

# LOADING AND BRACING (TL & LTL) IN CLOSED OR OPEN TOP VAN TRAILERS OF BULK EXPLOSIVES PACKED IN FIBERBOARD CARTONS (UNPALLETIZED)

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 **CAUTION:** THE PROCEDURES SHOWN HEREIN ARE ONLY APPLICABLE FOR HIGHWAY MOVEMENTS; NOT FOR CONTAINER/TRAILER-ON-FLAT-CAR MOVEMENTS.

DO NOT SCALE

REVISIONS				DRAFTSMAN	pkdn	PROJ ENG	
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				CLASS	DIVISION	DRAWING	FILE
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GENERAL NOTES

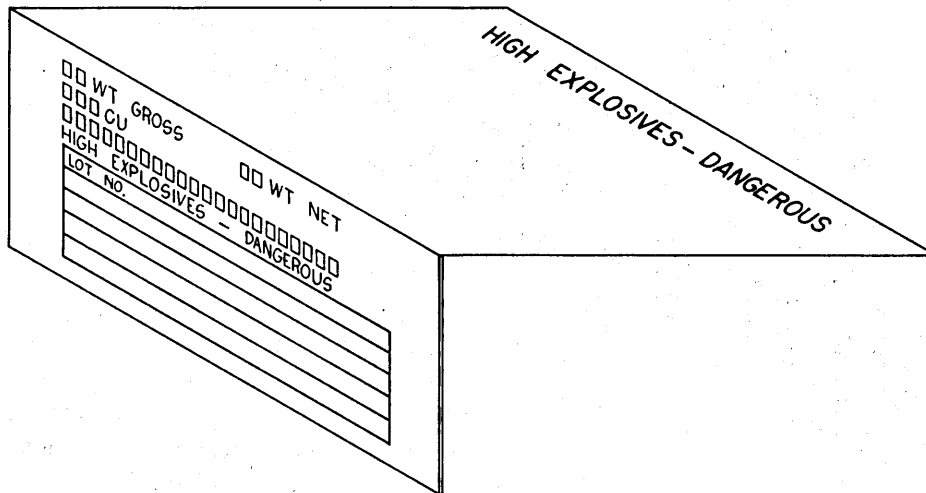
REVISION

- 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 TO MISCELLANEOUS BULK EXPLOSIVES PACKED IN FIBERBOARD CARTONS. SUBSEQUENT REFERENCE TO CARTON MEANS THE FIBERBOARD CARTON WITH CONTENTS.
- C. FOR DETAILS OF THE TWO-PIECE FIBERBOARD CARTON SEE THE DETAIL ON PAGE 3 AND PICATINNY ARSENAL DRAWING NO. 7548645. REFER TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS FOR THE SIZE CARTON SHOWN IN THAT LOAD.
- D. GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT FOR A LOAD WILL BE THE RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF THE APPLICABLE LOADING REQUIREMENTS, AND THE SHIPPER WILL LOAD ACCORDINGLY. NOTICE: A SHIPMENT WILL BE POSITIONED IN A TRAILER CONSISTENT WITH THE WEIGHT LAWS OF THE STATES THRU WHICH THE TRAILERS WILL BE TRANSPORTED VIA MOTOR CARRIER.
- E. THE NUMBER OF CARTONS MAY BE ADJUSTED TO FIT THE SIZE OF THE TRAILER TO BE LOADED OR THE QUANTITY TO BE SHIPPED; HOWEVER, THE APPROVED METHODS SHOWN HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE DESIGNATED ITEM.
- F. EXCEPT FOR PLYWOOD, 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.
- G. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING WILL BE USED WHEN LAMINATING DUNNAGE.
- H. DO NOT NAIL BLOCKING SHOWN HEREIN TO THE TRAILER WALLS OR FLOOR; ALL NAILING WILL BE ACCOMPLISHED WITHIN THE DUNNAGE.
- J. PORTIONS OF THE TRAILER BODY DEPICTED WITHIN THIS PROCEDURAL DRAWING, SUCH AS ONE OF THE SIDE WALLS, HAVE BEEN OMITTED FOR CLARITY PURPOSES.
- K. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO A DEPICTED OUTLOADING METHOD.
- L. THE PROCEDURES DEPICTED WITHIN THIS DRAWING ARE BASED ON THE USE OF DIMENSIONAL SIZED LUMBER. THE METRIC EQUIVALENT MAY BE COMPUTED BY USING 1" EQUALS 25.4MM. METRIC EQUIVALENTS FOR WEIGHTS ARE BASED ON 1 POUND EQUALS 0.454KG.
- M. NOTICE: FIBERBOARD CARTONS MUST NOT BE SHIPPED ON THEIR SIDES, OR ON END, OR IN ANY ORIENTATION OTHER THAN UPRIGHT (TOP SIDE UP).

REVISION NO. 1, DATED AUGUST 1986, CONSISTS OF:  
ADDING "TYGARD PROCEDURES".

MATERIAL SPECIFICATIONS

- LUMBER ----- : TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- PLYWOOD----- : FED SPEC NN-P-530; GROUP B, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- NAILS----- : COMMON, FED SPEC FF-N-105.
- TYGARD----- : POLYESTER YARN, 1,110 POUNDS/INCH OF WIDTH STRENGTH.
- ADHESIVE----- : TYGARD ADHESIVE.



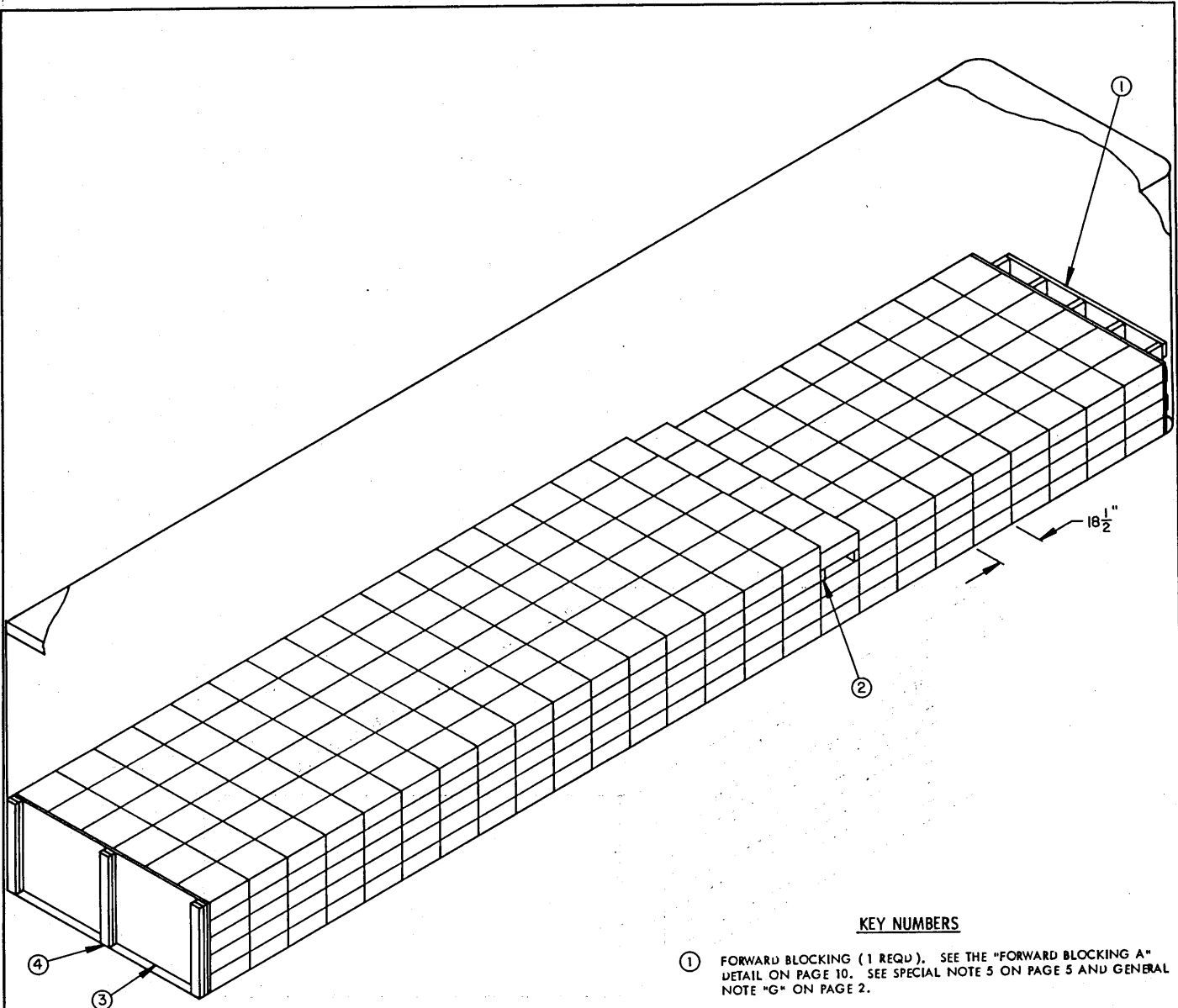
TYPICAL TWO-PIECE FIBERBOARD CARTON

SPECIAL NOTE:

1. ALTHOUGH THE OUTLOADING PROCEDURES WITHIN THIS DRAWING SHOW A GIVEN CARTON SIZE FOR EACH LOAD, THE CARTON FOR THE PARTICULAR EXPLOSIVE TO BE SHIPPED MAY VARY IN SIZE FROM THOSE SHOWN. TYPICAL BOX SIZES AND WEIGHTS ARE SHOWN BELOW.

16-1/4" LONG BY 16-1/4" WIDE BY 8-1/8" HIGH.  
 18-3/4" LONG BY 15-1/4" WIDE BY 7-5/8" HIGH.  
 18-1/4" LONG BY 15-1/4" WIDE BY 7-1/2" HIGH.  
 18-1/2" LONG BY 15-1/4" WIDE BY 7-5/8" HIGH.  
 18-3/4" LONG BY 15-1/2" WIDE BY 7-5/8" HIGH.  
 15-3/8" LONG BY 15-3/8" WIDE BY 7-5/8" HIGH.  
 16-1/4" LONG BY 16-1/4" WIDE BY 7-1/8" HIGH.

EXPLOSIVE WEIGHT VARIES FROM 34 TO 64 POUNDS.



ISOMETRIC VIEW

KEY NUMBERS

- ① FORWARD BLOCKING (1 REQD). SEE THE "FORWARD BLOCKING A" DETAIL ON PAGE 10. SEE SPECIAL NOTE 5 ON PAGE 5 AND GENERAL NOTE "G" ON PAGE 2.
- ② RISER (1 REQD). SEE THE "RISER A" DETAIL ON PAGE 12. SEE SPECIAL NOTE 6 ON PAGE 5.
- ③ REAR-OF-LOAD GATE (1 REQD). SEE THE DETAIL ON PAGE 11. SEE SPECIAL NOTE 4 ON PAGE 5.
- ④ SOLID FILL, 1" AND/OR 2" THICK BY 4" WIDE BY GATE HEIGHT MATERIAL (AS REQD AT 3 PLACES). NAIL TO THE VERTICAL PIECE OF THE GATE AND/OR LAMINATE W/1 APPLICABLY SIZED NAIL EVERY 12".

**SPECIAL NOTES:**

1. A 696-CARTON LOAD IS SHOWN IN A 40'-0" LONG BY 7'-8" WIDE ( INSIDE DIMENSION ) CONVENTIONAL VAN TRAILER. TRAILERS OF OTHER DIMENSIONS MAY ALSO BE USED.
2. THE FIBERBOARD CARTON SHOWN IN THE TYPICAL 6-WIDE LOAD ON PAGE 4 HAS DIMENSIONS OF 18-1/2" LONG BY 15-1/4" WIDE BY 7-5/8" HIGH. WEIGHT OF THE DEPICTED CARTON IS 59 POUNDS ( APPROX ). SEE SPECIAL NOTE 1 ON PAGE 3 FOR OTHER CARTON SIZES.
3. **NOTE:** EXCESS SPACE ACROSS THE TRAILER MUST NOT EXCEED 1/5 OF THE CARTON DIMENSION WHICH IS POSITIONED ACROSS THE TRAILER.
4. THE "ALTERNATIVE REAR BLOCKING" SHOWN ON PAGE 11 MAY BE USED IF THE LENGTHWISE VOID SPACE IS ONE-FIFTH OR LESS OF THE CARTON DIMENSION WHICH IS POSITIONED LENGTHWISE IN THE TRAILER.
5. A TRAILER HAVING ROUNDED CORNERS AT THE FORWARD END IS SHOWN. IF THE TRAILER BEING USED IS EQUIPPED WITH A SQUARE FRONT OR WITH AN INSTALLED BULKHEAD, OMIT THE FORWARD BLOCKING, PIECE MARKED (D), AND POSITION THE CARTONS DIRECTLY AGAINST THE FORWARD PORTION OF THE TRAILER.
6. THE LOCATION SHOWN FOR THE RISER IN THE LOAD VIEW ON PAGE 4 IS TYPICAL. THE POSITION MAY BE ADJUSTED AS NECESSARY TO PROVIDE FOR PROPER WEIGHT DISTRIBUTION OR TO ADJUST A LOAD QUANTITY.
7. THE DEPICTED LOAD CAN BE INCREASED, LOAD LIMIT PERMITTING, BY INSTALLING THE RISER IN A MORE FORWARD LOCATION. THE LOAD CAN BE DECREASED BY INSTALLING THE RISER CLOSER TO THE REAR OF THE TRAILER. A LOAD CAN BE ADJUSTED BY TWO THRU FIVE CARTONS BY INSTALLING A RISER "A" OF AN APPROPRIATE LENGTH. A LOAD CAN BE ADJUSTED BY ONE CARTON BY INSTALLING A "RISER C" AS DETAILED ON PAGE 12.

**BILL OF MATERIAL**

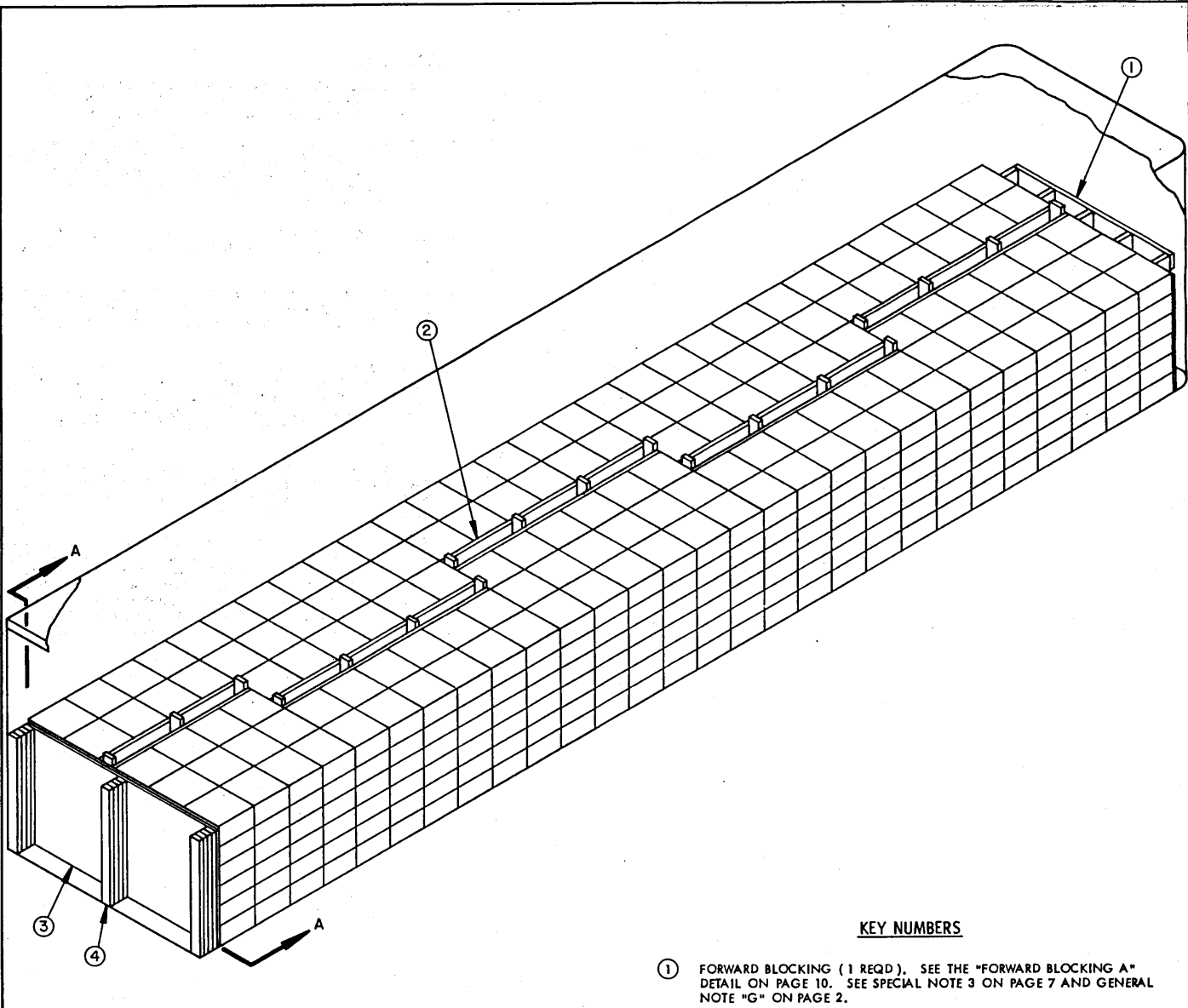
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	37	25
2" X 6"	32	32
NAILS	NO. REQD	POUNDS
6d (2")	40	1/4
10d (3")	39	3/4
PLYWOOD, 1/2"-----45 SQ FT REQD-----		62 LBS

