

APPROVED BY  
 MECH DIV AAR, THEIR LETTER  
 DATED 14 DEC. 1967 FILE LR 110  
 SIGNED [Signature] - RSE  
 DATE 22 DEC 1967  
 MTMTS, WASHINGTON, D. C.

# LANCE

## LOADING & BRACING ON FLAT CAR OF LAUNCHER, ZERO LENGTH, GUIDED MISSILE, XM740

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DRAFTER <b>R.K. EGG</b> CHECKED J.D.S. W.C. / H.P.	PROJ ENG DIW / R.M. AC M AWC AMMO CTR [Signature]	REV [Signature] LC	SUBMITTED <b>B.B. Abrams, Col.</b> COMMANDING OFFICER, BRYANNA ARMY DEPOT								
<b>REVISIONS</b>			APPROVED <b>[Signature]</b> ARMY MISSILE COMMAND APPROVED BY ORDER OF COMMANDING GENERAL U. S. ARMY MATERIEL COMMAND <b>[Signature]</b> U. S. ARMY MATERIEL COMMAND <b>9 FEBRUARY 1968</b>								
			<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>CLASS</th> <th>DIVISION</th> <th>DRAWING</th> <th>FILE</th> </tr> <tr> <td style="text-align: center;">19</td> <td style="text-align: center;">48</td> <td style="text-align: center;">7152</td> <td style="text-align: center;">GSE 5LC3</td> </tr> </table>	CLASS	DIVISION	DRAWING	FILE	19	48	7152	GSE 5LC3
CLASS	DIVISION	DRAWING	FILE								
19	48	7152	GSE 5LC3								

**DO NOT SCALE**

## GENERAL NOTES

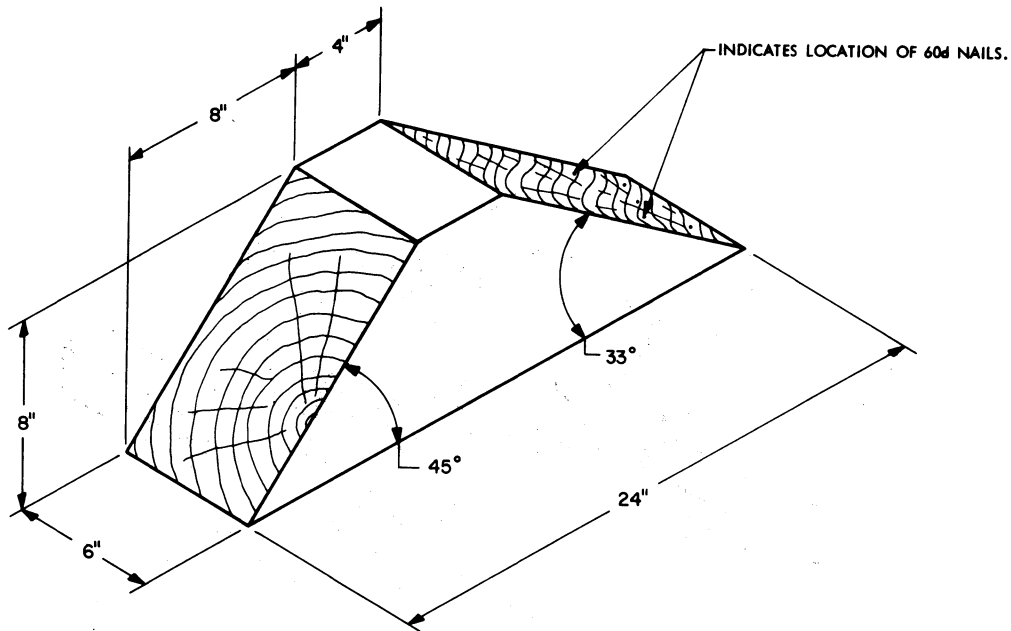
- A. THE LOADS AS SHOWN ON PAGES 6 THRU 9 ARE BASED ON FLAT CARS 8'-6" WIDE (PLATFORM). THE LOAD AS SHOWN ON PAGES 10 AND 11 IS BASED ON A FLAT CAR 10'-0" WIDE (PLATFORM). WIDER CARS CAN BE USED. MULTIPLES OF UNITS, AS SHOWN OR DISSIMILAR IN NATURE, MAY BE LOADED ON A CAR. THE NUMBER OF UNITS TO BE LOADED ON A CAR WILL BE DEPENDENT ON THE SIZE OF THE CAR USED OR THE QUANTITIES OF UNITS TO BE SHIPPED WITH THE VIEW OF FULL UTILIZATION OF CARRIER EQUIPMENT.
- B. LADING DATA:  
ITEM DIMENSIONS -----21'-0-1/2" LONG X 6'-6" WIDE X 6'-7-1/2" HIGH.  
ITEM GROSS WEIGHT ----- 3,210 POUNDS (APPROX).  
NOTE: ITEM LENGTH W/O TOWBAR - 11'-11-3/4".
- C. REFER TO ORD DWG 19-48-C-ORDJU-588, "WIRE ROPE AND ANNEALED WIRE APPLICATION METHODS FOR SECURING LADING ON RAIL & MOTOR CARRIER EQUIP", FOR PROPER TIE DOWN APPLICATION, EXCEPT AS SPECIFIED BY "NOTE ■" BELOW.  
CAUTION: DURING WIRE ROPE INSTALLATION AVOID CONTACT WITH ALL ELECTRICAL WIRING, VEHICLE CONTROLS AND OTHER APPURTENANCES. METAL FILLERS OR COMPARABLE CUSHIONING MATERIAL MUST BE USED BETWEEN TIE DOWN WIRES AND/OR CABLES AND ALL SHARP EDGES, AND ANTI-CHAFING MATERIAL MUST BE USED BETWEEN CONTACTING TIE DOWN WIRES AND LADING TIRES. ADDITIONALLY, LADING TIRES WILL BE INFLATED TO 10 PSI ABOVE HIGHWAY OPERATING PRESSURE, AND ALL HAND BRAKES MUST BE "SET" WITH THE HAND LEVERS WIRE TIED OR BLOCKED.
- D. REFER TO ASSOCIATION OF AMERICAN RAILROADS MANUAL, "GENERAL RULES GOVERNING THE LOADING OF COMMODITIES ON OPEN TOP CARS", FOR APPLICABLE LOADING RULES; PREFACE, 1-A, 2, 3, 4, 5, 9, 10-D, 14, 15, AND 19-B
- E. 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.
- F. WHEN ANY STRAP IS SEALED AT AN END-OVER-END LAP JOINT, OR AS SHOWN IN DETAILS "A" AND "B", PAGE 3, A MINIMUM OF TWO SEALS WITH TWO CRIMPS PER SEAL MUST BE USED.
- G. CAUTION: STAKE POCKETS WILL BE USED FOR ALL TIE DOWN STRAPPING WHENEVER POSSIBLE. DO NOT USE SWIVEL RING TYPE ANCHOR DEVICES. IF OTHER TYPES ARE USED, THEY MUST BE OF SUFFICIENT WIDTH TO RECEIVE 2" STRAP.  
NOTE: ONLY ONE (1) STRAP MAY BE ANCHORED INTO ANY ONE (1) CAR STAKE POCKET.

