

APPROVED BY	
BUREAU OF EXPLOSIVES/ <i>A. F. Grassmuck</i> MILITARY ASSISTANT	
DATE	<i>11/18/69</i>
REVISION NO 1	
SIGNED	<i>A. F. Grassmuck</i>
DATE	<i>4/24/72</i>

# LOADING & BRACING (CL & LCL) IN BOX CARS OF CBU ITEMS PACKED IN THE CNU-100/E CONTAINER

## INDEX

ITEM	PAGE (S)
GENERAL NOTES, AND MATERIAL SPECIFICATIONS-----	2
BUNDLE DETAIL AND HANDLING PROCEDURES-----	3
LOADS FOR CONVENTIONAL BOX CARS:	
168-UNIT LOAD (BUNDLED) IN A 50'-6" LONG BY 9'-2" WIDE CAR-----	4,5
TYPICAL LCL (3-UNIT LOAD) IN A 9'-2" WIDE CAR-----	6
TYPICAL LCL (11-UNIT LOAD)(BUNDLED) IN A 9'-2" WIDE CAR-----	7
PARTIAL LAYER BRACING-----	8,9
TYPICAL LCL (8-UNIT LOAD)(BUNDLED) IN A 9'-2" WIDE CAR-----	10
LOADS FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES HAVING ADJUSTABLE AND/OR FIXED WALL MEMBERS:	
TYPICAL LCL (8-UNIT LOAD)(BUNDLED) IN A 9'-2" WIDE CAR-----	11
160-UNIT LOAD (BUNDLED) IN A 50'-6" LONG BY 9'-2" WIDE CAR-----	12,13
TYPICAL LCL (3-UNIT LOAD) IN A 9'-2" WIDE CAR-----	14
DETAILS-----	15-18
LOAD DIVIDER DETAILS-----	19

⊙ INCLUDES CONVENTIONAL BOX CARS, BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES OF VARIOUS DESIGN AND MANUFACTURE, AND CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDERS.

DRAFTSMAN <b>DLP</b>	PROJ ENG <i>WWD</i>	APSA <i>BT</i>	SUBMITTED <i>W. S. Harding Col.</i>
CHECKER <i>RA/GBF</i>	ANC ARMO CLR <i>John Rynd</i>		COMMANDING OFFICER, SAVANNAH ARMY DEPOT
REVISIONS			EXAMINED AND APPROVED <i>Patrick Hall</i>
1	MAR 72	<i>WWD</i>	ARMUNITION PROCUREMENT & SUPPLY AGENCY
			APPROVED BY ORDER OF COMMANDING GENERAL U. S. ARMY MATERIEL COMMAND
			<i>Patrick Hall</i>
			U. S. ARMY MATERIEL COMMAND
			OCTOBER 1969
			CLASS    DIVISION    DRAWING    FILE
			19      48      7053    SP5K2

DO NOT SCALE

## GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMCR 740-13, AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED ARE APPLICABLE TO CBU ITEMS WHEN PACKAGED IN THE CNU-100/E CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER MEANS THE CNU-100/E CONTAINER WITH CONTENTS. **CAUTION:** CONTAINERS MUST NOT BE STACKED MORE THAN FOUR (4) CONTAINERS HIGH.
- C. FOR DETAILS OF THE CONTAINER SEE DRAWING NO. 66F10067.
- CONTAINER DIMENSIONS ---- 85-1/2" LONG X 14" WIDE X 16-5/8" HIGH.  
GROSS WEIGHT (MAX) ----- 328 POUNDS (APPROX).  
TARE WEIGHT ----- 62 POUNDS (APPROX).
- D. THIS ITEM IS A DOT CLASS "A" EXPLOSIVE (DOT SHIPPING NOMENCLATURE "EXPLOSIVE BOMB") AND WILL BE SHIPPED UNDER THE PROVISIONS OF DOT SPECIAL PERMIT NO. 5047.
- E. THE LOADS AS SHOWN ARE BASED ON CONVENTIONAL BOX CARS, OR ARE BASED ON BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES HAVING ADJUSTABLE AND/OR FIXED WALL MEMBERS. PROVISIONS ARE ALSO INCLUDED FOR SHIPMENT IN CARS EQUIPPED WITH LOAD DIVIDERS. SEE PAGE 19. **NOTE:** ALL METAL CARS CAN BE USED FOR LOADS DELINEATED ON PAGES 4 THROUGH 7 PROVIDING THE CARS BEING USED HAVE NAILABLE FLOORS. ALL METAL CARS CANNOT BE USED FOR LCL LOADS OR FOR LOADS REQUIRING A K-BRACE TYPE OF PARTIAL LAYER BLOCKING AS DEPICTED ON PAGES 8 THROUGH 9.
- F. BOX CARS HAVE BEEN SHOWN WHICH HAVE 8'-0" WIDE THROUGH DOORS OF THE CONVENTIONAL SLIDING TYPE. NARROWER DOORS MAY BE USED; HOWEVER, TO FACILITATE LOADING AND UNLOADING OF THE SPECIFIED CONTAINERS, IT IS RECOMMENDED THAT CARS BE USED WHICH HAVE 8'-0" MINIMUM WIDTH DOORS.
- G. THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE TO CARS WHICH ARE EQUIPPED WITH PLUG DOORS. THE "DOORWAY AREA" WITHIN A CAR IS DEFINED AS THE CARGO SPACE THAT IS ADJACENT TO A CONVENTIONAL TYPE AND/OR A PLUG TYPE DOOR. THE LENGTH OF A "DOORWAY AREA" CAN BE AS MUCH AS 24 FEET IN SOME CARS THAT ARE EQUIPPED WITH STAGGERED DOORS. **CAUTION:** DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, WHETHER AUXILIARY OR MAIN, EXCEPT TO A NAILING STRIP IF A DOOR IS SO EQUIPPED, FOR SECURING SUCH ITEMS AS GATE HOLD DOWNS OR DOORWAY SPANNER DUNNAGE. 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 THROUGH THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.
- H. THE OUTLOADING PROCEDURES SPECIFIED ON PAGES 4 THROUGH 9 ARE FOR CONVENTIONAL TYPE BOX CARS OF VARIOUS LENGTH AND WIDTH COMBINATIONS. WIDER CARS THAN SHOWN CAN BE USED.

(CONTINUED AT RIGHT)

## REVISIONS

REVISION NO. 1, DATED MARCH 1972, CONSISTS OF:

1. CONTAINER DIMENSIONAL CHANGES.
2. BUNDLING PROCEDURES ADDED.
3. ESTABLISHED DIRECTION OF LOADING.

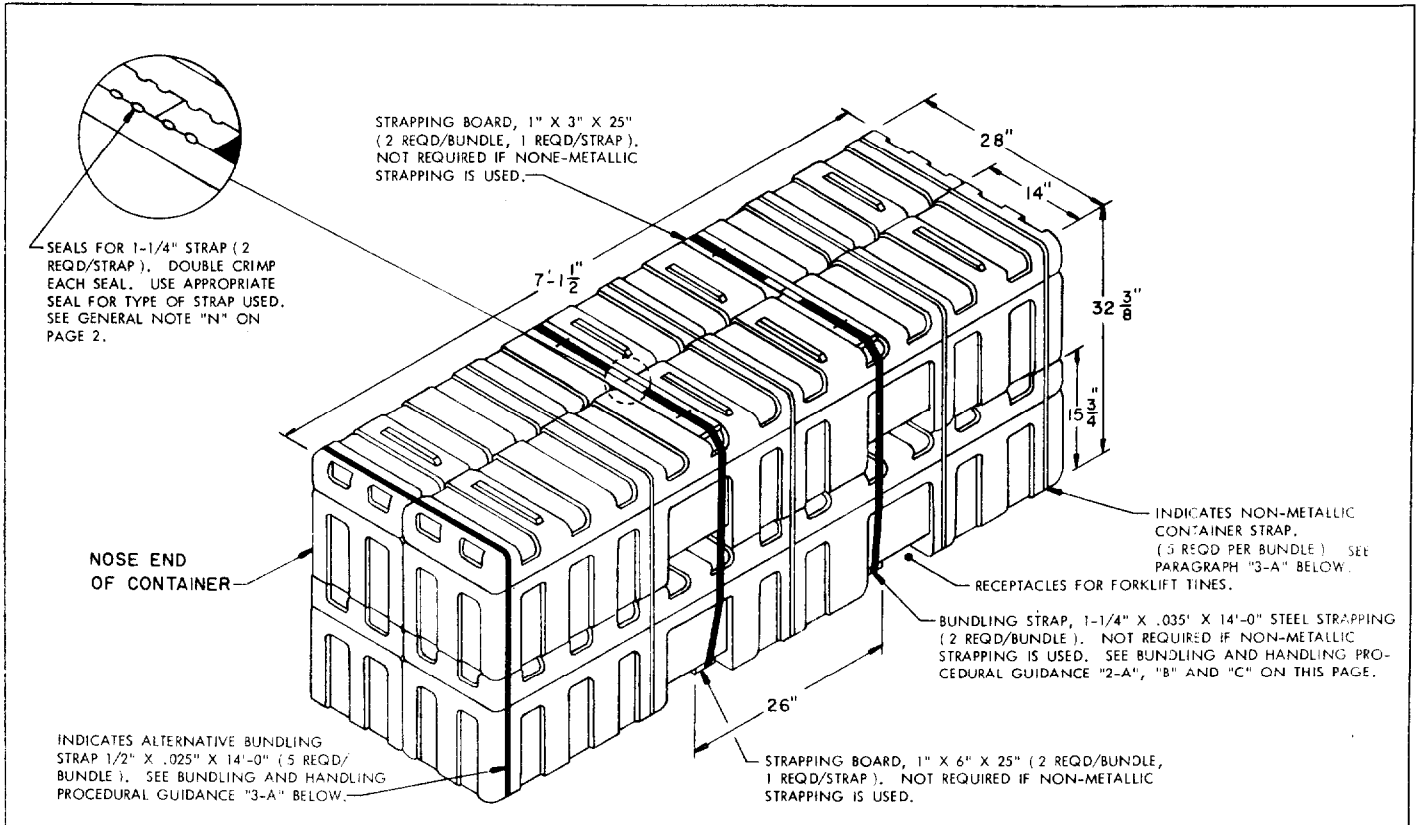
## MATERIAL SPECIFICATIONS

- LUMBER** ----- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- PLYWOOD** ----- : GROUP B OR C, GRADE C-D (EXTERIOR); \*  
FED SPEC NN-P-530. FSN 5530-051-1198.
- NAILS** ----- : COMMON, CEMENT COATED OR CHEMICALLY ETCHED;  
REF: FED SPEC FF-N-105.  
ALT: ANNULAR-RING TYPE NAIL OF SAME SIZE.
- FASTENERS, CORRUGATED** : STEEL, FED SPEC FF-F-133. FSN 5315-597-9767.
- STRAPPING, STEEL** ----- : TYPE I OR IV, CLASS A OR B, FED SPEC QQ-S-781.
- NON METALIC STRAPPING** : TYPE II OR III, FED SPEC PPP-S-760.
- STRAP SEAL;  
STRAP STAPLE** ----- : COMMERCIAL GRADE.
- ANTI-CHAFING MATERIAL** : NEUTRAL BARRIER MATERIAL, MIL-B-121 (OR EQUAL);  
OR FED SPEC LLL-H-35 (HARD BOARD).

\* IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER EXTERIOR GRADE MAY BE SUBSTITUTED.

## (GENERAL NOTES CONTINUED)

- J. THE OUTLOADING PROCEDURES SPECIFIED ON PAGES 10 THROUGH 12 ARE FOR BOX CARS OF VARIOUS LENGTH AND WIDTH COMBINATIONS AND WHICH ARE EQUIPPED WITH MECHANICAL BRACING DEVICES. WIDER CARS CAN BE USED. THE PROCEDURES 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. A CROSS MEMBER, WHEN USED AS SPECIFIED BY ANY ONE OF THE OUTLOADING METHODS CONTAINED, WILL NOT BE RELIED UPON TO RETAIN MORE LADING WEIGHT ON EITHER SIDE THAN AS SHOWN FOR THE SPECIFIC OUTLOADING METHOD BEING USED. 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 PERMITS. 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 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 DOORWAY MEMBERS, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.
3. AS REQUIRED, ANTI-CHAFING MATERIAL OF SUITABLE THICKNESS MUST BE USED BETWEEN CONTAINERS AND CAR SIDE WALLS TO PREVENT CONTACT OF THE CONTAINERS WITH ANY EXPOSED METAL SURFACE. THE ANTI-CHAFING MATERIAL MUST BE SECURED TO PREVENT DISPLACEMENT DURING TRANSPORT.
4. IF A CAR HAS A "BOWED END", RATHER THAN SQUARING OFF THE END BY INSTALLING DUNNAGE, ADDITIONAL CROSS MEMBERS CAN BE INSTALLED NEAR THE END OF THE CAR TO PROVIDE A "SQUARED" END. THESE CROSS MEMBERS SHOULD BE INSTALLED IN THE SAME QUANTITY AND AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS LOAD BLOCKING MEMBERS.
- K. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY TO BE SHIPPED, AND COMBINATIONS OF THE OUTLOADING PROCEDURES SPECIFIED FOR THE VARIOUS LOADS SHOWN MAY BE USED AS REQUIRED. HOWEVER, THE APPROVED METHODS SPECIFIED FOR FULL OR PARTIAL CARLOADS MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE DESIGNATED ITEMS.
- L. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN BOX CARS WHICH ARE PARTIALLY LOADED WITH ITEMS PACKED IN THE CNU-100/E CONTAINER, 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.
- M. THE OUTLOADING PROCEDURES SPECIFIED CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED CONTAINERS WHEN THEY ARE LOADED WITH EMPTY DISPENSERS OR LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEMS DESIGNATED WITHIN THE DRAWING TITLE.
- N. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT AS SHOWN, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED TO SEAL THE JOINT. **CAUTION:** EXERCISE CARE DURING TENSIONING TO PREVENT DAMAGE TO CONTAINERS. SEE "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" ON PAGE 3.
- O. 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 FOR THE NAILING OF THE APPLICABLE DUNNAGE PIECES. IF A NAIL SIZE IS NOT SPECIFIED, 30d NAILS SHOULD BE USED.
- P. EXCEPT FOR PLYWOOD, DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 6" MATERIAL IS ACTUALLY 1-5/8" THICK BY 5-5/8" WIDE AND 4" X 4" MATERIAL IS ACTUALLY 3-5/8" THICK BY 3-5/8" WIDE.
- Q. **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 A SIDE WALL OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. 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.
- R. 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 VIEWS FOR CLARITY PURPOSES.
- S. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" ON PAGE 3 AND TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO DEPICTED OUTLOADING METHODS.
- T. **NOTICE:** SEE "SPECIAL REQUIREMENTS FOR LOAD-DIVIDER-EQUIPPED CARS" ON PAGE 19 FOR ADDITIONAL INFORMATION PERTAINING THERETO.