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
FIBERBOARD CARTON-----	696-----	41,064 LBS *
DUNNAGE-----		177 LBS
<b>TOTAL WEIGHT-----</b>		<b>41,241 LBS</b>

\* SEE SPECIAL NOTE 2 ABOVE.

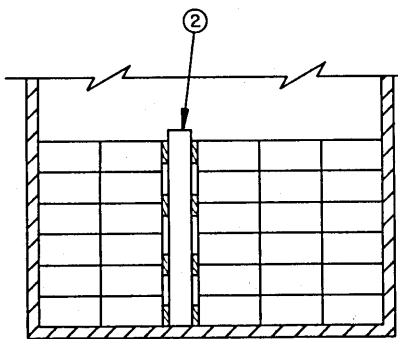
**TYPICAL 6-CARTON WIDE LOAD IN A 40'-0' LONG VAN TRAILER**



ISOMETRIC VIEW

KEY NUMBERS

- ① FORWARD BLOCKING (1 REQD). SEE THE "FORWARD BLOCKING A" DETAIL ON PAGE 10. SEE SPECIAL NOTE 3 ON PAGE 7 AND GENERAL NOTE "G" ON PAGE 2.
- ② CRIB FILL (5 REQD). SEE THE DETAIL ON PAGE 11.
- ③ REAR-OF-LOAD GATE (1 REQD). SEE THE DETAIL ON PAGE 11. SEE SPECIAL NOTE 4 ON PAGE 7.
- ④ SOLID FILL, 1" AND/OR 2" THICK BY 4" WIDE BY GATE HEIGHT MATERIAL (AS REQD AT 3 PLACES). NAIL TO THE VERTICAL PIECE OF THE GATE AND/OR LAMINATE W/1 APPLICABLY SIZED NAIL EVERY 12".



SECTION A-A

**SPECIAL NOTES:**

1. AN 840-CARTON LOAD IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER. TRAILERS OF OTHER DIMENSIONS MAY ALSO BE USED.
2. THE FIBERBOARD CARTON SHOWN IN THE TYPICAL 5-WIDE LOAD ON PAGE 6 HAS DIMENSIONS OF 16-1/4" LONG BY 16-1/4" WIDE BY 8-1/8" HIGH. WEIGHT OF THE DEPICTED CARTON IS 50 POUNDS (APPROX). SEE SPECIAL NOTE 1 ON PAGE 3 FOR OTHER CARTON SIZES.
3. A TRAILER HAVING ROUNDED CORNERS AT THE FORWARD END IS SHOWN. IF THE TRAILER BEING USED IS EQUIPPED WITH A SQUARE FRONT OR WITH AN INSTALLED BULKHEAD, OMIT THE FORWARD BLOCKING, PIECE MARKED ①, AND POSITION THE CARTONS DIRECTLY AGAINST THE FORWARD PORTION OF THE TRAILER.
4. THE "ALTERNATIVE REAR BLOCKING" SHOWN ON PAGE 11 MAY BE USED IF THE LENGTHWISE VOID SPACE IS ONE-FIFTH OR LESS OF THE CARTON DIMENSION WHICH IS POSITIONED LENGTHWISE IN THE TRAILER. THE ADJACENT CRIB FILL MUST BE LENGTHENED TO SUIT.
5. THE DEPICTED LOAD CAN BE INCREASED, LOAD LIMIT PERMITTING, BY INSTALLING ONE OR MORE RISERS TO STEP UP A PORTION OF THE LOAD, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 4. FOR CONSTRUCTION GUIDANCE, SEE THE APPLICABLE RISER DETAIL ON PAGE 12. ADJUST THE HEIGHT OF AN ADJACENT CRIB FILL AS NECESSARY. RISERS CAN ALSO BE USED TO STEP DOWN A LOAD IF IT IS DESIRED TO REDUCE THE LOAD QUANTITY.

BILL OF MATERIAL		
LUMBER	.. LINEAR FEET	BOARD FEET
2" X 4"	48	32
2" X 6"	425	425
NAILS	NO. REQD	POUNDS
6d (2")	40	1/4
10d (3")	370	5-3/4
PLYWOOD, 1/2"-----60 SQ FT REQD-----84 LBS		

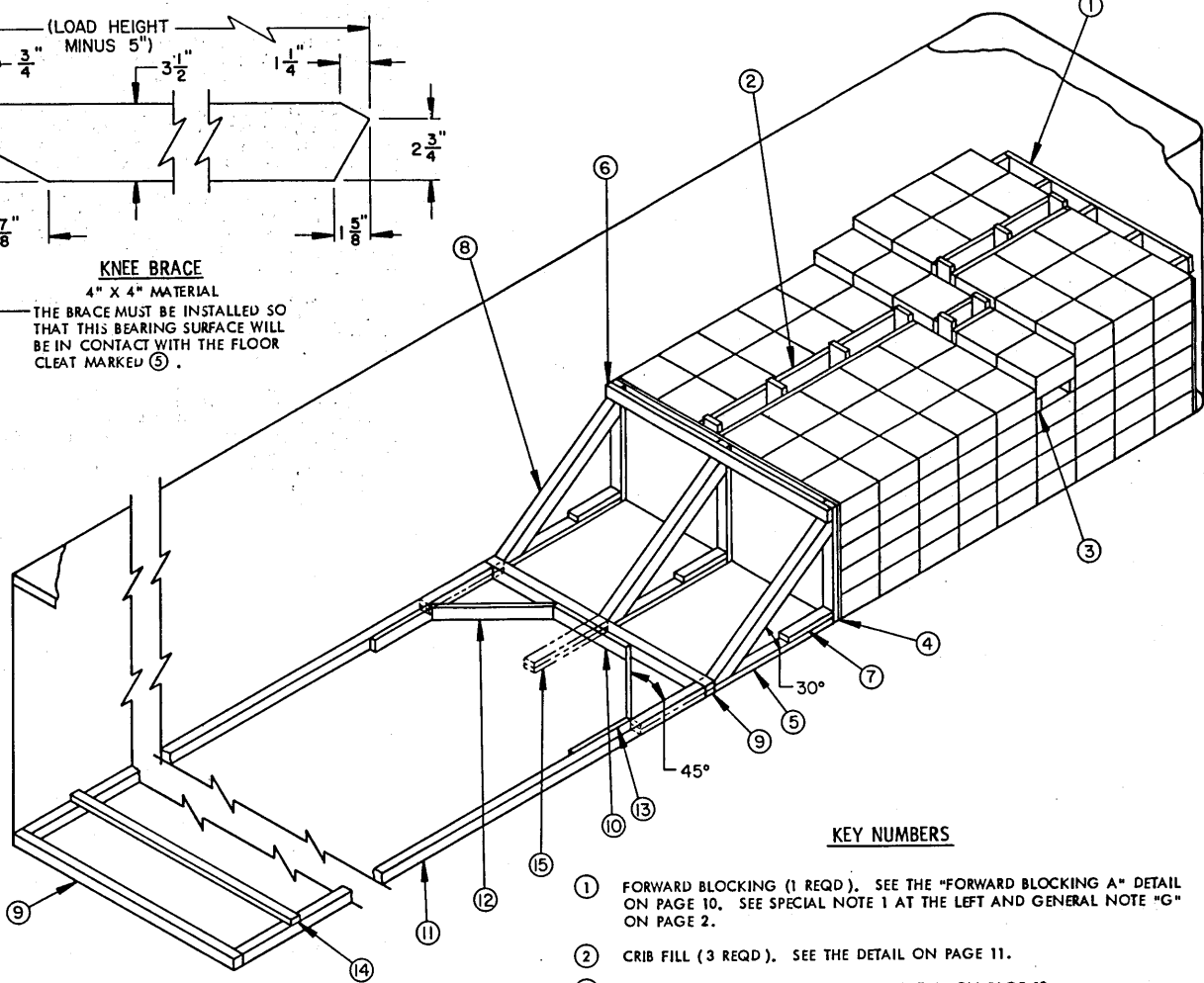
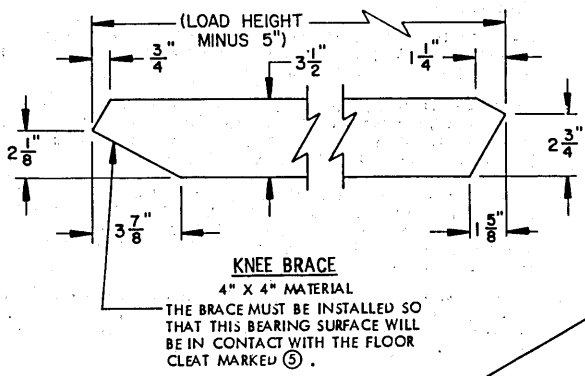
ITEM	LOAD AS SHOWN QUANTITY	WEIGHT ( APPROX )
FIBERBOARD CARTON-----	840-----	42,000 LBS *
DUNNAGE-----	-----	1,004 LBS
TOTAL WEIGHT-----		43,004 LBS