NOTE ■ :

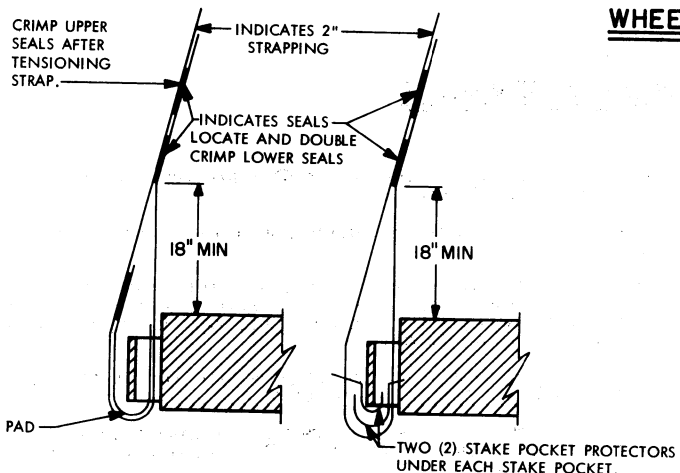
NUTS ON 1/2" CABLE CLIPS WILL BE TIGHTENED TO A TORQUE OF 85 TO 95 FOOT POUNDS.

## MATERIAL SPECIFICATIONS

- LUMBER ----- : DOUGLAS FIR OR COMPARABLE LUMBER WITH STRAIGHT GRAIN AND FREE FROM 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, 11.5 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 1, CLASS "A" OR "C". REF: FED SPEC QQ-S-781.  
(FOR FSN SEE SB-38-100).
- STRAP ANCHOR  
PLATE ----- : FSN 5340-252-3015.



**WHEEL BLOCK**

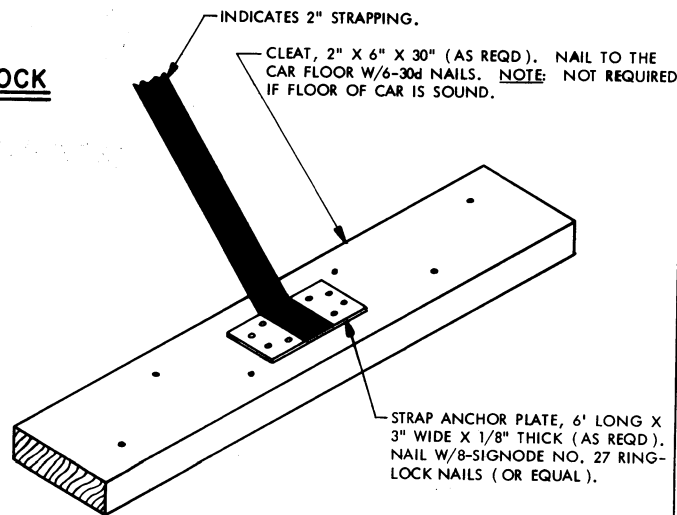


**DETAIL A**

METHOD OF INSTALLING 2" STRAPPING AND PAD AT STAKE POCKET.

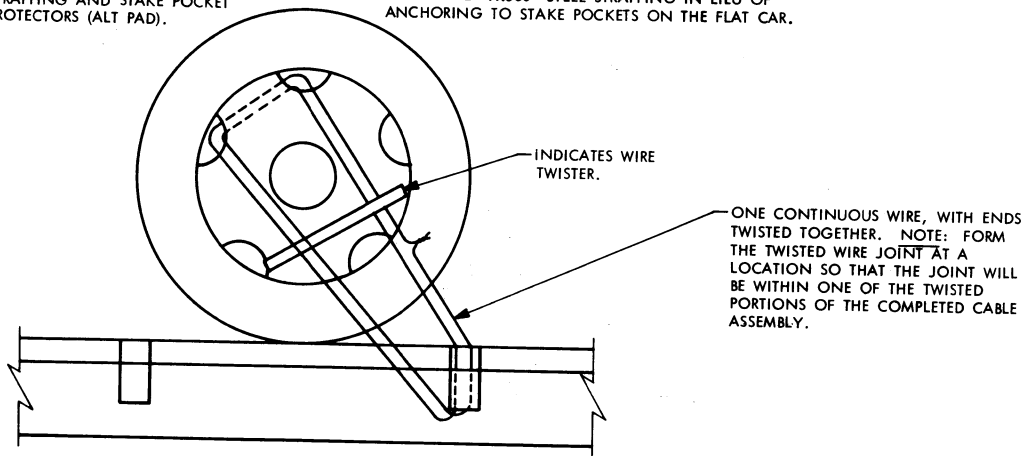
**DETAIL B**

METHOD OF INSTALLING 2" STRAPPING AND STAKE POCKET PROTECTORS (ALT PAD).



**DETAIL C**

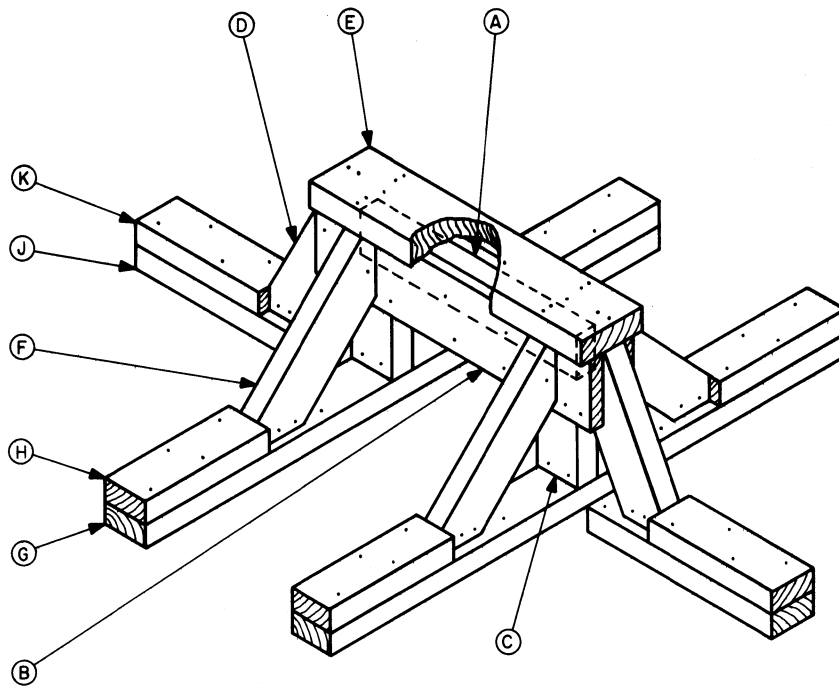
AN ALTERNATIVE STRAP ANCHORING METHOD IS SHOWN, WHICH MAY BE USED TO SECURE THE SPECIFIED 2" X.050" STEEL STRAPPING IN LIEU OF ANCHORING TO STAKE POCKETS ON THE FLAT CAR.