**TYPICAL BUNDLE DETAIL**

**BUNDLING AND HANDLING  
PROCEDURAL GUIDANCE**

(BUNDLING AND HANDLING PROCEDURAL GUIDANCE CONTINUED)

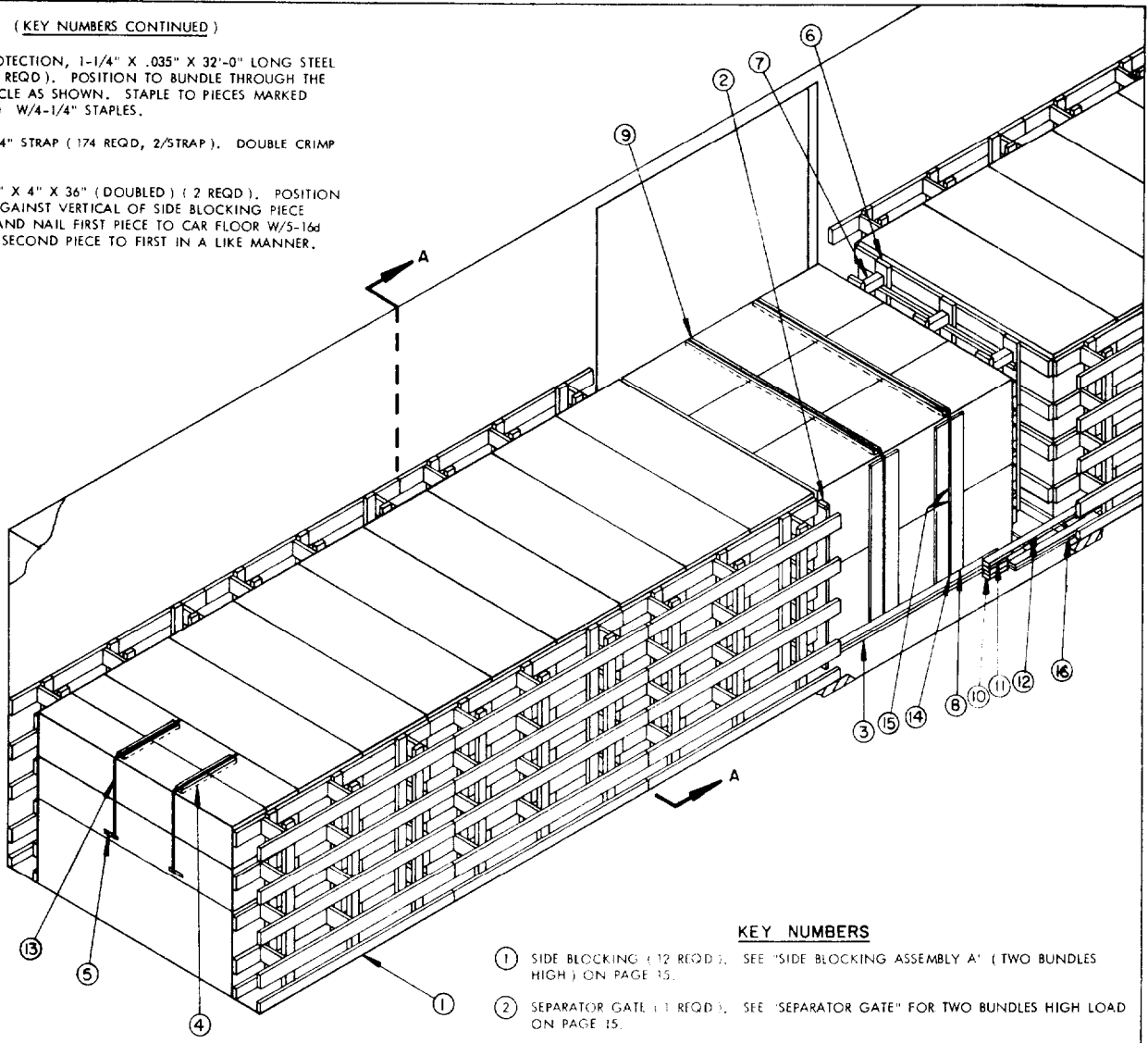
1. BUNDLING CONTAINERS.
  - A. THE BOTTOM CONTAINERS WILL BE ALIGNED WITH THE ADJACENT CONTAINER.
  - B. AN UPPER CONTAINER WILL BE FULLY SEATED ON THE CONTAINER STACKING LOCATORS OF THE NEXT LOWER CONTAINER AND AS NEARLY AS POSSIBLE IN VERTICAL ALIGNMENT.
2. INSTALLATION OF 1-1/4" X .035" STEEL BUNDLING STRAP. SEE GENERAL NOTES "S" AND "N" ON PAGE 2. NOT REQUIRED IF BUNDLED IN ACCORDANCE WITH PARAGRAPH 3A.
  - A. THE BUNDLING STRAP SHOULD BE POSITIONED AROUND THE CONTAINERS AND STRAPPING BOARD AS SHOWN, AND PLACED SO THAT THE STRAPPING LAYS FLAT AND STRAIGHT WITH THE BODY SURFACES OF THE CONTAINERS; VERTICAL ALONG THE SIDES AND STRAIGHT ACROSS THE TOP AND BOTTOMS OF THE BUNDLE.
  - B. PLACE THE STRAPPING BOARDS (1" X 3" X 25") UNDER THE STRAPPING ACROSS THE TOP AND THE (1" X 6" X 25") ACROSS THE BOTTOM OF THE BUNDLE AS SHOWN ABOVE, TO PREVENT THE STRAPPING FROM DAMAGING THE CONTAINER WHEN TENSIONED.
  - C. STRAPPING WILL BE FIRMLY TENSIONED AND EACH END OVER END LAP JOINT WILL BE SEALED WITH TWO (2) DOUBLE CRIMPED STRAP SEALS AS SHOWN. THE LAP JOINT WILL BE MADE ABOVE THE TOP OF THE BUNDLE SO THAT THE SEALS WILL NOT BE IN CONTACT WITH THE CONTAINER. DURING TENSIONING CARE MUST BE EXERCISED TO INSURE THAT THE CONTAINERS ARE NOT DAMAGED. EXCESS STRAPPING (STRAP ENDS) SHALL BE CUT OFF OR BROKEN NEAR THE JOINT SEALS.
3. INSTALLATION OF NON-METALLIC BUNDLING STRAP AND/OR 1/2" X .025" ALTERNATIVE STEEL BUNDLING STRAP.
  - A. BUNDLING STRAP SHOULD BE PLACED DIRECTLY OVER THE CONTAINER STRAPS AT ALL FIVE (5) PLACES. CAUTION: CARE MUST BE TAKEN NOT TO TENSION SO THAT IT CAUSES DAMAGE TO THE CONTAINER OR CONTAINER STRAPPING.

4. BUNDLE HANDLING.
  - A. CAUTION: EXTREME CARE MUST BE EXERCISED DURING OUTLOADING OPERATIONS TO PREVENT DAMAGE TO THE CONTAINER.
    1. APPROVED MATERIAL HANDLING EQUIPMENT (FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS, SPREADER BARS, ETC.) IS SPECIFIED ELSEWHERE, OTHER THAN HEREIN.
    2. PRECAUTIONARY HANDLING TECHNIQUES NORMALLY EMPLOYED OR AS SPECIFIED FOR THE TYPE OF COMMODITY INVOLVED WILL BE OBSERVED.
  - B. ONLY APPROVED AND APPROPRIATELY SIZED MATERIAL HANDLING EQUIPMENT WILL BE USED FOR HANDLING THE DEPICTED CONTAINER.
  - C. IF HANDLING IS ACCOMPLISHED WITH A FORKLIFT, CONTAINERS SHOULD BE HANDLED FROM A SIDE POSITION. CAUTION: THE USUALLY APPLIED END HANDLING IS NOT PERMITTED.

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( KEY NUMBERS CONTINUED )

- 14 DOORWAY PROTECTION, 1-1/4" X .035" X 32'-0" LONG STEEL STRAPPING ( 2 REQD ). POSITION TO BUNDLE THROUGH THE FORK RECEPTACLE AS SHOWN. STAPLE TO PIECES MARKED 8 AND 7 W/4-1/4" STAPLES.
- 15 SEAL FOR 1-1/4" STRAP ( 174 REQD, 2/STRAP ). DOUBLE CRIMP EACH SEAL.
- 16 STOP PIECE, 2" X 4" X 36" ( DOUBLED ) ( 2 REQD ). POSITION AS SHOWN, AGAINST VERTICAL OF SIDE BLOCKING PIECE MARKED 1 AND NAIL FIRST PIECE TO CAR FLOOR W/5-16d NAILS. NAIL SECOND PIECE TO FIRST IN A LIKE MANNER.

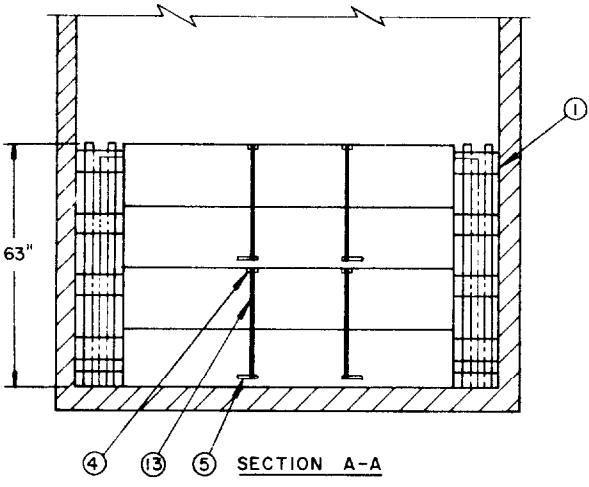


ISOMETRIC VIEW

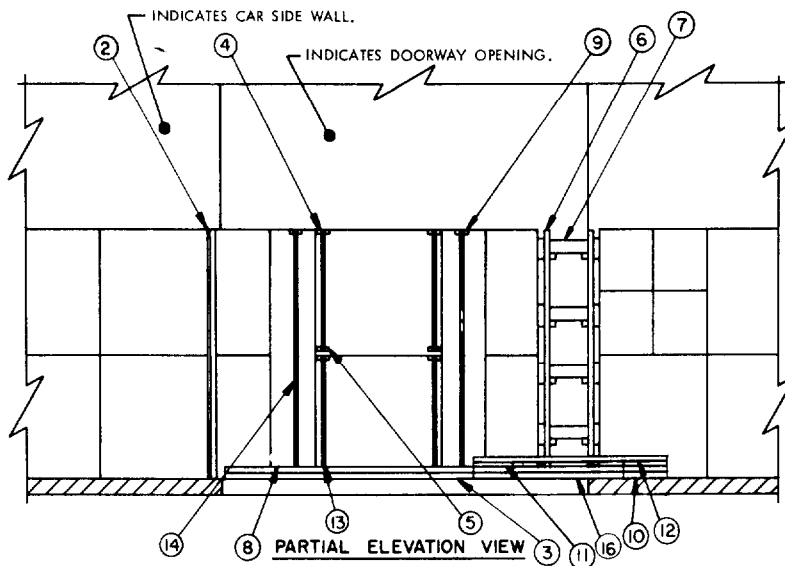
KEY NUMBERS

- 1 SIDE BLOCKING ( 12 REQD ). SEE "SIDE BLOCKING ASSEMBLY A" ( TWO BUNDLES HIGH ) ON PAGE 15.
- 2 SEPARATOR GATE ( 1 REQD ). SEE "SEPARATOR GATE" FOR TWO BUNDLES HIGH LOAD ON PAGE 15.
- 3 DOORWAY PROTECTION, 2" X 6" X 6'-0" ( DOUBLED ) ( 2 REQD ). POSITION AS SHOWN AND NAIL FIRST PIECE TO CAR FLOOR W/1-16d NAIL EVERY 4". NAIL SECOND PIECE TO FIRST PIECE IN A LIKE MANNER. SEE GENERAL NOTE "Q" ON PAGE 2.
- 4 STRAPPING BOARD, 1" X 3" X 25" ( 84 REQD, 2/BUNDLE ). SEE "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" AND "TYPICAL BUNDLE DETAIL" ON PAGE 3.
- 5 STRAPPING BOARD, 1" X 6" X 25" ( 84 REQD, 2/BUNDLE ). SEE "TYPICAL BUNDLE DETAIL" ON PAGE 3.
- 6 CENTER GATE ( 2 REQD ). SEE "CENTER GATE" ON PAGE 18 AND SPECIAL NOTE 3 ON PAGE 5.
- 7 STRUT, 4" X 4" BY CUT TO FIT ( 12 REQD ). POSITION TO CENTER ON AND TO NAIL TO THE VERTICAL PIECES OF CENTER GATES PIECE MARKED 6 W/2-12d NAILS AT EACH END. SEE THE "STRUT BRACING" DETAIL ON PAGE 17.
- 8 PLYWOOD VERTICAL STRAPPING BOARD, 1/2" THICK X 12" X 62-1/4" ( 4 REQD ). CUT A 2" WIDE BY 2-3/4" HIGH NOTCH AT CENTER OF BOTTOM EDGE OF BOARD FOR STRAPPING. POSITION UNDER DOORWAY PROTECTION STRAP PIECE MARKED 13.
- 9 DOORWAY PROTECTION, STRAPPING BOARD, 1" X 3" X 7'-1" ( 2 REQD ). POSITION UNDER DOORWAY PROTECTION STRAP PIECE MARKED 14.
- 10 GATE HOLD-DOWN SUPPORT, 2" X 4" X 12" ( DOUBLED ) ( 4 REQD ). POSITION AS SHOWN AND NAIL FIRST PIECE TO CAR FLOOR W/3-16d NAILS. NAIL SECOND PIECE TO FIRST PIECE IN A LIKE MANNER.
- 11 RISER PIECE, 1" X 4" X 12" ( 4 REQD ). POSITION AS SHOWN AND NAIL TO PIECE MARKED 10 W/4-6d NAILS.
- 12 GATE HOLD-DOWN STOP PIECE, 2" X 4" BY CUT TO FIT ( 2 REQD ). POSITION ON AND NAIL TO PIECE MARKED 11 W/3-10d NAILS AT EACH END. SEE NOTE "C" ON PAGE 15.
- 13 BUNDLING STRAP, 1-1/4" X .035" X 14'-0" LONG STEEL STRAPPING ( 84 REQD, 2/BUNDLE ). SEE "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" ON PAGE 3.