\* SEE SPECIAL NOTE 2 ABOVE.

TYPICAL 5-CARTON WIDE LOAD IN A 40'-0' LONG VAN TRAILER

PAGE 7

PROJECT CA 186-82



ISOMETRIC VIEW

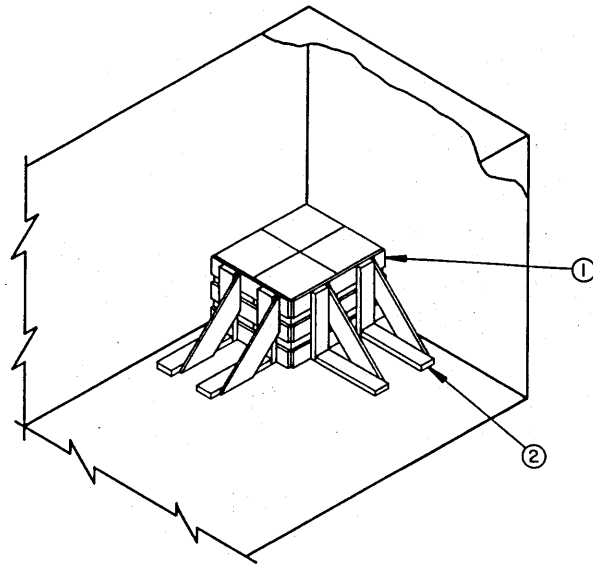
KEY NUMBERS

- ① FORWARD BLOCKING (1 REQD). SEE THE "FORWARD BLOCKING A" DETAIL ON PAGE 10. SEE SPECIAL NOTE 1 AT THE LEFT AND GENERAL NOTE "G" ON PAGE 2.
- ② CRIB FILL (3 REQD). SEE THE DETAIL ON PAGE 11.
- ③ RISER (2 REQD). SEE THE "RISER A" DETAIL ON PAGE 12.
- ④ REAR-OF-LOAD GATE (1 REQD). SEE THE DETAIL ON PAGE 11.
- ⑤ FLOOR CLEAT, 2" X 4" X 49" (3 REQD).
- ⑥ HOLD-DOWN, 2" X 4" BY TRAILER WIDTH MINUS 1/2" IN LENGTH (1 REQD). NAIL TO THE VERTICAL PIECES OF THE GATE MARKED ④ W/3-10d NAILS AT EACH JOINT.
- ⑦ POCKET CLEAT, 2" X 4" X 18" (3 REQD). NAIL TO PIECE MARKED ⑤ W/5-10d NAILS. TOENAIL TO PIECE MARKED ④ W/2-12d NAILS.
- ⑧ KNEE BRACE, 4" X 4" X 71-1/4" (3 REQD). SEE THE DETAIL ABOVE FOR THE BEVEL CUTS REQUIRED. TOENAIL TO PIECES MARKED ④ AND ⑤ W/2-16d NAILS AT EACH END.
- ⑨ HEADER, 4" X 4" BY TRAILER WIDTH MINUS 1/2" IN LENGTH (2 REQD). TOENAIL THE FORWARD HEADER TO KNEE BRACES MARKED ⑧ W/2-12d NAILS AT EACH JOINT.
- ⑩ CENTER CLEAT, 2" X 4" X 30" (1 REQD). NAIL TO THE FORWARD PIECE MARKED ⑨ W/7-10d NAILS.
- ⑪ SIDE STRUT, 4" X 4" BY CUT-TO-FIT BETWEEN FORWARD AND REAR PIECES MARKED ⑨ (2 REQD). TOENAIL TO THE HEADERS MARKED ⑨ W/2-16d NAILS AT EACH END.
- ⑫ DIAGONAL BRACE, 2" X 4" BY CUT-TO-FIT (2 REQD). DOUBLE BEVEL END WITH 45° CUTS. INSTALL AT A 45° ANGLE AS SHOWN AND TOENAIL TO PIECES MARKED ⑨ AND ⑪ W/2-12d NAILS AT EACH END.
- ⑬ SIDE CLEAT, 2" X 4" X 24" (2 REQD); NAIL TO PIECE MARKED ⑪ W/8-10d NAILS.
- ⑭ STRUT BRACING, 2" X 4" BY TRAILER WIDTH MINUS 1/2" IN LENGTH (CUT-TO-FIT) (MINIMUM OF 1 REQD). INSTALL ONE (1) NEAR THE REAR OF PIECES MARKED ⑪ AS SHOWN. ONE (1) ADDITIONAL PIECE IS REQUIRED FOR EVERY 7'-0" OF STRUT LENGTH. NAIL TO PIECES MARKED ⑪ W/3-10d NAILS AT EACH END.
- ⑮ BACK-UP CLEAT, 2" X 4" X 30" (DOUBLED) (3 REQD). ALIGN WITH A KNEE BRACE, PIECE MARKED ⑧, AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/7-12d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 4 AT THE LEFT.

SPECIAL NOTES:

1. THESE LTL OUTLOADING PROCEDURES ARE SHOWN DEPICTING THE USE OF "KNEE BRACE" BLOCKING IN A 7'-6" WIDE TRAILER. WIDER OR NARROWER TRAILERS CAN BE USED. IF A SQUARE FRONT TRAILER IS TO BE USED, THE FORWARD BLOCKING, PIECE MARKED ①, WILL NOT BE REQUIRED.
2. THE FIBERBOARD CARTON SHOWN IN THE ABOVE VIEW HAS DIMENSIONS OF 16-1/4" LONG BY 16-1/4" WIDE BY 8-1/8" HIGH. SEE SPECIAL NOTE 1 ON PAGE 3 FOR OTHER CARTON SIZES.
3. THE "KNEE BRACE" BLOCKING, SHOWN AS PIECES MARKED ⑧ THRU ⑬ IS ADEQUATE FOR RETAINING A MAXIMUM LOAD OF NOT MORE THAN 24,000 POUNDS. IF IT IS DESIRED TO SHIP A LOAD OF UP TO 36,000 POUNDS, ADD A PIECE MARKED ⑮ IN ALIGNMENT WITH THE CENTER KNEE BRACE, PIECE MARKED ⑧. PIECES MARKED ⑮, ⑫, AND ⑬ WILL NOT BE REQUIRED.
4. PIECES MARKED ⑮ ARE FOR USE IN A TRAILER WHICH HAS A NAILABLE FLOOR AND MAY BE USED, IF DESIRED, IN LIEU OF PIECES MARKED ⑨ THRU ⑭ WHICH APPLY TO TRAILERS HAVING NON-NAILABLE FLOORS. WHEN USING NAILABLE FLOOR LINE DUNNAGE, NAIL THE FLOOR CLEAT, PIECE MARKED ⑤ TO THE TRAILER FLOOR W/1-12d NAIL EVERY 6". THREE (3) BACK-UP CLEATS, SHOWN AS PIECE MARKED ⑮ ARE ADEQUATE FOR RETAINING A MAXIMUM LOAD OF NOT MORE THAN 10,800 POUNDS. FOR A LOAD OF UP TO 14,000 POUNDS USE 36" LONG CLEATS W/9 NAILS EACH LAYER. FOR A LOAD OF UP TO 19,000 POUNDS, USE 42" LONG CLEATS W/11 NAILS EACH LAYER.