**WHEEL SECUREMENT**

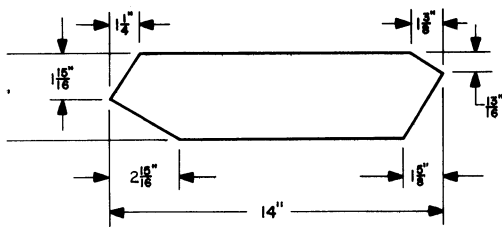
A FOUR (4) STRAND INSTALLATION OF NO. 8 GAGE BLACK ANNEALED WIRE IS SHOWN, PASSED THRU HOLES IN WHEEL AND CAR STAKE POCKET TO FORM A COMPLETE LOOP, AND READY TO BE TWISTED TAUT WITH WIRE TWISTER.

**DETAILS**

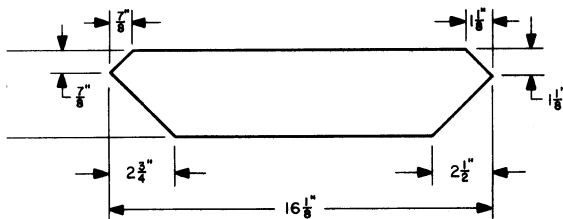


### FORWARD BLOCKING ASSEMBLY A

- (A) 2" X 4" X 22" (1 REQD).
- (B) 1" X 6" X 27" (2 REQD). NAIL TO PIECE MARKED (A) W/5-6d NAILS AND NAIL TO PIECES MARKED (C) AND (D) W/3-6d NAILS.
- (C) 2" X 4" X 8-1/8" (2 REQD). CENTER ON AND TOENAIL TO PIECE MARKED (A) W/4-16d NAILS.
- (D) 2" X 4" X 14" (2 REQD). DOUBLE BEVEL EACH END. SEE DETAIL OF PIECE FOR BEVEL CUTS REQUIRED. TOENAIL TO PIECE MARKED (J) W/4-16d NAILS. AFTER PARTIAL ASSEMBLY (PIECES MARKED (A) THRU (C)) HAS BEEN LOCATED ON THE RAIL CAR AND PIECE MARKED (D) HAS BEEN NAILED TO THE CAR FLOOR.
- (E) 2" X 6" X 27" (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 16-1/8" (4 REQD). DOUBLE BEVEL EACH END. SEE DETAIL OF PIECE FOR BEVEL CUTS REQUIRED. TOENAIL TO PIECE MARKED (B) W/2-16d NAILS AND TO PIECE MARKED (G) W/4-16d NAILS.
- (G) 2" X 4" X 50" (2 REQD). LOCATE PARTIAL ASSEMBLY (PIECES MARKED (A) THRU (C)) UNDER ITEM AND NAIL PIECE MARKED (G) TO CAR FLOOR W/1-30d NAIL EVERY 8".
- (H) 2" X 4" X 12" (4 REQD). POSITION AGAINST PIECE MARKED (F) AND NAIL TO PIECE MARKED (C) W/4-30d NAILS.
- (J) 2" X 4" X 18" (2 REQD). LOCATE UNDER PIECE MARKED (D) AS SHOWN AND NAIL TO CAR FLOOR W/5-30d NAILS.
- (K) 2" X 4" X 12" (2 REQD). POSITION AGAINST PIECE MARKED (D) AND NAIL TO PIECE MARKED (J) W/4-30d NAILS.

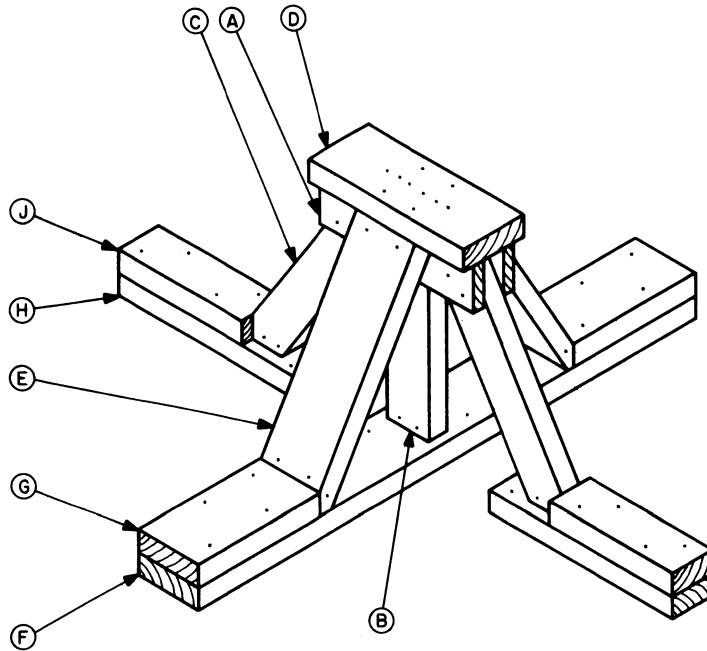


DETAIL: PIECE (D)



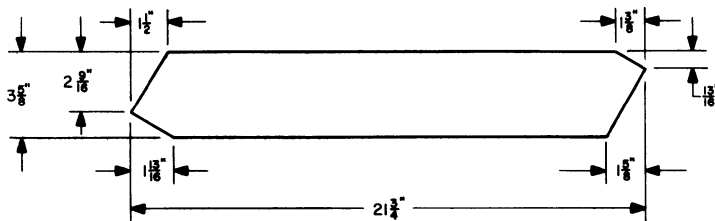
DETAIL: PIECE (F)

### DETAILS

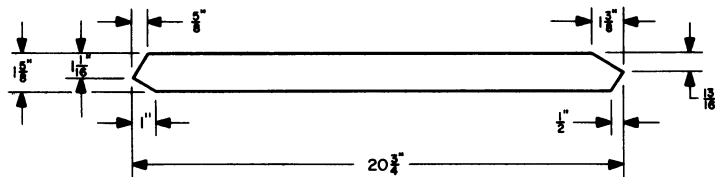


**FORWARD BLOCKING ASSEMBLY B**

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

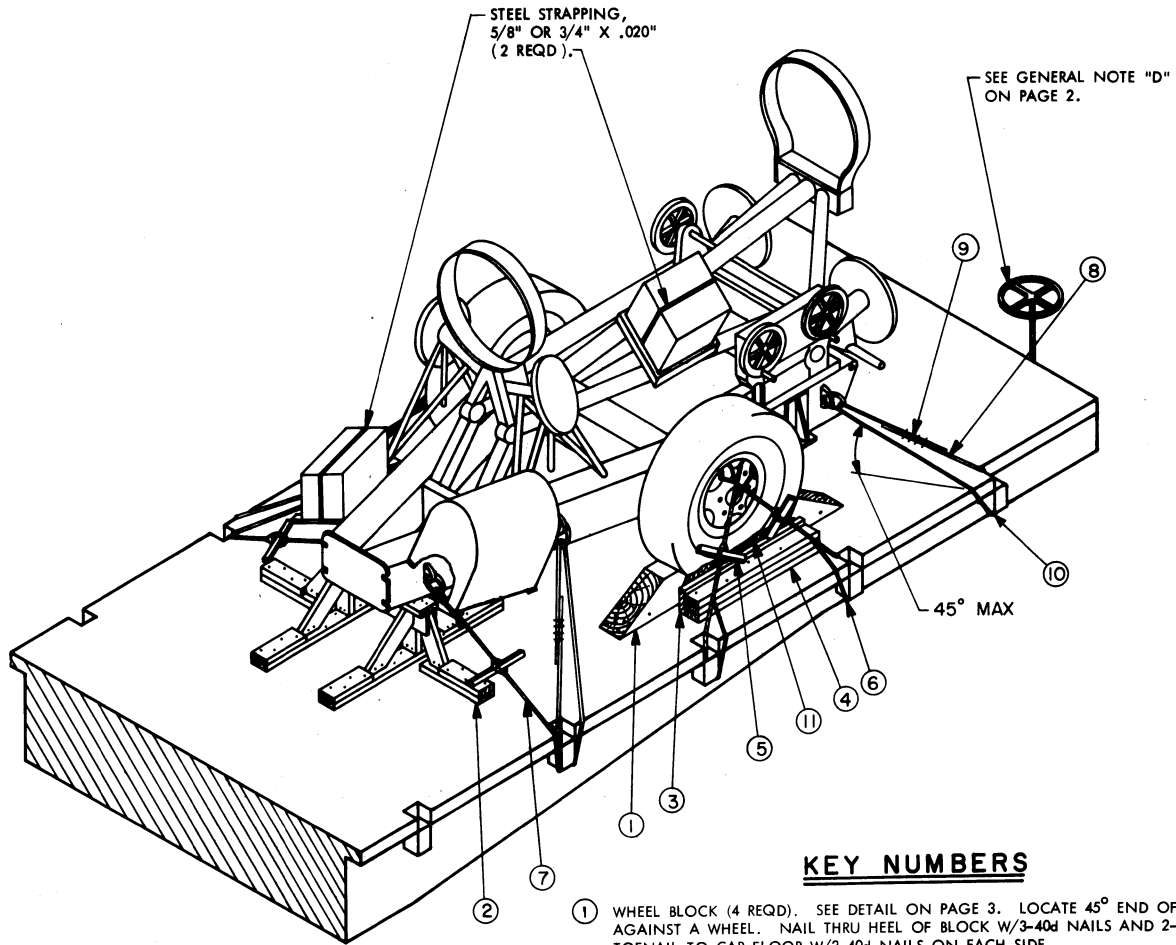


**DETAIL: PIECE (C)**



**DETAIL: PIECE (E)**

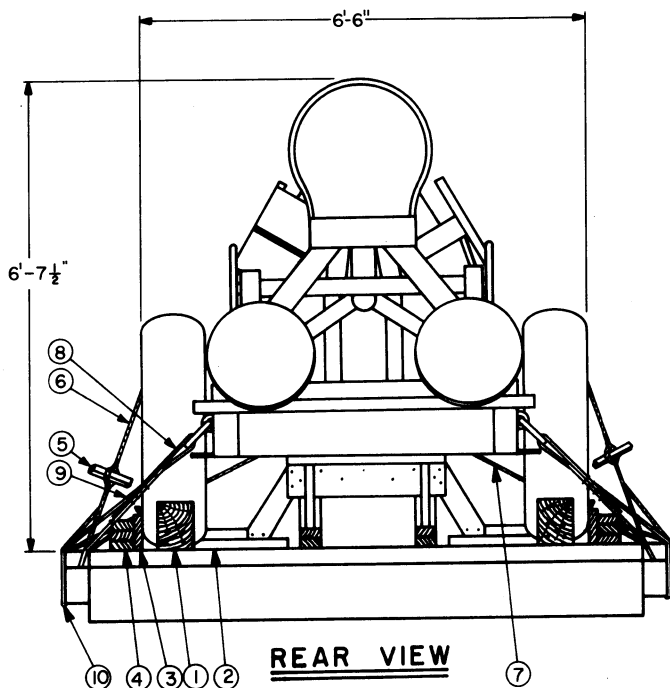
**DETAILS**



**ISOMETRIC VIEW**

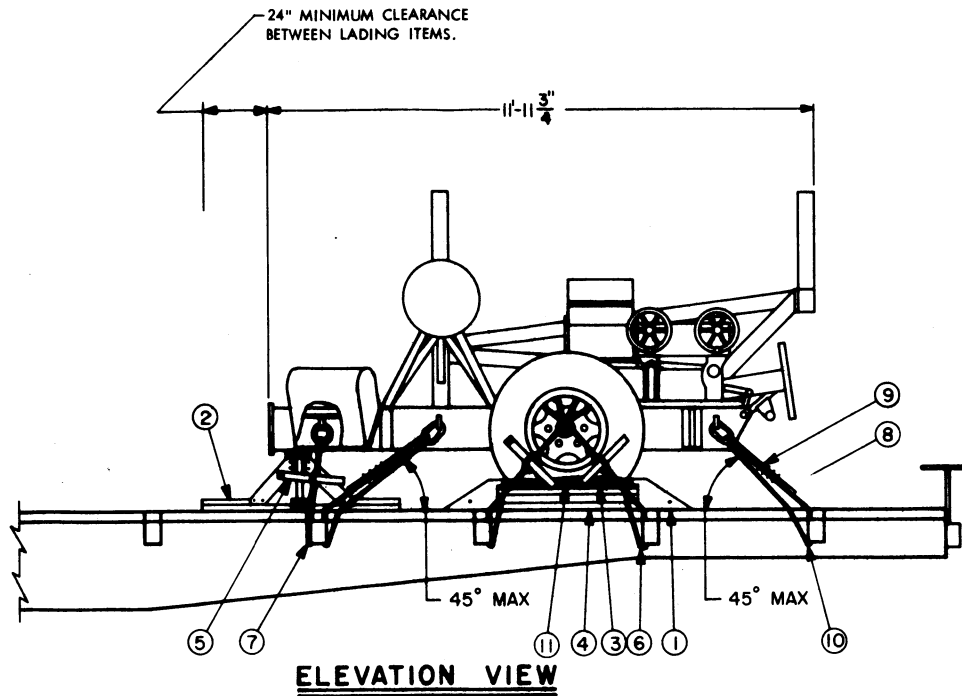
**KEY NUMBERS**

- ① WHEEL BLOCK (4 REQD). SEE DETAIL ON PAGE 3. LOCATE 45° END OF BLOCK AGAINST A 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 "FORWARD BLOCKING ASSEMBLY A" DETAIL ON PAGE 4.
- ③ RUBBING STRIP, 2" X 6" X 36" (2 REQD). POSITION ON EDGE AND NAIL TO LOWER PIECE MARKED ④ W/5-12d NAILS.
- ④ SIDE BLOCKING, 2" X 4" X 36" (TRIPLED) (2 REQD). NAIL FIRST PIECE TO CAR FLOOR W/5-30d NAILS. NAIL EACH ADDITIONAL PIECE IN LIKE MANNER.
- ⑤ WIRE TWISTER, 2" X 2" X LENGTH TO SUIT (6 REQD). SEE GENERAL NOTE "C" ON PAGE 2.
- ⑥ FOUR (4) STRANDS OF NO. 8 GAGE BLACK ANNEALED WIRE (4 REQD). PASS THRU HOLES IN WHEEL AND STAKE POCKET TO FORM A COMPLETE LOOP. TWIST TAUT WITH PIECE MARKED ⑤. SEE GENERAL NOTES "C" AND "D" ON PAGE 2 AND "WHEEL SECUREMENT" DETAIL ON PAGE 3.
- ⑦ EIGHT(8) STRANDS OF NO. 8 GAGE BLACK ANNEALED WIRE (2 REQD). PASS THRU TIE DOWN DEVICE ON LAUNCHER AND STAKE POCKET ON CAR TO FORM A COMPLETE LOOP. TWIST TAUT WITH PIECE MARKED ⑤. SEE GENERAL NOTES "C" AND "D" ON PAGE 2.
- ⑧ STEEL WIRE ROPE, 1/2" DIA, 11.5 TONS (4 REQD). INSTALL CABLE ANGULARLY AS SHOWN AND TO FORM A COMPLETE LOOP FROM STAKE POCKET ON CAR THRU TIE DOWN DEVICE ON LAUNCHER AND BACK TO STAKE POCKET. SEE GENERAL NOTES "C" AND "D" ON PAGE 2.
- ⑨ CLIP, WIRE ROPE, SIZE 1/2" (24 REQD). FOUR (4) PER CABLE AND ONE (1) PER THIMBLE. SEE GENERAL NOTE "C" ON PAGE 2.
- ⑩ THIMBLE, STANDARD, SIZE 1/2" (8 REQD). USE WITH PIECES MARKED ⑧; ONE (1) PER STAKE POCKET AND ONE (1) PER TIE DOWN DEVICE. SECURE TO PIECE MARKED ⑧ W/1 CLIP PER THIMBLE. SEE GENERAL NOTE "C" ON PAGE 2.
- ⑪ WATERPROOF PAPER OR BURLAP OF A SUFFICIENT SIZE TO POSITION UNDER AND EXTEND 2" ABOVE PIECES MARKED ③.