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SECTION A-A



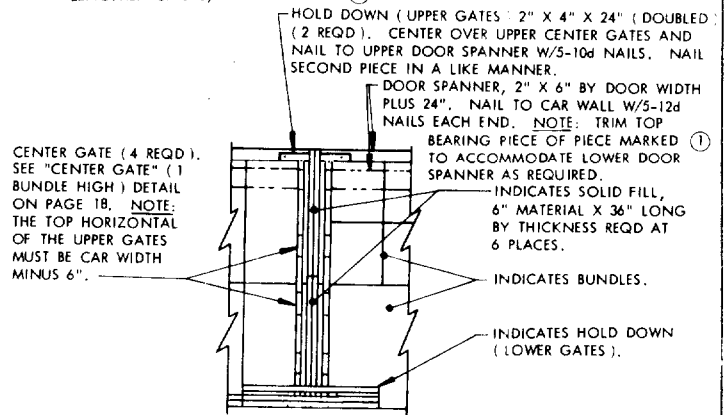
( SPECIAL NOTES CONTINUED )

**SPECIAL NOTES:**

1. A 168-UNIT ( BUNDLED ) LOAD IS SHOWN IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS.
2. NARROWER OR WIDER CARS MAY BE USED; HOWEVER, THE WIDTH OF THE SIDE BLOCKING PIECE MARKED ① MUST BE ADJUSTED TO SUIT.
3. A CAR WITH WIDER DOORS, STAGGERED DOORS, AND/OR PLUG DOORS CAN BE USED FOR SHIPMENT OF THE ITEM. SEE SPECIAL NOTE 6.
4. IF THE DELINEATED OUTLOADING METHOD IS USED FOR A SHIPMENT OF A LOAD WHICH CONTAINS LESS CONTAINERS THAN SHOWN, AND THE QUANTITY CANNOT BE SATISFIED BY OMITTING A COMPLETE STACK OR LAYER OF BUNDLES, A "FILLER ASSEMBLY", AS SHOWN ON PAGE 17, MUST BE SUBSTITUTED IN THE BUNDLES FOR EACH OMITTED CONTAINER. BUNDLES WITH OMITTED CONTAINERS MAY BE POSITIONED AT ANY LOCATION IN THE TOP BUNDLED LAYER OF THE LOAD. NOTE: ONLY THE CONTAINERS IN THE UPPER PORTION OF A BUNDLE MAY BE OMITTED. SEE PAGE 7 FOR A TYPICAL "FILLER ASSEMBLY" INSTALLATION. IF THE QUANTITY TO BE SHIPPED CAN NOT READILY BE ACHIEVED BY APPLYING THE CRITERIA JUST CITED, IT WILL BE NECESSARY TO INSTALL A K-BRACE ASSEMBLY TO RETAIN A PARTIAL LAYER. SEE THE "PARTIAL LAYER BRACING" PROCEDURES ON PAGE 8 AND THE "K-BRACE ASSEMBLY" DETAIL ON PAGE 9 FOR A TYPICAL INSTALLATION.
5. FOR A SHIPMENT OF 136 CONTAINER UNITS OR LESS, THE DEPICTED PROCEDURES CAN ALSO BE USED FOR A 40'-6" LONG BY 9'-2" WIDE CAR WHICH IS EQUIPPED WITH 8'-0" MINIMUM WIDTH DOOR OPENING.

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6. A CAR EQUIPPED WITH WIDER DOOR OPENINGS IS PREFERRED TO FACILITATE UNLOADING OPERATIONS FROM EITHER SIDE OF A CAR, HOWEVER BUNDLED UNITS IN THE DOORWAY AREA MUST BE POSITIONED LONGITUDINALLY AND STRAPPED AS SHOWN. SEE "PARTIAL ELEVATION VIEW" ABOVE.
7. IF THE VOID AT THE CENTER OF THE CAR IS LESS THAN 12', SOLID FILL MUST BE INSTALLED IN LIEU OF STRUT PIECES MARKED ⑦. SEE "TYPICAL SOLID FILL APPLICATION" DETAIL BELOW.
8. IF THE CAR OFFERED FOR SHIPMENT IS EQUIPPED WITH LOAD DIVIDERS, THE LONGITUDINAL LADING, AND PIECES MARKED ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, ⑪, ⑫, AND ⑬ MAY BE OMITTED FROM THE LOAD. HOWEVER, THE REQUIREMENTS FOR LOAD-DIVIDER-EQUIPPED CARS AND THE BLOCKING PROCEDURES SPECIFIED ON PAGE 19 WILL APPLY.
9. IF ADDITIONAL SPACE IS REQUIRED TO ACCOMPLISH BLOCKING AND BRACING AT THE CENTER OF THE CAR, OMIT ONE (1) LATERAL STACK, USE TWO (2) ASSEMBLIES OF "SIDE BLOCKING B" IN PLACE OF "SIDE BLOCKING A" PIECE MARKED ①. SEE PAGE 15. LENGTHEN PIECE MARKED ⑫ TO SUIT, AND LENGTHEN STRUTS, PIECES MARKED ⑦ TO FIT.



**TYPICAL SOLID FILL APPLICATION**

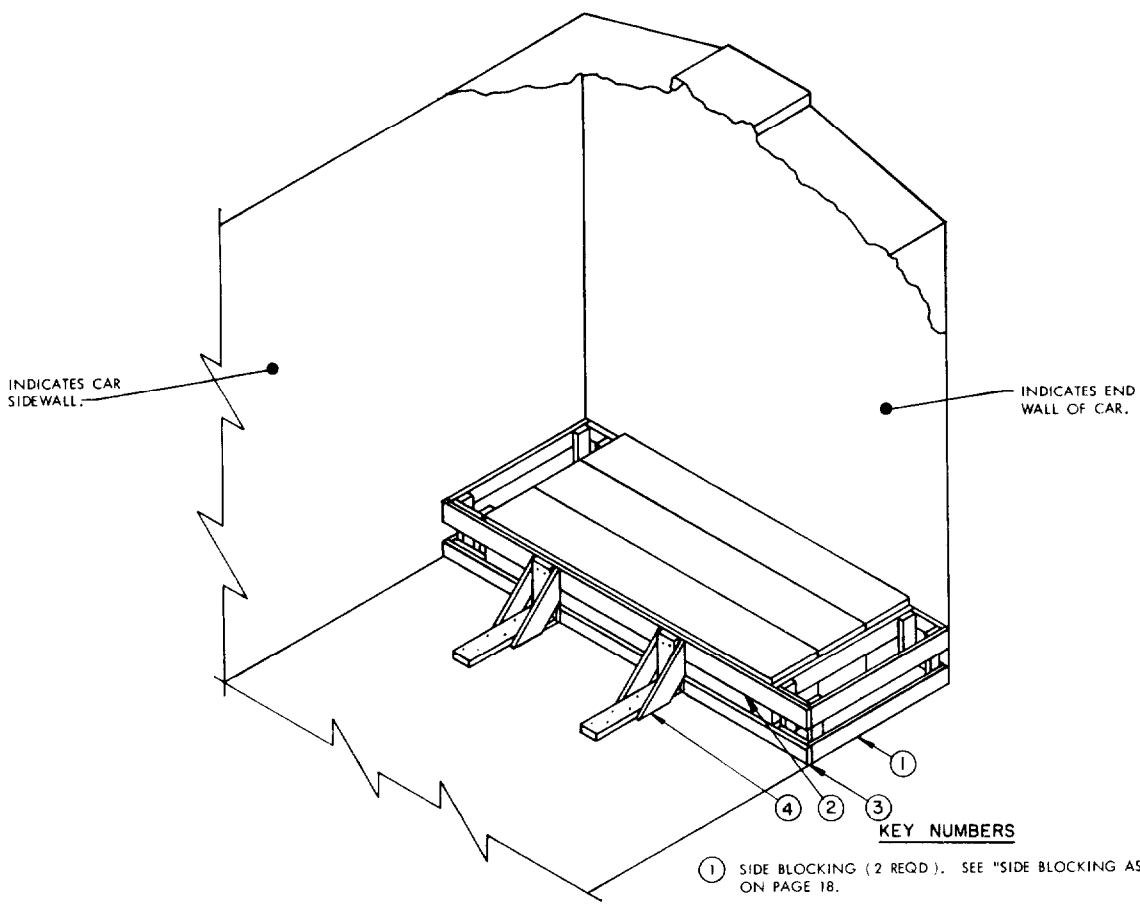
( ELEVATION VIEW )

**NOTE:** LOWER GATES MUST BE POSITIONED AND BLOCKED WITH SOLID FILL AND NAILED BEFORE UPPER GATES AND FILL ARE INSTALLED. NAIL FIRST PIECE OF FILL TO GATE W/1-10d NAIL EVERY 8". WEDGE FIT LAST FILL PIECE AND TOENAIL W/2-12d NAILS.

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
CONTAINER ( W/CBU ITEM )	168	55,104 LBS
DUNNAGE		3,831 LBS
<b>TOTAL WEIGHT</b>		<b>58,935 LBS</b>

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 3"	189	50
1" X 6"	175	88
2" X 2"	40	13
2" X 4"	587	392
2" X 6"	844	844
4" X 4"	12	16
NAILS	NO. REQD	POUNDS
6d ( 2" )	32	1/4
10d ( 3" )	1,950	30
12d ( 3-1/4" )	48	3/4
16d ( 3-1/2" )	118	2-3/4
PLYWOOD, 1/2"	64 SQ FT REQD	88 LBS
STEEL STRAPPING, 1-1/4" X .035"	1240' REQD	177 LBS
SEAL FOR 1-1/4" STRAPPING	20 REQD	1 LB
STAPLE FOR 1-1/4" STRAPPING	192 REQD	1-1/2 LBS



**KEY NUMBERS**

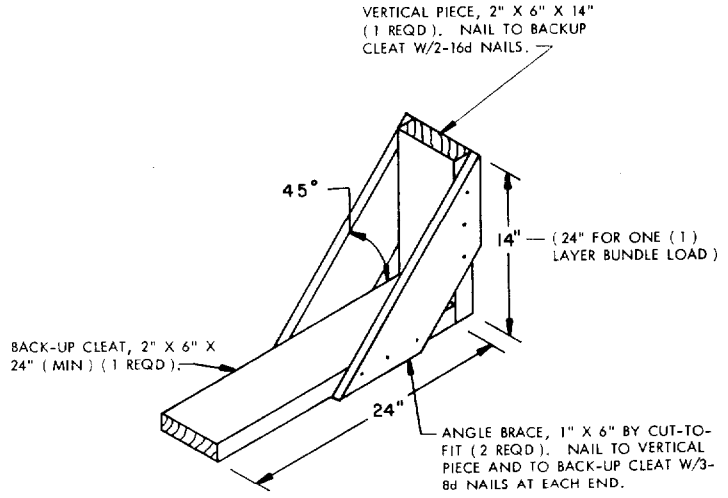
- ① SIDE BLOCKING (2 REQD.). SEE "SIDE BLOCKING ASSEMBLY C" ON PAGE 18.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH MINUS 1/2" (1 REQD.). POSITION AS SHOWN.
- ③ LOAD BEARING PIECE, 2" X 4" BY CAR WIDTH MINUS 1/2" (1 REQD.). POSITION AS SHOWN.
- ④ LCL BRACE (2 REQD.). SEE "LCL BRACE" DETAIL BELOW. POSITION AS SHOWN AND NAIL TO THE CAR FLOOR W/7-16d NAILS AND TO LOAD BEARING PIECES MARKED ② AND ③ W/2-10d NAILS AT EACH JOINT.

**SPECIAL NOTES:**

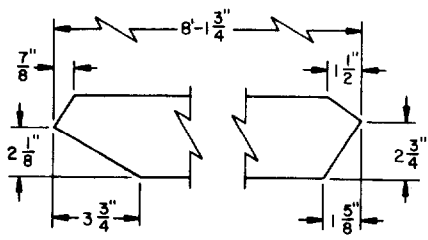
- 1. A 9'-2" WIDE CONVENTIONAL BOX CAR WITH NAILABLE FLOORS IS SHOWN; HOWEVER, ANY WIDTH CAR CAN BE USED BY CHANGING THE THICKNESS OF THE SIDE BLOCKING PIECES MARKED ①, TO SUIT THE CAR BEING LOADED.
- 2. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL SUPPORT 2,000 POUNDS. AT LEAST TWO (2) BRACES MUST BE USED. ADDITIONAL BRACES MAY BE APPLIED AS NECESSARY.
- 3. THE PROCEDURES DEPICTED MAY BE USED FOR THE SHIPMENT OF A GREATER OR LESSER QUANTITY OF CONTAINERS BY ADJUSTING THE LENGTH OF THE SIDE BLOCKING PIECE MARKED ①. FOR SHIPMENT OF A ONE (1) LAYER BUNDLED LCL LOAD, THE VERTICAL PIECE OF THE "LCL BRACE" MUST BE INCREASED TO 24". SEE THE OUTLOADING PROCEDURES DEPICTED ON PAGE 10.