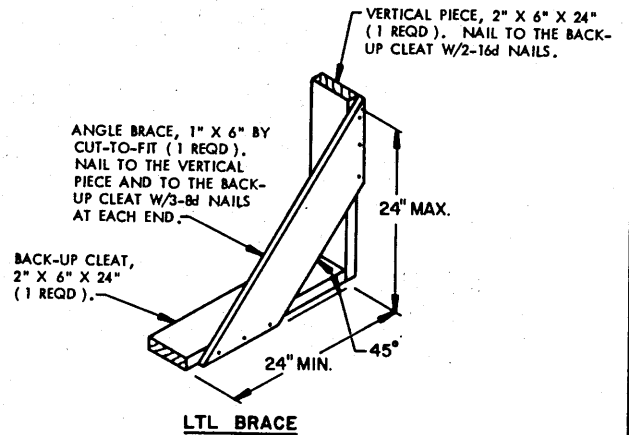
ISOMETRIC VIEW

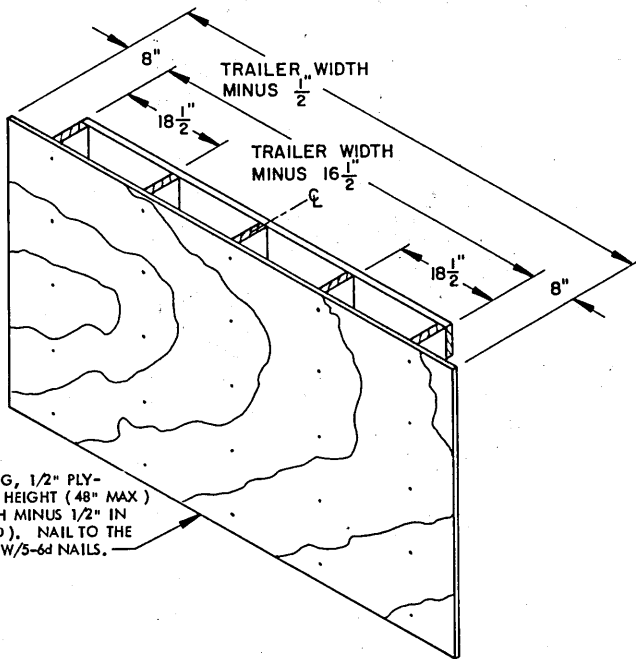
KEY NUMBERS

- ① LOAD BEARING PIECE, 1" X 6" BY A LENGTH TO SUIT (6 REQD). NAIL TO THE LTL BRACES W/3-6d NAILS AT EACH JOINT.
- ② LTL BRACE (4 REQD). SEE THE DETAIL BELOW. NAIL TO THE TRAILER FLOOR W/7-12d NAILS.

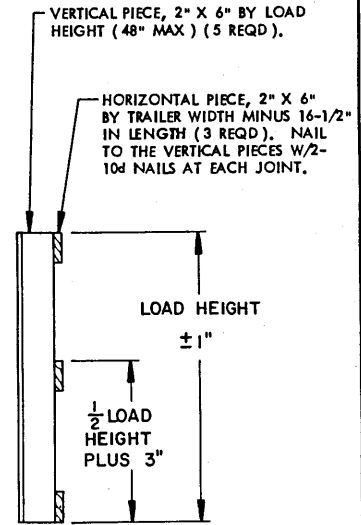
SPECIAL NOTES:

1. THESE LTL OUTLOADING PROCEDURES DEPICT THE USE OF "LTL BRACE". TYPE BLOCKING IN A 7'-6" WIDE VAN TRAILER WHICH IS EQUIPPED WITH A NAILABLE FLOOR. WIDER OR NARROWER TRAILERS MAY BE USED.
2. THE FIBERBOARD CARTON SHOWN IN THE ABOVE VIEW HAS DIMENSIONS OF 18-3/4" LONG BY 15-1/2" WIDE BY 7-5/8" HIGH. SEE SPECIAL NOTE 1 ON PAGE 3 FOR OTHER TYPICAL CARTON SIZES.
3. A TRAILER HAVING A SQUARE FRONT IS SHOWN. IF THE TRAILER HAS ROUNDED CORNERS, THE LOAD MAY BE POSITIONED AWAY FROM THE FRONT WALL AND LTL BRACES AND LOAD BEARING PIECES INSTALLED AT EACH END OF THE LOAD.
4. EACH LTL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL SUPPORT 2,000 POUNDS.
5. THE PROCEDURES SHOWN ON THIS PAGE ARE LIMITED TO LOADS WHICH ARE NOT MORE THAN 25" IN HEIGHT.





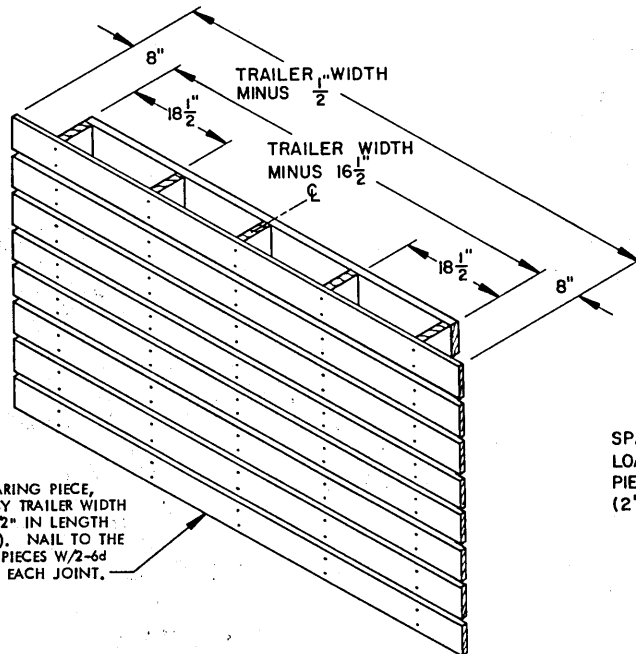
PLYWOOD FACING, 1/2" PLYWOOD BY LOAD HEIGHT (48" MAX) BY TRAILER WIDTH MINUS 1/2" IN LENGTH (1 REQD). NAIL TO THE VERTICAL PIECES W/5-6d NAILS.



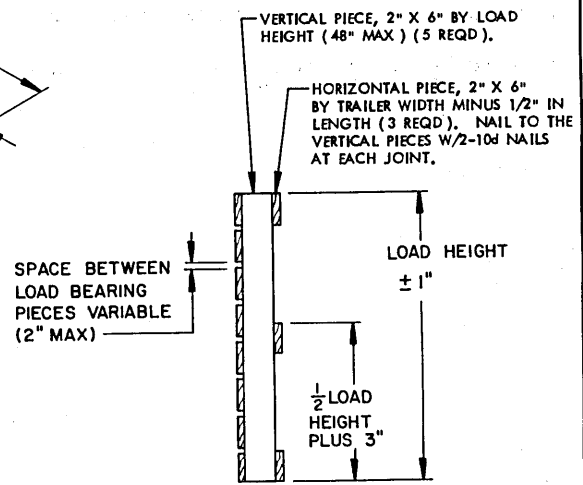
END VIEW

**FORWARD BLOCKING A**

IF 1/2" PLYWOOD IS NOT AVAILABLE OR IF DESIRED, AN ASSEMBLY CONSTRUCTED ENTIRELY OF DIMENSIONAL LUMBER MAY BE USED. SEE THE "FORWARD BLOCKING B" DETAIL BELOW FOR CONSTRUCTION GUIDANCE.



