

APPROVED BY  
 MOVEMENTS CONTROL AGENCY,  
 U. S. ARMY TRANSPORTATION  
 COMMAND, EUROPE  
 SIGNED *C. R. Fitch, Lt. Col. C.*  
 DATE 25 TC CMDG.  
70

# LANCE

## LOADING AND BRACING ON GERMAN RAILCAR OF LAUNCHER, ZERO LENGTH, GUIDED MISSILE, XM740

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<small>DRAFTSMAN</small> <i>JPH / CAC</i>	<small>PROJ ENG</small> <i>WWD / WWD</i>	<small>ASCEM-LOSM</small> <i>CSH</i>	<small>SUBMITTED</small> <i>C. R. Fitch, Lt. Col. C.</i>
<small>CHECKER</small> <i>TAS / BGA</i>	<small>ANC ANNO CTR</small> <i>John Boyd</i>	<small>ANSMI-SUMP</small> <i>John Boyd</i>	<small>COMMANDING OFFICER, SAVANNA ARMY DEPOT</small>
<b>REVISIONS</b>			<small>APPROVED</small> <i>Andrew D. Ford</i>
			<small>ARMY MISSILE COMMAND</small>
			<small>APPROVED BY ORDER OF COMMANDING GENERAL, U. S. ARMY MATERIEL COMMAND</small> <i>S. D. Heil</i>
			<small>U. S. ARMY MATERIEL COMMAND</small>
			<small>FEBRUARY 1971</small>
		<small>CLASS</small>	<small>DIVISION</small>
		<small>DRAWING</small>	<small>FILE</small>
		19	48
		7188	GSE 5LC7

**DO NOT SCALE**

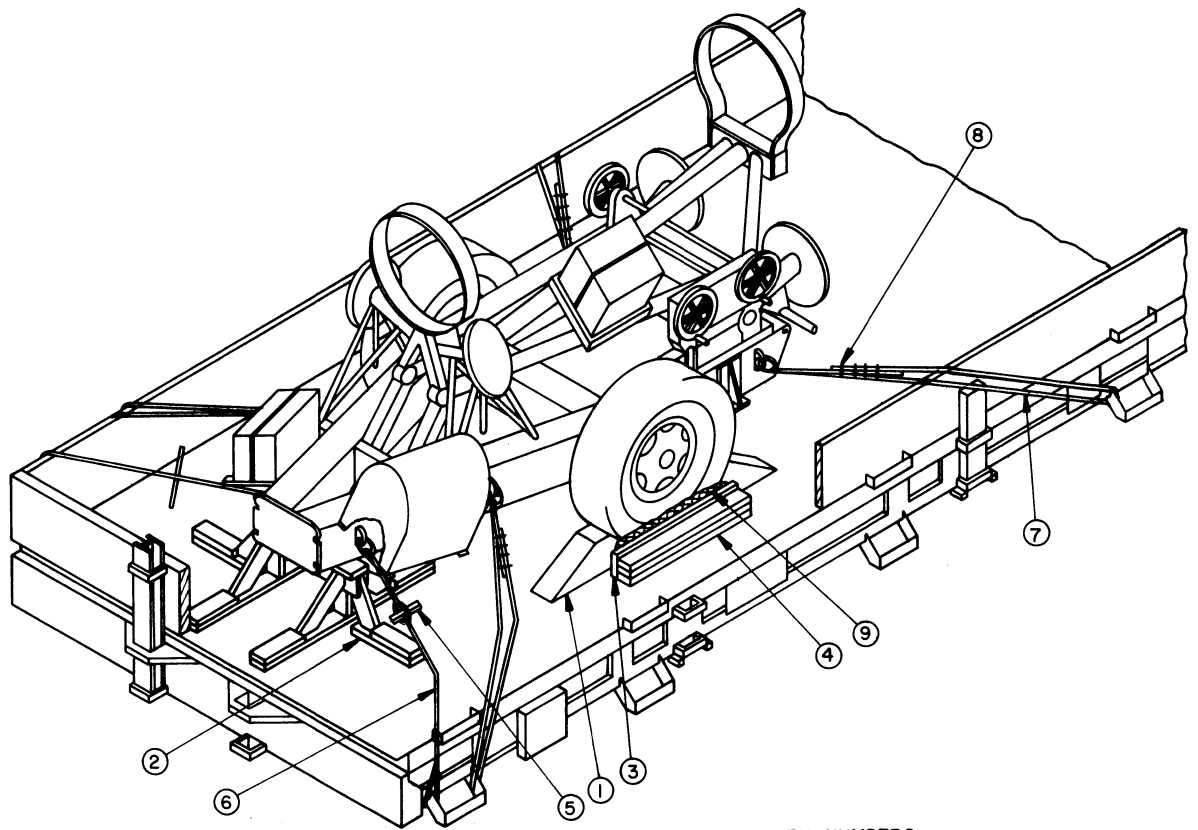
## GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AMCR 740-13.
- B. THE OUTLOADING PROCEDURES SHOWN HEREIN ARE APPLICABLE TO GERMAN RAILCARS AND OTHER FOREIGN RAILCARS OF SIMILAR DESIGN AND CONSTRUCTION.
- C. THE LOADS AS SHOWN ARE BASED ON GERMAN RAILCAR (RLMMS) 40'-11" (12471MM) LONG BY 9'-1-1/2" (2781MM) WIDE WITH 18" (457MM) HIGH CAR SIDE. ADDITIONAL UNITS OR OTHER ITEMS MAY BE LOADED ON THE CAR WITH THE VIEW TOWARD FULL UTILIZATION OF CARRIER EQUIPMENT.
- D. LADING DATA:  
DIMENSIONS ----- 21'-0-1/2" (6414MM) LONG BY 6'-6" (1981MM) WIDE BY 6'-7-1/2" (2019MM) HIGH.  
GROSS WEIGHT ----- 3,210 POUNDS (APPROX) (1456 KG).  
NOTE: ITEM LENGTH WITHOUT TOWBAR --- 11'-11-3/4" (3651MM).
- E. REMOVE ALL POSTS FROM SIDE OF CAR AND PLACE IN RACKS UNDER CAR.
- F. CAUTION: DURING WIRE ROPE INSTALLATION AVOID CONTACT WITH ALL ELECTRICAL WIRING, VEHICLE CONTROLS AND OTHER APPURTENANCES.
- G. WIRE ROPE CABLE MUST BE TENSIONED SUFFICIENTLY TO CAUSE SLIGHT VEHICLE BODY DEPRESSION. TENSIONING CAN BE ACCOMPLISHED BY EMPLOYING TWO (2) CABLE "GRIPPERS" AND AN APPLICABLY SIZED "COME-A-LONG" TYPE MECHANICAL HOIST.
- H. ALL HAND BRAKES MUST BE "SET" WITH THE HAND LEVERS WIRE TIED OR BLOCKED, AND TIRES WILL BE INFLATED TO 10 PSI ABOVE REGULAR OPERATING PRESSURE.
- J. WHEN ANY STRAP IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF TWO SEALS, BUTTED TOGETHER, AND TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED TO SEAL THE JOINT.
- K. 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 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 ON-TO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.