**ISOMETRIC VIEW**

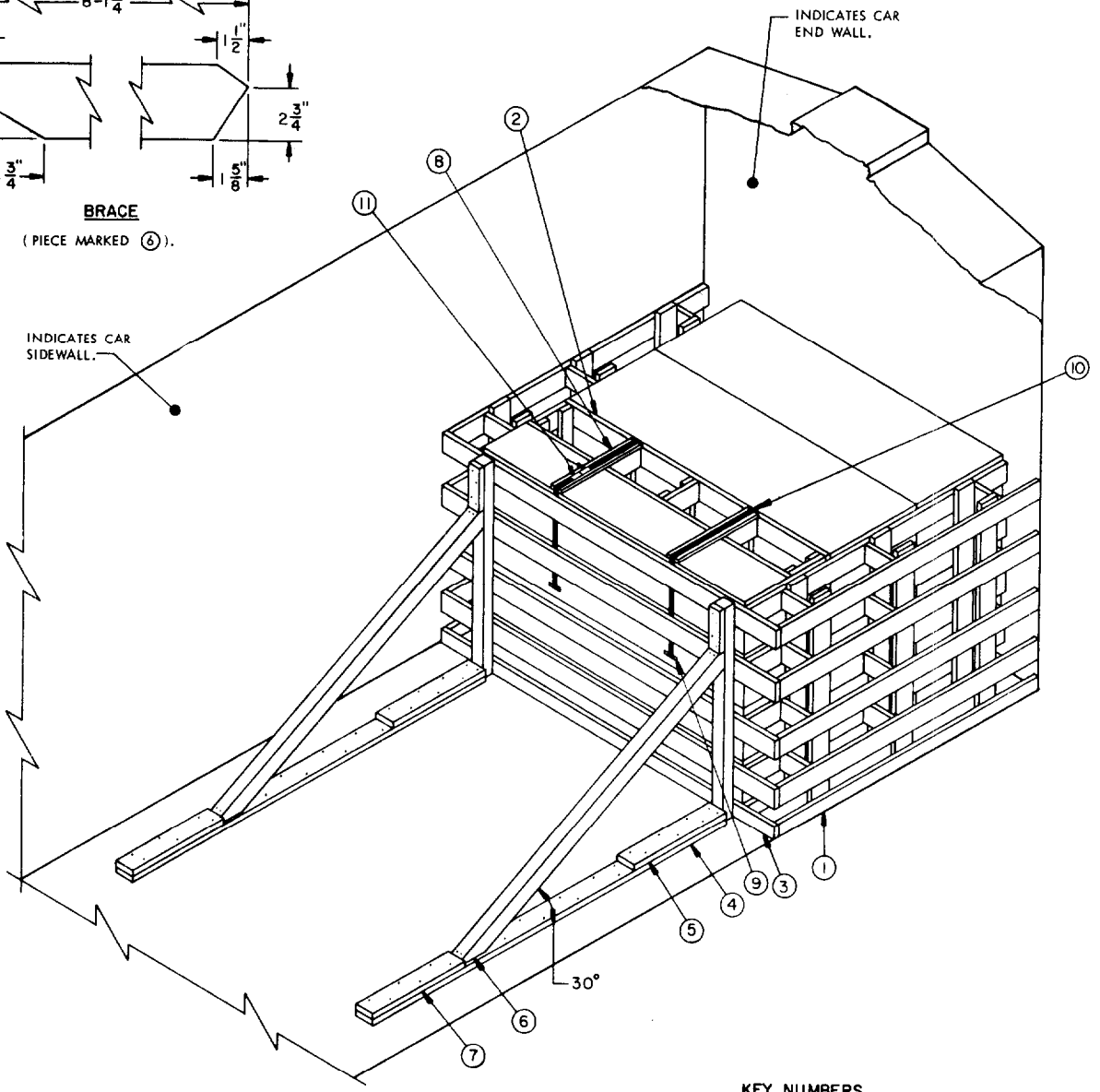
VERTICAL PIECE, 2" X 6" X 14" (1 REQD.). NAIL TO BACKUP CLEAT W/2-16d NAILS.



**LCL BRACE**  
(SEE SPECIAL NOTES 2 AND 3 AT LEFT).



**BRACE**  
(PIECE MARKED ⑥).



**ISOMETRIC VIEW**

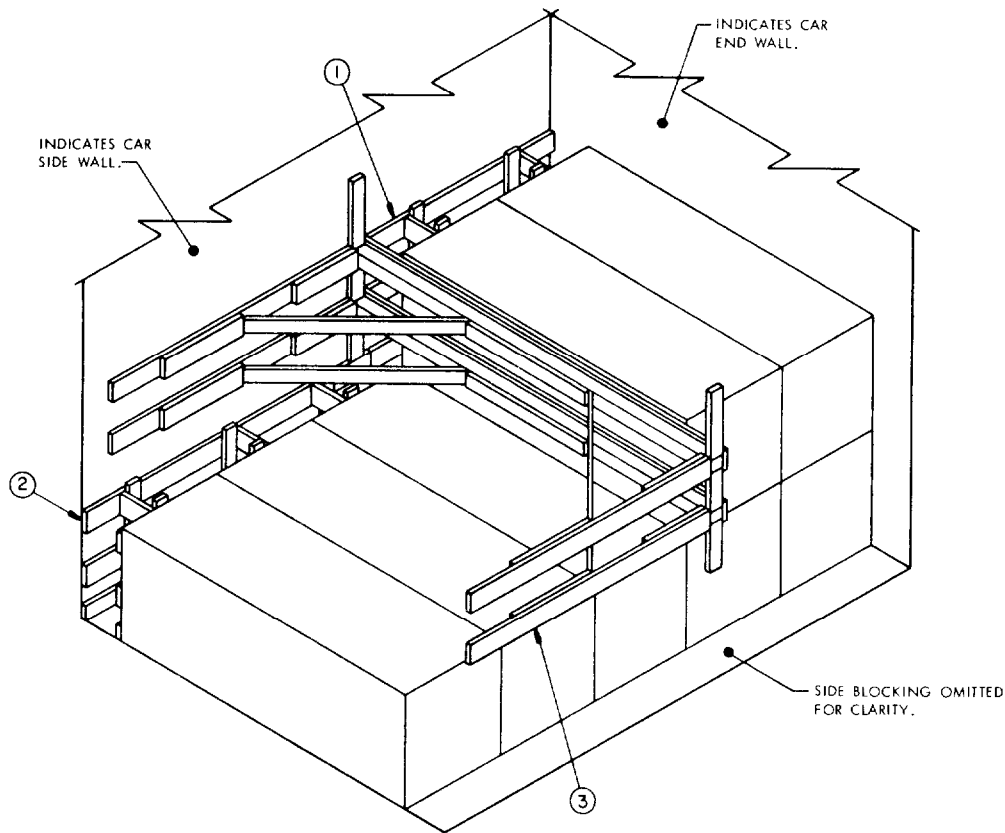
**KEY NUMBERS**

- ① SIDE BLOCKING ASSEMBLY (2 REQD). SEE "SIDE BLOCKING ASSEMBLY A" (2 HIGH) DETAIL ON PAGE 15.
- ② FILLER ASSEMBLY (1 REQD). SEE SPECIAL NOTE 4 AT LEFT AND "FILLER ASSEMBLY" DETAIL ON PAGE 17.
- ③ LOAD BEARING GATE (1 REQD). SEE "LOAD BEARING GATE A" DETAIL ON PAGE 16.
- ④ FLOOR CLEAT, 2" X 6" X 9'-7" (2 REQD). ALIGN WITH VERTICALS ON THE LOAD BEARING GATE MARKED ③ AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "O" ON PAGE 2.
- ⑤ POCKET CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO FLOOR CLEAT PIECE MARKED ④ W/6-40d NAILS. TOENAIL TO VERTICAL OF LOAD BEARING GATE MARKED ③ W/2-16d NAILS.
- ⑥ KNEE BRACE, 4" X 4" X 8'-1-3/4" (2 REQD). SEE "BRACE" DETAIL ABOVE FOR REQUIRED BEVEL CUTS. TOENAIL TO VERTICAL OF LOAD BEARING GATE PIECE MARKED ③ AND TO FLOOR CLEAT PIECE MARKED ④ W/2-30d NAILS AT EACH END.
- ⑦ BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO FLOOR CLEAT PIECE MARKED ④ W/6-40d NAILS.
- ⑧ STRAPPING BOARD, 1" X 3" X 25" (12 REQD, 2/BUNDLE). SEE "TYPICAL BUNDLE DETAIL" AND "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" INFORMATION ON PAGE 3.
- ⑨ STRAPPING BOARD, 1" X 6" X 25" (12 REQD, 2/BUNDLE). SEE "TYPICAL BUNDLE DETAIL" ON PAGE 3.
- ⑩ STEEL STRAPPING, 1-1/4" X .035" X 14'-0" (12 REQD, 2/BUNDLE). SEE "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" ON PAGE 3.
- ⑪ SEALS FOR 1-1/4" STRAP (24 REQD, 2/STRAP). POSITION AND DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.

**SPECIAL NOTES:**

- 1. A 9'-2" WIDE BOX CAR IS SHOWN; HOWEVER, ANY WIDTH CAR MAY BE USED BY CHANGING THE THICKNESS OF THE SIDE BLOCKING PIECE MARKED ①, TO SUIT THE WIDTH OF THE CAR BEING LOADED.
- 2. ONE (1) KNEE BRACE ASSEMBLY, SHOWN AS PIECES MARKED ④, ⑤, ⑥ AND ⑦ IS ADEQUATE FOR RETAINING AN LCL LOAD OF NOT MORE THAN 7,000 POUNDS. NOT LESS THAN TWO (2) KNEE BRACE ASSEMBLIES WILL BE USED FOR BLOCKING AN LCL LOAD.
- 3. IF THE CAR BEING USED FOR THE SHIPMENT OF THE DEPICTED LOAD IS EQUIPPED WITH A NAILABLE METAL FLOOR, SEE GENERAL NOTE "O" ON PAGE 2 FOR GUIDANCE.
- 4. BUNDLES CONTAINING OMITTED CONTAINERS MUST BE POSITIONED IN THE TOP BUNDLED LAYER OF THE LOAD. NOTE: FILLER ASSEMBLIES WILL BE USED ONLY IN THE TOP LAYER OF THE BUNDLE.

**TYPICAL LCL(23 UNIT LOAD)(BUNDLED) IN A 9' 2" WIDE CAR (CONVENTIONAL)**



**ISOMETRIC VIEW**

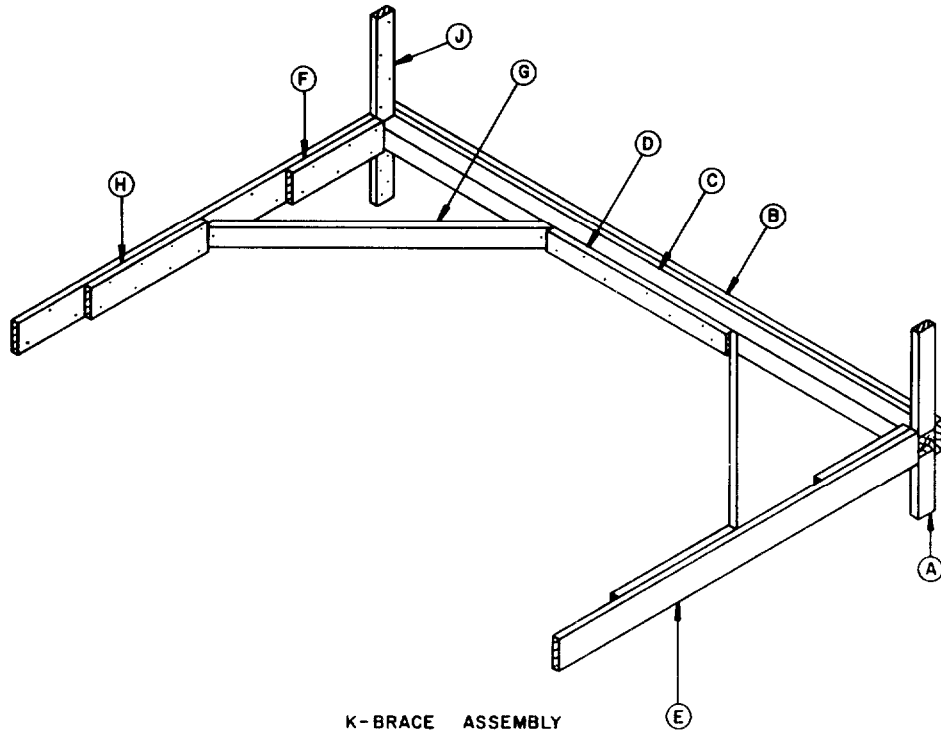
**KEY NUMBERS**

**SPECIAL NOTES:**

1. THE LOAD AS SHOWN IS BASED ON A 9'-2" WIDE CONVENTIONAL BOX CAR. HOWEVER, NARROWER OR WIDER CARS MAY ALSO BE USED BY ADJUSTING THE WIDTH OF THE "SIDE BLOCKING ASSEMBLY" TO SUIT.
2. A TWO BUNDLE (8 CONTAINER) PARTIAL LAYER AS SHOWN SHOULD BE CONSIDERED TYPICAL. ADDITIONAL BUNDLES (4 CONTAINERS) MAY BE ADDED TO THE "PARTIAL LAYER" PROVIDING THE PROVISIONS OF SPECIAL NOTE 4 ARE NOT VIOLATED.
3. SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL LAYER BRACING", BECAUSE THE LENGTH OF THE PARTIAL LAYER 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 (A), (B), (C), (E), AND (F) MUST BE SUPPORTED AT THE SIDES OF A CAR BY THE SIDE WALL AS SHOWN ON PAGE 9. THE END OF A DIAGONAL BRACE MARKED (C) MAY BEAR IN FRONT OF A DOOR OPENING; HOWEVER, PIECE MARKED (E) MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE.
4. THE DOUBLED K-BRACE ASSEMBLY AS SHOWN ABOVE IS ADEQUATE FOR RETAINING A MAXIMUM PARTIAL LAYER LOAD OF NOT MORE THAN 8,000 POUNDS OR SIX (6) BUNDLES (24 CONTAINERS) WITH CONTENTS.