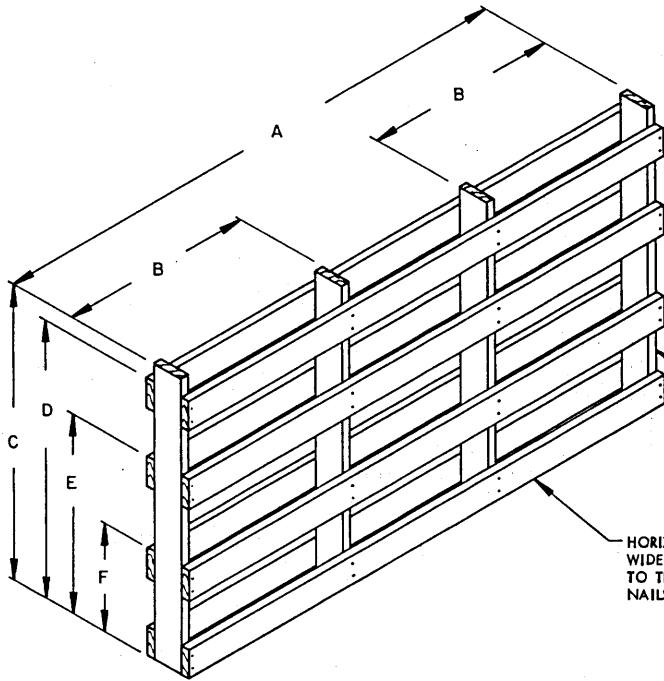
LOAD BEARING PIECE, 1" X 6" BY TRAILER WIDTH MINUS 1/2" IN LENGTH (8 REQD). NAIL TO THE VERTICAL PIECES W/2-6d NAILS AT EACH JOINT.



END VIEW

**FORWARD BLOCKING B**

DETAILS



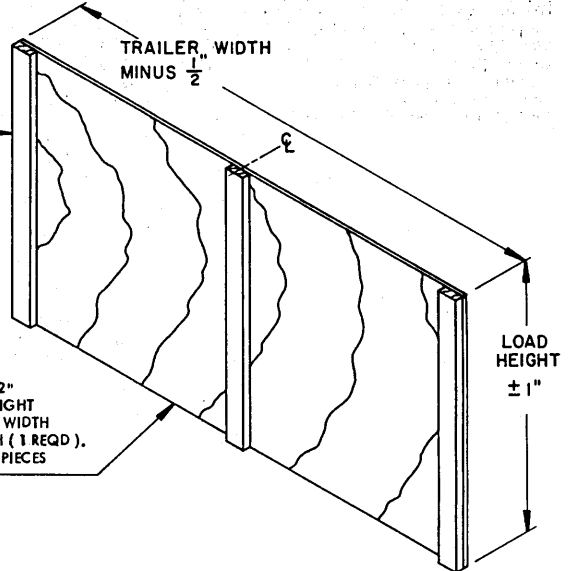
CRIB FILL DIMENSIONAL CHART	
LOCATION IDENTITY	DESCRIPTION
A	LENGTH TO SUIT
B	NOT TO EXCEED LENGTH OF 2 BOXES
C	LOAD HEIGHT PLUS 2"
D	LOAD HEIGHT
E	4 BOXES HIGH PLUS 3"
F	2 BOXES HIGH PLUS 3"

VERTICAL PIECE, 2" THICK BY A WIDTH AND LENGTH TO SUIT (4 REQD).

HORIZONTAL PIECE, 1" AND/OR 2" THICK BY 6" WIDE BY A LENGTH TO SUIT (AS REQD). NAIL TO THE VERTICAL PIECES W/2 APPLICABLY SIZED NAILS AT EACH JOINT.

**CRIB FILL**

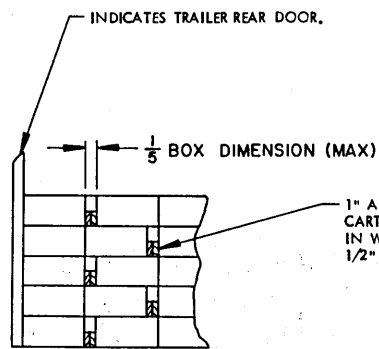
THE CRIB FILL SHOWN ABOVE IS FOR A 6-CARTON HIGH BY 6-CARTON LONG LOAD. IT MAY BE MODIFIED AS NECESSARY TO SUIT THE LOAD BEING SHIPPED. HORIZONTAL PIECES MUST CONTACT AT LEAST EVERY OTHER JOINT BETWEEN LAYERS, AND VERTICAL PIECES MUST BE SPACED NOT FURTHER APART THAN EVERY OTHER JOINT BETWEEN STACKS. ALSO, THE WIDTH AND THICKNESS OF THE MATERIAL MAY BE ADJUSTED AS NECESSARY, DEPENDING ON THE CARTON SIZE AND/OR TRAILER WIDTH.



VERTICAL PIECE, 2" X 4" BY LOAD HEIGHT (48" MAX) (3 REQD).

PLYWOOD FACING, 1/2" PLYWOOD BY LOAD HEIGHT (48" MAX) BY TRAILER WIDTH MINUS 1/2" IN LENGTH (1 REQD). NAIL TO THE VERTICAL PIECES W/5-6d NAILS.

**REAR-OF-LOAD GATE**

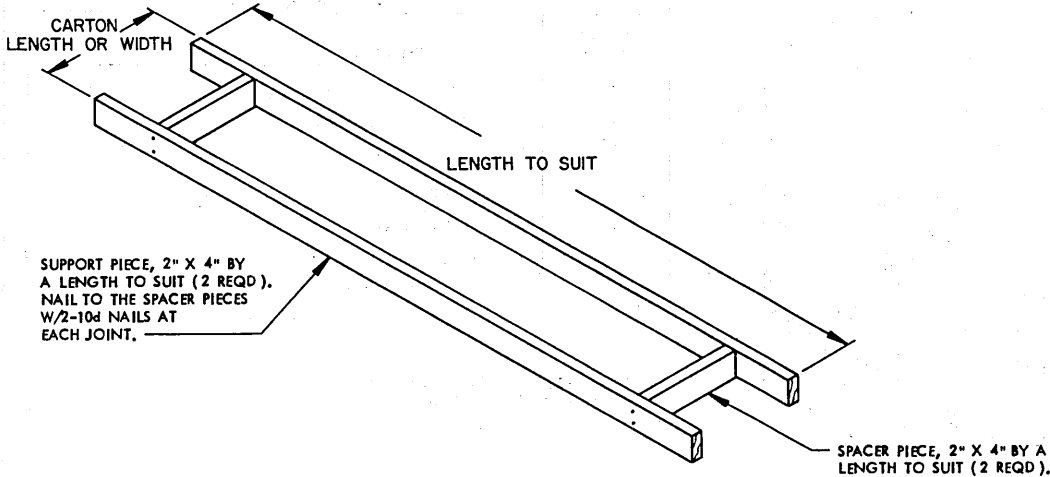


**ELEVATION VIEW**

**ALTERNATIVE REAR BLOCKING**

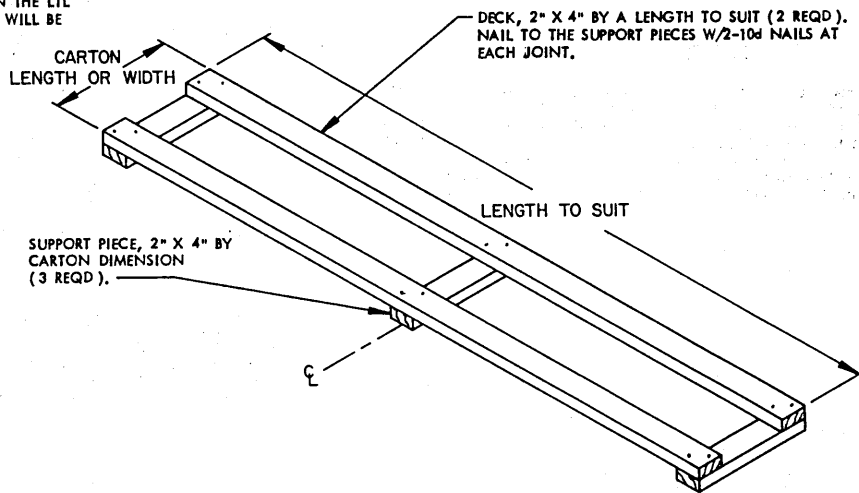
THE 1/5 BOX DIMENSION INDICATES 1/5 OF THE DIMENSION OF THE CARTON THAT IS POSITIONED LENGTHWISE IN THE TRAILER.

