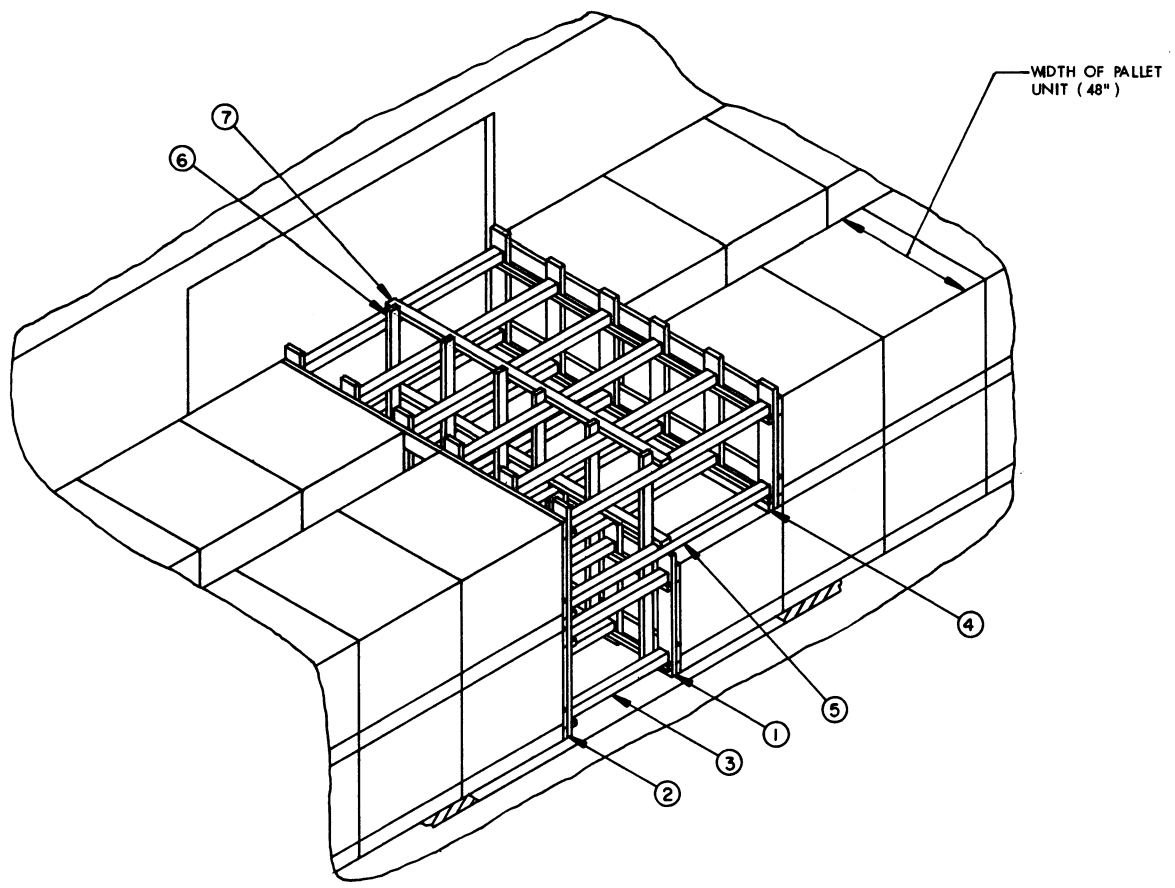
1. A 9'-0" WIDE (INSIDE CLEARANCE) BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. FIVE (5) UNITS ARE SHOWN AS A TYPICAL LOAD QUANTITY. THE NUMBER OF UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A UNIT WITH NO. 14 GAGE WIRE. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 40'-6" OR 50'-6" LONG CAR; FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60'-8" LONG CAR.
4. THE SPACER ASSEMBLIES, SHOWN AS PIECES MARKED ⑥, MAY ALSO BE USED IN AN UPPER LAYER OF A LOAD FOR THE OMISSION OF A PALLET UNIT. IF THE ASSEMBLIES ARE USED NEXT TO THE CAR END WALL IN EITHER A FIRST LAYER OR IN AN UPPER LAYER, AND THE END WALL IS WOOD-LINED, CUT THE ADJACENT ENDS OFF THE SUPPORT PIECES FLUSH WITH THE LATERAL PIECE. EACH ASSEMBLY CAN THEN BE SUPPORTED BY NAILING THE LATERAL PIECE TO THE CAR END WALL W/6-10d NAILS. IF THE END WALL IS NON-NAILABLE, CROSS MEMBERS MUST BE INSTALLED AT THE END OF THE LOAD TO SUPPORT THE SPACER ASSEMBLIES.
5. A PLUS 2" TOLERANCE IS PERMISSIBLE FOR THE LOCATION OF THE WALL MEMBER AT THE 3" LEVEL. A PLUS 1" OR MINUS 4" TOLERANCE IS PERMITTED FOR THE WALL MEMBER SHOWN AT 36", HOWEVER, IF THE WALL MEMBER IS LOCATED AT LESS THAN 35", A LOAD BEARING GATE MUST BE INSTALLED BETWEEN THE ODD PALLET UNIT AND THE ADJACENT CROSS MEMBERS ON EACH SIDE.

KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤. SEE SPECIAL NOTE 5 AT LEFT AND 6 ON PAGE 11.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 14. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 38. SEE SPECIAL NOTE 3 AT LEFT.
- ④ LOAD BEARING GATE (1 REQD). SEE THE "LOAD BEARING GATE A" DETAIL ON PAGE 16. SEE SPECIAL NOTE 5 AT LEFT.
- ⑤ CROSS MEMBER (5 REQD). SEE GENERAL NOTE "W" ON PAGE 3.
- ⑥ SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY B" DETAIL ON PAGE 19 AND SPECIAL NOTES 4 AND 5 AT LEFT. WIRE TIE TO CROSS MEMBERS W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

TYPICAL LCL (5-UNIT LOAD) IN A BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES HAVING ADJUSTABLE OR FIXED WALL MEMBERS





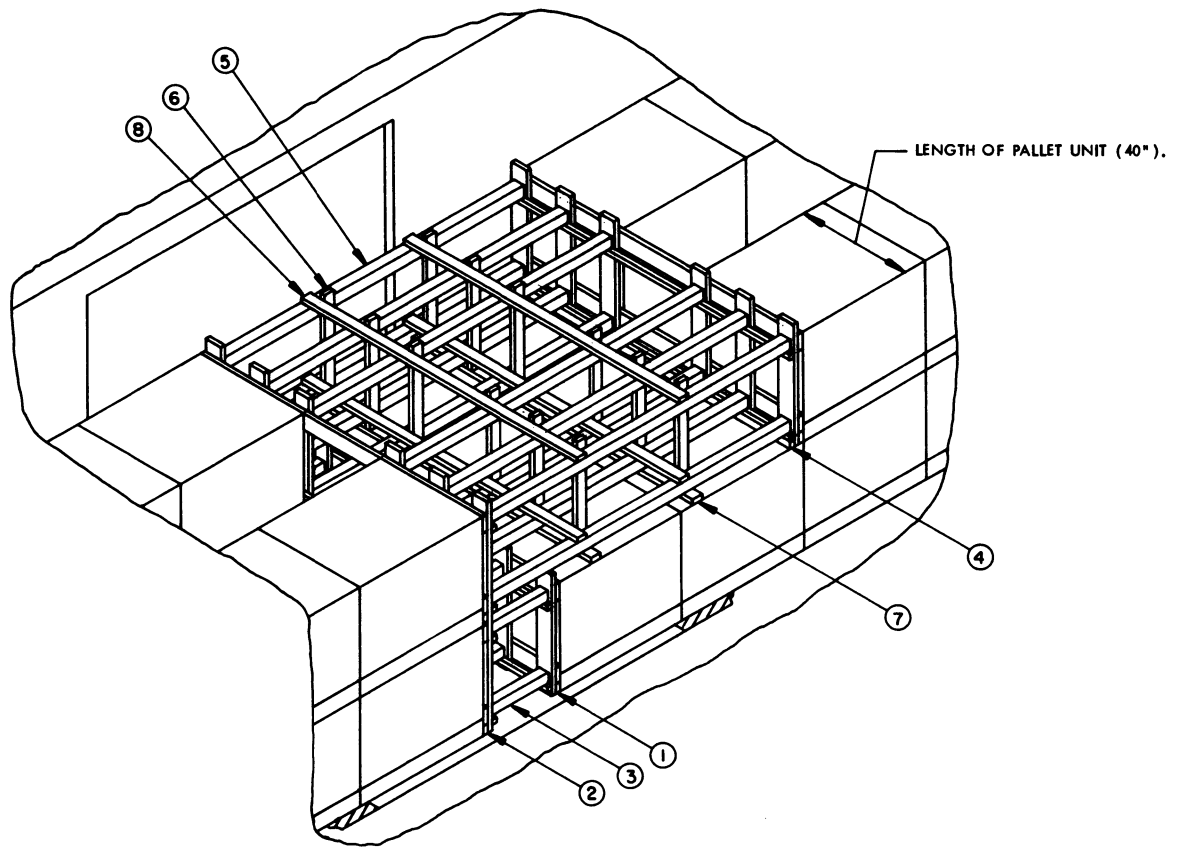
ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF DIFFERENT LENGTHS OR WIDTHS MAY ALSO BE USED. NOTE THAT IF A 60'-8" LONG CAR IS TO BE LOADED USING THESE PROCEDURES, DOUBLED 2" X 6" STRUTS MUST BE USED IN LIEU OF 4" X 4" STRUTS.
2. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN. FOR ADDITIONAL GUIDANCE, REFER TO THE LOAD ON PAGE 6 AND SPECIAL NOTES ON PAGE 7.

KEY NUMBERS

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 14. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 14.
- ③ STRUT, 4" X 4" BY CUT TO FIT (12 REQD) (REF: 40"). POSITION BETWEEN THE CENTER GATES, PIECES MARKED ① AND ② IN THE FIRST LAYER AND TOENAIL W/2-10d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U" ON PAGE 2 AND SPECIAL NOTE 1 AT LEFT.
- ④ GATE SUPPORT PIECE, 2" X 2" BY CAR WIDTH MINUS 1/2" (1 REQD). POSITION AT BOTTOM OF THE VERTICAL PIECES OF THE CENTER GATE USED IN THE SECOND LAYER AND NAIL W/2-10d NAILS AT EACH JOINT.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (12 REQD) (REF: 6'-8"). POSITION BETWEEN THE CENTER GATES, PIECES MARKED ① AND ② IN THE SECOND LAYER AND TOENAIL W/2-10d NAILS AT EACH END.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" X 6'-6" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" IN LENGTH. (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.



ISOMETRIC VIEW

SPECIAL NOTES:

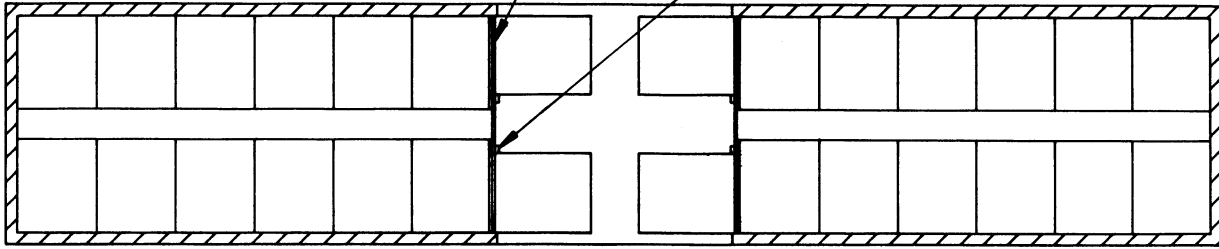
1. ONLY THE CENTER PORTION OF A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER LENGTHS OR WIDTHS CAN ALSO BE USED. IF A 60'-8" LONG CAR IS TO BE LOADED, VERTICAL AND HORIZONTAL STRUT BRACING WILL ALSO BE REQUIRED FOR THE FIRST LAYER OF PALLET UNITS.
2. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE TOP LAYER FROM TWO (2) LOAD UNITS ARE SHOWN AS TYPICAL. THE PRINCIPLES MAY ALSO BE APPLIED FOR THE OMISSION OF THE TOP LAYER FROM JUST ONE (1) LOAD UNIT.
3. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN. FOR ADDITIONAL GUIDANCE, REFER TO THE LOAD ON PAGE 8 AND THE SPECIAL NOTES ON PAGE 9.
4. TO PROTECT THE LADING FROM BEING PUNCTURED WHEN A SET OF VERTICAL STRUT BRACING IS INSTALLED ABOVE THE LOWER LAYER OF A LOAD, A SUITABLE LENGTH PAD OF 2" X 4" MATERIAL, SHOWN AS PIECE MARKED ⑦, MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE.

KEY NUMBERS

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 15. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 15.
- ③ STRUT, 4" X 4" BY CUT TO FIT (12 REQD) (REF: 24"). POSITION BETWEEN THE CENTER GATES, PIECES MARKED ① AND ② IN THE FIRST LAYER AND TOENAIL W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U" ON PAGE 2 AND SPECIAL NOTE 1 AT LEFT.
- ④ GATE SUPPORT PIECE, 2" X 2" BY CAR WIDTH MINUS 1/2" (1 REQD). POSITION AT BOTTOM OF THE VERTICAL PIECES OF THE CENTER GATE USED IN THE SECOND LAYER AND NAIL W/2-10d NAILS AT EACH JOINT.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (12 REQD) (REF: 10'-0"). POSITION BETWEEN THE CENTER GATES, PIECES MARKED ① AND ② IN THE SECOND LAYER AND TOENAIL W/2-16d NAILS AT EACH END.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" X 40-1/2" (12 REQD). NAIL TO THE STRUTS MARKED ⑤ W/3-10d NAILS AT EACH JOINT. TOENAIL TO THE STRUT BRACING PAD, PIECE MARKED ⑦ W/1-10d NAIL AT EACH JOINT. SEE SPECIAL NOTE 4 AT LEFT.
- ⑦ STRUT BRACING PAD, 2" X 4" BY CAR WIDTH MINUS 1/2" (2 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

SEPARATOR GATE (1 OR 2 REQD AS APPLICABLE). SEE THE DETAIL ON PAGE 21. POSITION AS SHOWN WITH THE VERTICAL PIECES AGAINST THE 48" SIDE OF THE PALLET UNIT.

STOP PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD). POSITION SO AS TO BE IN CONTACT WITH THE ADJACENT PALLET UNIT AND SECURE BY NAILING THRU THE HORIZONTAL PIECES OF THE SEPARATOR GATE W/3-6d NAILS AT EACH JOINT. NOTE THAT STOP PIECES ARE ONLY REQUIRED ON SEPARATOR GATES WHICH ARE IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE DOOR OPENING.