- ① SIDE BLOCKING (2 REQD). SEE "SIDE BLOCKING ASSEMBLY B" DETAIL FOR TWO (2) BUNDLES HIGH LOAD ON PAGE 15.
- ② SIDE BLOCKING (1 AS REQD). SEE "SIDE BLOCKING ASSEMBLY A" DETAIL FOR ONE (1) BUNDLE HIGH LOAD ON PAGE 15.
- ③ K-BRACE ASSEMBLY (2 REQD). POSITION THE TOP OF PIECE MARKED (B) ON PAGE 9, TO ALIGN WITH AND EXTEND 2" ABOVE THE OPENING SEAM OF THE CONTAINER.

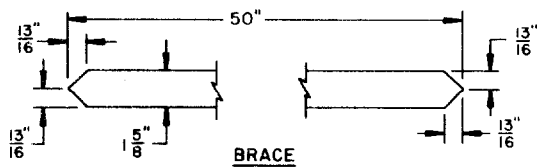


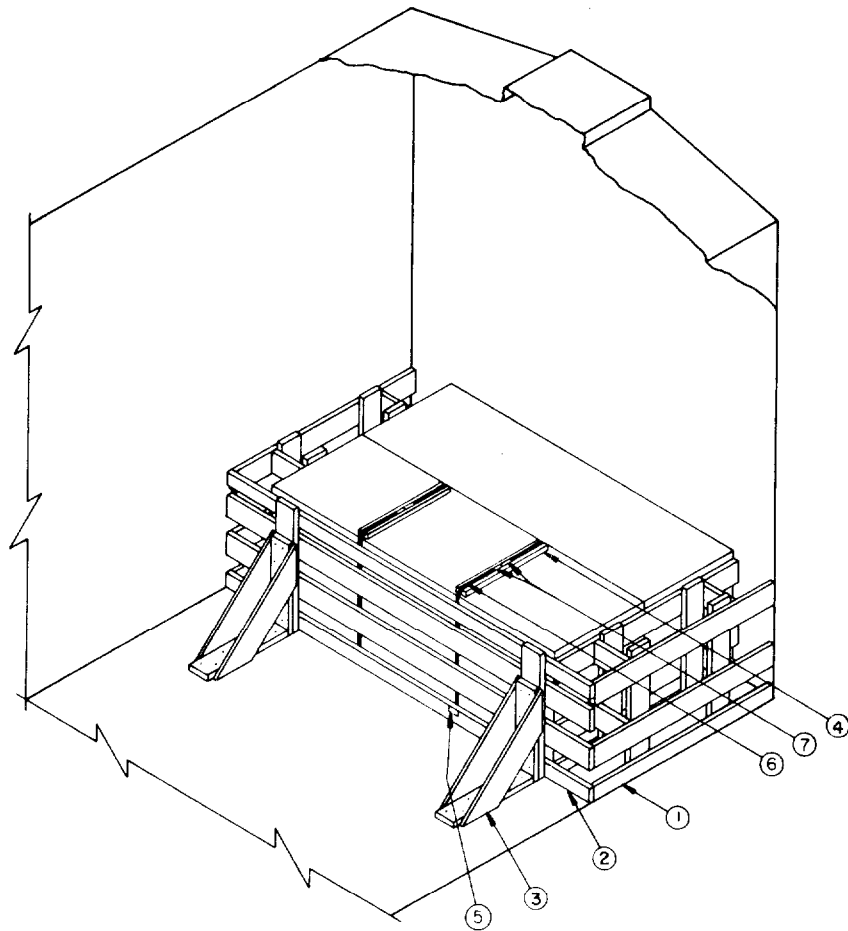


**K-BRACE ASSEMBLY**

**KEY LETTERS**

- (A) WALL CLEAT, 2" X 4" X 11" (2 REQD.). NAIL TO A CAR SIDE WALL W/4-12d NAILS.
- (B) HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (1 REQD.). NAIL TO PIECE MARKED (C) W/1-12d NAIL EVERY 6".
- (C) CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (1 REQD.).
- (D) CENTER CLEAT, 2" X 4" X 28" FOR AN 8'-6" WIDE CAR OR 2" X 4" X 36" FOR A 9'-2" WIDE CAR (1 REQD.). NAIL TO PIECE MARKED (E) W/7-12d NAILS.
- (E) HORIZONTAL WALL CLEAT, 2" X 6" X 72" (2 REQD.). NAIL TO CAR SIDE WALL W/16d NAILS.
- (F) POCKET CLEAT, 2" X 6" X 18" (2 REQD.). NAIL TO PIECE MARKED (E) W/6-16d NAILS.
- (G) DIAGONAL BRACE, 2" X 4" X 50" (2 REQD.). SEE THE "BRACE" DETAIL AT LEFT FOR BEVEL CUT REQUIREMENT. TOENAIL TO PIECES MARKED (C) AND (E) W/1-16d NAIL AT EACH END.
- (H) BACK-UP CLEAT, 2" X 6" X 24" (2 REQD.). NAIL TO PIECE MARKED (E) W/8-16d NAILS.
- (J) HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD.). NAIL TO CAR SIDE WALL W/4-12d NAILS. NOTE: WHEN TWO K-BRACE ASSEMBLIES ARE USED, PIECE (J) IS ONLY REQUIRED WITH THE UPPER ASSEMBLY.





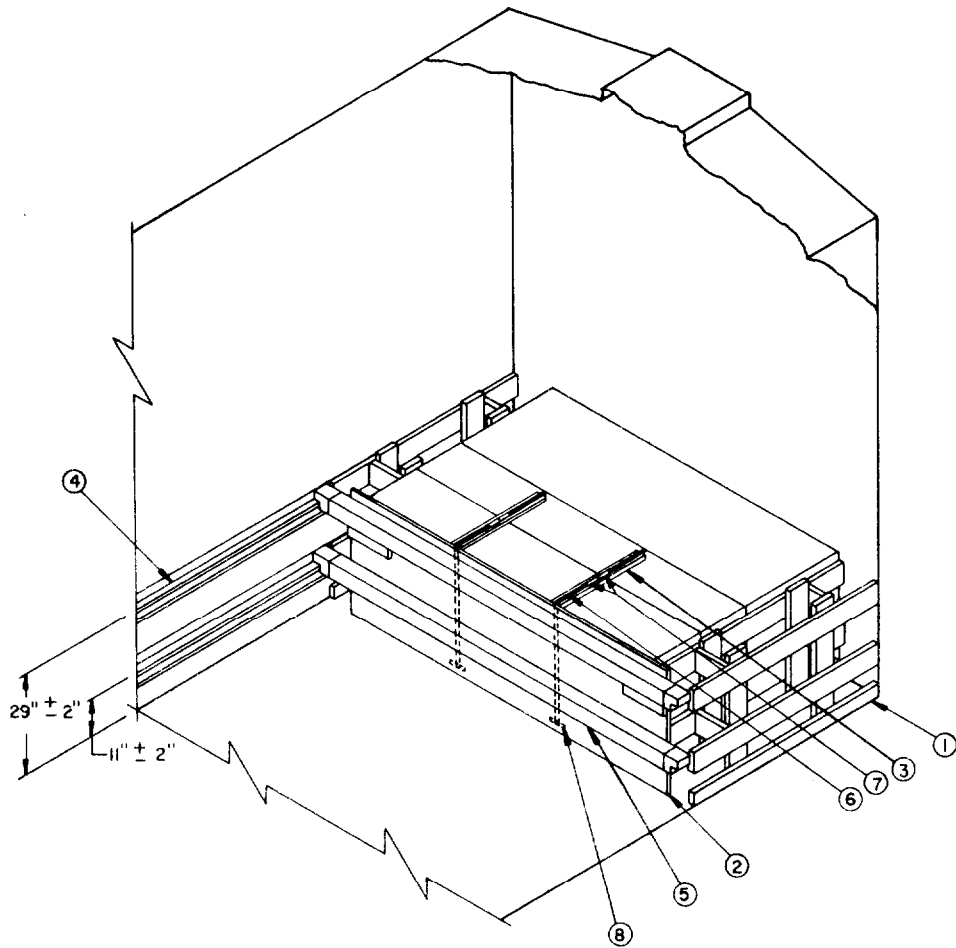
**ISOMETRIC VIEW**

**SPECIAL NOTES:**

1. AN 8-UNIT BUNDLED LOAD IS SHOWN IN A 9'-2" WIDE BOX CAR. CARS OF DIFFERENT WIDTHS MAY BE USED BY ADJUSTING THE THICKNESS OF THE SIDE BLOCKING ASSEMBLY PIECE MARKED ① TO SUIT THE CAR WIDTH.
2. THE LENGTH AND/OR NUMBER OF SIDE BLOCKING PIECES MARKED ① MAY BE INCREASED AS DESIRED TO SUIT THE NUMBER OF BUNDLES SHIPPED. SEE "SIDE BLOCKING ASSEMBLY A" AND "B" ON PAGE 15.
3. THE PROCEDURE DEPICTED IS LIMITED TO A THREE (3) BUNDLE (12-UNIT) LOAD; HOWEVER ADDITIONAL LCL BRACES MAY BE APPLIED AS NECESSARY. SEE SPECIAL NOTE 2 ON PAGE 6.

**KEY NUMBERS**

- ① SIDE BLOCKING (2 REQD.). SEE "SIDE BLOCKING ASSEMBLY B" ON PAGE 15.
- ② LOAD BEARING GATE (1 REQD.). SEE "LOAD BEARING GATE C" ON PAGE 18.
- ③ LCL BRACE (2 REQD.). NAIL TO THE LOAD BEARING GATE VERTICALS W/5-10d NAILS AND NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE "LCL BRACE" DETAIL ON PAGE 6.
- ④ STRAPPING BOARD, 1" X 3" X 25" (4 REQD, 2/BUNDLE). SEE "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" AND "TYPICAL BUNDLE DETAIL" INFORMATION ON PAGE 3.
- ⑤ STRAPPING BOARD, 1" X 6" X 25" (4 REQD, 2/BUNDLE). SEE "TYPICAL BUNDLE DETAIL" ON PAGE 3.
- ⑥ STEEL STRAPPING, 1-1/4" X .035" X 14'-0" (4 REQD, 2/BUNDLE). POSITION AS SHOWN AND SEAL W/2 SEALS. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑦ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2/STRAP). POSITION AS SHOWN AND DOUBLE CRIMP EACH SEAL.



ISOMETRIC VIEW

**SPECIAL NOTES:**

1. AN 8-UNIT (BUNDLED) LOAD IS SHOWN IN A 9'-2" WIDE BOX CAR. CARS OF DIFFERENT WIDTHS MAY BE USED BY ADJUSTING THE THICKNESS OF THE SIDE BLOCKING ASSEMBLY PIECE MARKED ① TO SUIT THE CAR WIDTH.
2. THE LENGTH AND/OR NUMBER OF SIDE BLOCKING PIECES MARKED ① MAY BE INCREASED AS DESIRED TO SUIT THE NUMBER OF BUNDLES SHIPPED. SEE "SIDE BLOCKING ASSEMBLY A" AND "B" ON PAGE 15.
3. THE PROCEDURE SHOWN IS LIMITED TO NOT MORE THAN A SIX (6) BUNDLE (24-UNIT) LOAD.