**REAR VIEW**

**LAUNCHER WITHOUT TOWBAR**



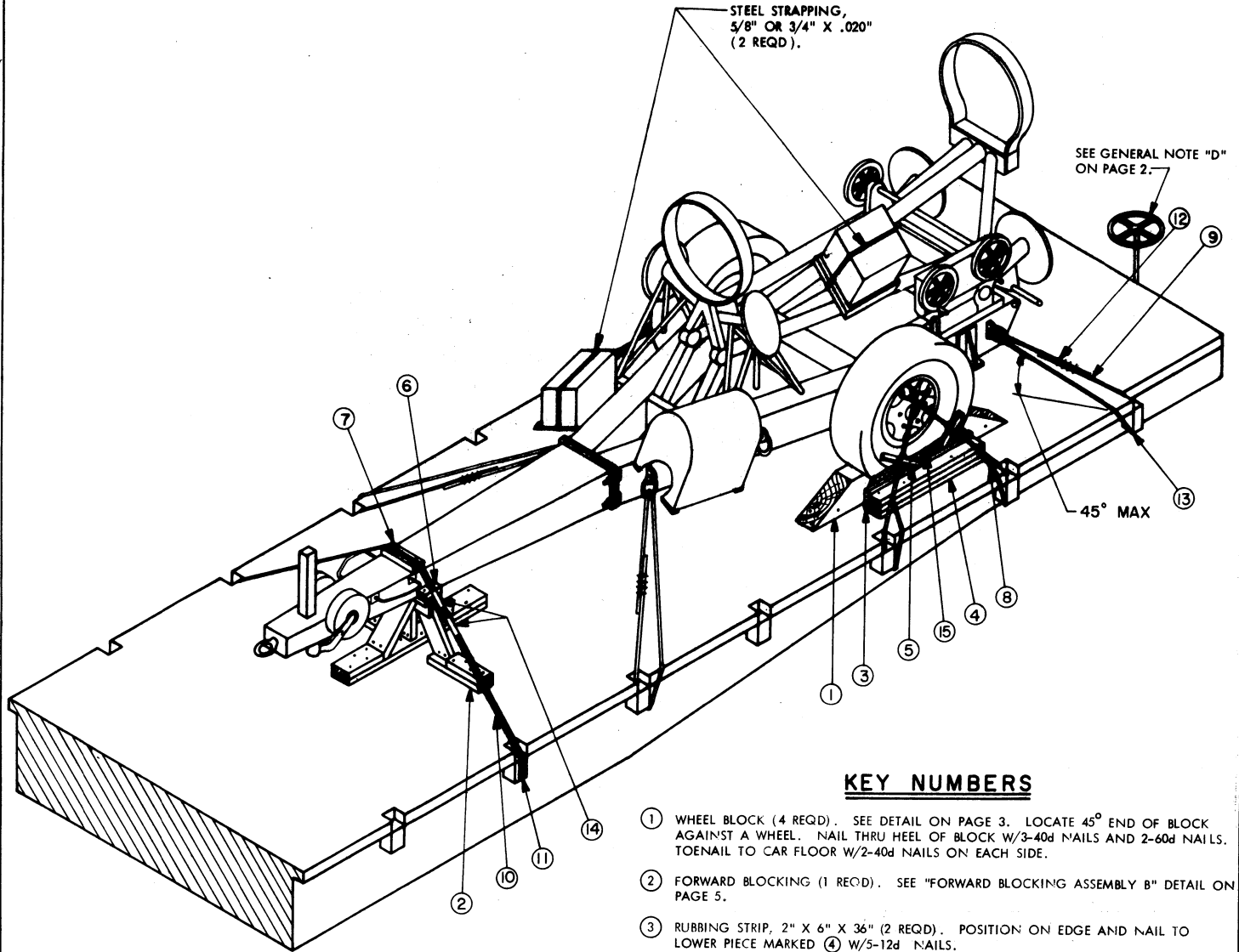
**BILL OF MATERIAL**

LUMBER	LINEAL FEET	BOARD FEET
1" X 6"	5	3
2" X 2"	6	2
2" X 4"	47	32
2" X 6"	9	9
6" X 8"	6	24
NAILS	NO REQD	POUNDS
6d (2")	34	1/4
12d (3-1/4")	26	1/2
16d (3-1/2")	40	1
30d (4-1/2")	78	4
40d (5")	28	1-3/4
60d (6")	8	1
ROPE, STEEL WIRE 1/2" DIA	60' REQD	27 LBS
CLIP, 1/2"	24 REQD	11 LBS
THIMBLE, STANDARD, 1/2"	8 REQD	2 LBS
WIRE, NO. 8 GAGE	192' REQD	19 LBS
WATERPROOF PAPER OR BURLAP	AS REQD	NIL

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
LAUNCHER (WITHOUT TOWBAR)	1	2,904 LBS
DUNNAGE		243 LBS
TOTAL WEIGHT		3,147 LBS

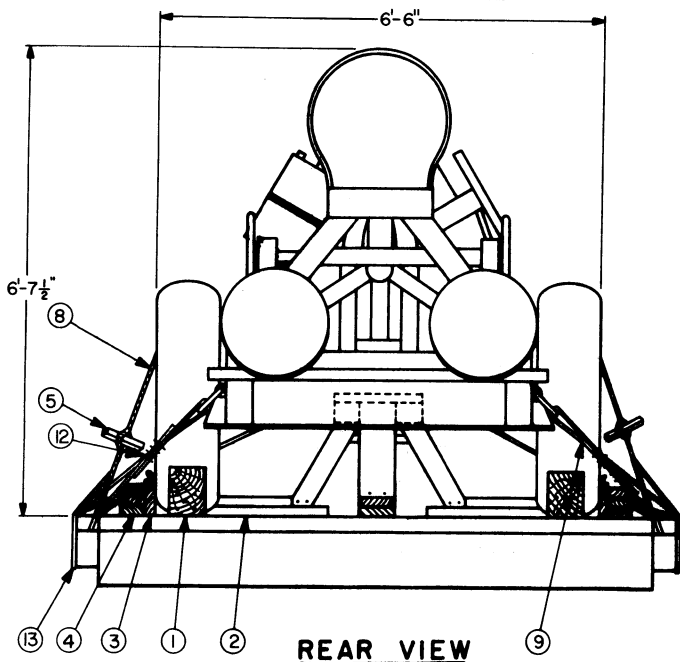
**LAUNCHER WITHOUT TOWBAR**



### KEY NUMBERS

- ① WHEEL BLOCK (4 REQD). SEE DETAIL ON PAGE 3. LOCATE 45° END OF BLOCK AGAINST A 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 "FORWARD BLOCKING ASSEMBLY B" DETAIL ON PAGE 5.
- ③ RUBBING STRIP, 2" X 6" X 36" (2 REQD). POSITION ON EDGE AND NAIL TO LOWER PIECE MARKED ④ W/5-12d NAILS.
- ④ SIDE BLOCKING, 2" X 4" X 36" (TRIPLED) (2 REQD). NAIL FIRST PIECE TO CAR FLOOR W/5-30d NAILS. NAIL EACH ADDITIONAL PIECE IN LIKE MANNER.
- ⑤ WIRE TWISTER, 2" X 2" X LENGTH TO SUIT (4 REQD). SEE GENERAL NOTE "C" ON PAGE 2.
- ⑥ ANTI-SWAY CLEAT, 2" X 4" X 6" (2 REQD). POSITION AS SHOWN. NAIL TO PIECE MARKED ② W/2-12d NAILS.
- ⑦ STRAPPING BOARD, 2" X 4" X LENGTH TO SUIT (1 REQD). POSITION AS SHOWN.
- ⑧ FOUR (4) STRANDS OF NO. 8 GAGE BLACK ANNEALED WIRE (4 REQD). PASS THRU HOLES IN WHEEL AND STAKE POCKET TO FORM A COMPLETE LOOP. TWIST TAUT WITH PIECE MARKED ③. SEE GENERAL NOTES "C" AND "D" ON PAGE 2 AND "WHEEL SECUREMENT" DETAIL ON PAGE 3.
- ⑨ STEEL WIRE ROPE, 1/2" DIA, 11.5 TONS (4 REQD). INSTALL CABLE ANGULARLY AS SHOWN AND TO FORM A COMPLETE LOOP FROM STAKE POCKET ON CAR THRU TIE DOWN DEVICE ON LAUNCHER AND BACK TO STAKE POCKET. SEE GENERAL NOTES "C" AND "D" ON PAGE 2.
- ⑩ STEEL STRAPPING, 2" X .050" X 20'-0" (1 REQD). STAPLE TO PIECE MARKED ⑦ W/2-2" STAPLES. SEE DETAIL "C" ON PAGE 3 FOR AN ALTERNATIVE STRAP ANCHORING METHOD.
- ⑪ WIRE TWISTER, 2" X .050" STRAP 24" LONG (2 REQD). POSITION UNDER AND SEAL TO PIECE MARKED ⑩. SEE "DETAIL A" ON PAGE 3. ALT: STAKE POCKET PROTECTOR, SIGNODE NO. 1 (OR EQUAL) (4 REQD). TWO (2) USED UNDER EACH STAKE POCKET WITH PIECE MARKED ⑩. SEE "DETAIL B" ON PAGE 3.
- ⑫ CLIP, WIRE ROPE, SIZE 1/2" (24 REQD). FOUR (4) PER CABLE AND ONE (1) PER THIMBLE. SEE GENERAL NOTE "C" ON PAGE 2.
- ⑬ THIMBLE, STANDARD, SIZE 1/2" (8 REQD). USE WITH PIECES MARKED ⑨; ONE (1) PER STAKE POCKET AND ONE (1) PER TIE DOWN DEVICE. SECURE TO PIECE MARKED ⑨ W/1 CLIP PER THIMBLE. SEE GENERAL NOTE "C" ON PAGE 2.
- ⑭ SEALS FOR 2" STRAPPING (8 REQD). SEE GENERAL NOTE "F" ON PAGE 2.
- ⑮ WATERPROOF PAPER OR BURLAP OF A SUFFICIENT SIZE TO POSITION UNDER AND EXTEND 2" ABOVE PIECES MARKED ③.

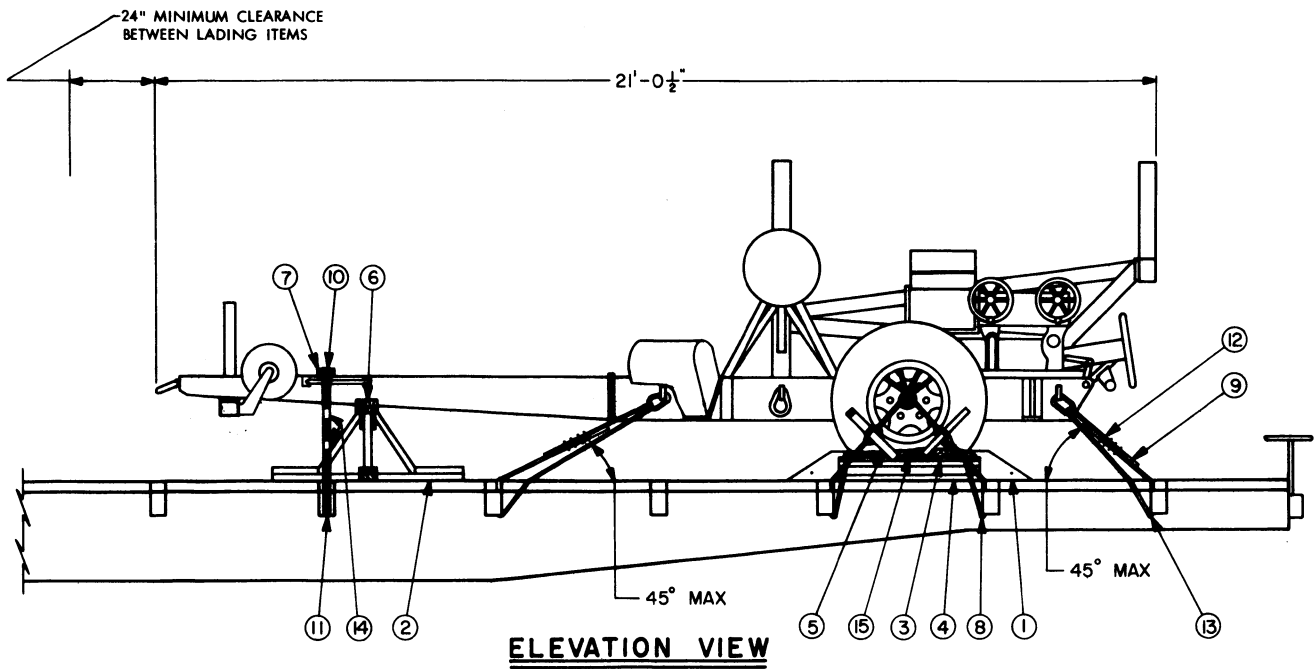
### ISOMETRIC VIEW



### REAR VIEW

### LAUNCHER WITH TOWBAR





**BILL OF MATERIAL**

LUMBER	LINEAL FEET	BOARD FEET
1" X 4"	3	1
2" X 2"	6	2
2" X 4"	26	18
2" X 6"	22	22
6" X 8"	6	24

NAILS	NO. REQD	POUNDS
6d (2")	18	1/4
12d (3-1/4")	28	1/2
16d (3-1/2")	20	1/2
30d (4-1/2")	62	3- 1/4
40d (5")	28	1- 3/4
60d (6")	8	1

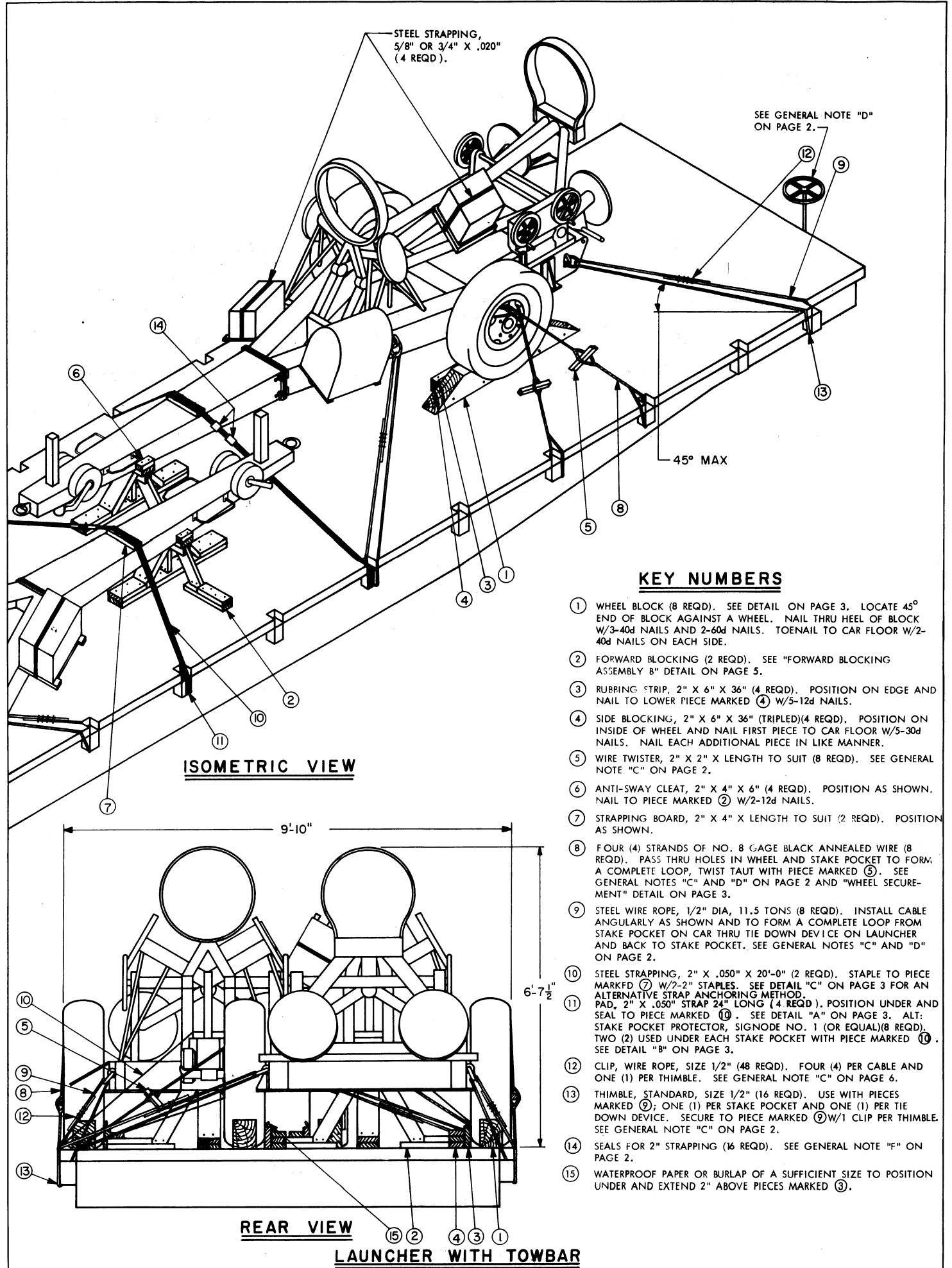
  

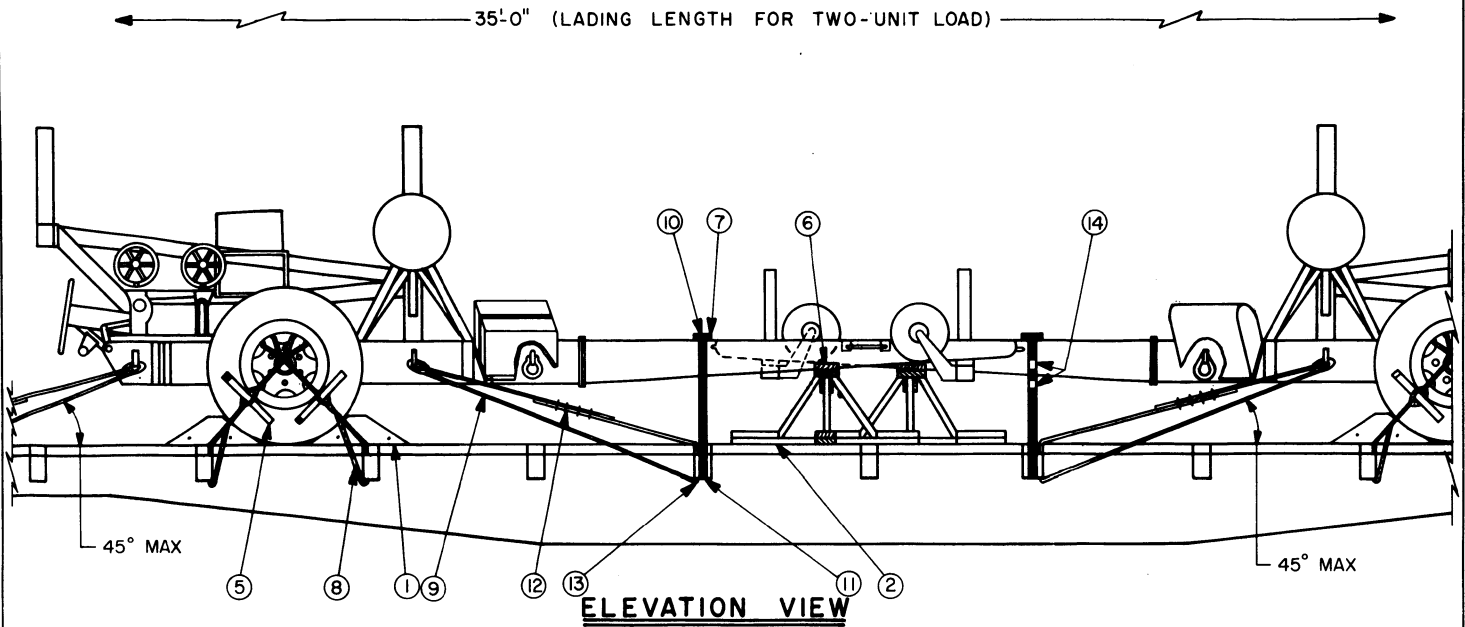
ROPE, STEEL WIRE, 1/2" DIA -----	60' REQD ----	27 LBS
STEEL STRAPPING, 2" X .050" -----	20' REQD ----	7 LBS
CLIP, 1/2" -----	24 REQD ----	11 LBS
THIMBLE, STANDARD, 1/2" -----	8 REQD ----	2 LBS
WIRE, NO. 8 GAGE -----	96' REQD ----	9 LBS
SEAL FOR 2" STRAPPING -----	8 REQD ----	2 LBS
STAPLE FOR 2" STRAPPING -----	2 REQD ----	NIL
WATERPROOF PAPER OR BURLAP -----	AS REQD ----	NIL

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
LAUNCHER -----	1 -----	3,210 LBS
DUNNAGE -----	-----	233 LBS
TOTAL WEIGHT -----		3,443 LBS

**LAUNCHER WITH TOWBAR**





**BILL OF MATERIAL**

LUMBER	LINEAL FEET	BOARD FEET
1" X 4"	5	2
2" X 2"	12	4
2" X 4"	51	34
2" X 6"	44	44
6" X 8"	12	48
NAILS	NO. REQD	POUNDS
6d (2")	36	1/4
12d (3-1/4")	56	1
16d (3-1/2")	40	1
30d (4-1/2")	124	6-1/4
40d (5")	56	3-1/2
60d (6")	16	1-3/4
ROPE, STEEL WIRE, 1/2" DIA	120' REQD	53 LBS
STEEL STRAPPING, 2" X .050"	40' REQD	14 LBS
CLIP, 1/2"	48 REQD	21 LBS
THIMBLE, STANDARD, 1/2"	16 REQD	4 LBS
WIRE, NO. 8 GAGE	192' REQD	19 LBS
SEALS FOR 2" STRAPPING	16 REQD	3 LBS
STAPLES FOR 2" STRAPPING	4 REQD	NIL
WATERPROOF PAPER OR BURLAP	AS REQD	NIL

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
LAUNCHER	2	6,420 LBS
DUNNAGE		458 LBS
TOTAL WEIGHT		6,878 LBS

**LAUNCHER WITH TOWBAR**