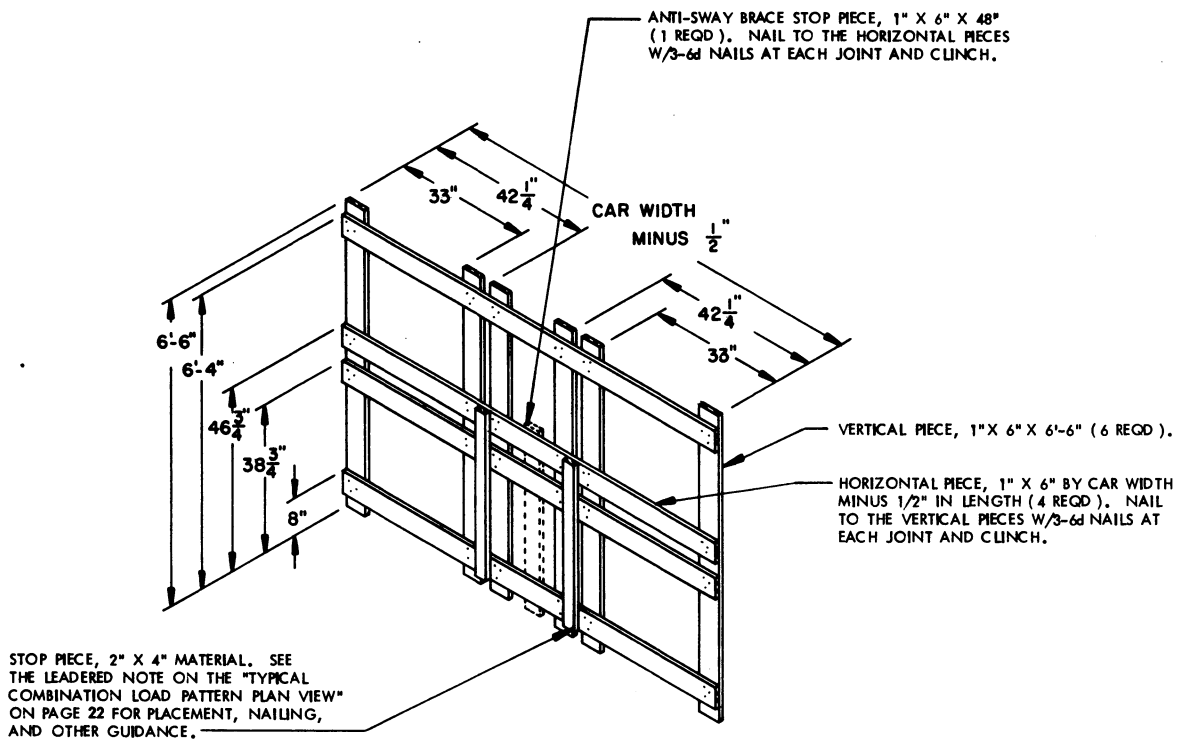
TYPICAL COMBINATION LOAD PATTERN PLAN VIEW

A 12 LONG PLUS 2 WIDE LOAD IS SHOWN

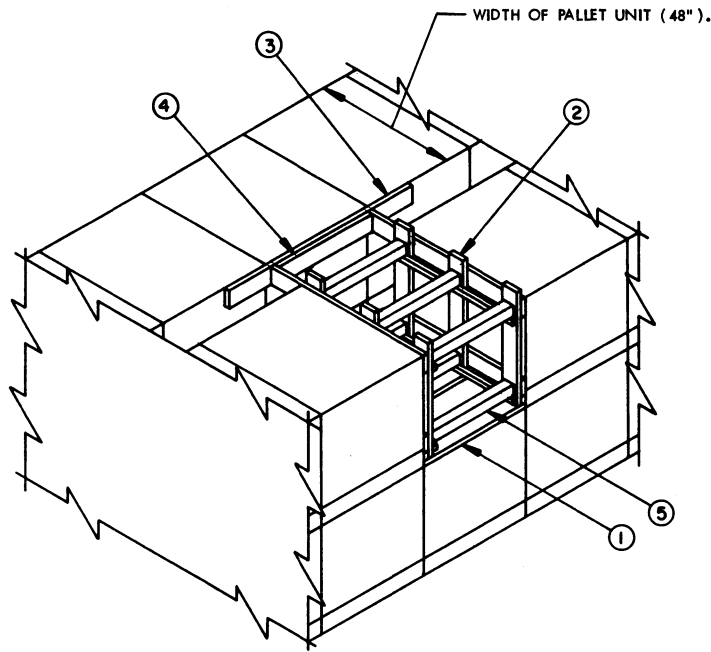
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER LENGTHS AND WIDTHS CAN BE USED.
2. THE PROCEDURES ON THIS PAGE AND ON PAGE 23 ARE PRESENTED TO PROVIDE A METHOD OF OBTAINING A LOAD QUANTITY WHICH MAY NOT BE READILY ATTAINABLE BY ANY OF THE OTHER METHODS OF ADJUSTING A LOAD QUANTITY SPECIFIED HEREIN, INCLUDING THE DEPICTED LCL PROCEDURES.
3. THE BLOCKING AND BRACING FOR THE COMBINATION LOAD, OTHER THAN THE SEPARATOR GATE, HAS NOT BEEN SHOWN. REFER TO THE APPLICABLE LOAD PAGES FOR BLOCKING AND BRACING SPECIFICATIONS. A SEPARATOR GATE MUST BE INSTALLED AT EVERY LOCATION WHERE THE DIRECTION OF THE UNITS CHANGES. THE GATE MUST BE POSITIONED SO THAT THE VERTICAL PIECES ARE AGAINST THE 48" SIDE OF THE UNITS.
4. A CHART IS SHOWN ON THIS PAGE FOR THE VARIOUS QUANTITIES WHICH CAN BE ATTAINED BY THE COMBINATION LOAD METHOD, AND THE PATTERNS REQUIRED TO PROVIDE THESE QUANTITIES. FOR COMPARISON PURPOSES, THE OTHER TYPE LOADS WHICH CAN BE USED TO ATTAIN A LIKE QUANTITY, OR A QUANTITY WITHIN THE RANGE OF THE COMBINATION LOAD METHOD, AS WELL AS THE APPROXIMATE LENGTH OF THE STRUTS, ARE ALSO INCLUDED IN THE CHART.

PALLET UNIT			
CAR LENGTH	UNITS PER LAYER	LOAD PATTERN	APPROX STRUT LENGTH
40'-6" CAR	22	11 LONG AT 40" AS LOADED ON PAGE 6	40"
	20	4 LONG AT 40" PLUS 6 WIDE AT 48"	29"
	20	5 LONG AT 40" PLUS 5 WIDE AT 48"	37"
	18	9 LONG AT 48" AS LOADED ON PAGE 8	48"
50'-6" CAR	28	14 LONG AT 40" AS LOADED ON PAGE 6	40"
	26	8 LONG AT 40" PLUS 5 WIDE AT 48"	37"
	26	7 LONG AT 40" PLUS 6 WIDE AT 48"	29"
	24	12 LONG AT 48" AS LOADED ON PAGE 8	24"
60'-8" CAR	34	17 LONG AT 40" AS LOADED ON PAGE 6	42"
	32	11 LONG AT 40" PLUS 5 WIDE AT 48"	39"
	32	10 LONG AT 40" PLUS 6 WIDE AT 48"	31"
	30	4 LONG AT 40" PLUS 11 WIDE AT 48"	31"
	28	12 LONG AT 48" AS LOADED ON PAGE 8	50"



SEPARATOR GATE



KEY NUMBERS

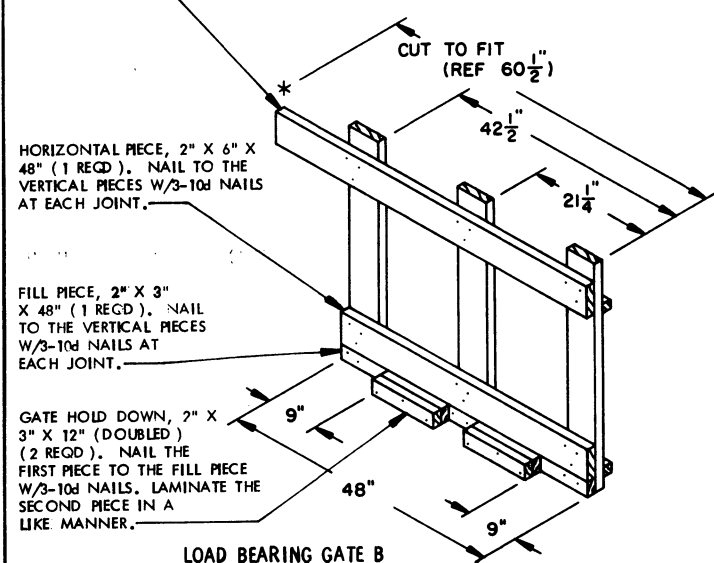
SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. A UNIT OMITTED FROM THE TOP LAYER OF A 2-LAYER LOAD IS SHOWN AS TYPICAL.
3. THE OMITTED UNIT PROCEDURE SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO PAGE 6 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

ISOMETRIC VIEW

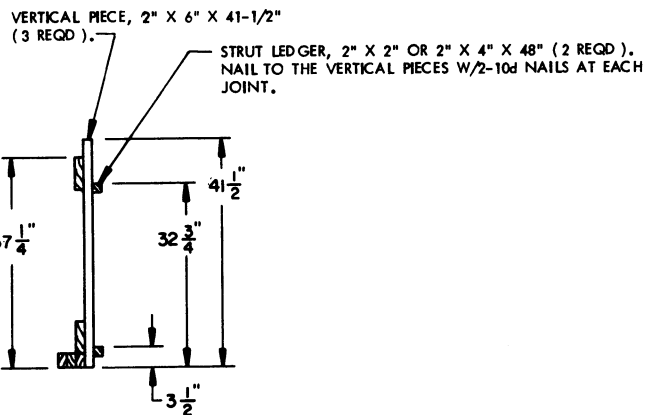
- ① SUPPORT PIECE, 2" X 6" X 40" (3 REQD). POSITION BENEATH THE 2" X 6" VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED ②.
- ② LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "LOAD BEARING GATE B" DETAIL BELOW. NAIL TO FILLER PIECE, PIECE MARKED ④, W/3-10d NAILS.
- ③ ANTI-SWAY BEARING PIECE, 2" X 6" X 6'-0" (1 REQD).
- ④ FILLER PIECE, 2" X 6" X 37" (1 REQD).
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 34") (6 REQD). TOENAIL TO PIECES MARKED ② W/2-10d NAILS AT EACH END.

HORIZONTAL BEARING PIECE, 2" X 6" BY CAR WIDTH MINUS 49-1/2" (REF: 60-1/2") (1 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.



LOAD BEARING GATE B

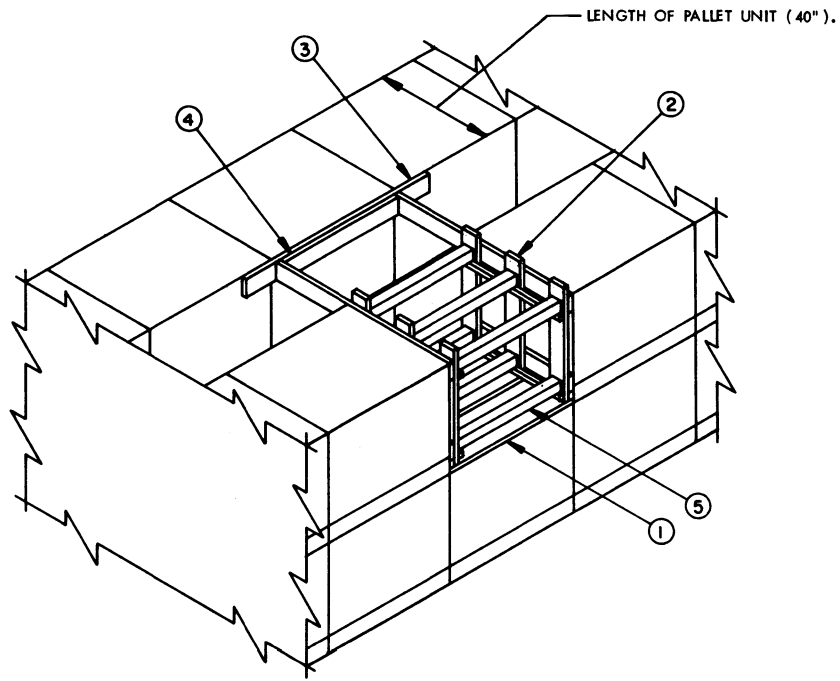
ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED.



END VIEW

CROSSWISE LOAD

TYPICAL LCL-ONE PALLET UNIT OMITTED FROM THE TOP LAYER OF A LOAD



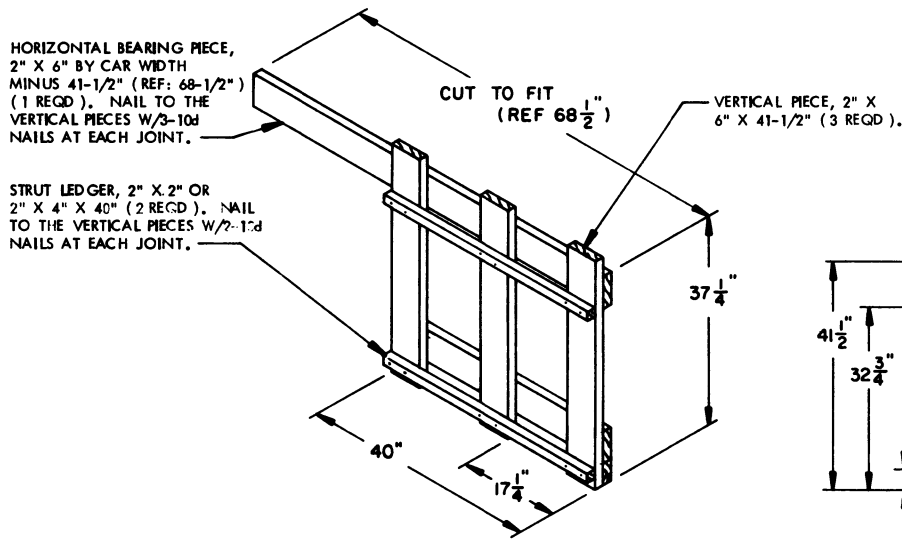
ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT PIECE, 2" X 6" X 48" (3 REQD). POSITION BENEATH THE 2" X 6" VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED ②.
- ② LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "LOAD BEARING GATE C" DETAIL BELOW. NAIL TO THE FILLER PIECE, PIECE MARKED ④ W/3-10d NAILS.
- ③ ANTI-SWAY BEARING PIECE, 2" X 6" X 6'-0" (1 REQD).
- ④ FILLER PIECE, 2" X 6" X 45" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ③ W/5-10d NAILS.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 42") (6 REQD). TOENAIL TO PIECES MARKED ② W/2-16d NAILS AT EACH END.

SPECIAL NOTES:

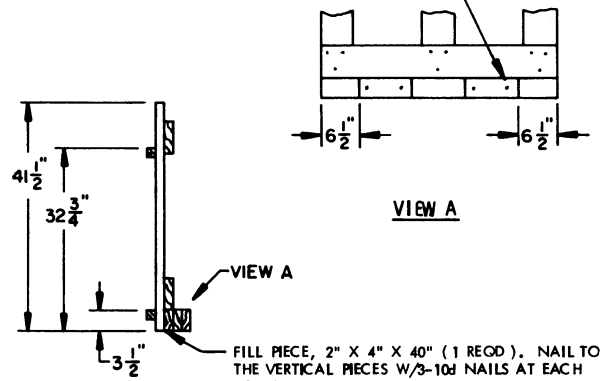
- 1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
- 2. A UNIT OMITTED FROM THE TOP LAYER OF A 2-LAYER LOAD IS SHOWN AS TYPICAL.
- 3. THE OMITTED-UNIT PROCEDURE SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
- 4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN. REFER TO PAGE 8 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.



LOAD BEARING GATE C

ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED.

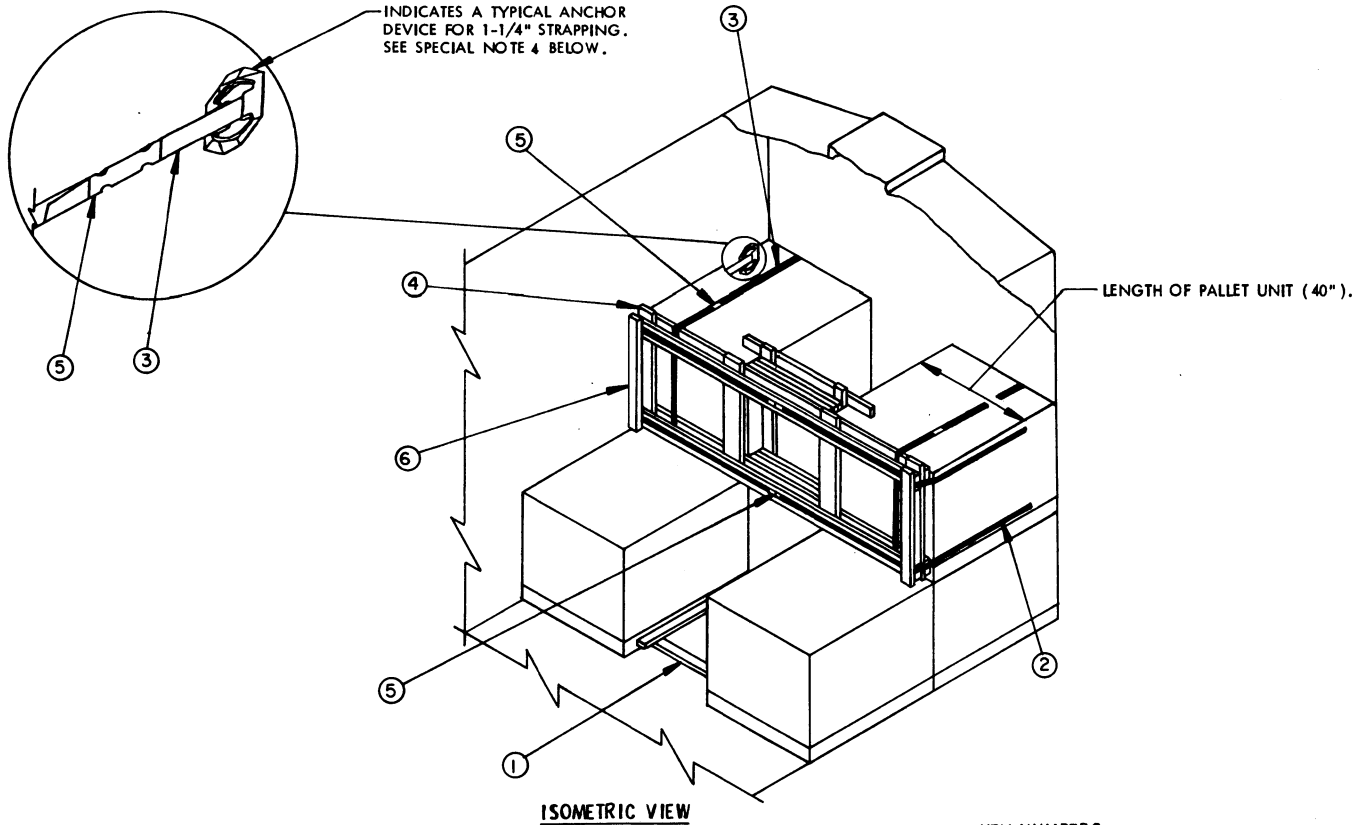
GATE HOLD DOWN, 2" X 4" X 9" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE FILL PIECE W/2-10d NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER.



END VIEW

LENGTHWISE LOAD

TYPICAL LCI: ONE PALLET UNIT OMITTED FROM THE TOP LAYER OF A LOAD



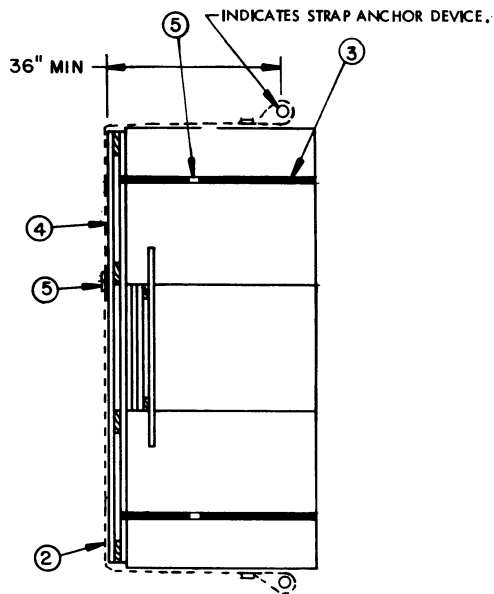
ISOMETRIC VIEW

KEY NUMBERS

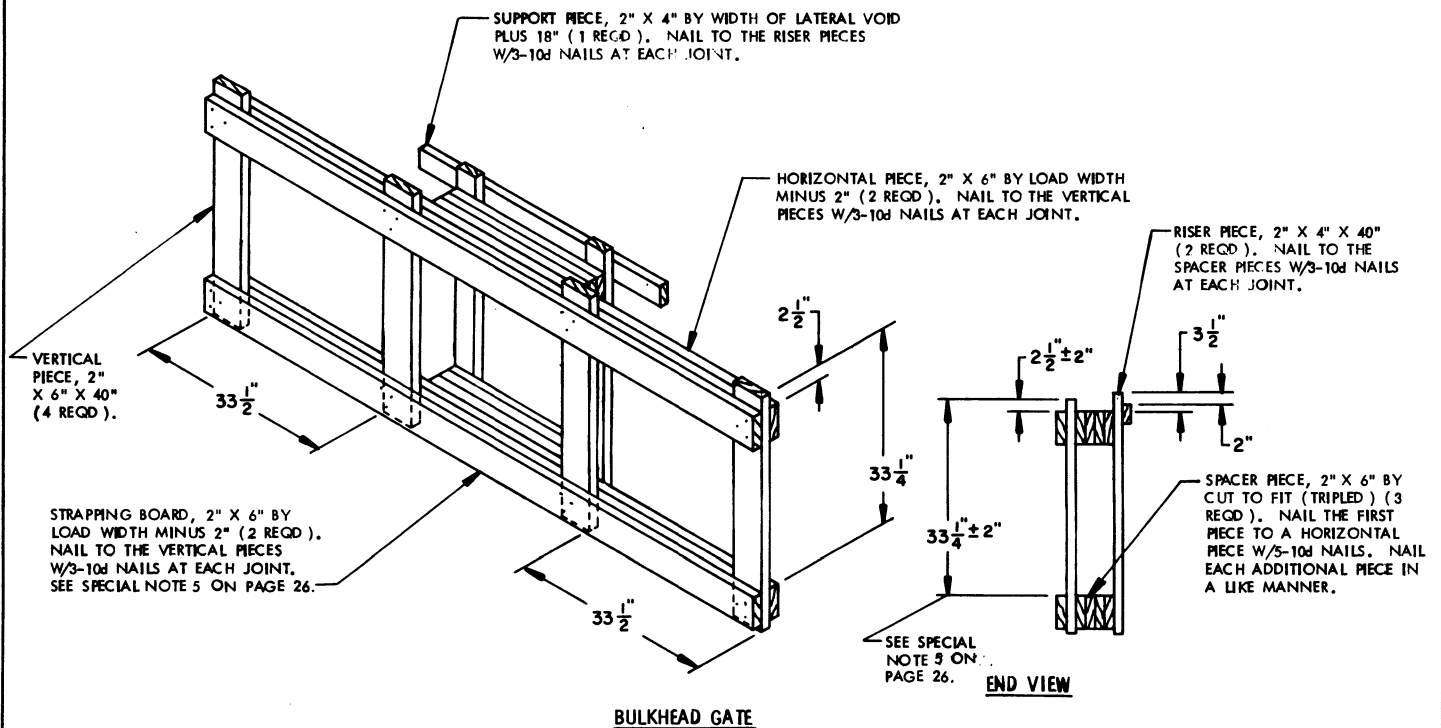
SPECIAL NOTES:

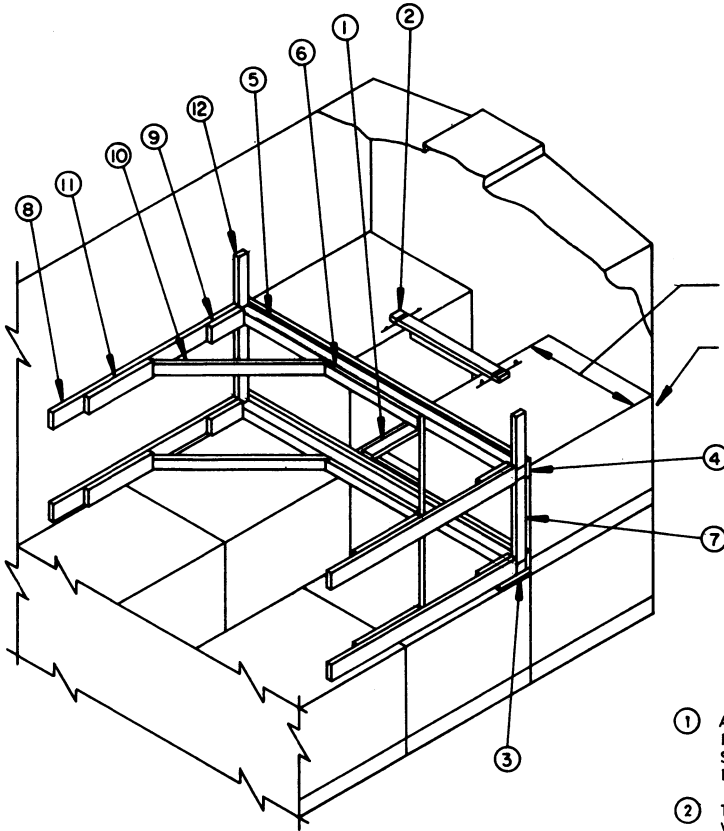
1. A 9'-4" WIDE ALL-METAL BOX CAR EQUIPPED WITH STRAP ANCHOR DEVICES AND HAVING AN AAR MECHANICAL DESIGNATION CLASS OF XL IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING IS SHOWN IN A LOAD HAVING THE 40" DIMENSION OF THE PALLET POSITIONED ACROSS THE CAR. THE PROCEDURES MAY ALSO BE USED FOR LOADS HAVING THE 40" DIMENSION POSITIONED LENGTHWISE IN THE CAR. NOTE THAT ANTI-SWAY BRACE "A" WILL BE USED IN LIEU OF ANTI-SWAY BRACE "B", PIECE MARKED ①.
3. A BULKHEAD GATE USED IN CONJUNCTION WITH TWO (2) BULKHEAD STRAPS WILL RETAIN UP TO 5,000 POUNDS OF LADING. THIS WILL BE NOT MORE THAN 2 PALLET UNITS. THREE (3) BULKHEAD STRAPS WILL NOT RETAIN 3 PALLET UNITS; THE PARTIAL LAYER IS THEREFORE LIMITED TO NOT MORE THAN 2 PALLET UNITS.
4. THE ANCHOR DEVICES TO BE USED FOR THE ATTACHMENT OF THE BULKHEAD STRAPS MUST BE LOCATED AT LEAST THIRTY-SIX INCHES (36") TOWARD THE CAR END WALL FROM THE OPPOSITE-THE-LOAD SIDE OF THE BULKHEAD GATE. IF THE ANCHOR DEVICES IN THE CAR BEING LOADED ARE NOT LOCATED NEAR ENOUGH TO THE END OF THE CAR SO THAT THE 36" REQUIREMENT CAN BE SATISFIED, IT WILL BE NECESSARY TO INSTALL GATES AND STRUTS AT THE END OF THE CAR. THESE GATES WILL BE 1-HIGH GATES FOR THE ITEM BEING LOADED AND WILL BE INSTALLED SIMILAR TO THE STRUTTED GATE METHOD SHOWN ON PAGE 21 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 25 FOR A SINGLE UNIT, WHEN THE PALLET UNITS ARE POSITIONED AS SHOWN. THE PROCEDURES SHOWN ON PAGES 20 AND 24, RESPECTIVELY, WILL BE USED WHEN THE PALLET UNITS ARE POSITIONED WITH THE 40" DIMENSION LENGTHWISE IN THE CAR.
5. THE STRAPPING BOARDS ON A BULKHEAD GATE ARE TO BE ALIGNED AS NEARLY AS POSSIBLE WITH THE ANCHOR DEVICES IN THE CAR TO WHICH THE BULKHEAD STRAPS ARE ATTACHED. TOLERANCES ARE SPECIFIED ON THE END VIEW OF THE BULKHEAD GATE ON PAGE 27 FOR THE LOCATION OF THE HORIZONTAL PIECES IN RELATION TO THE LOCATION OF THE STRAPPING BOARDS. THE STRAPPING BOARDS/HORIZONTAL PIECES MUST BE LOCATED WITHIN THESE TOLERANCES.

- ① ANTI-SWAY BRACE (3 REQD.). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN THE LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2. SEE SPECIAL NOTE 2 AT LEFT.
- ② BULKHEAD STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD.). INSTALL FROM TWO EQUAL LENGTH PIECES. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 27 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 3 AND 4 AT LEFT.
- ③ BUNDLING STRAP, 1-1/4" X .035" X 15'-6" LONG STEEL STRAPPING (2 REQD.). ENCIRCLE THE PALLET UNIT AND THE HORIZONTAL PIECES OF THE BULKHEAD GATE. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECE MARKED ②.
- ④ BULKHEAD GATE (1 REQD.). SEE THE DETAIL ON PAGE 27. SEE SPECIAL NOTE 2 AT LEFT.
- ⑤ SEAL FOR 1-1/4" STEEL STRAPPING (10 REQD., 4 PER BULKHEAD STRAP, PIECE MARKED ②), AND 1 PER BUNDLING STRAP, PIECE MARKED ③). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑥ STRAP RETAINER, 2" X 4" BY A LENGTH TO SUIT (2 REQD.). NAIL TO THE BULKHEAD GATE W/2-12d NAILS ABOVE AND BELOW EACH BULKHEAD STRAP.



STRAP APPLICATION PLAN VIEW





LENGTH OF PALLET UNIT (40").

IF THE CAR HAS BOWED END WALLS, A BULKHEAD MUST BE INSTALLED. SEE THE "END OF CAR BULKHEAD DETAIL ON PAGE 38."

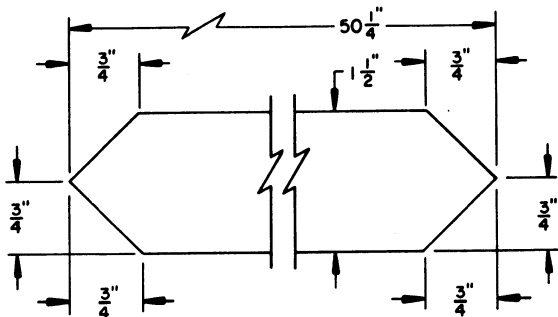
KEY NUMBERS

- ① ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE DETAIL ON PAGE 14. WIRE TIE TO PALLET UNITS AS SHOWN BY THE APPLICABLE TIE WIRE APPLICATION DETAIL ON PAGE 38. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL-TIER UNITS.
- ③ SUPPORT CLEAT, 2" X 3" X 12" (2 REQD). POSITION HORIZONTALLY AS SHOWN, 1" ABOVE THE LOWER PALLET UNIT. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 4 AT LEFT.
- ④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/1-12d NAIL EVERY 6". SEE SPECIAL NOTE 2 AT LEFT.
- ⑤ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). SEE DETAIL.
- ⑥ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤ W/7-16d NAILS. SEE SPECIAL NOTE 5 AT LEFT.
- ⑦ SPACER CLEAT, 2" X 4" X 27-1/8" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑧ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑨ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧ W/4-16d NAILS.
- ⑩ DIAGONAL BRACE, 2" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤ AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/2-16d NAILS AT EACH END.
- ⑪ BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/8-16d NAILS.
- ⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

SPECIAL NOTES:

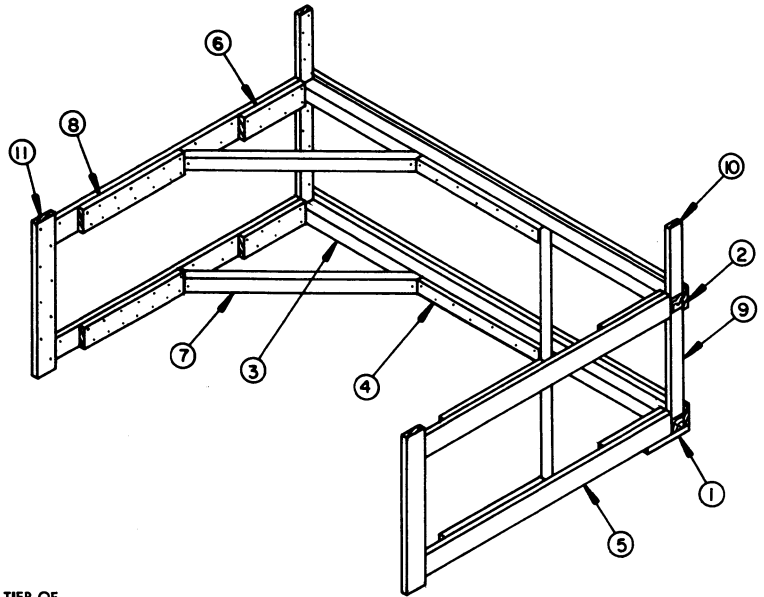
ISOMETRIC VIEW

- 1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOX CAR IS SHOWN. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.
- 2. PARTIAL-LAYER BRACING MAY BE APPLIED FOR EITHER OF THE CONVENTIONAL CARLOADS DEPICTED HEREIN. THE PIECES MARKED ④ SHOULD BE LOCATED SO AS TO BEAR AGAINST THE PALLET UNITS IN THE SAME LOCATION AS THE HORIZONTAL PIECES OF A CENTER GATE.
- 3. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN WOOD-LINED CARS FOR THE SECUREMENT OF A PARTIAL TOP TIER, BE IT A SECOND TIER OR A FIRST. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 8,000 POUNDS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 29, 30, AND 31 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.
- 4. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ③, ④, ⑤, ⑦, ⑨, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALLRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑩ TO BEAR IN FRONT OF A DOOR OPENING; HOWEVER, THE ADJACENT PIECE MARKED ⑧ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 60"), TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑧ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑧ IS DOUBLED.
- 5. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑥, WILL BE 28" LONG FOR A 9'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.



DIAGONAL BRACE

TYPICAL LCL LOAD USING K-BRACE METHOD OF PARTIAL-LAYER BRACING



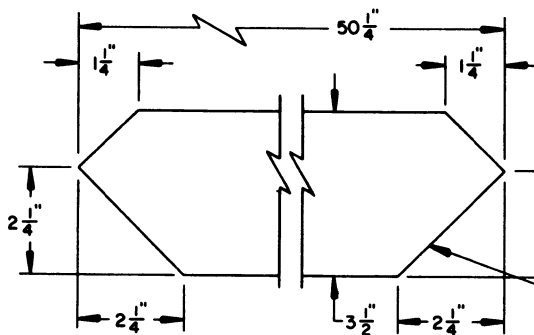
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 14,000 POUNDS. THIS WILL BE NOT MORE THAN SIX (6) UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 30 AND 31 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 28 MAY BE USED.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑤, ⑥, ⑧, ⑨, AND ⑪ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING. HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. REFER TO PAGE 28 FOR A TYPICAL INSTALLATION OF A K-BRACE.

- ① SUPPORT CLEAT, 2" X 3" X 12" (2 REQD). POSITION HORIZONTALLY AS SHOWN, 1" ABOVE THE LOWER PALLET UNIT. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③ AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 27-1/4" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑩ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑪ VERTICAL BACK UP CLEAT, 2" X 6" X 40" (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.

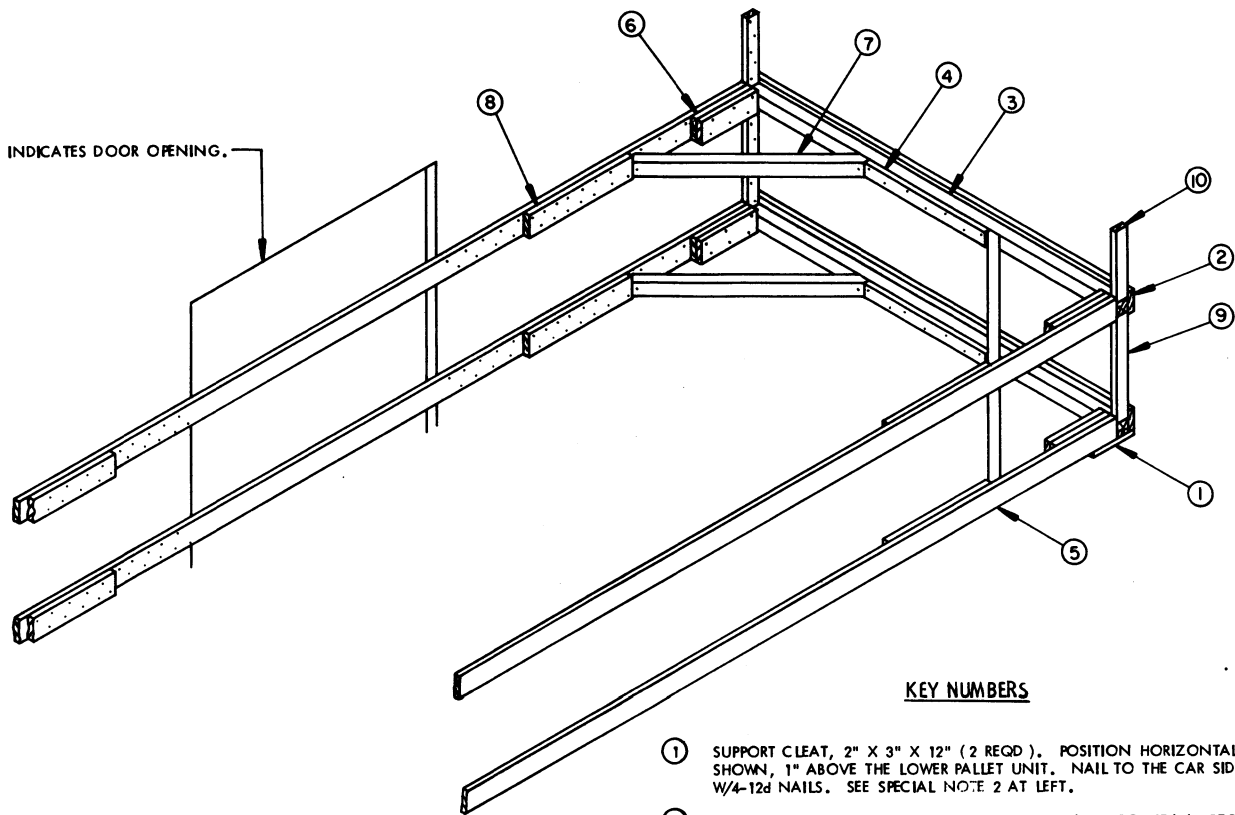


THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ③, OR A HORIZONTAL WALL CLEAT, PIECE MARKED ⑤.

DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE

TYPE "B" K-BRACE



ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 3" X 12" (2 REQD). POSITION HORIZONTALLY AS SHOWN, 1" ABOVE THE LOWER PALLET UNIT. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③ W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③ W/7-16d NAILS. SEE SPECIAL NOTE 3 BELOW.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENINGS TO CONTACT PIECE MARKED ⑧ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 27-1/4" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

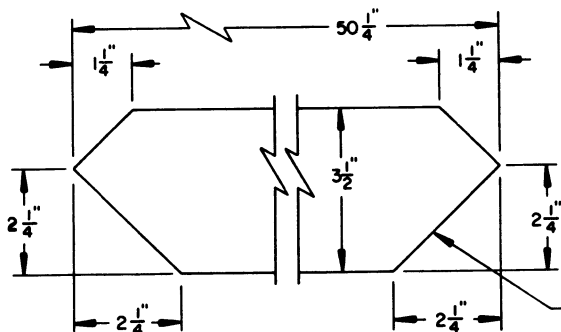
SPECIAL NOTES:

1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 20,000 POUNDS. THIS WILL BE NOT MORE THAN EIGHT (8) UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 31 FOR THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 8,000 POUNDS AND 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 29 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 28 WILL BE ADEQUATE.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑨, AND ⑩, MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALLRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.

(CONTINUED AT RIGHT)

(SPECIAL NOTES CONTINUED)

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2" AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. **CAUTION:** A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑤, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

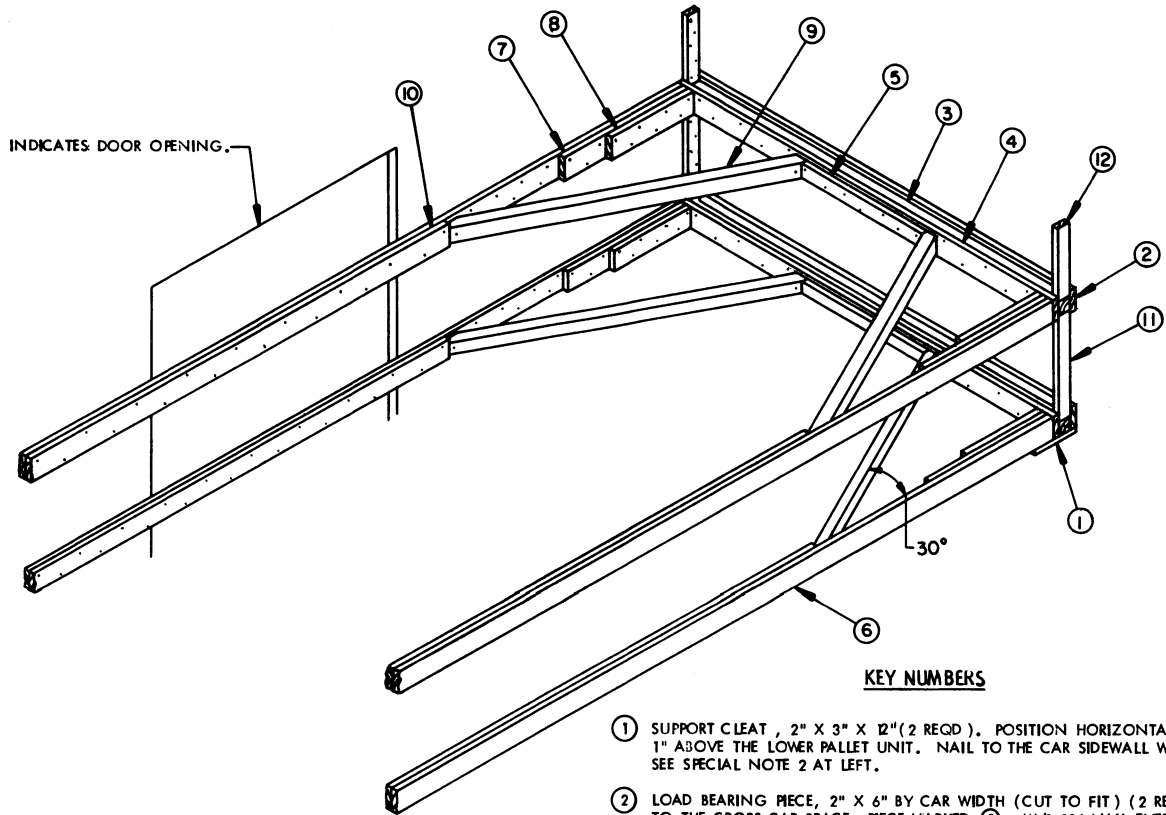


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ③, OR A HORIZONTAL WALL CLEAT, PIECE MARKED ⑤.

TYPE "C" K-BRACE



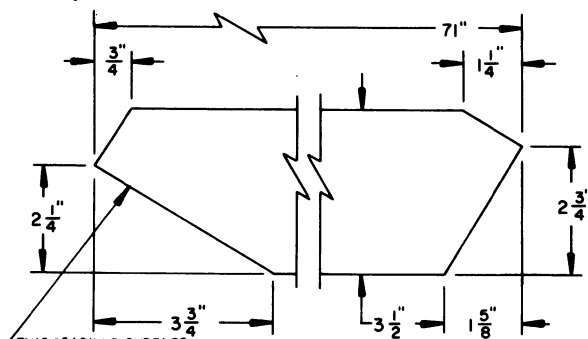
ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 3" X 12" (2 REQD). POSITION HORIZONTALLY AS SHOWN, 1" ABOVE THE LOWER PALLET UNIT. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③ W/1-12d NAIL EVERY 6".
- ⑤ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑥ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑦ POCKET CLEAT, 2" X 6" X 36" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/10-16d NAILS.
- ⑧ POCKET CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE POCKET CLEAT, PIECE MARKED ⑦, W/7-16d NAILS.
- ⑨ DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/1-60d NAIL AT EACH END.
- ⑩ BACK-UP CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND TO CONTACT THE DIAGONAL BRACE, PIECE MARKED ⑨, IN THE OPPOSITE END OF THE CAR. NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/1-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING, IF APPLICABLE.
- ⑪ SPACER CLEAT, 2" X 4" X 27-1/4" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑫ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

SPECIAL NOTES:

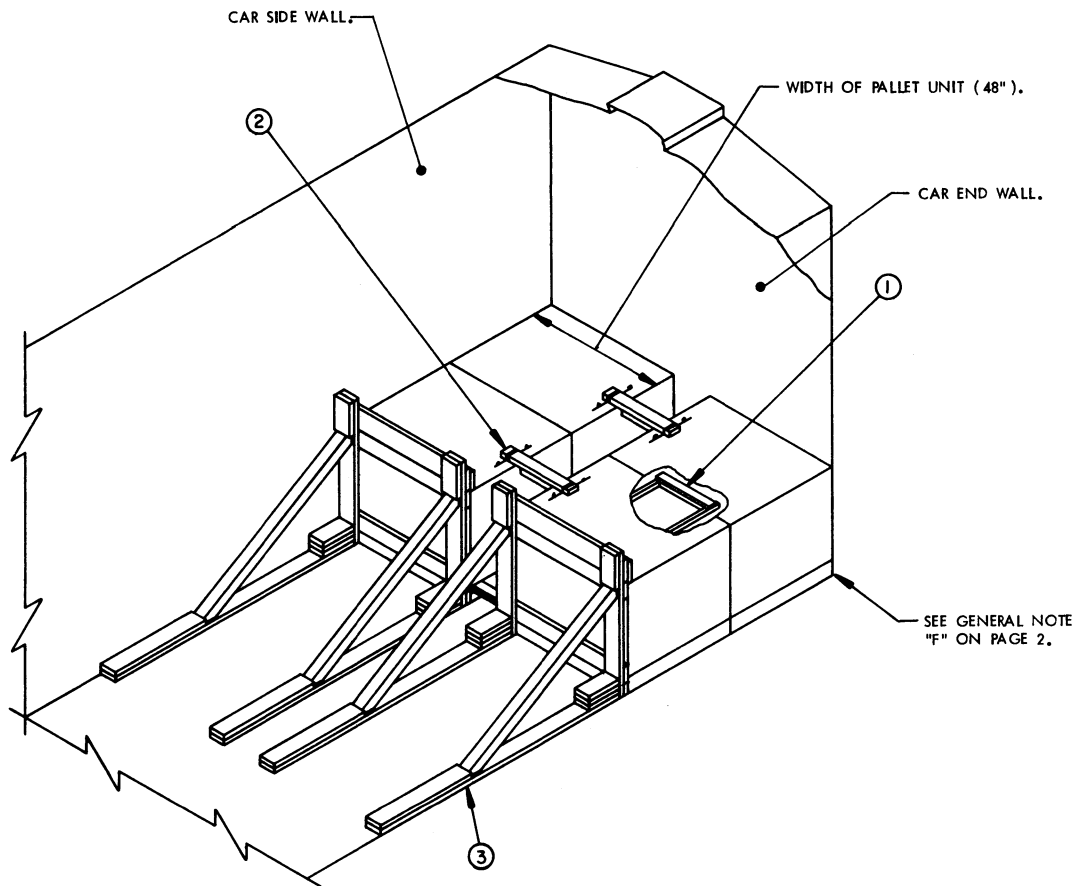
1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS. THIS WILL BE NOT MORE THAN TEN (10) UNITS. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 14,000 POUNDS AND 20,000 POUNDS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 30 MAY BE USED. FOR A PARTIAL TIER OF 9,000 POUNDS TO 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 29 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 28 WILL BE ADEQUATE.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑦, ⑧, ⑪, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALLRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ④ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 70-1/4" LONG IN LIEU OF 71" LONG WHEN PIECE MARKED ⑥ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑤, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. CAUTION: A TYPE "D" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑥ AND ⑩, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.



DIAGONAL BRACE

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A HORIZONTAL WALL CLEAT, PIECE MARKED ⑥.

TYPE "D" K-BRACE



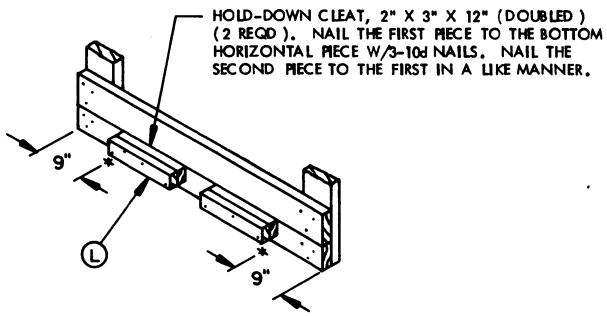
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR AVAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED.
2. THE LOAD SHOWN DEPICTING THE KNEE BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. THE QUANTITY MAY BE ADJUSTED TO SUIT, PROVIDED THE LIMITATIONS OF THE KNEE BRACE AS SET FORTH IN SPECIAL NOTE 3 ARE NOT EXCEEDED. UNITS CAN ALSO BE TURNED IN THE OPPOSITE DIRECTION.
3. A KNEE BRACE ASSEMBLY WILL BE USED FOR EACH ROW OF PALLET UNITS. ONE (1) KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF NOT MORE THAN 8,500 POUNDS.
4. HOLD DOWN CLEATS (GATE HOLD DOWN) MUST BE APPLIED TO THE BOTTOM HORIZONTAL PIECE OF A KNEE BRACE ASSEMBLY; THE PROPER MATERIAL SIZE AND PLACEMENT IS DEPICTED BY THE TWO PARTIAL VIEWS SHOWN ON PAGE 33.