**KEY NUMBERS**

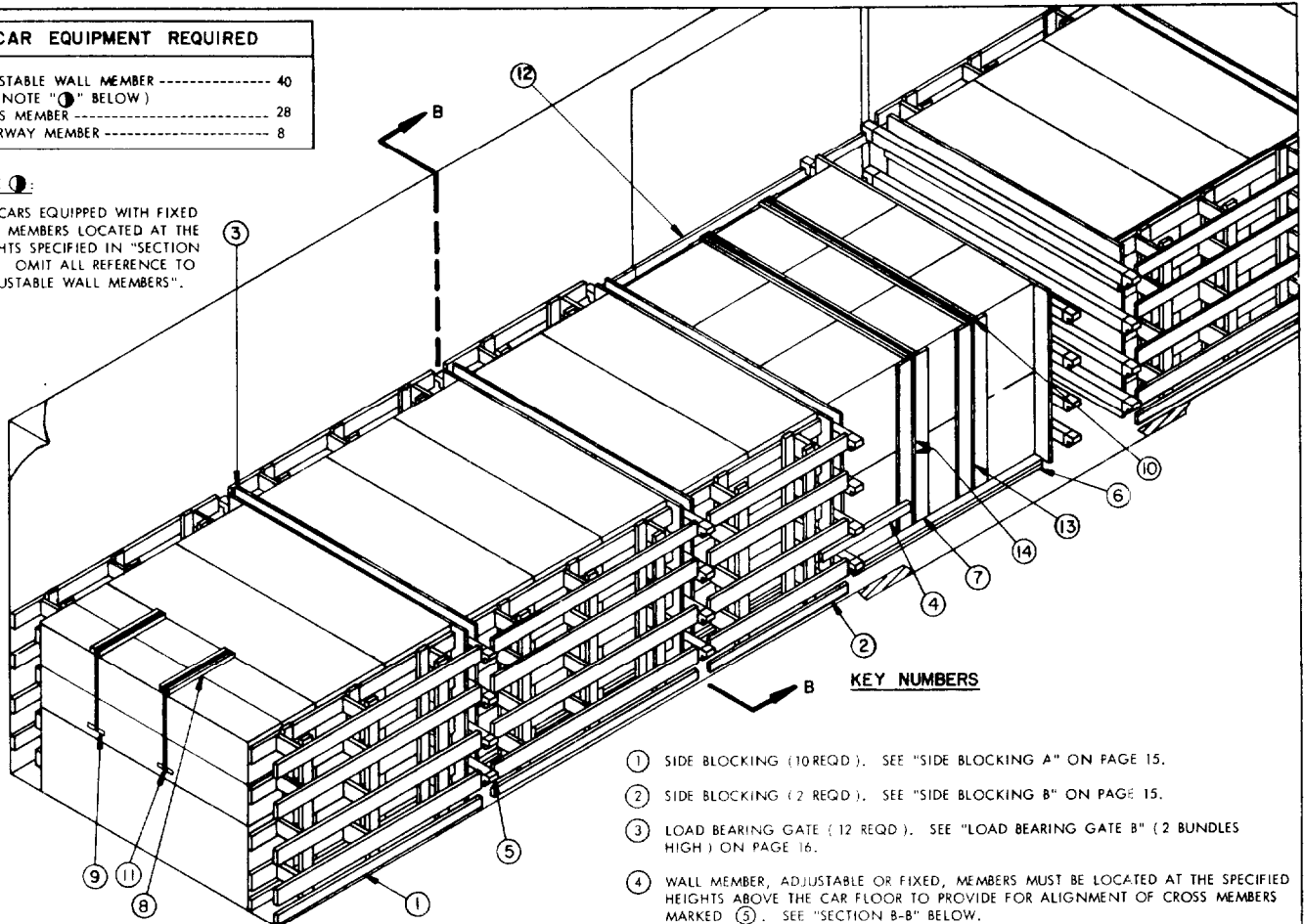
- ① SIDE BLOCKING (2 REQD.). SEE SIDE BLOCKING ASSEMBLY "B" ON PAGE 15.
- ② LOAD BEARING GATE (1 REQD.). SEE "LOAD BEARING GATE B" (1 HIGH) DETAIL ON PAGE 16.
- ③ STRAPPING BOARD, 1" X 3" X 25" (4 REQD, 2/BUNDLE). SEE "TYPICAL BUNDLING DETAIL" ON PAGE 3.
- ④ WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE FOR ALIGNMENT OF CROSS MEMBERS PIECE MARKED ⑤.
- ⑤ CROSS MEMBER (2 REQD.). SEE GENERAL NOTE "J" ON PAGE 2.
- ⑥ STEEL STRAPPING, 1-1/4" X .035" X 14'-0" (4 REQD, 2/BUNDLE). SEE "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" ON PAGE 3.
- ⑦ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2/STRAP). POSITION AND SEAL WITH TWO (2) CRIMPS PER SEAL. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑧ STRAPPING BOARD, 1" X 6" X 25" (4 REQD, 2/BUNDLE). SEE "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" AND "TYPICAL BUNDLING DETAIL" INFORMATION ON PAGE 3.

**CAR EQUIPMENT REQUIRED**

ADJUSTABLE WALL MEMBER -----	40
(SEE NOTE "O" BELOW)	
CROSS MEMBER -----	28
DOORWAY MEMBER -----	8

**NOTE O:**

FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION B-B". OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".

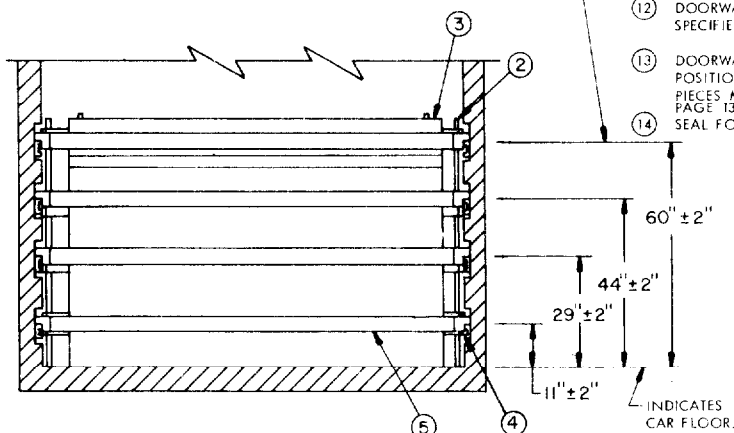


**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① SIDE BLOCKING (10 REQD.). SEE "SIDE BLOCKING A" ON PAGE 15.
- ② SIDE BLOCKING (2 REQD.). SEE "SIDE BLOCKING B" ON PAGE 15.
- ③ LOAD BEARING GATE (12 REQD.). SEE "LOAD BEARING GATE B" (2 BUNDLES HIGH) ON PAGE 16.
- ④ WALL MEMBER, ADJUSTABLE OR FIXED, MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE FOR ALIGNMENT OF CROSS MEMBERS MARKED ⑤. SEE "SECTION B-B" BELOW.
- ⑤ CROSS MEMBER (28 REQD.). SEE GENERAL NOTE "J-1" ON PAGE 2.
- ⑥ DOORWAY PROTECTION, 2" X 6" X 7'-0" (DOUBLED) (2 REQD.). POSITION AS SHOWN AND NAIL FIRST PIECE TO CAR FLOOR W/1-16d NAIL EVERY 4". NAIL SECOND PIECE TO FIRST IN A LIKE MANNER. SEE GENERAL NOTE "Q" ON PAGE 2.
- ⑦ PLYWOOD VERTICAL STRAPPING BOARD, 1/2" THICK X 12" WIDE X 62-1/2" LONG (4 REQD.). CUT A 2" WIDE BY 2-3/4" HIGH NOTCH AT CENTER OF BOTTOM EDGE OF BOARD FOR STRAPPING. POSITION UNDER DOORWAY PROTECTION PIECE MARKED ⑬.
- ⑧ STRAPPING BOARD, 1" X 3" X 25" (80 REQD, 2/BUNDLE). SEE "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" AND "TYPICAL BUNDLE DETAIL" ON PAGE 3.
- ⑨ STRAPPING BOARD, 1" X 6" X 25" (80 REQD, 2/BUNDLE). SEE THE "TYPICAL BUNDLE DETAIL" ON PAGE 3.
- ⑩ DOORWAY PROTECTION, STRAPPING BOARD, 1" X 3" X 7'-1" (2 REQD.). POSITION UNDER DOORWAY PROTECTION STRAP PIECE MARKED ⑬.
- ⑪ BUNDLING STRAP, 1-1/4" X .035" X 14'-0" LONG STEEL STRAPPING (80 REQD, 2/BUNDLE). SEE "BUNDLING AND HANDLING PROCEDURAL GUIDANCE".
- ⑫ DOORWAY MEMBER (8 REQD.). POSITION AT HEIGHTS ABOVE THE CAR FLOOR AS SPECIFIED IN SECTION BELOW.
- ⑬ DOORWAY PROTECTION, 1-1/4" X .035" X 32'-0" LONG STEEL STRAPPING (2 REQD.). POSITION TO BUNDLE THROUGH THE FORK RECEPTACLE AS SHOWN. STAPLE TO PIECES MARKED ⑩ AND ⑦ W/1-1/4" STAPLES. SEE SPECIAL NOTE 4 ON PAGE 13.
- ⑭ SEAL FOR 1-1/4" STRAPPING (164 REQD, 2/STRAP). DOUBLE CRIMP EACH SEAL.

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED ④ AND OR DOORWAY MEMBER MARKED ⑫ IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER.



**SECTION B-B**

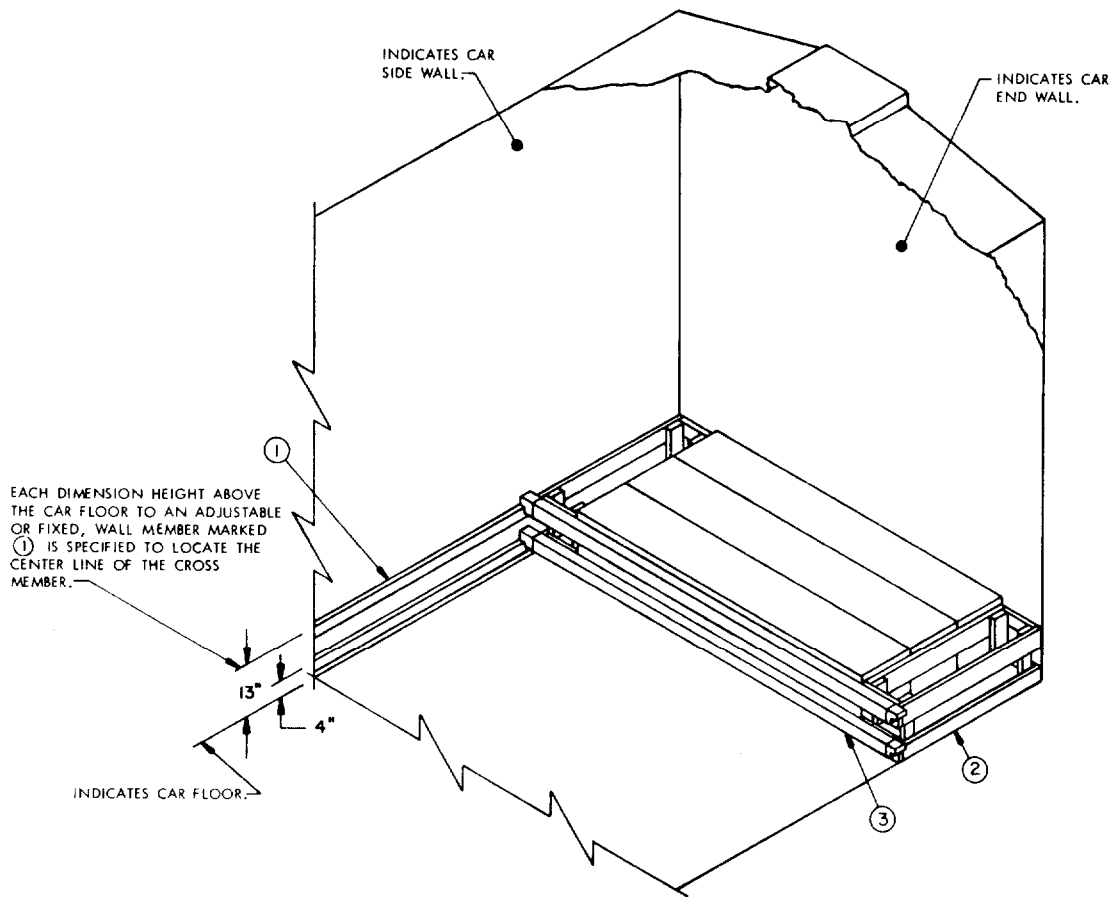
**SPECIAL NOTES:**

1. A 160-UNIT ( BUNDLED ) LOAD IS SHOWN IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS AND WITH AN 8'-0" WIDE DOOR OPENING.
2. A NARROWER OR WIDER CAR MAY BE USED; HOWEVER, THE WIDTH OF THE SIDE BLOCKING PIECES MARKED ① AND ② MUST BE ADJUSTED TO SUIT.
3. A CAR WITH WIDER DOORS OR WITH STAGGERED AND/OR PLUG DOORS CAN BE USED FOR THE SHIPMENT OF THE DEPICTED LOAD.
4. IF THE DELINEATED OUTLOADING METHOD IS USED FOR A SHIPMENT OF A LOAD WHICH CONTAINS LESS CONTAINERS THAN SHOWN, AND THE QUANTITY CANNOT BE SATISFIED BY OMITTING A COMPLETE STACK OR LAYER OF BUNDLES, A "FILLER ASSEMBLY", AS SHOWN ON PAGE 17, MUST BE SUBSTITUTED IN THE BUNDLES FOR EACH OMITTED CONTAINER. BUNDLES WITH OMITTED CONTAINERS MAY BE POSITIONED AT ANY LOCATION IN THE TOP BUNDLED LAYER OF THE LOAD. **NOTE:** ONLY THE CONTAINERS IN THE UPPER PORTION OF A BUNDLE MAY BE OMITTED. SEE PAGE 7 FOR A TYPICAL "FILLER ASSEMBLY" INSTALLATION. IF THE QUANTITY TO BE SHIPPED CAN NOT READILY BE ACHIEVED BY APPLYING THE CRITERIA JUST CITED, IT WILL BE NECESSARY TO INSTALL A K-BRACE ASSEMBLY TO RETAIN A PARTIAL LAYER. SEE THE "PARTIAL LAYER BRACING" PROCEDURES ON PAGE 8 AND THE "K-BRACE ASSEMBLY" DETAIL ON PAGE 9 FOR A TYPICAL INSTALLATION.
5. FOR SHIPMENT OF 128 CONTAINER UNITS OR LESS THE DEPICTED PROCEDURES CAN ALSO BE USED FOR A 40'-6" LONG BY 9'-2" WIDE CAR WHICH IS EQUIPPED WITH 8'-0" MINIMUM WIDTH DOOR OPENINGS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 3"	181	45
1" X 6"	265	133
2" X 4"	524	349
2" X 6"	799	799
NAILS	NO. REQD	POUNDS
6d ( 2" )	120	3/4
10d ( 3" )	906	13-3/4
16d ( 3-1/2" )	84	1-3/4
PLYWOOD, 1/2" --- 501 SQ FT REQD ----- 689 LBS STEEL STRAPPING, 1-1/4" X .035" ----- 1,184' REQD ---- 170 LBS SEAL FOR 1-1/4" STRAPPING ----- 164 REQD ---- 33 LBS STAPLE FOR 1-1/4" STRAPPING ----- 360 REQD ---- 2 LBS		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
CONTAINER ( W/CBU ITEM )	----- 160 -----	52,480 LBS
DUNNAGE	-----	4,226 LBS
<b>TOTAL WEIGHT</b>	-----	<b>56,706 LBS</b>