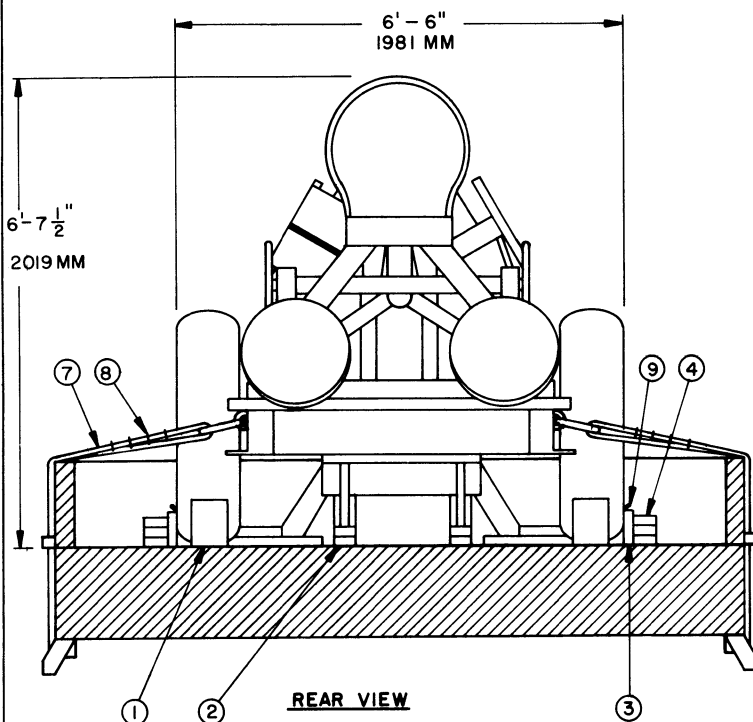
## MATERIAL SPECIFICATIONS

- LUMBER ----- : DOUGLAS FIR OR COMPARABLE LUMBER WITH STRAIGHT GRAIN AND FREE OF MATERIAL DEFECTS. REF: FED SPEC MM-L-751.
- NAILS ----- : COMMON, CEMENT COATED OR CHEMICALLY ETCHED.  
REF: FED SPEC FF-N-105.  
ALT: ANNULAR-RING TYPE NAIL OF SAME SIZE.
- ROPE ----- : STEEL, WIRE, PLAIN, PREFORMED, REGULAR LAY, 6.56 TONS, 6 X 19, FLEXIBLE IWRC, MACWHYTE WIRE ROPE CO (OR EQUAL).  
REF: FED SPEC RR-W-410.
- CLIPS ----- : "U" BOLT, CROSBY, HEAVY DUTY (OR EQUAL).
- WIRE ----- : ANNEALED, BLACK. REF: FED SPEC QQ-W-461.
- STRAPPING, STEEL -- : TYPE I OR IV, CLASS "A" OR "C", REF: FED SPEC QQ-S-781.  
FOR FSN SEE SB-38-100.
- STRAP ANCHOR PLATE: FSN 5340-252-3015.
- STRAP SEAL; STRAP STAPLE; STAKE  
POCKET PROTECTOR -- : COMMERCIAL GRADE.