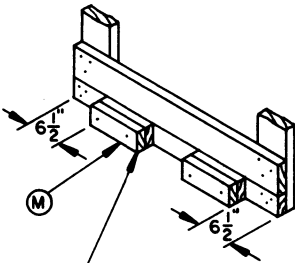
KEY NUMBERS

- ① ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 14. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 14. WIRE TIE TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 38.
- ③ KNEE BRACE ASSEMBLY (4 REQD). SEE THE DETAIL ON PAGE 33 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS.



PARTIAL VIEW A

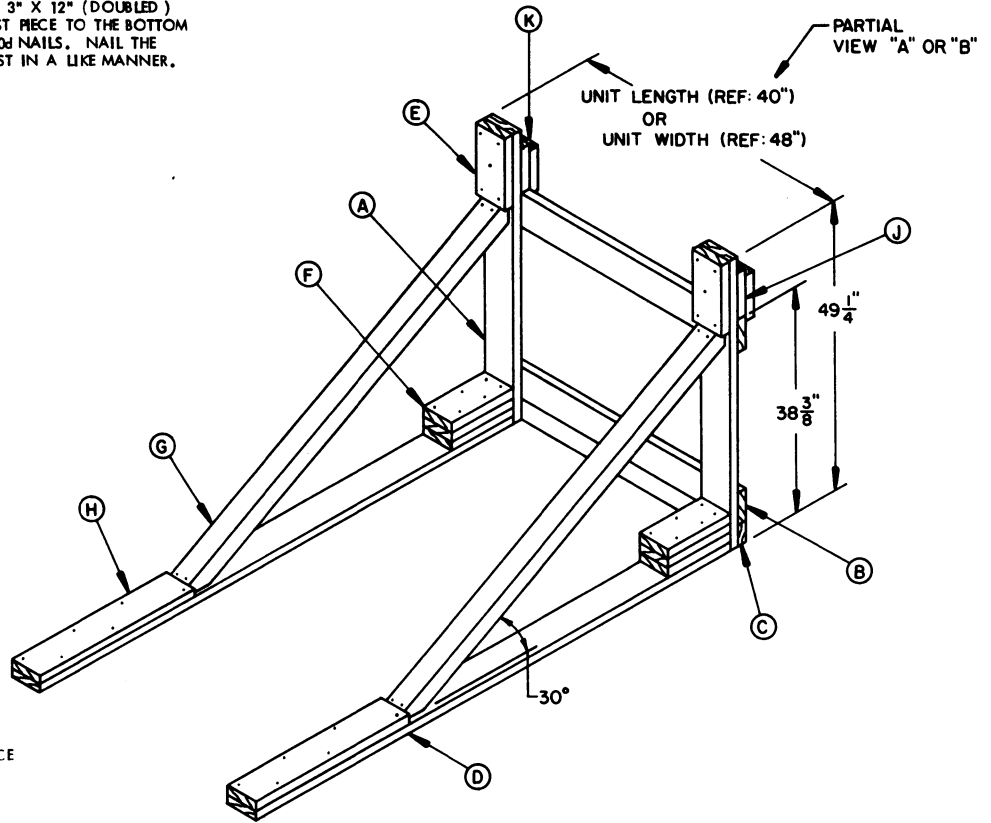
FOR 48" WIDE KNEE BRACE



PARTIAL VIEW B

FOR 40" WIDE KNEE BRACE

HOLD DOWN CLEAT, 2" X 4" X 9" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE BOTTOM HORIZONTAL PIECE W/2-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

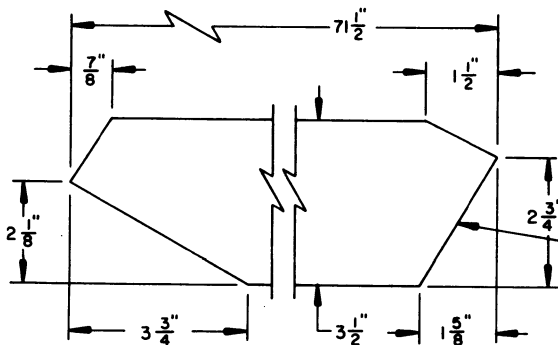


KNEE BRACE ASSEMBLY

KEY LETTERS

- (A) VERTICAL PIECE, 2" X 6" X 49-1/4" (2 REQD). NAIL TO PIECE (D) W/2-16d NAILS.
- (B) HORIZONTAL PIECE, 2" X 6" BY PALLET UNIT LENGTH, OR WIDTH, AS APPLICABLE (2 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- (C) HORIZONTAL PIECE, 2" X 4" BY PALLET UNIT LENGTH OR WIDTH, AS APPLICABLE. NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.
- (D) FLOOR CLEAT, 2" X 6" X 71-9" (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "R" ON PAGE 2.
- (E) HOLD DOWN CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.
- (F) POCKET CLEAT, 2" X 6" X 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (D), W/4-16d NAILS. NAIL THE SECOND AND THIRD PIECES IN A LIKE MANNER AND TOENAIL THE THIRD PIECE TO THE VERTICAL PIECE, PIECE MARKED (A), W/2-16d NAILS.
- (G) BRACE, 4" X 4" X 71-1/2" (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (D), W/2-16d NAILS AT EACH END.
- (I) BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO A FLOOR CLEAT, PIECE MARKED (D), W/6-40d NAILS.
- (J) FILLER PIECE, 2" X 6" X 8" (2 REQD). POSITION AS SHOWN AND NAIL TO A VERTICAL PIECE W/3-10d NAILS.
- (K) REINFORCING PIECE, 2" X 6" X 8" (2 REQD). POSITION TO CONTACT PALLET COVER AND NAIL TO A FILLER PIECE, PIECE MARKED (J) W/3-10d NAILS.
- (L) HOLD DOWN CLEATS FOR UNIT WIDTH BRACE (REF: 12") (2 REQD). SEE "PARTIAL VIEW A" ABOVE AND SPECIAL NOTE 4 ON PAGE 2.
- (M) HOLD DOWN CLEAT FOR UNIT LENGTH BRACE (REF: 9") (2 REQD). SEE "PARTIAL VIEW B" ABOVE AND SPECIAL NOTE 4 ON PAGE 32.

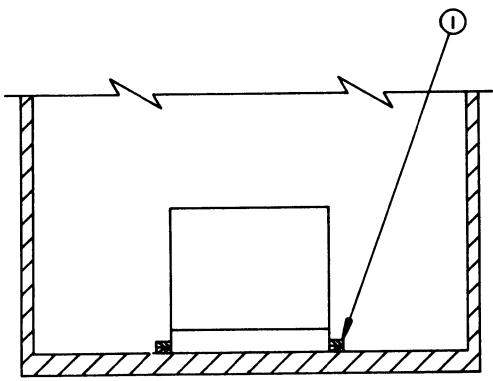
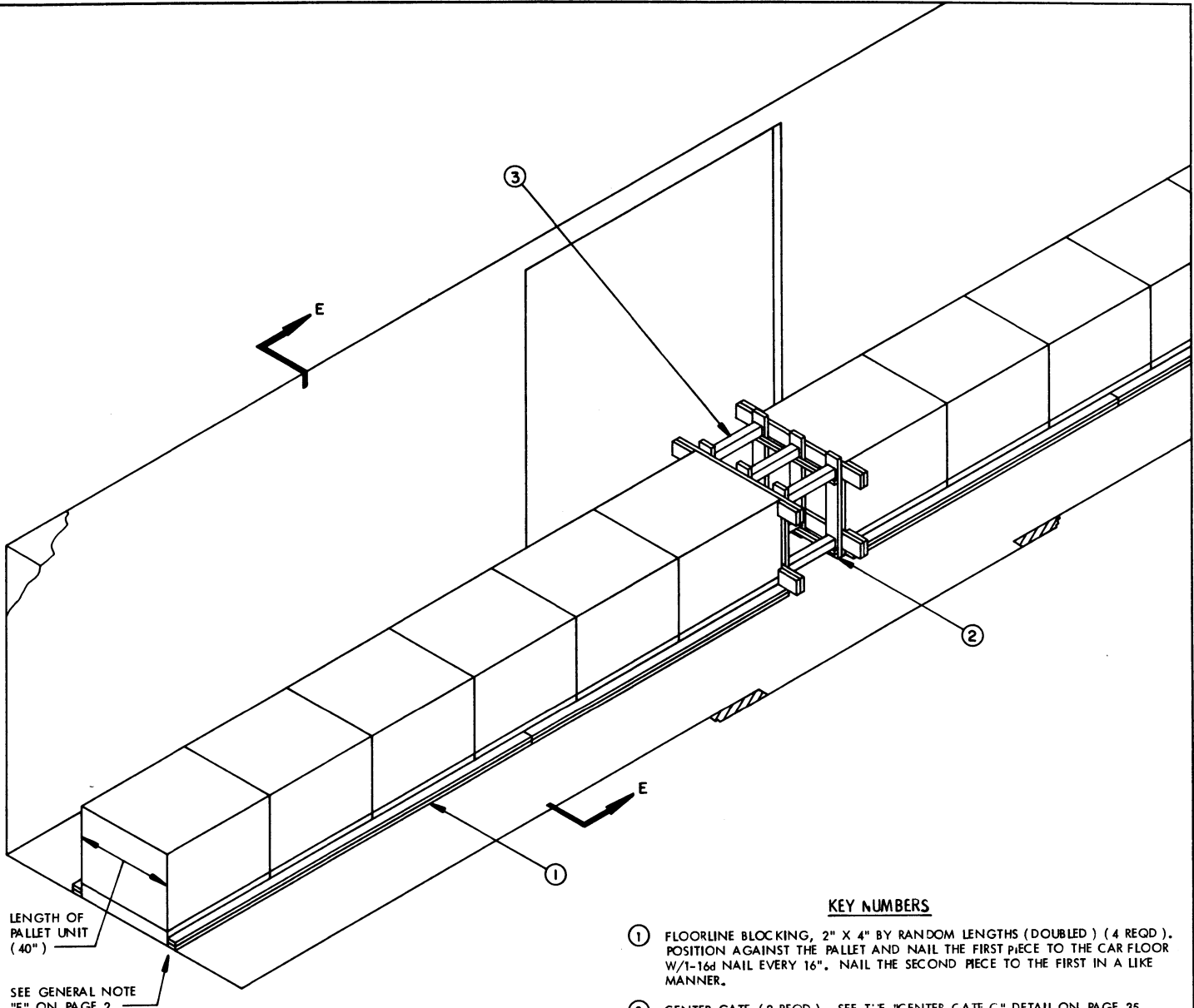
THE BRACE MUST BE INSTALLED SO THAT THIS BEARING SURFACE WILL BE IN CONTACT WITH THE VERTICAL PIECE MARKED (A).



BRACE

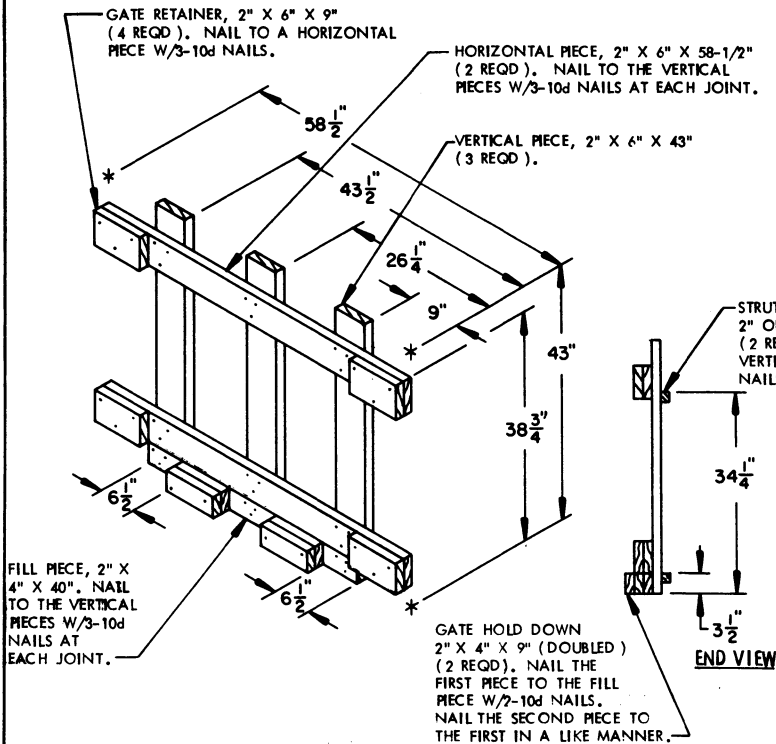
4" X 4" MATERIAL

TYPICAL LCL LOAD USING KNEE BRACE METHOD OF PARTIAL-LAYER BRACING



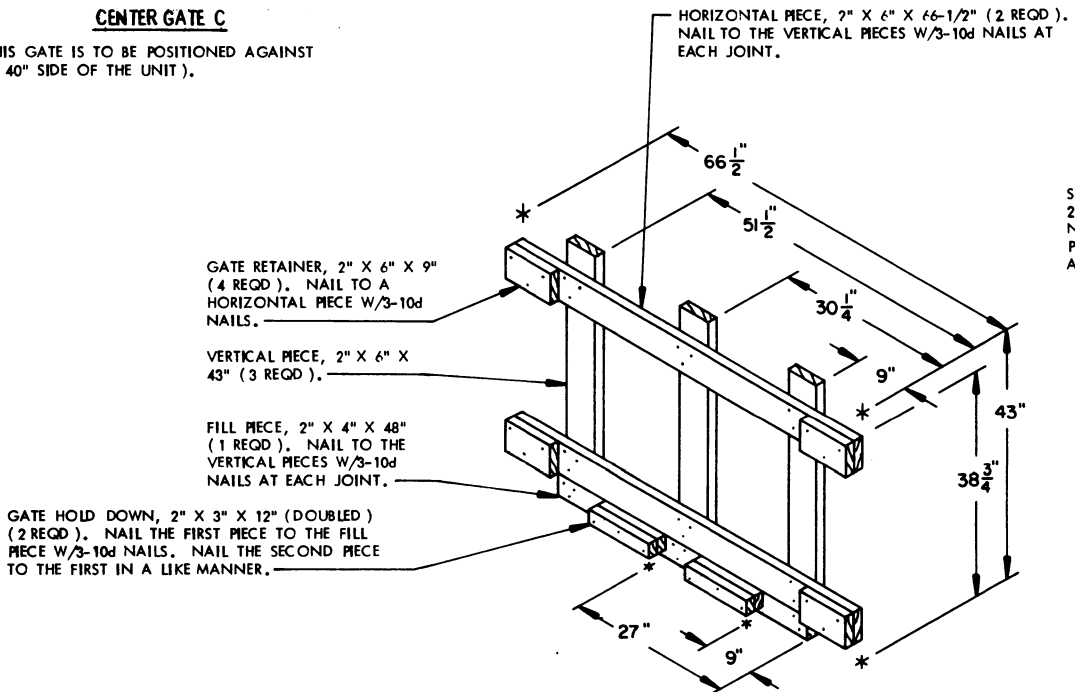
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED AND SHORTER BUT NOT LONGER CARS MAY BE USED.
2. A 1-WIDE LOAD WITH THE 40" DIMENSION OF THE UNIT ACROSS THE CAR IS SHOWN AS TYPICAL. THE UNIT MAY ALSO BE TURNED IN THE OTHER DIRECTION FOR A ONE WIDE LOAD. THE CENTER GATE "D" WILL THEN BE USED.
3. THE BILL OF MATERIAL AND LOAD AS SHOWN ARE BASED ON THE DEPICTED LOAD AND THEREFORE ONLY TYPICAL.



CENTER GATE C

(THIS GATE IS TO BE POSITIONED AGAINST THE 40" SIDE OF THE UNIT).



CENTER GATE D

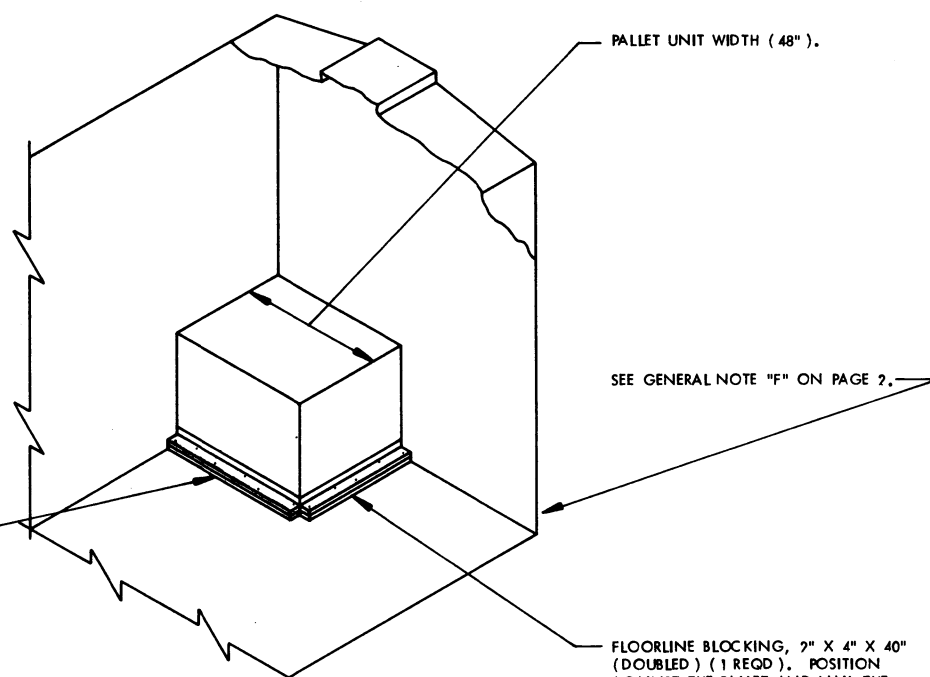
(THIS GATE IS TO BE POSITIONED AGAINST THE 48" SIDE OF THE UNIT).

BILL OF MATERIAL (TYPICAL)		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	14	5
2" X 4"	205	137
2" X 6"	47	47
4" X 4"	12	16
NAILS	NO. REQD	POUNDS
10d (3")	118	2
16d (3-1/2")	168	3-3/4

LOAD AS SHOWN (TYPICAL)

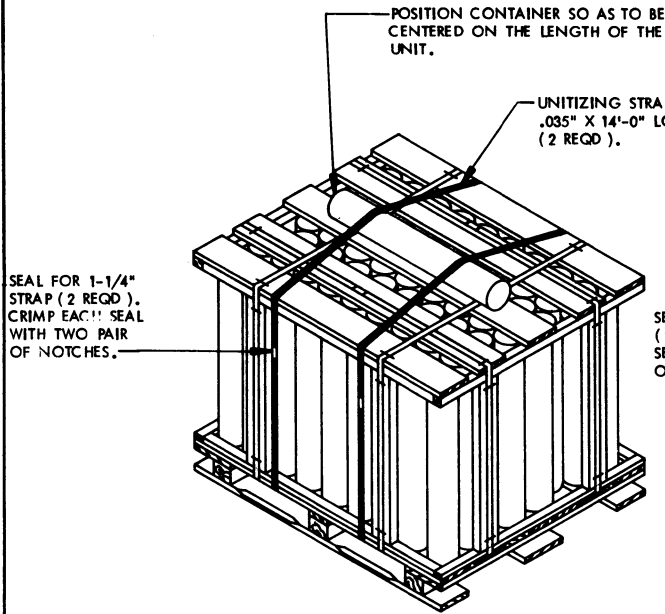
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET	12	26,976 LBS
DUNNAGE		416 LBS
TOTAL WEIGHT		27,392 LBS (APPROX)

FLOORLINE BLOCKING, 2" X 4" X 48" (DOUBLED) (1 REQD). POSITION AGAINST THE PALLET AND NAIL THE FIRST PIECE TO THE FLOOR W/1-16d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTES "L" AND "R" ON PAGE 2.

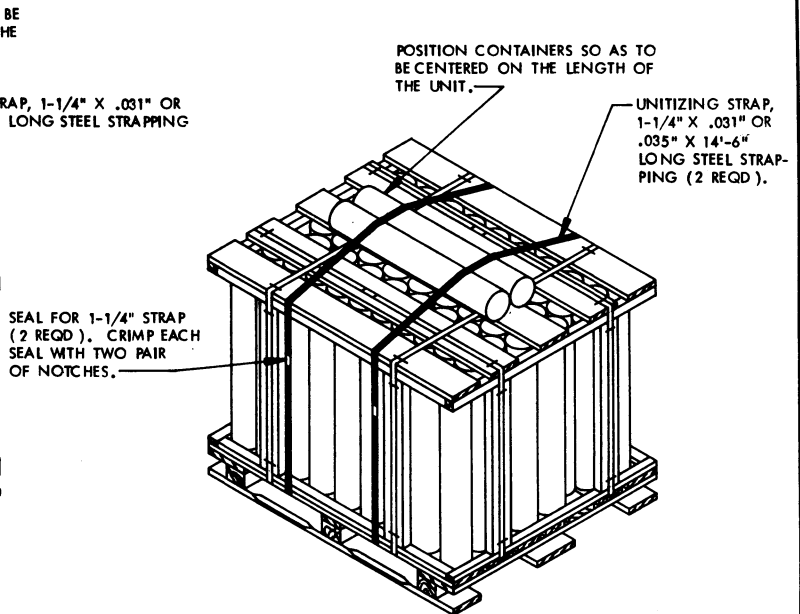


FLOORLINE BLOCKING, 2" X 4" X 40" (DOUBLED) (1 REQD). POSITION AGAINST THE PALLET AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/1-16d NAIL EVERY 8". NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

ISOMETRIC VIEW



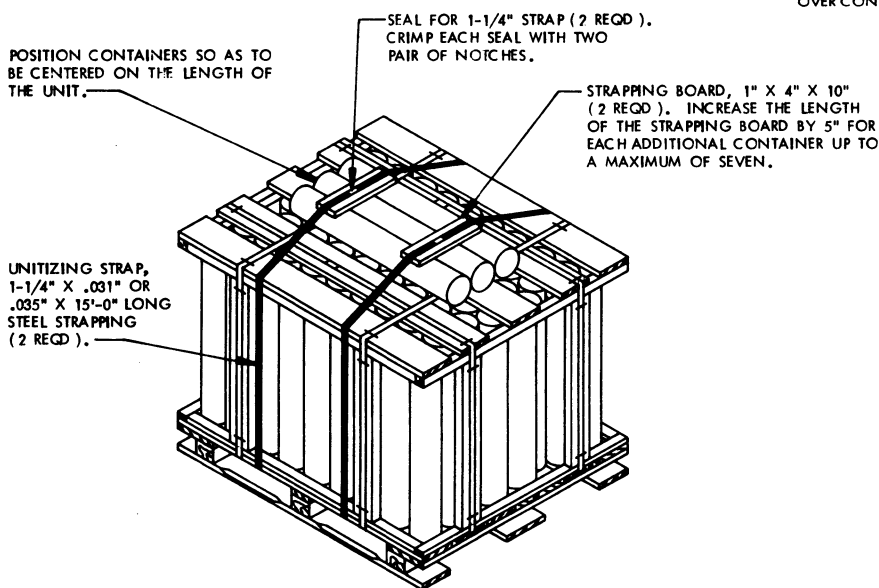
SECUREMENT OF ONE CONTAINER



SECUREMENT OF TWO CONTAINERS

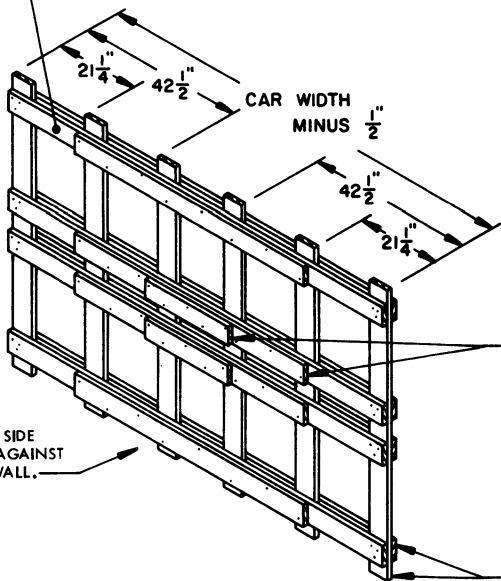
SPECIAL NOTES:

1. SHIPMENTS OF COMPLETE ROUNDS SHOULD CONSIST OF FULL UNITS TO THE MAXIMUM EXTENT POSSIBLE, HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS.
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLY, AND PACK PLANTS TO DEPOTS. **CAUTION:** A LOAD CONTAINING LEFTOVER CONTAINERS SECURED TO THE TOP OF A FULL UNIT MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
3. OBVIOUSLY, A PALLET UNIT WITH ONE OR MORE CONTAINERS STRAPPED TO THE TOP MUST BE POSITIONED IN THE TOP LAYER OF A LOAD. THE PREFERRED LOCATION WOULD BE NEAR THE CENTER AREA OF A CAR IF A FULL LOAD IS BEING SHIPPED, BUT NOT IN THE DOORWAY.
4. THE PROCEDURES ON THIS PAGE ARE APPLICABLE FOR THE SHIPMENT OF LEFTOVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.



SECUREMENT OF THREE CONTAINERS

FILL PIECE, 2" X 6" BY CAR WIDTH MINUS 1/2" IN LENGTH (ONE REQUIRED FOR EACH HORIZONTAL PIECE ON THE CENTER GATE). ALIGN WITH THE HORIZONTAL PIECES AND NAIL TO THE VERTICAL PIECES OF THE CENTER GATE W/3-10d NAILS AT EACH JOINT.



POSITION THIS SIDE OF BULKHEAD AGAINST THE CAR END WALL.

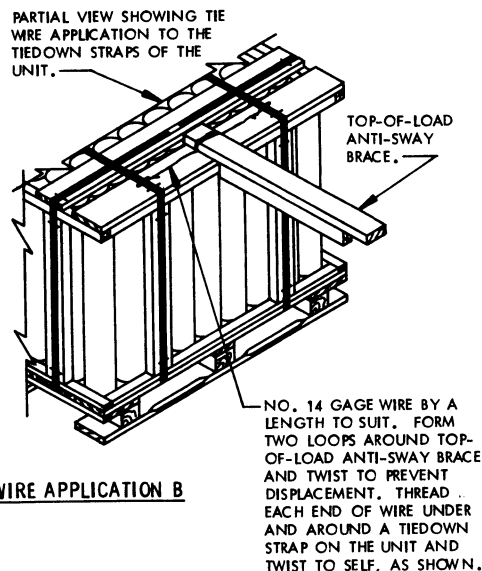
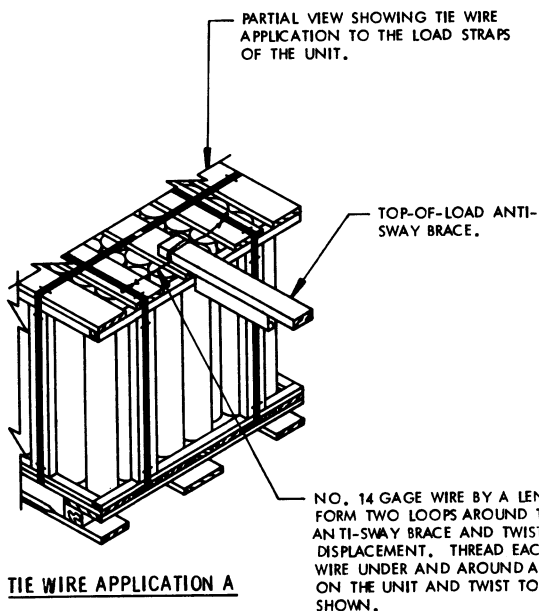
SHIM MATERIAL, 6" WIDE PLYWOOD OR DIMENSIONAL LUMBER OF A THICKNESS AND LENGTH AS REQUIRED TO FILL THE VOID BETWEEN THE CAR END WALL AND THE BULKHEAD. NAIL TO THE FILLER PIECE AND/OR LAMINATE W/1 APPLICABLY SIZED NAIL EVERY 6".

THESE 2" X 6" HORIZONTAL PIECES AND 2" X 6" VERTICAL PIECES ARE PART OF THE MODIFIED CENTER GATE. SEE "NOTE O" ABOVE.

NOTE O :

IF A BOX CAR TO BE LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. THE BULKHEAD IS APPLICABLE FOR USE AT THE END OF A LOAD IN A CONVENTIONAL BOX CAR OR IN A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS, OR AT THE END OF A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES, IF DESIRED, IN LIEU OF USING CROSS MEMBERS. THE BULKHEAD MAY BE FABRICATED FROM A CENTER GATE FOR THE UNIT THAT IS TO BE LOADED AND FOR THE UNIT POSITIONING (LENGTHWISE OR CROSSWISE). NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD DOWN PIECES. A MODIFIED CENTER GATE "A", AS DETAILED ON PAGE 14, IS SHOWN AS TYPICAL.

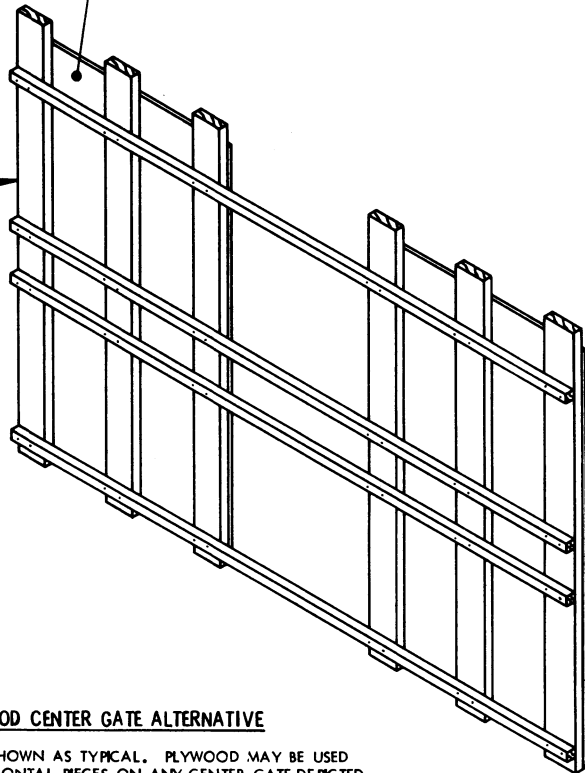
END-OF-CAR BULKHEAD



DETAILS

INDICATES A TYPICAL CAR WIDTH CENTER GATE WITH THE HORIZONTAL PIECES OMITTED (1 REQD). SEE THE APPLICABLE CENTER GATE DETAIL FOR LOCATION OF THE VERTICAL PIECES AND THE "TRUT LEDGERS."

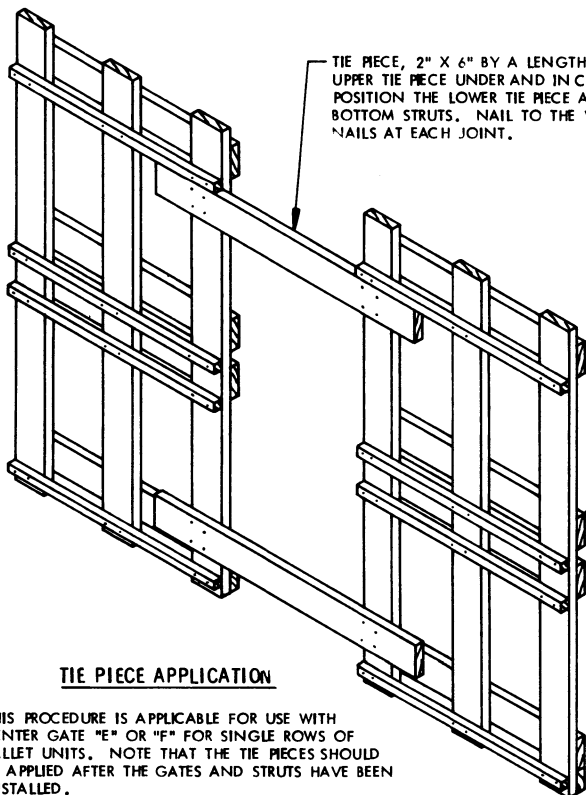
PLYWOOD, 1/2" THICK BY THE UNIT WIDTH (REF 48") OR LENGTH (REF 40") BY THE LOAD HEIGHT (2 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6". PLYWOOD MAY BE ALLOWED TO EXTEND BEYOND THE UNIT LENGTH OR WIDTH IF DESIRED.



THE APPLICABLE GATE HOLD DOWN PIECES MUST BE SECURED TO THE PLYWOOD.

PLYWOOD CENTER GATE ALTERNATIVE

CENTER GATE "B" IS SHOWN AS TYPICAL. PLYWOOD MAY BE USED IN LIEU OF THE HORIZONTAL PIECES ON ANY CENTER GATE DEPICTED HEREIN.

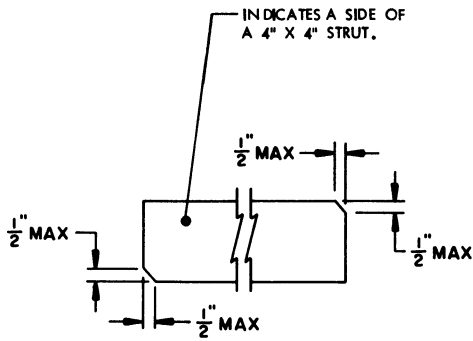


TIE PIECE, 2" X 6" BY A LENGTH TO SUIT (2 REQD). POSITION THE UPPER TIE PIECE UNDER AND IN CONTACT WITH THE TOP STRUT LEDGERS. POSITION THE LOWER TIE PIECE ABOVE AND IN CONTACT WITH THE BOTTOM STRUTS. NAIL TO THE VERTICAL PIECES OF THE GATES W/4-10d NAILS AT EACH JOINT.

INDICATES A TYPICAL "SPLIT" CENTER GATE. SEE THE CENTER GATE "E" OR CENTER GATE "F" DETAIL ON PAGE 16 FOR GUIDANCE.

TIE PIECE APPLICATION

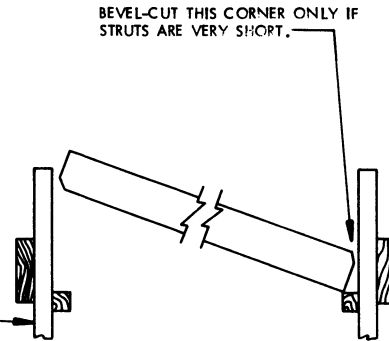
THIS PROCEDURE IS APPLICABLE FOR USE WITH CENTER GATE "E" OR "F" FOR SINGLE ROWS OF PALLET UNITS. NOTE THAT THE TIE PIECES SHOULD BE APPLIED AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED.



BEVEL CUT

BEVEL CUTTING THE STRUTS AS SPECIFIED WILL FACILITATE INSTALLING THE STRUTS WITH A "DRIVE FIT". CAUTION: DO NOT BEVEL A CORNER MORE THAN ONE-HALF INCH (1/2").

INDICATES A TYPICAL CENTER GATE.

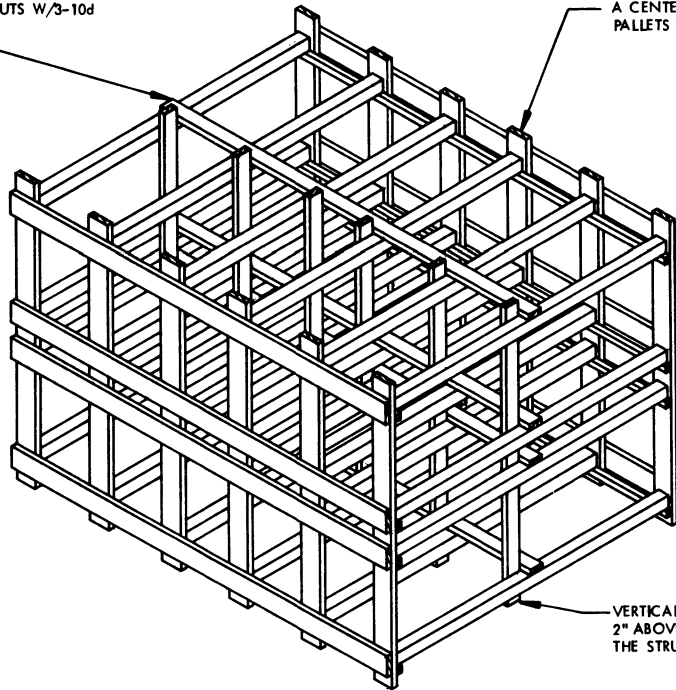


STRUT INSTALLATION

SEE GENERAL NOTE "U" ON PAGE 2 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.

HORIZONTAL STRUT BRACING, 2" X 4" BY A LENGTH TO SUIT (AS REQD.). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

A CENTER GATE FOR A 2-LAYER LOAD OF PALLETS IS SHOWN AS TYPICAL.

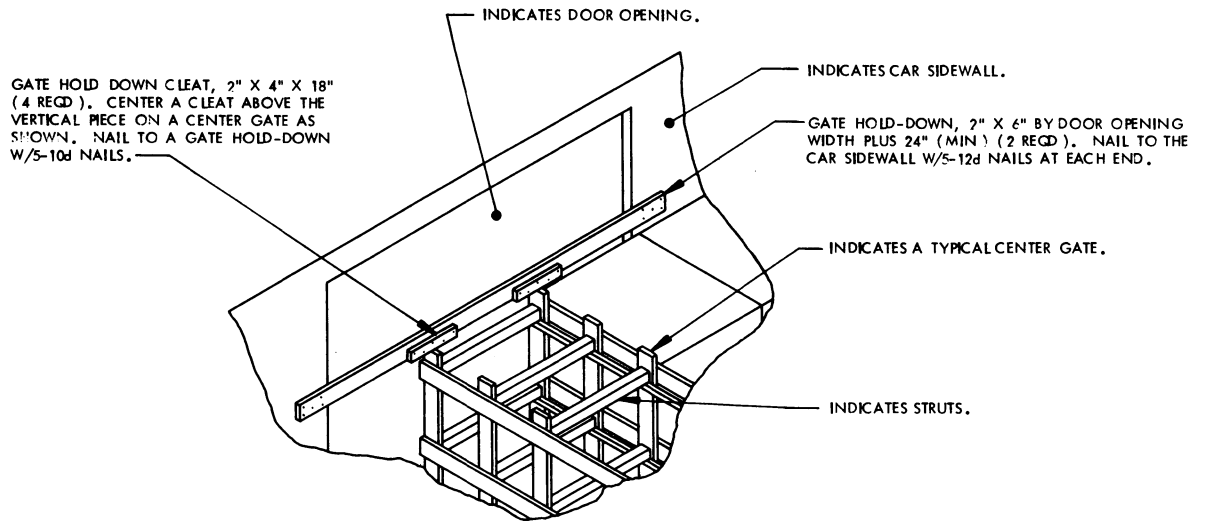


VERTICAL PIECE, 2" X 4" BY A LENGTH TO EXTEND 2" ABOVE THE TOP STRUT (AS REQD.). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

TYPICAL STRUT BRACING

SEE GENERAL NOTE "T" ON PAGE 2.

DETAILS



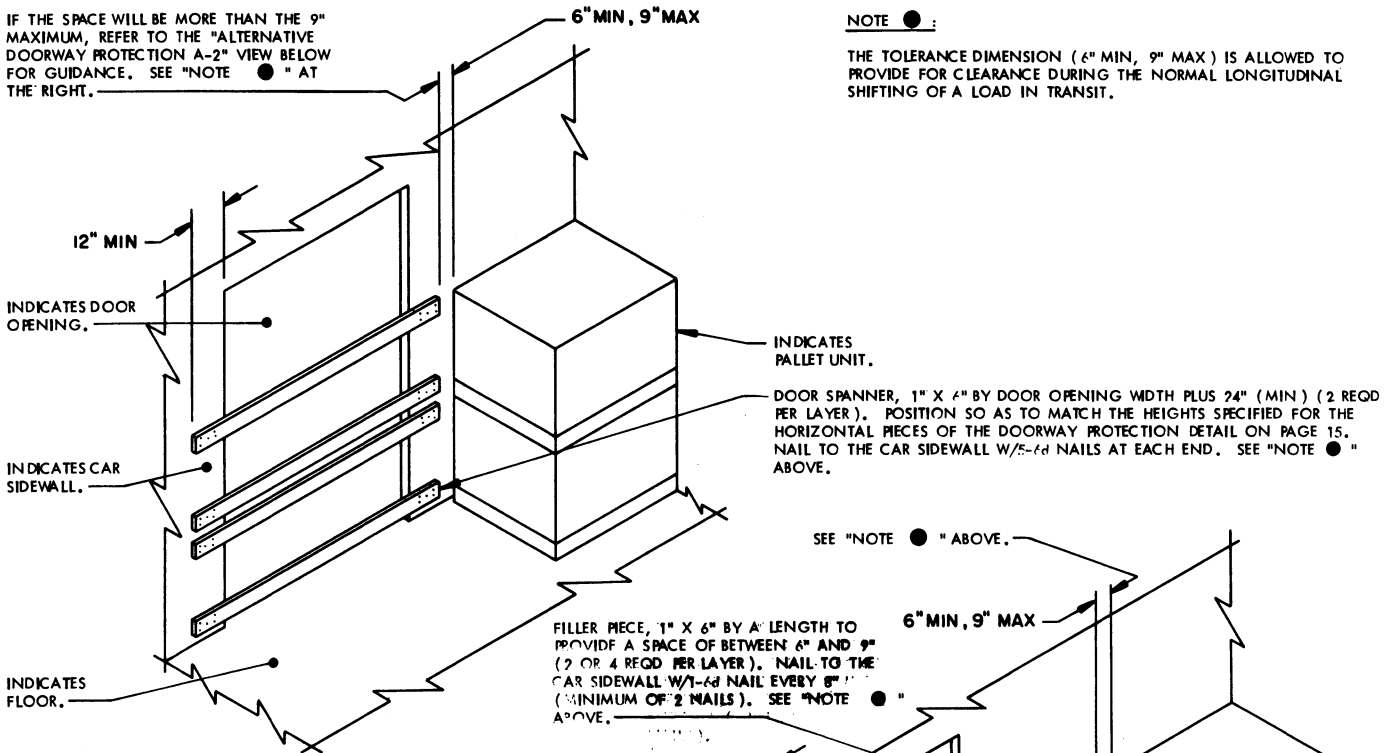
ALTERNATIVE GATE HOLD DOWN

THIS VIEW DEPICTS AN ALTERNATIVE METHOD OF CENTER GATE HOLD-DOWN WHICH CAN BE USED IF DESIRED, PROVIDING THE CAR HAS NAILABLE SIDEWALLS. THIS METHOD MAY BE APPLIED IN LIEU OF USING THE GATE HOLD-DOWN PIECES WHICH ARE PART OF A CENTER GATE. NOTE: FOR A GATE NOT LOCATED IN OR NEAR THE DOORWAY AREA, THE GATE HOLD-DOWN CLEAT MAY BE DOUBLED AND NAILED TO THE CAR SIDEWALL TO PROVIDE A HOLD DOWN.

IF THE SPACE WILL BE MORE THAN THE 9" MAXIMUM, REFER TO THE "ALTERNATIVE DOORWAY PROTECTION A-2" VIEW BELOW FOR GUIDANCE. SEE "NOTE ●" AT THE RIGHT.

NOTE ●:

THE TOLERANCE DIMENSION (6" MIN, 9" MAX) IS ALLOWED TO PROVIDE FOR CLEARANCE DURING THE NORMAL LONGITUDINAL SHIFTING OF A LOAD IN TRANSIT.



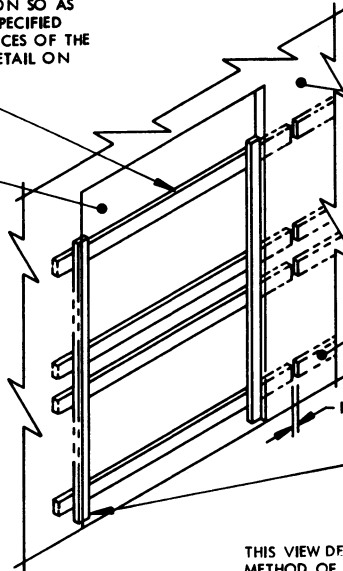
ALTERNATIVE DOORWAY PROTECTION A-1

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS, HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE DOORWAY PROTECTION A-3" PROCEDURES BELOW MUST BE USED ON THE LOADING SIDE OF THE CAR, SUCH AS THE NAILED-DOWN BLOCKING AND STEEL STRAPPING METHOD AS SHOWN IN THE LOAD ON PAGE 12.

DOOR SPANNER, 1" X 6" BY DOOR OPENING WIDTH PLUS 24" (2 REQD PER LAYER). POSITION SO AS TO MATCH THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE DOORWAY PROTECTION DETAIL ON PAGE 15. NAIL TO THE CAR SIDEWALL W/5-6d NAILS AT EACH END.

DOOR SPANNER, 2" (MIN) X 6" BY DOOR OPENING WIDTH PLUS 24" (2 REQD PER LAYER). POSITION SO AS TO MATCH THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE DOORWAY PROTECTION DETAIL ON PAGE 15.

INDICATES DOOR OPENING.



FILLER PIECE, 1" X 6" BY A LENGTH TO PROVIDE A SPACE OF BETWEEN 6" AND 9" (2 OR 4 REQD PER LAYER). NAIL TO THE CAR SIDEWALL W/1-6d NAIL EVERY 8" (MINIMUM OF 2 NAILS). SEE "NOTE ●" ABOVE.

12" MIN

INDICATES DOOR OPENING.

INDICATES CAR SIDEWALL.

INDICATES OUTSIDE WALL OF CAR.

INDICATES FILL MATERIAL NAILED TO THE SIDEWALL, OR A FILLER PIECE, 2" X 6" BY A LENGTH TO EQUAL THE LENGTH OF THE FILLER PIECE ON THE OPPOSITE SIDEWALL MINUS 1" (QUANTITY TO BE THE SAME AS FOR THE DOOR SPANNERS AND/OR FILLER PIECES ON THE OPPOSITE SIDEWALL). SEE "NOTE ●" ABOVE.

SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD). POSITION AGAINST DOOR POST AND NAIL TO THE DOOR SPANNER PIECES W/3-10d NAILS AT EACH JOINT.

ALTERNATIVE DOORWAY PROTECTION A-2

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. SEE THE NOTE UNDER THE "A-1" PROCEDURES.

ALTERNATIVE DOORWAY PROTECTION A-3

THIS VIEW DEPICTS THE DOOR OPENING OF A CAR AS IT APPEARS WHEN LOOKING AT IT FROM OUTSIDE OF THE CAR. THE METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE FOR THE LOADING SIDE OF THE CAR. NOTE THAT THE ADJACENT PALLET UNITS MUST BE POSITIONED APPROXIMATELY 1-3/4" (REF) FROM THE CAR SIDEWALL (1/4" MORE THAN THE THICKNESS OF THE DOOR SPANNER PIECES) TO FACILITATE THE INSTALLATION OF THESE DOOR SPANNER PIECES. THE VIEW SHOWN ABOVE IS FOR A TWO LAYER LOAD.

HORIZONTAL PIECE, 1" X 6" BY DOOR OPENING WIDTH (2 REQD PER LAYER), NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END. SEE THE APPLICABLE DOORWAY PROTECTION DETAIL FOR HEIGHT LOCATION.

INDICATES DOOR OPENING.

VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD).

INDICATES CAR SIDEWALL.

DOORWAY PROTECTION-GATE STRAP, 1-1/4" X .035" X 3'-0" (REF) NAIL-ON TYPE STEEL STRAPPING (4 REQD PER LAYER OF LOAD), NAIL TO GATE AND CAR SIDEWALL AS SHOWN BY THE "VIEW B" SKETCH BELOW. NOTE THAT TYPE 1 STRAPPING MAY BE PUNCHED FOR NAILING IF TYPE 2 STRAPPING IS NOT AVAILABLE.

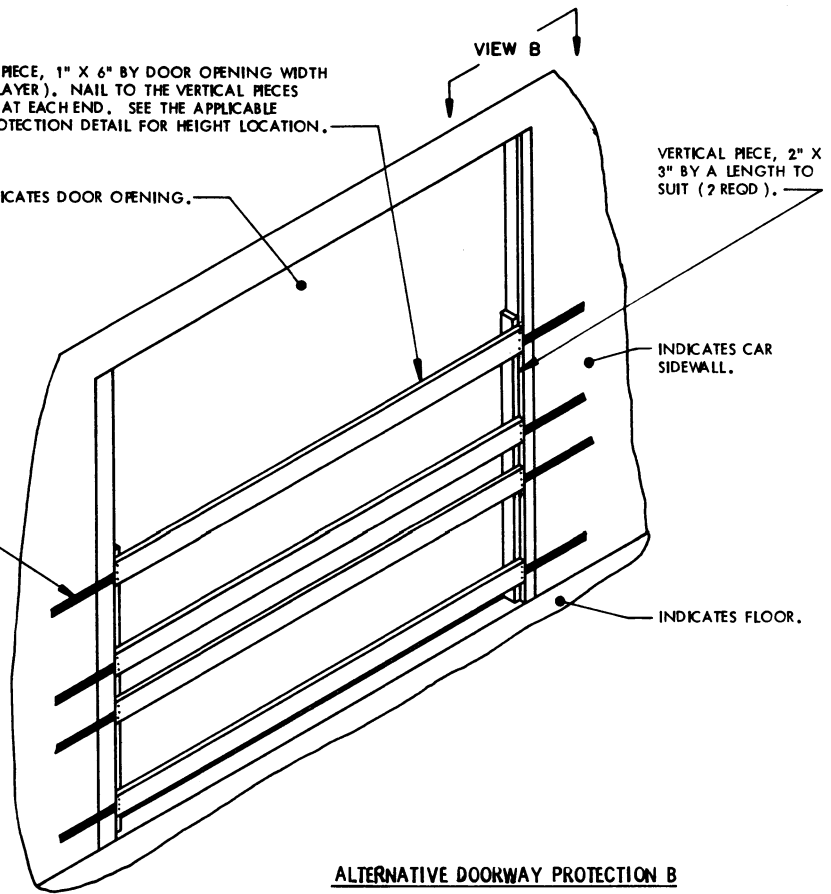
INDICATES LOCATION OF 7 (MIN) 4d NAILS PER STRAP.

DOOR POST.

INSIDE WALL.

VIEW B

THIS VIEW DEPICTS THE LOCATION OF THE NAILS FOR SECURING THE DOORWAY PROTECTION GATE STRAP. NOTE THAT THE STRAPS MUST BE APPLIED TO THE CAR SIDEWALL PRIOR TO POSITIONING THE ADJACENT UNITS.



ALTERNATIVE DOORWAY PROTECTION B

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE STEEL WITHOUT NAILING HOLES AND THE CAR SIDEWALLS ARE NAILABLE. THE VIEW SHOWN ABOVE IS FOR A TWO-LAYER LOAD.

DOOR SPANNER, 2" X 6" BY DOOR OPENING WIDTH PLUS 24" (1 REQD.). POSITION ABOVE THE LOAD AND NAIL THRU A FILLER BLOCK INTO A VERTICAL PIECE W/3-12d NAILS AT EACH JOINT. NAIL TO THE CAR SIDEWALL W/3-12d NAILS AT EACH END (OPTIONAL).

FILLER BLOCK, 1" X 4" X 9" (2 REQD.). NAIL TO A VERTICAL PIECE W/4-6d NAILS.

DOOR OPENING WIDTH

12"

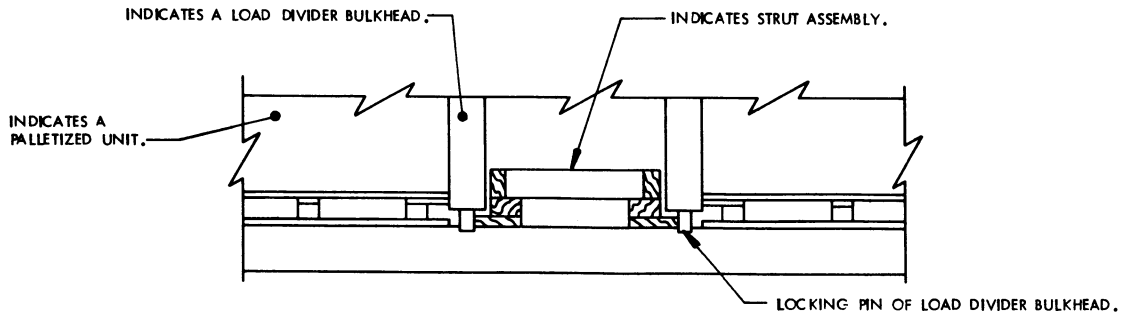
VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD.).

HORIZONTAL PIECE, 1" X 6" BY DOOR OPENING WIDTH (2 REQD PER LAYER). LOCATE AT HEIGHTS AS SPECIFIED BY THE APPLICABLE DOORWAY PROTECTION DETAIL ON PAGE 15. NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END.

SPREADER PIECE, 2" X 3" MATERIAL CUT SLIGHTLY LONGER THAN MEASURED DISTANCE (2 REQD.). DRIVE INTO POSITION TO PROVIDE FOR A WEDGE FIT. TOENAIL TO THE VERTICAL PIECES W/2-12d NAILS AT EACH END.

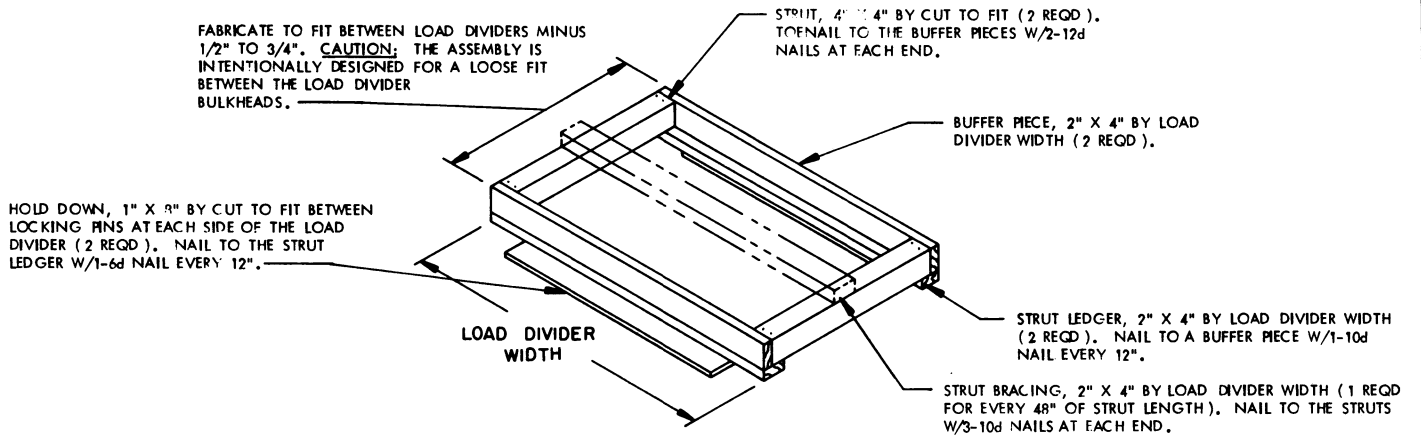
ALTERNATIVE DOORWAY PROTECTION C.

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT AVAILABLE. IF THE CAR HAS AVAILABLE SIDEWALLS, NAIL ON TYRE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION B" DETAIL ON PAGE 43 FOR GUIDANCE. NOTE THAT THE DOOR SPANNER IN THIS DETAIL MAY BE USED AS A GATE HOLD-DOWN PIECE FOR THE "ALTERNATIVE GATE HOLD-DOWN" METHOD SHOWN ON PAGE 41.



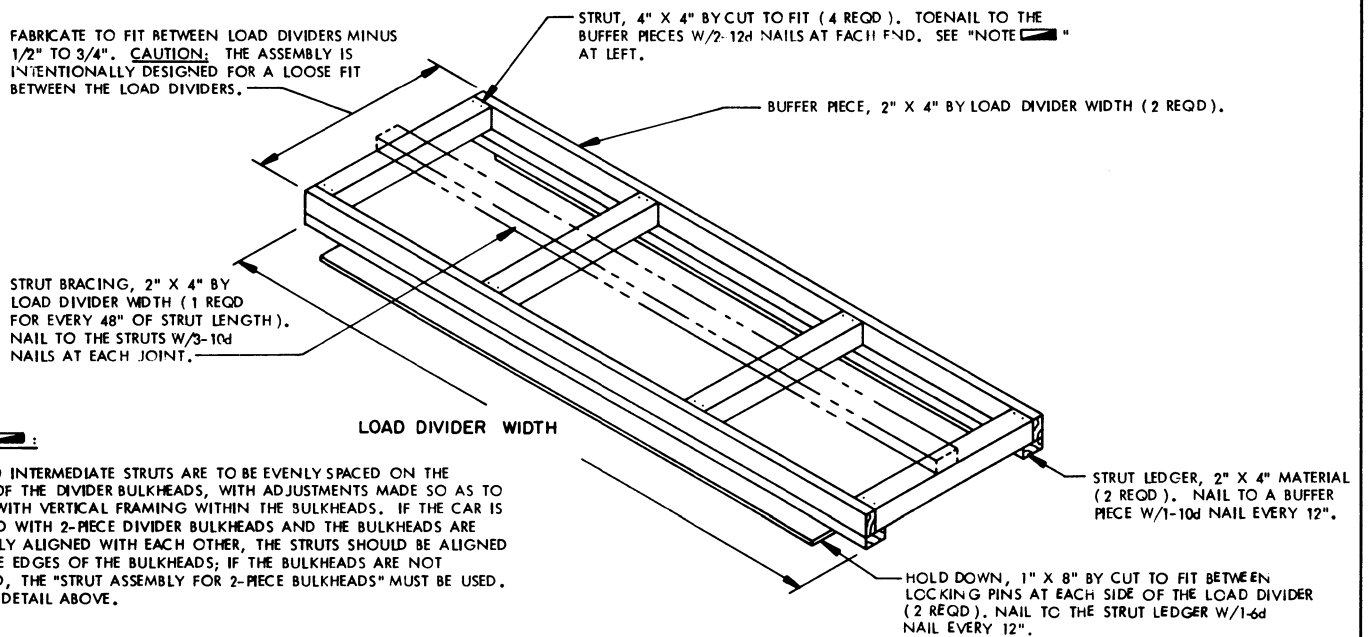
INSTALLATION OF STRUT ASSEMBLY

THIS VIEW SHOWS THE STRUT ASSEMBLY INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS. NOTE THE 1/2" TO 3/4" (TOTAL) SPACE INTENTIONALLY PROVIDED BETWEEN THE ASSEMBLY AND THE BULKHEADS.



STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF CLASS A OR CLASS B EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD. NOTE: TWO (2) ASSEMBLIES AS SHOWN ARE REQUIRED FOR A 2-PIECE BULKHEAD IF NOT LATERALLY ALIGNED. SEE "NOTE" BELOW.

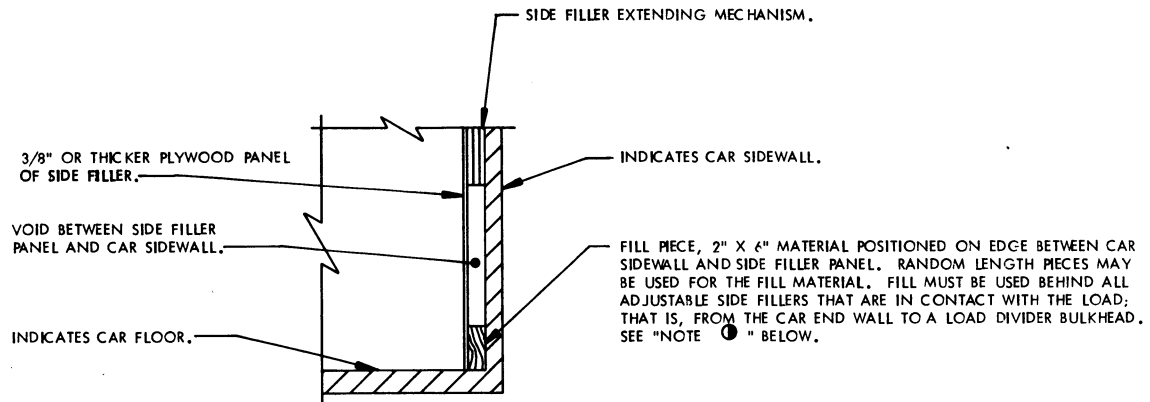


NOTE:

THE TWO INTERMEDIATE STRUTS ARE TO BE EVENLY SPACED ON THE WIDTH OF THE DIVIDER BULKHEADS, WITH ADJUSTMENTS MADE SO AS TO ALIGN WITH VERTICAL FRAMING WITHIN THE BULKHEADS. IF THE CAR IS EQUIPPED WITH 2-PIECE DIVIDER BULKHEADS AND THE BULKHEADS ARE LATERALLY ALIGNED WITH EACH OTHER, THE STRUTS SHOULD BE ALIGNED WITH THE EDGES OF THE BULKHEADS; IF THE BULKHEADS ARE NOT ALIGNED, THE "STRUT ASSEMBLY FOR 2-PIECE BULKHEADS" MUST BE USED. SEE THE DETAIL ABOVE.

STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF CLASS A OR CLASS B EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD.

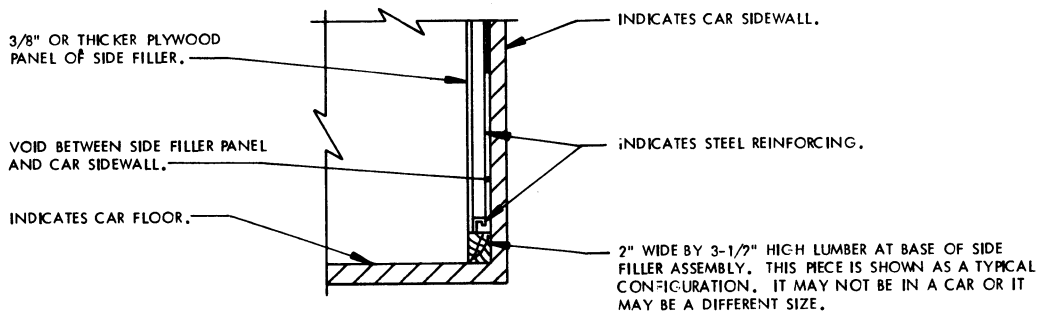


TYPICAL TYPE A

THIS VIEW SHOWS THE INSTALLATION OF A "FILL PIECE" IN A CAR EQUIPPED WITH A STANDARD ADJUSTABLE SIDE FILLER.

NOTE 1 :

NAILING OF "FILL PIECES" IS NOT REQUIRED EXCEPT THAT EACH "FILL PIECE" LOCATED NEAREST THE DOOR OPENINGS OF THE CAR WILL BE SECURED AGAINST LONGITUDINAL MOVEMENT WITH A NAIL DRIVEN THROUGH THE SIDE FILLER PANEL AND INTO THE "FILL PIECE".



TYPICAL TYPE B

THIS VIEW SHOWS A TYPICAL SECTION OF A CAR EQUIPPED WITH HEAVY DUTY, STEEL REINFORCED, ADJUSTABLE SIDE FILLERS. A "FILL PIECE", AS SHOWN IN THE "TYPICAL TYPE A" DETAIL ABOVE, IS NOT REQUIRED IN CARS SO EQUIPPED.