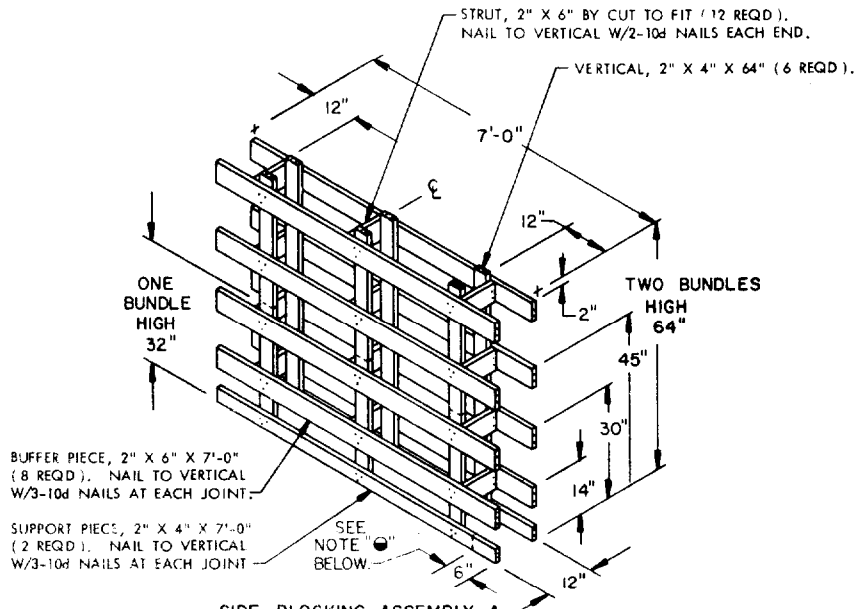
**ISOMETRIC VIEW**

**KEY NUMBERS**

- ① WALL MEMBER ADJUSTABLE OR FIXED MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE FOR ALIGNMENT OF CROSS MEMBERS, PIECE MARKED ③.
- ② SIDE BLOCKING ASSEMBLY (2 REQD). SEE "SIDE BLOCKING ASSEMBLY C" DETAIL ON PAGE 18.
- ③ CROSS MEMBER (2 REQD). SEE GENERAL NOTE "J" ON PAGE 2.

**SPECIAL NOTES:**

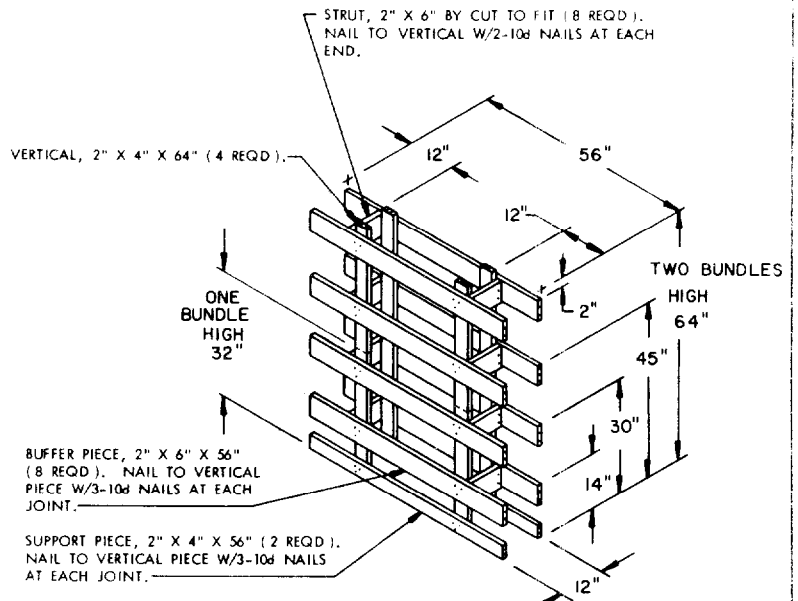
1. A 9'-2" WIDE BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBER IS SHOWN. NARROWER OR WIDER CARS CAN BE USED FOR THE SHIPMENT OF THE DEPICTED LOAD BY ADJUSTING THE FILLER WIDTH TO SUIT.
2. THE LENGTH OF "SIDE BLOCKING C" PIECE MARKED ② MAY BE ADJUSTED AS REQUIRED TO SATISFY THE NUMBER OF CONTAINERS TO BE SHIPPED.
3. THE PROCEDURE SHOWN IS LIMITED TO NOT MORE THAN SIX (6) CONTAINER LOAD. NOTE: A PLYWOOD ONE HIGH GATE CAN BE USED. SEE "LOAD BEARING GATE B" ON PAGE 16, (BUNDLED) LCL LOAD ON PAGE 11 AND "BUNDLING AND HANDLING PROCEDURAL GUIDANCE" ON PAGE 3.



**SIDE BLOCKING ASSEMBLY A**

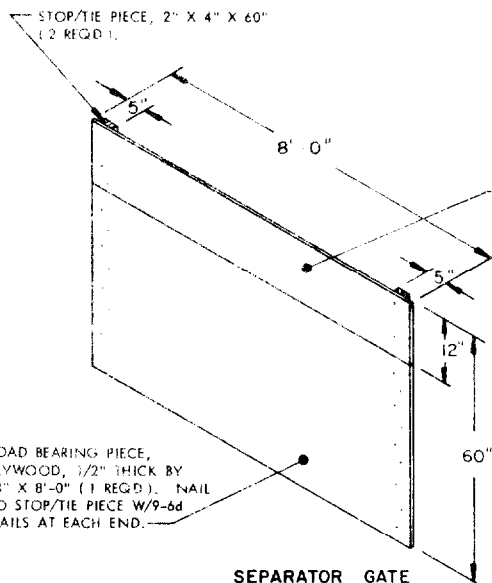
THE ASSEMBLY SHOWN IS FOR 9'-2" WIDE CARS. THE ASSEMBLY WIDTH MAY BE ADJUSTED TO SUIT CARS OF DIFFERENT WIDTH.

NOTE "ⓐ": THE INSIDE SUPPORT PIECE OF PIECE MARKED ① IN THE DOORWAY AREA MUST BE SHORTENED 6" TO ALLOW CLEARANCE FOR PIECE MARKED ②.



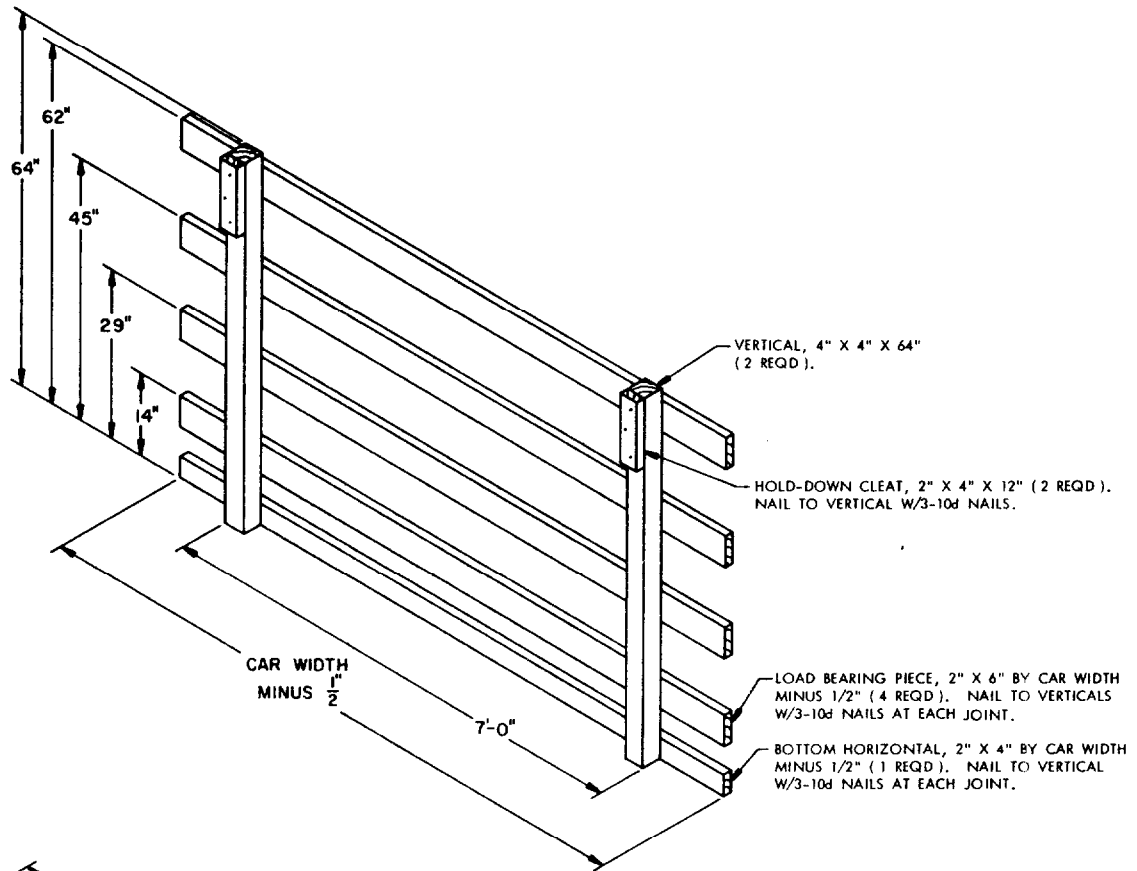
**SIDE BLOCKING ASSEMBLY B**

THE ASSEMBLY SHOWN IS FOR 9'-2" WIDE CARS. THE ASSEMBLY MAY BE ADJUSTED TO SUIT CARS OF DIFFERENT WIDTHS.



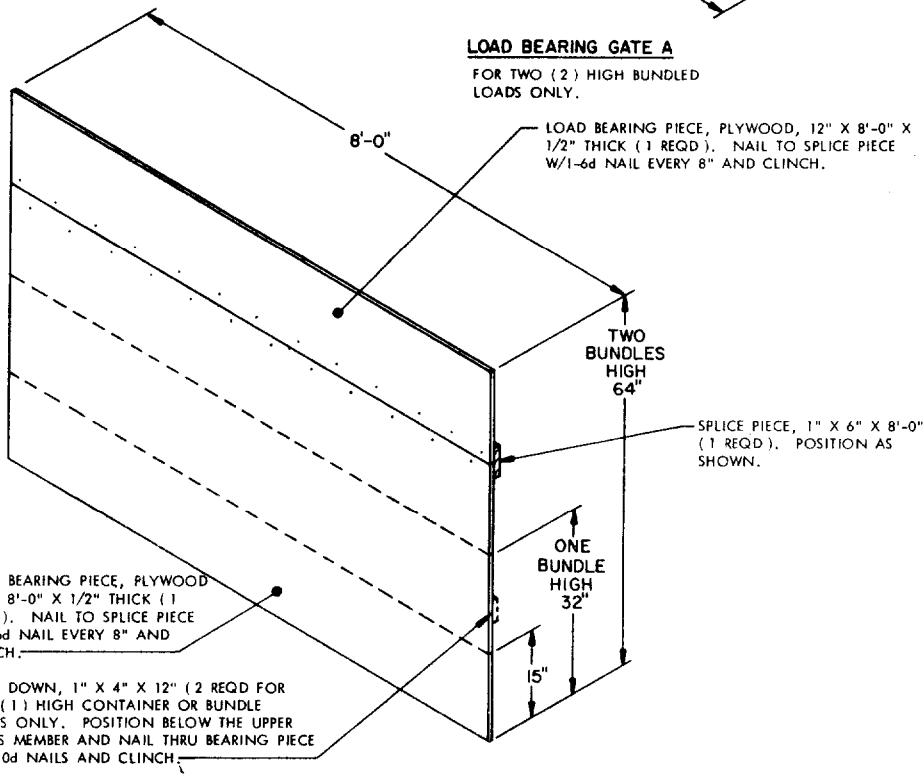
**SEPARATOR GATE**

FOR TWO BUNDLES HIGH LOAD.



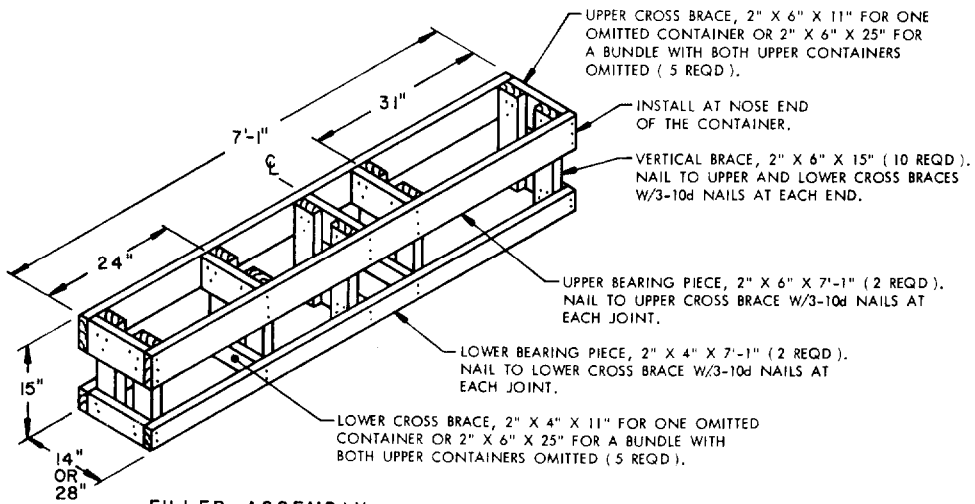
**LOAD BEARING GATE A**

FOR TWO (2) HIGH BUNDLED LOADS ONLY.