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**ISOMETRIC VIEW**



**REAR VIEW**

**KEY NUMBERS**

- ① CHOCK BLOCK (4 REQD). SEE THE "CHOCK BLOCK" DETAIL ON PAGE 10. LOCATE 45° END OF BLOCK AGAINST WHEEL. NAIL THRU HEEL OF BLOCK W/3-40d NAILS AND 2-60d NAILS. TOENAIL TO CAR FLOOR W/2-40d NAILS ON EACH SIDE.
- ② FORWARD BLOCKING (1 REQD). SEE THE "FORWARD BLOCKING ASSEMBLY A" DETAIL ON PAGE 8, AND GENERAL NOTE "K" ON PAGE 2.
- ③ RUBBING STRIP, 2" X 6" X 36" (60MM X 120MM X 914MM) (2 REQD). POSITION ON EDGE AND NAIL TO LOWER PIECE MARKED ④ W/5-12d NAILS.
- ④ SIDE BLOCKING, 2" X 4" X 36" (60MM X 100MM X 914MM) (TRIPLED) (2 REQD). NAIL FIRST PIECE TO CAR FLOOR W/5-16d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER.
- ⑤ WIRE TWISTER, 2" X 2" (60MM X 50MM) BY LENGTH TO SUIT (2 REQD).
- ⑥ EIGHT (8) STRANDS OF NO. 8 GAGE BLACK ANNEALED WIRE (2 REQD). PASS THRU TIE DOWN DEVICE ON LAUNCHER AND RAILCAR TIEDOWN FACILITY TO FORM A COMPLETE LOOP. TWIST TAUT WITH PIECE MARKED ⑤.
- ⑦ STEEL WIRE ROPE, 3/8" DIA., 6.56 TONS (4 REQD). INSTALL CABLE ANGULARLY AS SHOWN AND TO FORM A COMPLETE LOOP FROM TIEDOWN FACILITY ON RAILCAR THRU LADING TIEDOWN DEVICE AND BACK TO RAILCAR TIEDOWN FACILITY. SEE GENERAL NOTES "F" AND "G" ON PAGE 2.
- ⑧ CLIP, SIZE 3/8" (16 REQD). USE FOUR (4) PER CABLE.
- ⑨ WATERPROOF PAPER OR BURLAP, 36" (914MM) LONG BY 15" (381MM) WIDE (2 REQD). POSITION UNDER AND EXTEND 2" (51MM) ABOVE PIECE MARKED ③.

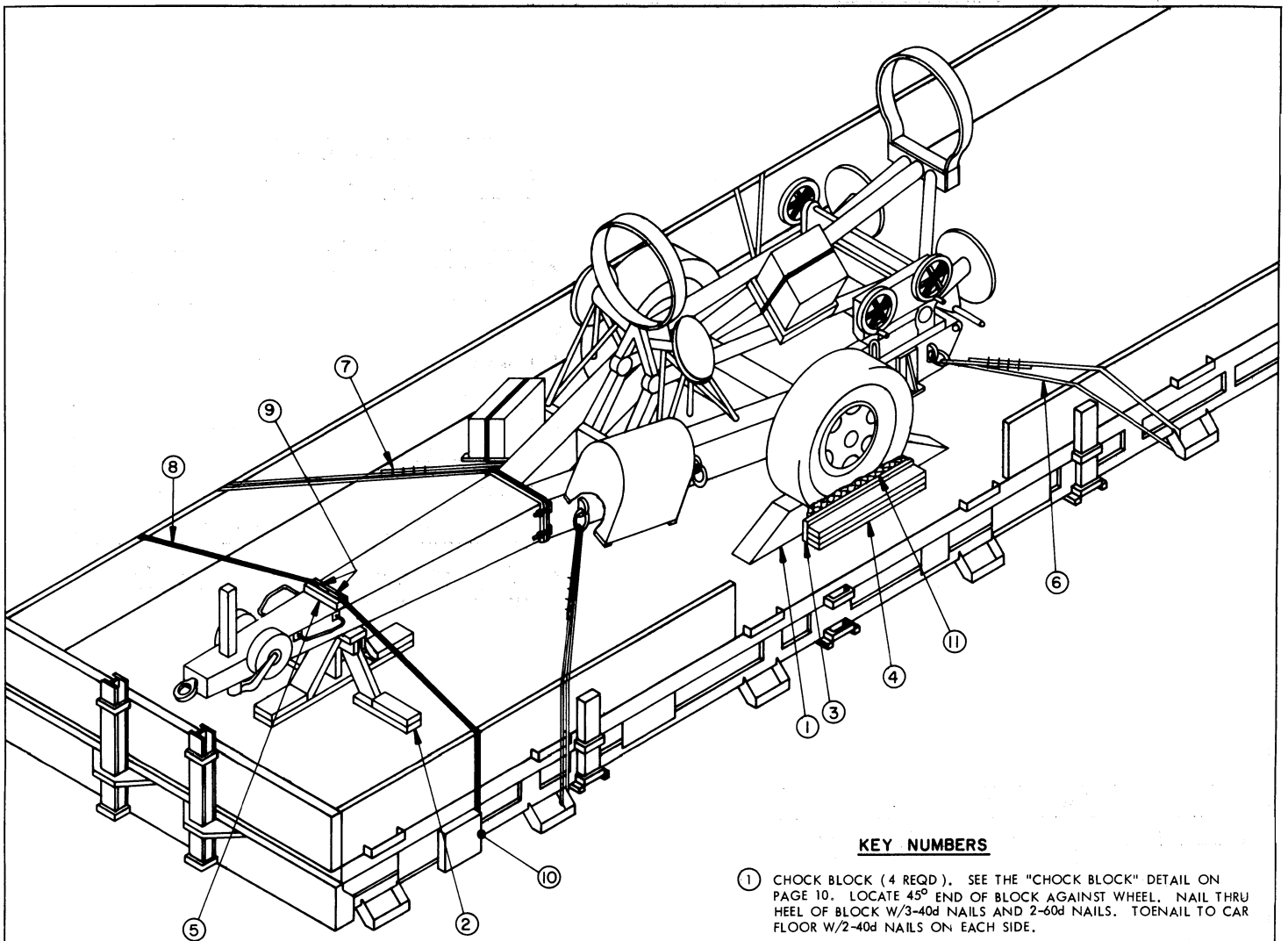
LIST OF RAILCARS THAT MAY BE USED FOR SHIPMENT		
RAILCARS	NO. OF ITEMS	TOTAL WEIGHT OF ITEMS
* RMS ----- 31	2	5,808 LBS (2634 KG)
* RMMS ----- 33	2	5,808 LBS (2634 KG)
* RLMMS ---- 56	3	8,712 LBS (3951 KG)
* RBMMS ---- 55	2	5,808 LBS (2634 KG)
* SM ----- 24	3	8,712 LBS (3951 KG)
* SSLMAS --- 53	4	11,616 LBS (5268 KG)
SSY ----- 45	2	5,808 LBS (2634 KG)
SSYM ----- 46	2	5,808 LBS (2634 KG)
XLM ----- 57	2	5,808 LBS (2634 KG)

\* INDICATES THE PREFERRED CARS TO BE USED FOR SHIPMENT OF THE SPECIFIED ITEM. OTHER LISTED CARS CAN BE USED IF PREFERRED CARS ARE NOT AVAILABLE.

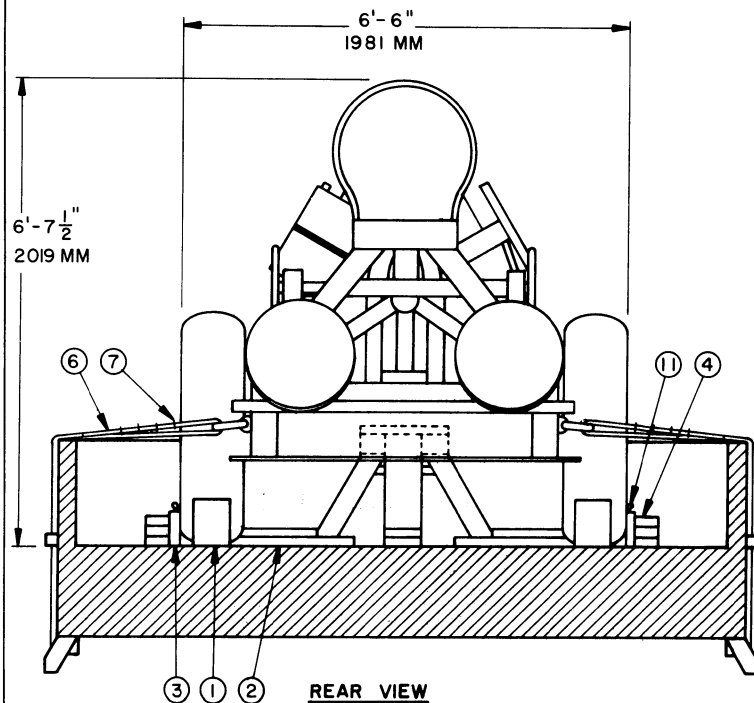
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	5	3
2" X 2"	3	1
2" X 4"	45	30
2" X 6"	9	9
6" X 8"	6	24
NAILS	NO. REQD	POUNDS
6d (2")	22	1/4
12d (3-1/4")	26	1/2
16d (3-1/2")	90	2
20d (4")	24	1
40d (5")	28	1-3/4
60d (6")	8	1
ROPE, STEEL WIRE, 3/8" DIA. -----	76' REQD -----	19 LBS
CLIPS, 3/8" -----	16 REQD -----	5 LBS
WIRE, NO. 8 GAGE -----	140' REQD -----	13 LBS
WATERPROOF PAPER OR BURLAP -----	6' REQD -----	NIL

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
LAUNCHER (W/O TOWBAR) -----	1 -----	2,904 LBS
DUNNAGE -----		212 LBS
TOTAL WEIGHT -----		3,116 LBS (1,413 KG)



**ISOMETRIC VIEW**



**REAR VIEW**

**KEY NUMBERS**

- ① CHOCK BLOCK (4 REQD). SEE THE "CHOCK BLOCK" DETAIL ON PAGE 10. LOCATE 45° END OF BLOCK AGAINST WHEEL. NAIL THRU HEEL OF BLOCK W/3-40d NAILS AND 2-60d NAILS. TOENAIL TO CAR FLOOR W/2-40d NAILS ON EACH SIDE.
- ② FORWARD BLOCKING (1 REQD). SEE THE "FORWARD BLOCKING ASSEMBLY B" DETAIL ON PAGE 9, AND GENERAL NOTE "K" ON PAGE 2.
- ③ RUBBING STRIP, 2" X 6" X 36" (60MM X 120MM X 914MM) (2 REQD). POSITION ON EDGE AND NAIL TO LOWER PIECE MARKED ④ W/5-12d NAILS.
- ④ SIDE BLOCKING, 2" X 4" X 36" (60MM X 100MM X 914MM) (TRIPLED) (2 REQD). NAIL FIRST PIECE TO CAR FLOOR W/5-16d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER.
- ⑤ STRAPPING BOARD, 2" X 4" (60MM X 100MM) BY LENGTH TO SUIT (1 REQD). POSITION AS SHOWN.
- ⑥ STEEL WIRE ROPE, 3/8" DIA., 6.56 TONS (4 REQD). INSTALL CABLE ANGULARLY AS SHOWN AND TO FORM A COMPLETE LOOP FROM TIEDOWN FACILITY ON RAILCAR THRU LADING TIEDOWN DEVICE AND BACK TO RAILCAR TIEDOWN FACILITY. SEE GENERAL NOTES "F" AND "G" ON PAGE 2.
- ⑦ CLIP, SIZE 3/8" (16 REQD). USE FOUR (4) PER CABLE.
- ⑧ STEEL STRAPPING, 2" X .050" X 20'-0" (1 REQD). STAPLE TO PIECE MARKED ⑤ W/2-2" STAPLES. SEE GENERAL NOTE "J" ON PAGE 2.
- ⑨ SEALS FOR 2" STRAPPING (6 REQD).
- ⑩ PAD, 2" X .050" STEEL STRAPPING, 24" LONG (2 REQD). POSITION UNDER AND SEAL TO PIECE MARKED ⑧. SEE "DETAIL A" ON PAGE 10. ALT: STAKE POCKET PROTECTOR (4 REQD). USE TWO (2) UNDER EACH TIEDOWN FACILITY WITH PIECE MARKED ⑧. SEE "DETAIL B" ON PAGE 10.
- ⑪ WATERPROOF PAPER OR BURLAP 36" (914MM) LONG BY 15" (381MM) WIDE (2 REQD). POSITION UNDER AND EXTEND 2" (51MM) ABOVE PIECE MARKED ③.

**LIST OF RAILCARS THAT MAY BE  
USED FOR SHIPMENT**

RAILCARS	NO. OF ITEMS	TOTAL WEIGHT OF ITEMS
* RMS ----- 31	1	3,210 LBS (1456 KG)
* RMMS ----- 33	1	3,210 LBS (1456 KG)
* RLMMS ----- 56	1	3,210 LBS (1456 KG)
* RBMMS ----- 55	1	3,210 LBS (1456 KG)
* SM ----- 24	1	3,210 LBS (1456 KG)
* SSLMAS ---- 53	2	6,420 LBS (2912 KG)
SSY ----- 45	1	3,210 LBS (1456 KG)
SSYM ----- 46	1	3,210 LBS (1456 KG)
XLM ----- 57	1	3,210 LBS (1456 KG)

\* INDICATES THE PREFERRED CARS TO BE USED FOR SHIPMENT OF THE SPECIFIED ITEM. OTHER LISTED CARS CAN BE USED IF PREFERRED CARS ARE NOT AVAILABLE.

**BILL OF MATERIAL**

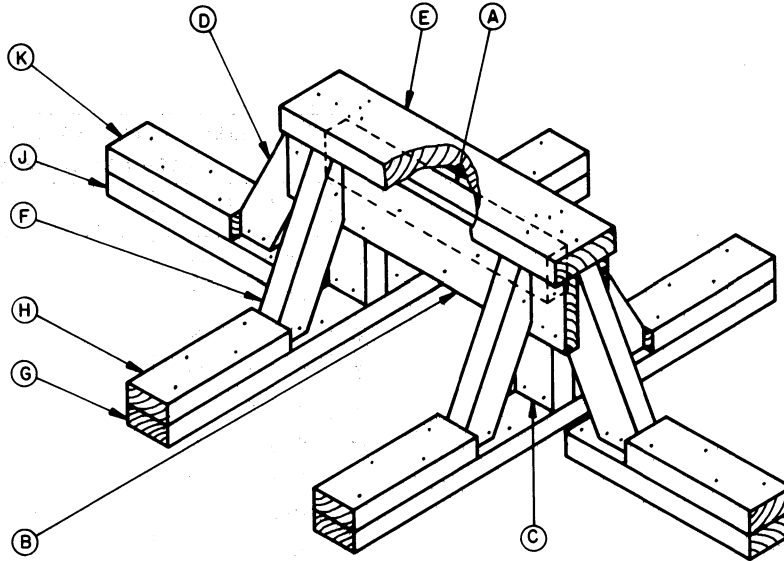
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	3	1
2" X 4"	30	20
2" X 6"	17	17
6" X 8"	6	24
NAILS	NO. REQD	POUNDS
6d (2")	18	1/4
12d (3-1/4")	24	1/2
16d (3-1/2")	66	1-1/2
20d (4")	16	3/4
40d (5")	28	1-3/4
60d (6")	8	1

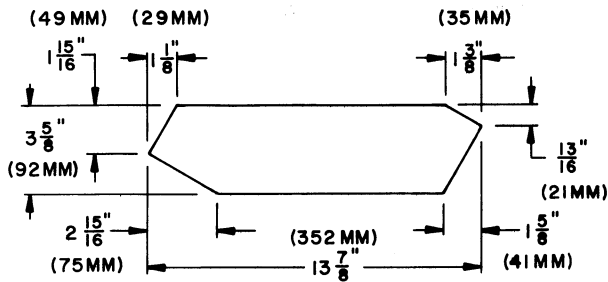
ROPE, STEEL WIRE, 3/8" DIA. -----	76'	REQD -----	19 LBS
STEEL STRAPPING, 2" X .050" -----	24'	REQD -----	8 LBS
CLIP, 3/8" -----	16	REQD -----	5 LBS
SEAL FOR 2" STRAPPING -----	6	REQD -----	2 LBS
STAPLE FOR 2" STRAPPING -----	2	REQD -----	NIL
WATERPROOF PAPER OR BURLAP -----	6'	REQD -----	NIL

**LOAD AS SHOWN**

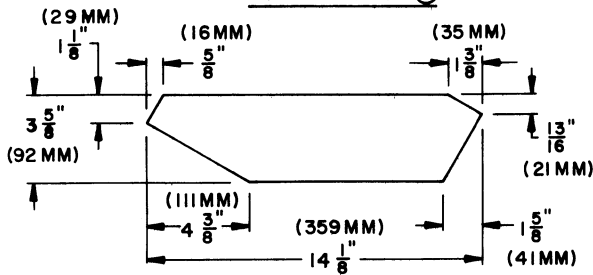
ITEM	QUANTITY	WEIGHT (APPROX)
LAUNCHER (WITH TOWBAR) -----	1	3,210 LBS
DUNNAGE -----		195 LBS
<b>TOTAL WEIGHT -----</b>		<b>3,405 LBS (1,545 KG)</b>



**FORWARD BLOCKING ASSEMBLY A**



**DETAIL: PIECE D**

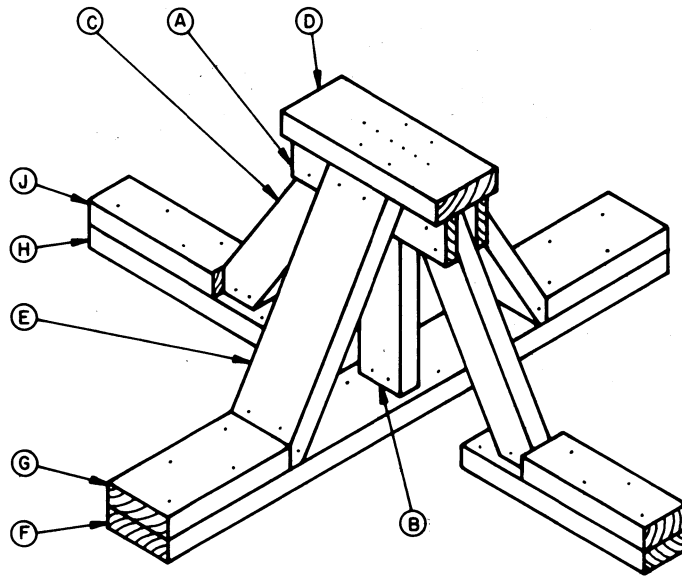


**DETAIL: PIECE F**

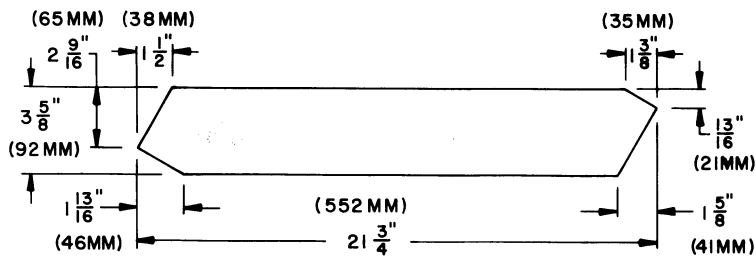
**KEY LETTERS**

- (A) 2" X 4" X 22" (60MM X 100MM X 559MM) (1 REQD).
- (B) 1" X 6" X 27" (30MM X 120MM X 686MM) (2 REQD). NAIL TO PIECE MARKED (A) W/5-6d NAILS AND NAIL TO PIECES MARKED (C) AND (D) W/3-6d NAILS EACH.
- (C) 2" X 4" X 8-1/8" (60MM X 100MM X 206MM) (2 REQD). CENTER ON AND TOE-NAIL TO PIECE MARKED (D) W/4-16d NAILS.
- (D) 2" X 4" X 13-7/8" (60MM X 100MM X 352MM) (2 REQD). DOUBLE BEVEL EACH END. SEE "DETAIL: PIECE D" FOR BEVEL CUTS REQUIRED. TOENAIL TO PIECE MARKED (J) W/4-16d NAILS AFTER ASSEMBLY ((A) THRU (C)) HAS BEEN LOCATED ON THE CAR AND PIECE MARKED (J) HAS BEEN NAILED TO THE CAR FLOOR.
- (E) 2" X 6" X 27" (60MM X 120MM X 686MM) (1 REQD). NAIL TO PIECE MARKED (A) W/4-12d NAILS AND TO PIECES MARKED (D) AND (F) W/2-12d NAILS AT EACH JOINT.
- (F) 2" X 4" X 14-1/8" (60MM X 100MM X 359MM) (4 REQD). DOUBLE BEVEL EACH END. SEE "DETAIL: PIECE F" FOR BEVEL CUTS REQUIRED. TOENAIL TO PIECE MARKED (B) W/2-16d NAILS AND TO PIECE MARKED (C) W/4-16d NAILS.
- (G) 2" X 4" X 41" (60MM X 100MM X 1041MM) (2 REQD). LOCATE ASSEMBLY ((A) THRU (C)) UNDER ITEM AND NAIL PIECE MARKED (C) TO CAR FLOOR W/1-16d NAIL EVERY 8".
- (H) 2" X 4" X 12" (60MM X 100MM X 305MM) (4 REQD). POSITION AGAINST PIECE MARKED (F) AND NAIL TO PIECE MARKED (C) W/4-20d NAILS.
- (J) 2" X 4" X 18" (60MM X 100MM X 457MM) (2 REQD). LOCATE UNDER PIECE MARKED (D) AS SHOWN AND NAIL TO CAR FLOOR W/5-16d NAILS.
- (K) 2" X 4" X 12" (60MM X 100MM X 305MM) (2 REQD). POSITION AGAINST PIECE MARKED (D) AND NAIL TO PIECE MARKED (J) W/4-20d NAILS.

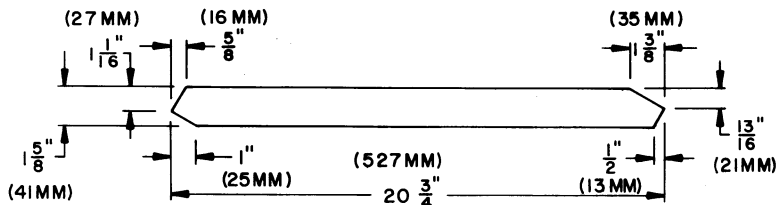




**FORWARD BLOCKING ASSEMBLY B**



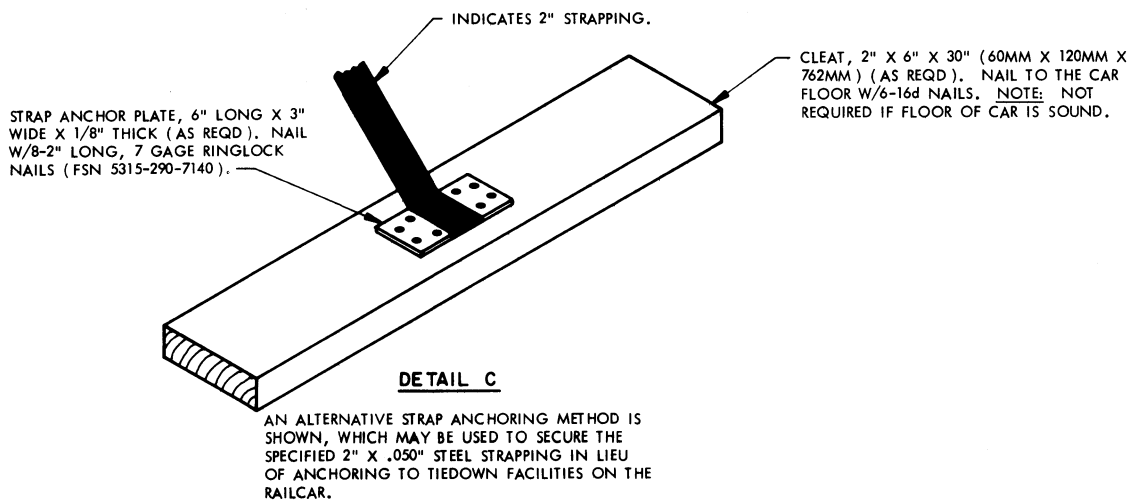
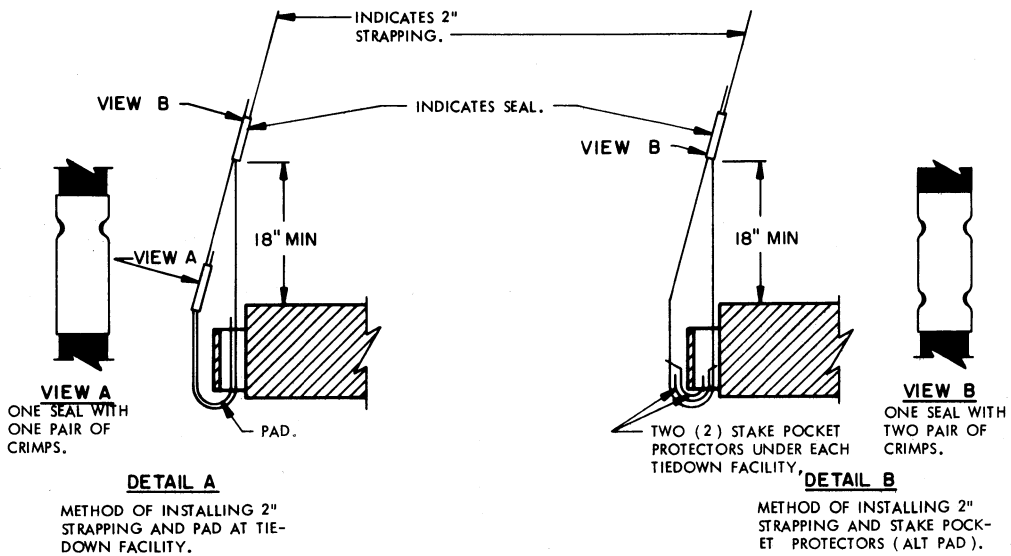
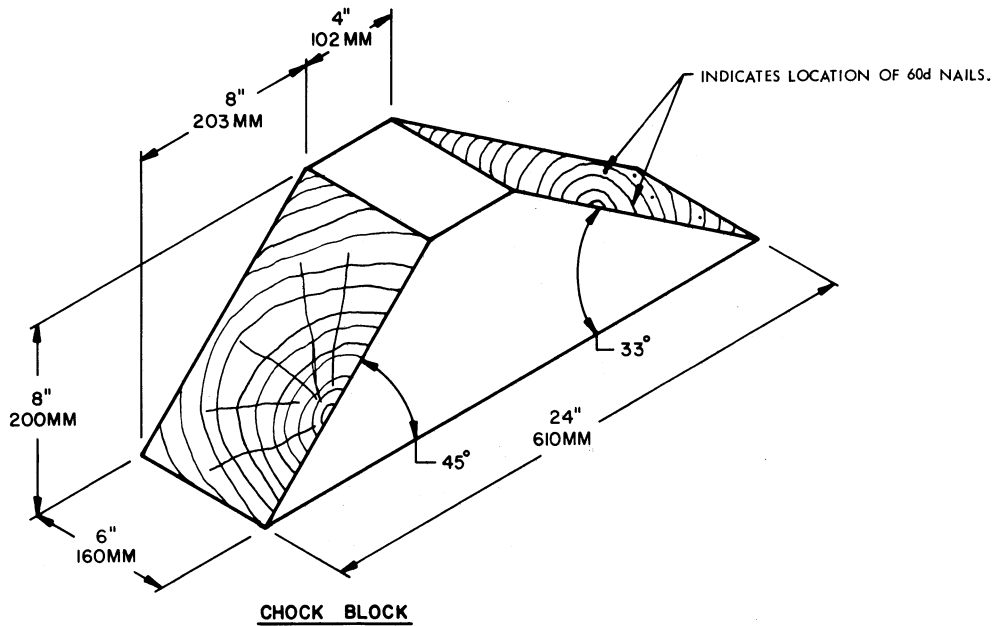
**DETAIL: PIECE C**



**DETAIL: PIECE E**

**KEY LETTERS**

- (A) 1" X 4" X 15" (30MM X 100MM X 381MM) (2 REQD). NAIL TO PIECES MARKED (B) AND (C) W/3-6d NAILS AT EACH JOINT.
- (B) 2" X 4" X 17-3/4" (60MM X 100MM X 451MM) (1 REQD). CENTER ON AND TOENAIL TO PIECE MARKED (F) W/4-16d NAILS.
- (C) 2" X 4" X 21-3/4" (60MM X 100MM X 552MM) (2 REQD). DOUBLE BEVEL EACH END. SEE "DETAIL: PIECE (C)" FOR BEVEL CUTS REQUIRED. TOENAIL TO PIECE MARKED (H) W/4-16d NAILS AFTER ASSEMBLY ((A) THRU (E)) HAS BEEN LOCATED ON THE CAR AND PIECE MARKED (H) HAS BEEN NAILED TO THE CAR FLOOR.
- (D) 2" X 6" X 15" (60MM X 120MM X 381MM) (1 REQD). NAIL TO PIECES MARKED (B), (C) AND (E) W/2-12d NAILS AT EACH JOINT.
- (E) 2" X 6" X 20-3/4" (60MM X 120MM X 527MM) (2 REQD). DOUBLE BEVEL EACH END. SEE "DETAIL: PIECE (E)" FOR BEVEL CUTS REQUIRED. TOENAIL TO PIECE MARKED (A) W/2-12d NAILS AND TO PIECE MARKED (F) W/4-16d NAILS.
- (F) 2" X 6" X 48-1/2" (60MM X 120MM X 1232MM) (1 REQD). LOCATE ASSEMBLY ((A) THRU (E)) UNDER ITEM AND NAIL PIECE MARKED (F) TO CAR FLOOR W/1-16d NAIL EVERY 8".
- (G) 2" X 6" X 12" (60MM X 120MM X 305MM) (2 REQD). POSITION AGAINST PIECE MARKED (E) AND NAIL TO PIECE MARKED (F) W/4-20d NAILS.
- (H) 2" X 4" X 18" (60MM X 100MM X 457MM) (2 REQD). LOCATE UNDER PIECE MARKED (C) AS SHOWN AND NAIL TO CAR FLOOR W/5-16d NAILS.
- (J) 2" X 4" X 12" (60MM X 100MM X 305MM) (2 REQD). POSITION AGAINST PIECE MARKED (C) AND NAIL TO PIECE MARKED (H) W/4-20d NAILS.



**DETAILS**