**DETAILS**

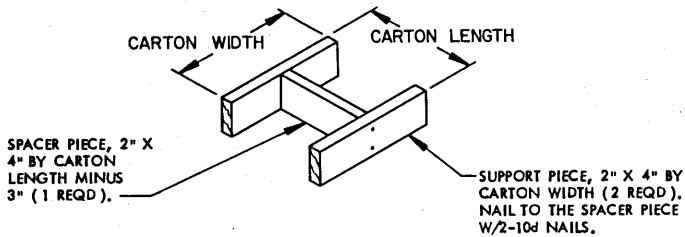


**RISER A**

**NOTE:** THE HEIGHT OF A RISER ASSEMBLY MUST BE 1/2 OF THE BOX HEIGHT PLUS OR MINUS 1". DIFFERENT WIDTHS OR THICKNESSES OF LUMBER THAN SHOWN BY THESE DETAILS MAY BE USED TO COMPENSATE FOR DIFFERENT HEIGHT FIBERBOARD CARTONS. THE LENGTH OF THE RISER ASSEMBLY A AND B MAY BE ADJUSTED AS NECESSARY TO SUIT THE NUMBER OF CARTONS IN A STACK, SUCH AS IN THE LTL SHOWN ON PAGE B. IN A CASE SUCH AS THAT, THE RISER WILL BE TWO AND/OR THREE CARTON WIDTHS IN LENGTH.

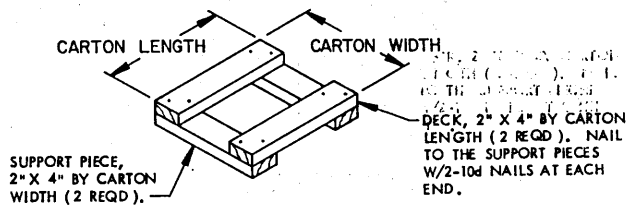


**RISER B**



**RISER C**

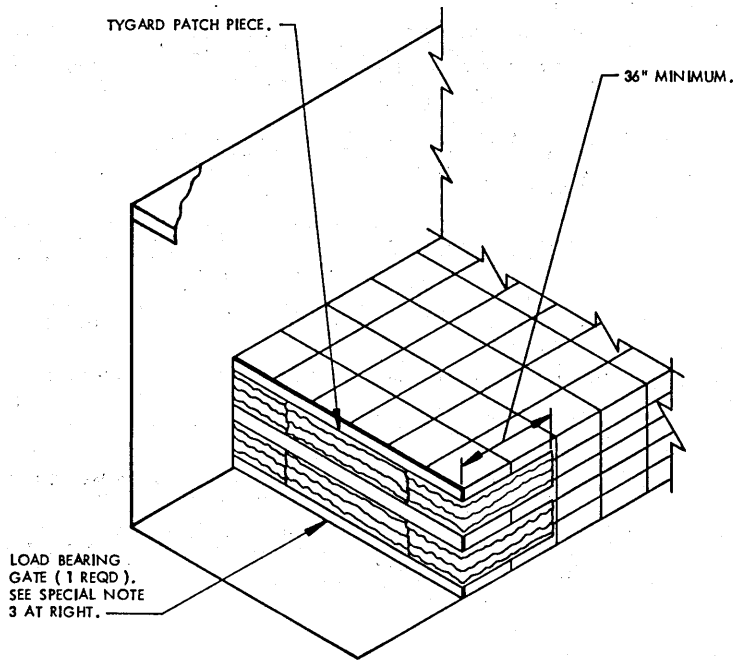
THIS RISER CAN BE USED IN THE PLACE OF AN OMITTED CARTON WHICH IS 5" TO 9" IN HEIGHT.



**RISER D**

THIS RISER CAN BE USED IN THE PLACE OF AN OMITTED CARTON WHICH IS 5" TO 7" IN HEIGHT.

**DETAILS**



### TYGARD METHOD

#### RECOMMENDED EQUIPMENT/INSTALLATION PROCEDURES

##### EQUIPMENT REQUIRED

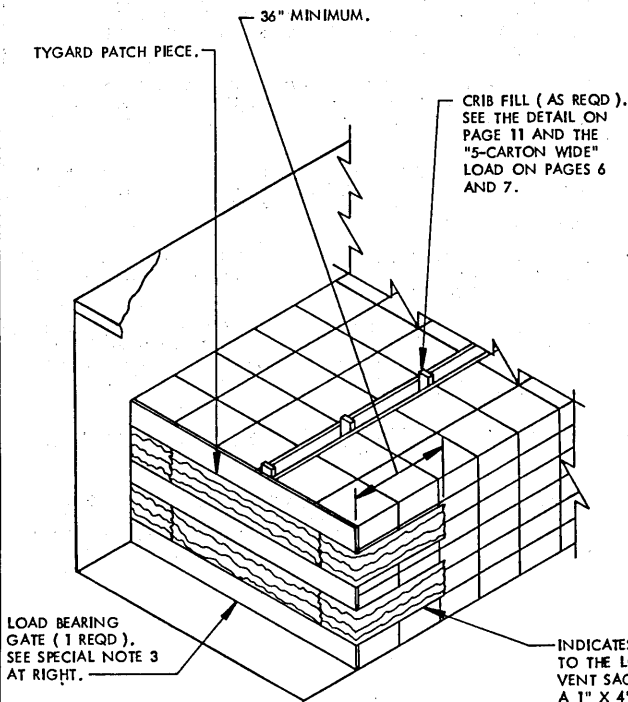
PAINT ROLLER, LATEX  
 PAINT ROLLER PAN  
 TENSIONING ROD/TOOL  
 PRESSURE ROLLER  
 RATCHET WRENCH ( 12" TO 15" HANDLE )  
 OPEN END OR BOX WRENCH ( 12" TO 15" HANDLE )  
 SCISSORS OR KNIFE  
 TYGARD ( 15" WIDE ROLL )  
 TYGARD ADHESIVE

##### BASIC INSTALLATION GUIDANCE

1. CUT TO LENGTH THE REQUIRED NUMBER OF TYGARD PIECES ( FROM 2 TO 4 DEPENDING UPON THE LOAD CONFIGURATION ) FOR ATTACHMENT TO THE TRAILER SIDEWALL. PIECES WILL BE OF A LENGTH AS REQUIRED TO PROVIDE PROPER BONDING TO THE TRAILER SIDEWALL AND TO EXTEND 60" ACROSS THE REAR OF THE LOAD. ALSO, CUT 72" LONG "PATCH" PIECES OF TYGARD MATERIAL, ONE FOR EACH SET OF TWO PIECES PREVIOUSLY CUT.
2. PRIOR TO POSITIONING OF THE BOXES IN THE REARMOST LOAD UNITS, APPLY TYGARD ADHESIVE TO THE PROPER PORTIONS OF THE TRAILER SIDEWALLS AND TO THE CORD SIDE OF A CORRESPONDING LENGTH OF EACH OF THE TYGARD PIECES THAT ARE TO BE ATTACHED TO THE SIDEWALLS OF THE TRAILER. ALLOW TIME FOR THE ADHESIVE TO "CURE" BEFORE PLACING A STRIP OF TYGARD ONTO A SIDEWALL ( ADHESIVE WILL FEEL ALMOST DRY WHEN TOUCHED ). NOTE: APPLICATION OF TYGARD IS SIMILAR TO THE APPLICATION OF "FORMICA".
3. APPLY THE TYGARD PIECES TO EACH SIDEWALL OF THE TRAILER SO THAT THE PIECES ARE PARALLEL OR NEARLY PARALLEL TO THE FLOOR. ROLL THE TYGARD WITH THE PRESSURE ROLLER TO ENSURE PROPER BONDING IS ACHIEVED. TEMPORARILY SECURE THE LOOSE ENDS TO THE TRAILER SIDEWALL OR TO AN OPEN HINGED TYPE DOOR OR TO THE OUTSIDE WALL, AS APPLICABLE.
4. POSITION THE BOXES OF THE REARMOST LOAD UNITS INTO THE TRAILER.
5. UNDO THE PREVIOUSLY SECURED LOOSE ENDS AND BRING A SET OF TWO PIECES TOGETHER ACROSS THE REAR OF THE LOAD. POSITION THE TENSIONING ROD SO THAT THE LOOSE ENDS OF THE TYGARD MATERIAL EXTEND THRU THE SLOT IN ROD. USING THE TWO WRENCHES, ROLL UP THE TYGARD TO TENSION IT ACROSS REAR OF THE LOAD. POSITION A WRENCH SO AS TO MAINTAIN THE TENSION IN THE TYGARD PIECES. CUT OFF AND DISCARD EXCESS MATERIAL FROM ONE PIECE OF THE TYGARD.
6. APPLY TYGARD ADHESIVE TO THE TENSIONED TYGARD PIECES AND ALSO TO THE CORD SIDE OF THE PREVIOUSLY CUT "PATCH" PIECE. APPLY THE "PATCH" AND ROLL WITH THE PRESSURE ROLLER TO ENSURE PROPER BONDING.