**LOAD BEARING GATE B**

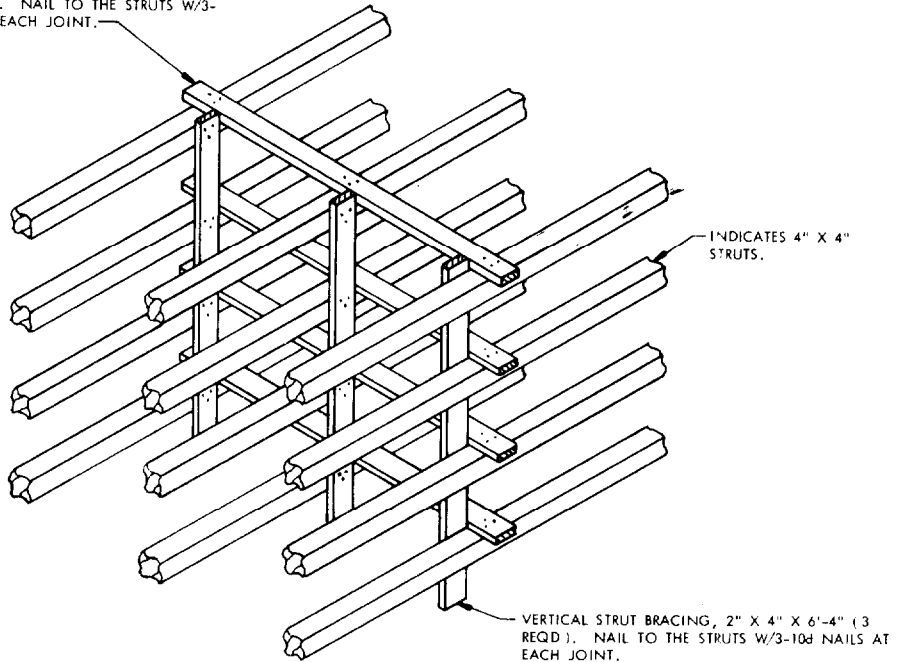




**FILLER ASSEMBLY**

THE FILLER ASSEMBLY MAY BE USED IN THE UPPER LAYER OF A BUNDLE; THAT BUNDLE MUST BE LOCATED IN THE UPPER LAYER OF THE LOAD. THE WIDTH OF A FILLER ASSEMBLY MAY BE ADJUSTED TO SUIT THE NUMBER OF CONTAINERS OMITTED FROM A BUNDLE. 14\"/>

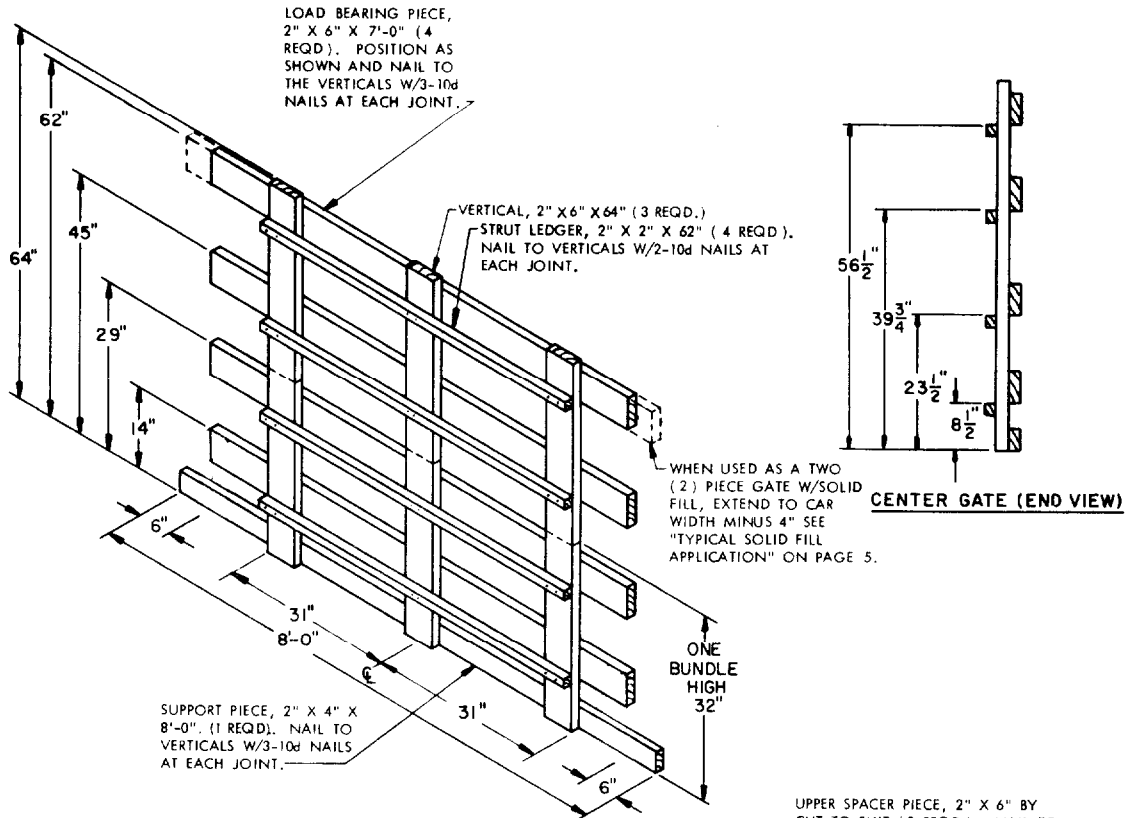
HORIZONTAL STRUT BRACING, 2\"/>



**STRUT BRACING**

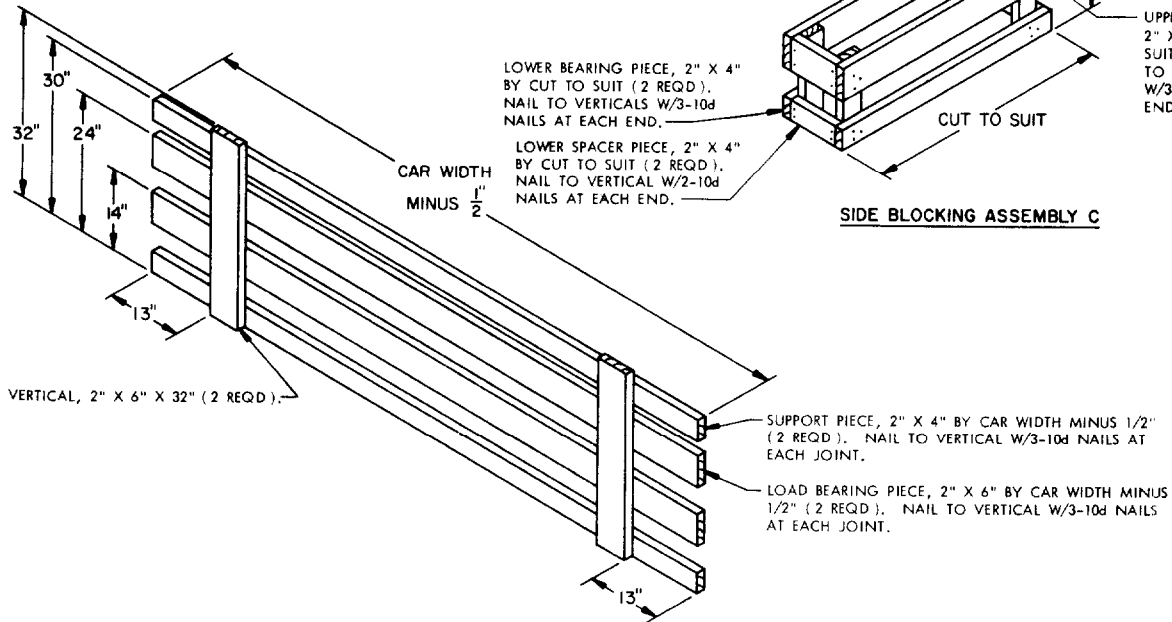
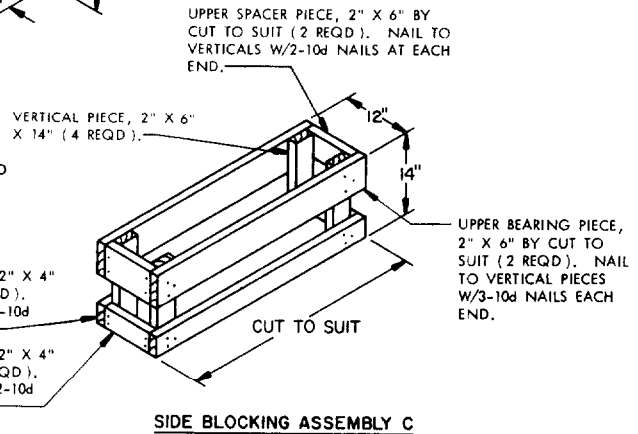
NOTE: STRUT BRACING IS REQUIRED WHEN STRUTS ARE 48\"/>

**DETAILS**



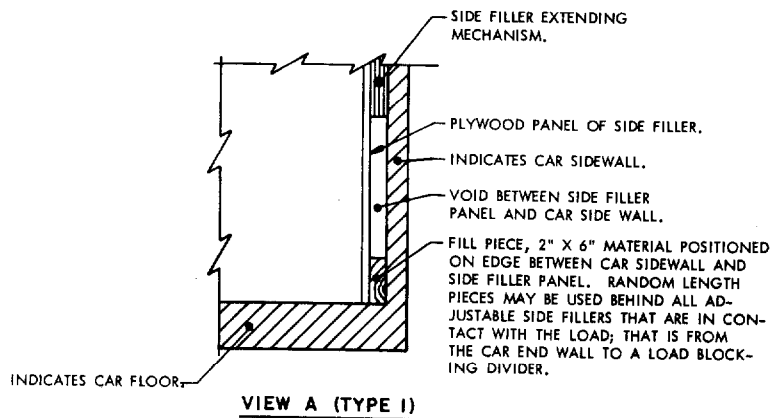
**CENTER GATE**

FOR CONVENTIONAL LOADS ONE (1) OR TWO (2) BUNDLES HIGH. NOTE: WHEN USED FOR SOLID FILL OMIT THE STRUT LEDGERS AND INSTALL THE GATE IN TWO (2) PARTS. EXTEND THE TOP HORIZONTAL TO CAR WIDTH MINUS 4". SEE "TYPICAL SOLID FILL APPLICATION" ON PAGE 6.

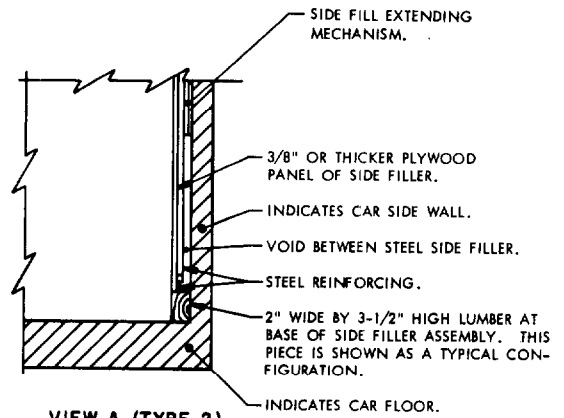


**LOAD BEARING GATE C**

FOR USE WITH ONE (1) HIGH BUNDLED LOADS ONLY.



**VIEW A (TYPE 1)**  
THIS VIEW SHOWS THE INSTALLATION OF A "FILL PIECE" IN A CAR EQUIPPED WITH A STANDARD ADJUSTABLE SIDE FILLER.



**VIEW A (TYPE 2)**  
THIS VIEW IS A TYPICAL SECTION OF A CAR EQUIPPED WITH A HEAVY DUTY STEEL REINFORCED ADJUSTABLE SIDE FILLER(S). A "FILL PIECE" AS SHOWN IN THE "TYPE 1" VIEW AT LEFT, IS NOT REQUIRED IN CARS SO EQUIPPED.

**SPECIAL REQUIREMENTS FOR LOAD-DIVIDER-EQUIPPED CARS:**

1. CARS THAT ARE EQUIPPED WITH LOAD-DIVIDERS MUST BE CUSHIONED. ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONING DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST 15" OF TRAVEL ARE ACCEPTABLE.
2. AFTER THE LOAD DIVIDERS IN A LOAD-DIVIDER-EQUIPPED CAR 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 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 SELECTED FOR SECURING A DIVIDER.
3. 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 SIDE WALL. A "FILL PIECE" MUST BE INSTALLED IN THE VOID BETWEEN THE CAR WALL AND THE SIDE FILLER PANEL. SEE THE "VIEW A (TYPE 1)" ABOVE FOR GUIDANCE. IF THE BACK OF THE SIDE FILLER PANELS ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN "VIEW A (TYPE 2)" ABOVE, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.
4. DOOR PROTECTION MUST BE PROVIDED WHEN LADING UNITS ARE LOADED IN THE DOORWAY AREA, OR WHEN ONE-HALF OR MORE OF THE LENGTH OF A UNIT EXTENDS INTO THE DOORWAY AREA OF CARS EQUIPPED WITH LOAD DIVIDERS AND/OR PLUG DOORS.
5. WHEN JUTLOADING THE UNITS AS DEPICTED ON PAGE 4, USING A CAR EQUIPPED WITH LOAD DIVIDERS, PIECES MARKED (6), (7), (10), (11), (12), AND (15) SHALL BE OMITTED. IF SUFFICIENT SPACE IS NOT AVAILABLE IN THE CENTER OF CAR FOR SECURING THE LOAD DIVIDERS, ONE STACK OF TWO (2) BUNDLES LATERALLY LOADED, MAY BE OMITTED.
6. WHEN OMITTING ONE STACK OF LATERALLY LOADED UNITS, TWO (2) UNITS OF "SIDE BLOCKING ASSEMBLY A" SHALL BE REPLACED WITH TWO (2) UNITS OF "SIDE BLOCKING ASSEMBLY B". SEE PAGE 15.
7. SINCE THE LADING WEIGHT AS SHOWN ON PAGE 4 IS LESS THAN 50,000 POUNDS IN EACH END OF THE CAR, THE USE OF A STRUT ASSEMBLY BETWEEN THE LOAD DIVIDERS IS NOT REQUIRED.

**CAUTION**

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.