#### SPECIAL NOTES:

1. THE LOAD AT LEFT IS SHOWN IN A 7'-8" WIDE ( INSIDE DIMENSION ) CONVENTIONAL VAN TRAILER. TRAILERS OF OTHER DIMENSIONS MAY ALSO BE USED. THE FIBERBOARD CARTON SHOWN IN THE LOAD AT LEFT HAS DIMENSIONS OF 18-1/2" LONG BY 15-1/4" WIDE BY 7-5/8" HIGH. SEE SPECIAL NOTE 1 ON PAGE 3 FOR OTHER CARTON SIZES.
2. THE TYGARD METHOD OF REAR BLOCKING DEPICTED AT LEFT CAN ONLY BE USED IN TRAILERS WHICH HAVE REASONABLE SMOOTH AND ADEQUATELY SECURED SIDEWALL PANELS IN THE AREA WHERE THE TYGARD MATERIAL IS TO BE APPLIED.
3. A LOAD HEIGHT PLYWOOD GATE MUST BE INSTALLED AT THE REAR OF THE LOAD TO PROVIDE A SMOOTH SURFACE FOR THE TYGARD MATERIAL TO EXTEND AROUND. A LOAD HEIGHT ( 48" MAXIMUM ) BY TRAILER WIDTH MINUS 1/2" IN LENGTH PIECE OF PLYWOOD WILL BE USED FOR A GATE.
4. TYGARD MATERIAL MUST BE INSTALLED AT TWO LEVELS WHEN LOAD HEIGHT EXCEEDS 24". ONLY ONE LEVEL OF TYGARD MATERIAL IS REQUIRED WHEN LOAD HEIGHT IS 24" OR LESS.
5. THE TYGARD MATERIAL AND THE ADHESIVE FOR ATTACHING IT ARE COMMERCIAL PRODUCTS. FOR A SOURCE OF SUPPLY, CONTACT WALNUT INDUSTRIES, INC., 1344 ADAMS ROAD, PO BOX "E", BENSALEM, PA 19020-0860, PHONE 1-800-523-6536. APPLICATION INSTRUCTIONS AND GUIDANCE CAN ALSO BE OBTAINED FROM THAT OFFICE.
6. THE TYGARD METHOD, ALTHOUGH ESPECIALLY FOR TRAILERS HAVING ROLL-UP TYPE DOORS, MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS.
7. NOTICE: IF THE AREA OF A SIDEWALL WHERE THE TYGARD SHOULD BE ATTACHED IS ROUGH AND/OR BROKEN, THE APPLICABLE PIECE ( S ) OF TYGARD CAN BE LENGTHENED A SUITABLE AMOUNT AND ATTACHED TO THE SIDEWALL AHEAD OF THE INDICATED REFERRED LOCATION.



**TYGARD METHOD**

CRIB FILL (AS REQD).  
SEE THE DETAIL ON  
PAGE 11 AND THE  
"5-CARTON WIDE"  
LOAD ON PAGES 6  
AND 7.

LOAD BEARING  
GATE (1 REQD).  
SEE SPECIAL NOTE 3  
AT RIGHT.

INDICATES TYGARD MATERIAL. STAPLE  
TO THE LOAD BEARING GATE TO PRE-  
VENT SAGGING. AS AN ALTERNATIVE,  
A 1" X 4" BY LOAD HEIGHT PIECE MAY  
BE NAILED THRU THE TYGARD MATERIAL  
INTO THE LOAD BEARING GATE. **CAUTION:**  
PLACE 1" X 4" SO AS TO BE ALIGNED WITH  
THE VOID BETWEEN THE ROWS OF BOXES.

**SPECIAL NOTES:**

1. THE LOAD AT LEFT IS SHOWN IN A 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER. TRAILERS OF OTHER DIMENSIONS MAY ALSO BE USED. THE FIBERBOARD CARTON SHOWN IN THE LOAD AT LEFT HAS DIMENSIONS OF 16-1/4" LONG BY 16-1/4" WIDE BY 8-1/8" HIGH. SEE SPECIAL NOTE 7 ON PAGE 3 FOR OTHER CARTON SIZES.
2. THE TYGARD METHOD OF REAR BLOCKING DEPICTED AT LEFT CAN ONLY BE USED IN TRAILERS WHICH HAVE REASONABLY SMOOTH AND ADEQUATELY SECURED SIDEWALL PANELS IN THE AREA WHERE THE TYGARD MATERIAL IS TO BE APPLIED.
3. A PLYWOOD GATE MUST BE INSTALLED AT THE REAR OF THE LOAD TO PROVIDE A SMOOTH SURFACE FOR THE TYGARD MATERIAL TO EXTEND AROUND. A LOAD HEIGHT (48" MAXIMUM, PLUS 0", MINUS 1") BY TRAILER WIDTH MINUS 1/2" IN LENGTH PIECE OF PLYWOOD WILL BE USED FOR A GATE.
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6. THE TYGARD METHOD, ALTHOUGH ESPECIALLY FOR TRAILERS HAVING ROLL-UP TYPE DOORS, MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS.
7. **NOTICE:** IF THE AREA OF A SIDEWALL WHERE THE TYGARD SHOULD BE ATTACHED IS ROUGH AND/OR BROKEN, THE APPLICABLE PIECE (S) OF TYGARD CAN BE LENGTHENED A SUITABLE AMOUNT AND ATTACHED TO THE SIDEWALL AHEAD OF THE INDICATED PREFERRED LOCATION.

**RECOMMENDED EQUIPMENT/INSTALLATION PROCEDURES**

**EQUIPMENT REQUIRED**

- PAINT ROLLER, LATEX
- PAINT ROLLER PAN
- TENSIONING ROD/TOOL
- PRESSURE ROLLER
- RATCHET WRENCH (12" TO 15" HANDLE)
- OPEN END OR BOX WRENCH (12" TO 15" HANDLE)
- SCISSORS OR KNIFE
- TYGARD (15" WIDE ROLL)
- TYGARD ADHESIVE

**BASIC INSTALLATION GUIDANCE**

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2. PRIOR TO POSITIONING OF THE BOXES IN THE REARMOST LOAD UNITS, APPLY TYGARD ADHESIVE TO THE PROPER PORTIONS OF THE TRAILER SIDEWALLS AND TO THE CORD SIDE OF A CORRESPONDING LENGTH OF EACH OF THE TYGARD PIECES THAT ARE TO BE ATTACHED TO THE SIDEWALLS OF THE TRAILER. ALLOW TIME FOR THE ADHESIVE TO "CURE" BEFORE PLACING A STRIP OF TYGARD ONTO A SIDEWALL (ADHESIVE WILL FEEL ALMOST DRY WHEN TOUCHED). **NOTE:** APPLICATION OF TYGARD IS SIMILAR TO THE APPLICATION OF "FORMICA".
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**TYGARD METHOD**

**PROCEDURES FOR CONVENTIONAL VAN TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS**