

REV NO. 3 APPROVED BY,  
 MECH DIV AAR, THEIR LETTER  
 DATED 2 Nov 81 FILE LR-11.0.79  
 SIGNED A. W. Muehlebach  
 DATE 18 Nov 1981  
 MTMCTEA, FT EUSTIS, VA.

# FAAR

## LOADING AND BRACING ON FLAT CAR OF RADAR SYSTEM COMPONENT, MOUNTED ON WHEELED VEHICLE, 6X6, M561 (GAMMA GOAT), AND COMPONENT EQUIPMENT IN M101A1 TRAILER, CARGO, 3/4 TON, 2-WHEEL

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THIS DRAWING, INCLUDING REVISION 3, SUPERSEDES  
 DRAWING 19-48-7200-GSE5FA2, DATED OCTOBER 1975,  
 AND ALL REVISIONS THERETO, THROUGH NUMBER 2,  
 DATED OCTOBER 1975.

REVISIONS				DRAFTER	PROJ ENG	DRSMI-2SDP
3	JUN 81	MWD/244M	W. F. Smith	Drew / Jpt	MWD / MWD	MWD / MWD
				CHECKER	LOG ENGINE OFFICE	
				APPROVED, U.S. ARMY MISSILE COMMAND		
				APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND (DARCOM) U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL		
<b>U.S. ARMY DARCOM DRAWING</b>						
<b>JUNE 1981</b>						
				CLASS	DIVISION	DRAWING
				19	48	7200
						FILE
						GSE 5FA2

**DO NOT SCALE**

## GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1.
- B. THE LOADS AS SHOWN ARE BASED ON FLAT CARS 8'-6" WIDE ( PLATFORM ). WIDER CARS MAY BE USED. ONLY ONE UNIT OF LADING IS SHOWN; HOWEVER, MULTIPLES OF UNITS, AS SHOWN OR DISSIMILAR IN NATURE, MAY BE LOADED ON A CAR IF SPACE PERMITS. THE NUMBER OF UNITS TO BE LOADED ON A CAR WILL BE DEPENDENT ON THE SIZE OF THE CAR OR THE QUANTITIES OF UNITS TO BE SHIPPED, WITH THE VIEW OF FULL UTILIZATION OF CARRIER EQUIPMENT.

### NOTICE TO TRANSPORTATION OFFICER:

IN LIEU OF REQUISITIONING A GENERAL SERVICE FM \*FLAT CAR AS DEPICTED HEREIN, EVERY EFFORT SHOULD BE MADE TO ACQUIRE A CUSHIONED FMS\*TYPE CAR EQUIPPED WITH SPECIAL TIE DOWN CHANNELS AND MOVABLE ANCHOR AND CHAIN ASSEMBLY TIE DOWN DEVICES\*\*, SUCH AS IS USED FOR TRANSPORTING AGRICULTURAL MACHINERY AND HEAVY, EARTH MOVING EQUIPMENT. SEE THE "SPECIAL PROVISIONS" OPPOSITE THE APPLICABLE LOAD VIEW FOR GUIDANCE.

- \* ASSOCIATION OF AMERICAN RAILROADS ( AAR ) MECHANICAL DESIGNATION FOR CAR TYPE. REFERENCE IS MADE TO THE "OFFICIAL RAILWAY EQUIPMENT REGISTER".
- \*\* A TYPICAL CAR OF THIS TYPE IS SHOWN BY FIGURE 88-B OF SECTION 6 IN PUBLICATION OF AAR TITLED, "GENERAL RULES GOVERNING THE LOADING OF COMMODITIES ON OPEN TOP CARS".

### C. LADING DATA FOR RADAR SYSTEM MOUNTED ON M561 VEHICLE:

ITEM DIMENSIONS ----- 20'-3" LONG BY 7'-1-1/4" WIDE B: 9'-5" HIGH.

ITEM GROSS WEIGHT ----- 10,500 POUNDS ( APPROX ).

### LADING DATA FOR COMPONENT EQUIPMENT IN M101A1 TRAILER:

ITEM DIMENSIONS ----- 12'-3" LONG BY 6'-7" WIDE BY 6'-3" HIGH.

ITEM GROSS WEIGHT ----- 2,660 POUNDS ( APPROX ).

### LADING DATA FOR M101A1 TRAILER ( W/COMPONENT EQUIPMENT ) ATTACHED TO M561 VEHICLE ( W/RADAR SYSTEM ):

ITEM DIMENSIONS-----30'-8-1/2" LONG BY 7'-1-1/4" WIDE BY 9'-5" HIGH.

ITEM GROSS WEIGHT-----13,160 POUNDS ( APPROX ).

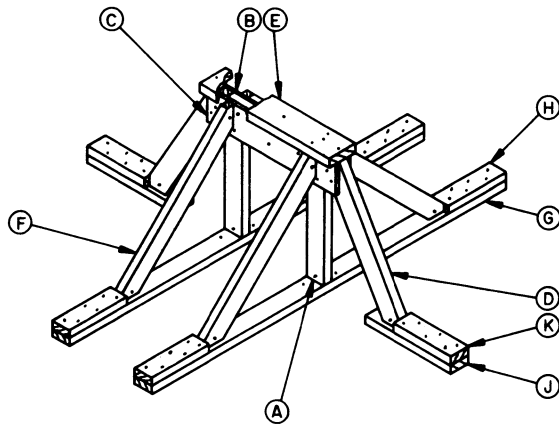
- D. REFER TO ORD DWG 19-48-C-ORDJU-588, "WIRE ROPE AND ANNEALED WIRE APPLICATION METHODS FOR SECURING LADING ON RAIL & MOTOR CARRIER EQUIP", FOR PROPER TIE DOWN APPLICATION, EXCEPT THAT THE NUTS ON 3/8" CABLE CLIPS WILL BE TIGHTENED TO A TORQUE OF 35 TO 40 FOOT POUNDS. CAUTION: DURING WIRE ROPE INSTALLATION, 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.
- E. 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, 14, 15, 19-A, 19-B AND 19-C.
- F. WIRE ROPE CABLE MUST BE TENSIONED SUFFICIENTLY TO CAUSE SLIGHT VEHICLE BODY DEPRESSION, AS APPLICABLE. TENSIONING CAN BE ACCOMPLISHED BY EMPLOYING TWO ( 2 ) CABLE "GRIPPERS" AND AN APPLICABLY SIZED "COME-A-LONG" TYPE MECHANICAL HOIST.
- G. 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. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN THE FLOOR BOARDS. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- H. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE UNLESS OTHERWISE DIMENSIONED. FOR EXAMPLE, 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE AND 4" X 4" MATERIAL IS ACTUALLY 3-1/2" THICK BY 3-1/2" WIDE.

## MATERIAL SPECIFICATIONS

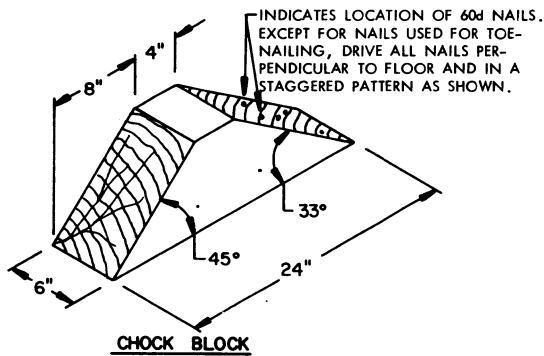
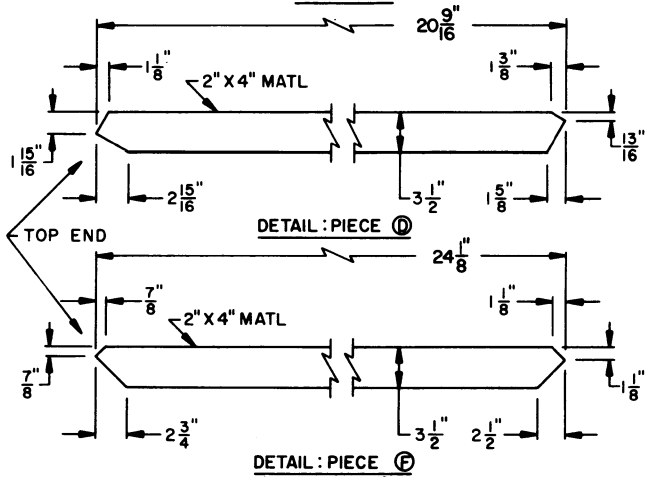
- LUMBER -----: DOUGLAS FIR OR COMPARABLE LUMBER WITH STRAIGHT GRAIN AND FREE OF MATERIAL DEFECTS. REF: FED SPEC MM-L-751.
- NAILS -----: COMMON, FED SPEC FF-N-105.
- ROPE -----: STEEL WIRE, PLAIN, PRE-FORMED, REGULAR LAY, 6.56 TONS, 6 X 19, FLEXIBLE IWRC, MACWHYTE WIRE ROPE CO ( OR EQUAL ). REF: FED SPEC RR-W-410.
- WIRE -----: ANNEALED, BLACK. REF: FED SPEC QQ-W-461.
- CLIPS -----: "U" BOLT, CROSBY, HEAVY DUTY ( OR EQUAL ). REF: FED SPEC FF-C-450, TYPE I, CLASS 1.

## REVISIONS

- REVISION NO. 1, DATED APRIL 1972, CONSISTS OF:
1. CHANGES AS NECESSARY TO UPDATE "GENERAL NOTES".
  2. CHANGES AS NECESSARY TO UPDATE DRAWING FORMAT.
  3. ADDING COMPONENT EQUIPMENT IN A M101A1 3/4 TON TRAILER.
  4. ADDING PROCEDURES FOR CARS EQUIPPED WITH MOVABLE ANCHOR AND CHAIN ASSEMBLY TIE DOWN DEVICES.
- REVISION NO. 2, DATED OCTOBER 1975, CONSISTS OF:
1. CHANGING ITEM DETAILS TO CURRENT CONFIGURATION.
  2. UPDATING THE GENERAL NOTES AND THE SPECIAL PROVISIONS.
- REVISION NO. 3, DATED JUNE 1981, CONSISTS OF:
1. ADDING PROCEDURES FOR THE M561 VEHICLE WITH THE M101A1 TRAILER ATTACHED.
  2. CHANGES AS NECESSARY TO UPDATE "GENERAL NOTES", "MATERIAL SPECIFICATIONS" AND "DRAWING FORMAT".

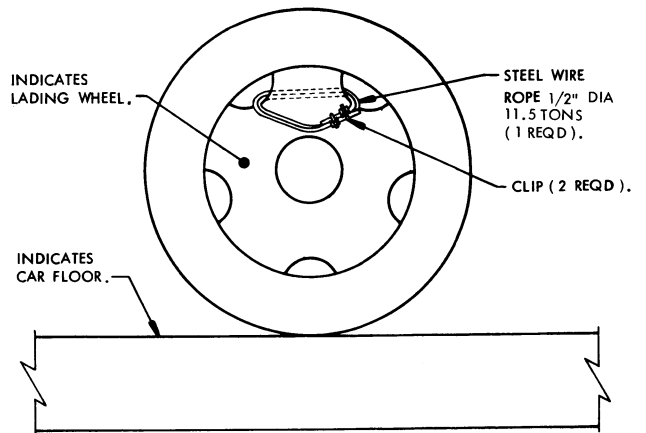


**STANCHION**



**KEY LETTERS**

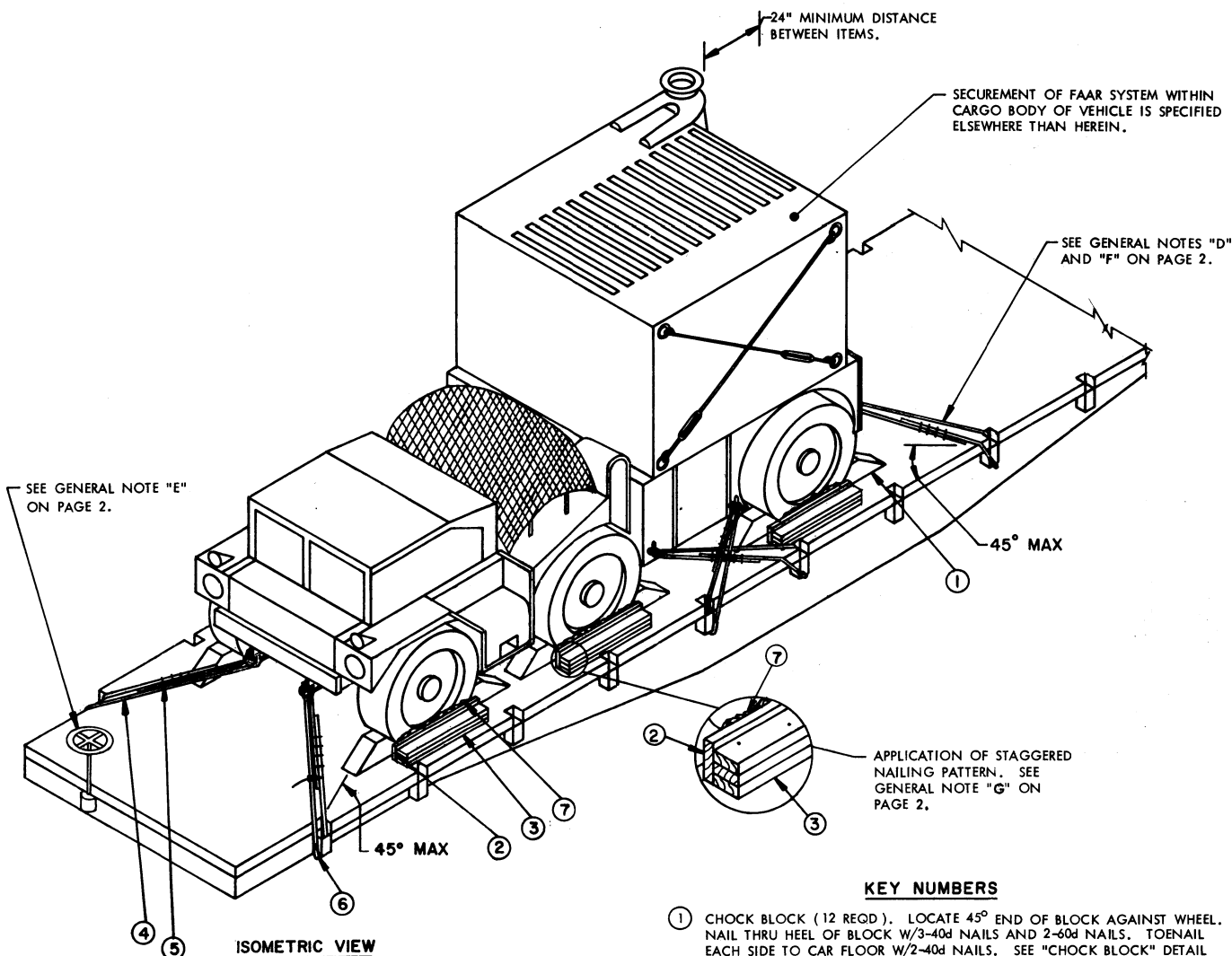
- (A) 2" X 4" X 13-5/8" (2 REQD). CENTER ON AND TOENAIL TO (C) W/2-16d NAILS.
- (B) 2" X 4" X 22" (1 REQD).
- (C) 1" X 6" X 27" (2 REQD). NAIL TO EACH (A) W/2-6d NAILS. NAIL TO (B) AND EACH (D) W/3-6d NAILS EACH.
- (D) 2" X 4" X 20-9/16" (2 REQD). DOUBLE BEVEL EACH END AS PER "DETAIL: PIECE (D)". TOENAIL TO (J) W/2-16d NAILS AFTER ASSEMBLY ((A) THRU (C)) HAS BEEN LOCATED ON TRANSPORTING VEHICLE AND (J) HAS BEEN NAILED TO FLOOR.
- (E) 2" X 6" X 27" (1 REQD). NAIL TO (B) W/3-12d NAILS AND TO EACH (D) AND (F) W/1-12d NAIL EACH.
- (F) 2" X 4" X 24-1/8" (4 REQD). DOUBLE BEVEL EACH END AS PER "DETAIL: PIECE (F)". TOENAIL TO (C) AND (E) W/2-16d NAILS EACH.
- (G) 2" X 4" X 61" (2 REQD). LOCATE BLOCKING ASSEMBLY ((A) THRU (C)) UNDER ITEM AND NAIL TO FLOOR OF TRANSPORTING VEHICLE W/2-20d NAILS NEAR (A) AND W/3-20d NAILS NEAR EACH END.
- (H) 2" X 4" X 12" (4 REQD). POSITION AGAINST (F) AND NAIL TO (G) W/6-20d NAILS.
- (J) 2" X 4" X 18" (2 REQD). POSITION UNDER (D) AS SHOWN AND NAIL TO FLOOR OF TRANSPORTING VEHICLE W/5-20d NAILS.
- (K) 2" X 4" X 12" (2 REQD). POSITION AGAINST (D) AND NAIL TO (J) W/6-20d NAILS.



AN INSTALLATION OF 1/2" DIAMETER STEEL WIRE ROPE IS SHOWN, PASSED THRU THE UPPER HOLES IN THE WHEEL TO FORM A COMPLETE DOUBLE LOOP WITH AN END-OVER-END LAP JOINT SECURED WITH TWO (2), SIZE 1/2", U-BOLT CLIPS. THE SIZE OF THE LOOP SHALL BE THE MINIMUM NECESSARY TO PERMIT ATTACHMENT OF TWO (2) CHAIN TIE DOWN ASSEMBLIES.

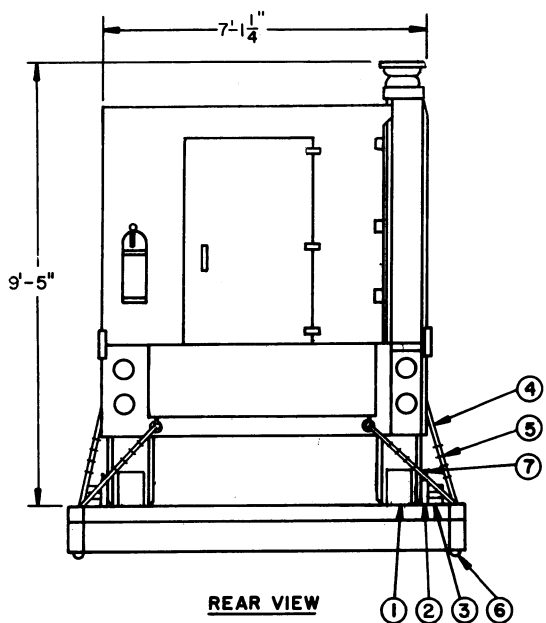
**ALTERNATIVE WHEEL SECUREMENT**

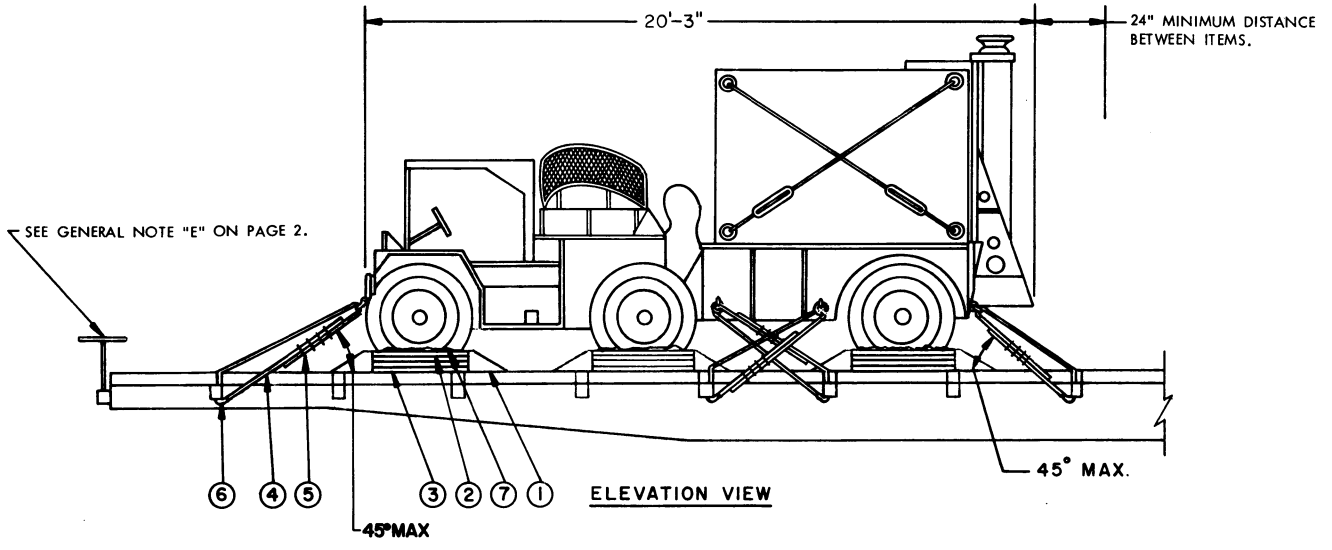
(FOR USE WITH CHAIN TIE DOWNS)



#### KEY NUMBERS

- ① CHOCK BLOCK (12 REQD). LOCATE 45° END OF BLOCK AGAINST WHEEL. NAIL THRU HEEL OF BLOCK W/3-40d NAILS AND 2-60d NAILS. TOENAIL EACH SIDE TO CAR FLOOR W/2-40d NAILS. SEE "CHOCK BLOCK" DETAIL ON PAGE 3.
- ② RUBBING STRIP, 2" X 6" X 36" (6 REQD). NAIL TO LOWER PIECE MARKED ③ W/5-12d NAILS.
- ③ SIDE BLOCKING, 2" X 4" X 36" (TRIPLED) (6 REQD). NAIL FIRST PIECE TO CAR FLOOR W/8-20d NAILS. NAIL EACH ADDITIONAL PIECE IN LIKE MANNER. SEE GENERAL NOTE "G" ON PAGE 2.
- ④ STEEL WIRE ROPE, 3/8" DIA., 6.56 TONS (8 REQD). INSTALL CABLE ANGULARLY AS SHOWN AND TO FORM A COMPLETE LOOP FROM STAKE POCKET ON CAR TO POINT OF ATTACHMENT ON LADING AND BACK TO STAKE POCKET. SEE "REAR VIEW" AT LEFT. **CAUTION:** DO NOT TIE TO LADING BUMPER OR BUMPERETTES. **NOTE:** CABLE OF A LARGER SIZE MAY BE USED IF AVAILABLE, WHEN SPECIFIED CABLE IS NOT AVAILABLE. SEE THE "SPECIAL PROVISIONS" ON PAGE 5 AND GENERAL NOTES "D" AND "F" ON PAGE 2.
- ⑤ CLIP, SIZE 3/8" (48 REQD). FOUR (4) PER CABLE AND ONE (1) PER THIMBLE.
- ⑥ THIMBLE, STANDARD, SIZE 3/8" (16 REQD). USE ONE (1) PER STAKE POCKET AND ONE (1) PER LADING TIEDOWN DEVICE. SECURE TO WIRE ROPE, PIECE MARKED ④, W/1 CLIP PER THIMBLE. **NOTE:** A STANDARD THIMBLE, AS SPECIFIED, CAN BE SECURED TO A CABLE WITH A 3/8" CLIP. HOWEVER, IF DESIRED, OR IF THE 3/8" THIMBLE BEING USED IS OF A TYPE WHICH CANNOT BE SECURED TO A CABLE WITH A 3/8" CLIP, A 1/2" CLIP MAY BE USED. **NOTE THAT AN "OPEN PATTERN" THIMBLE IS RECOMMENDED.**
- ⑦ WATERPROOF PAPER OR BURLAP OF A SUFFICIENT SIZE TO POSITION UNDER AND EXTEND 2" ABOVE PIECE MARKED ②.





**SPECIAL PROVISIONS FOR M561 VEHICLE:**

LADING MAY BE SECURED ON A CUSHIONED FMS TYPE FLAT CAR WITH CHAIN TIE DOWN ASSEMBLIES IN LIEU OF USING THE DEPICTED GENERAL SERVICE FM TYPE CAR AND THE SPECIFIED TIE DOWN MATERIALS, PROVIDING THE FOLLOWING CONDITIONS ARE MET:

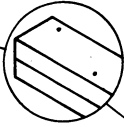
1. ONE ( 1 ) MOVABLE ANCHOR WITH CHAIN ASSEMBLY TIE DOWN DEVICE MUST BE SUBSTITUTED FOR EACH WIRE ROPE CABLE TIE DOWN MARKED ( 4 ). CHAINS WILL BE ATTACHED TO THE LADING AT THE SAME LOCATIONS SHOWN FOR THE WIRE ROPE. ANCHOR DEVICES WILL BE LOCATED SO AS TO POSITION THE CHAINS WITHIN THE ANGULAR TOLERANCES SPECIFIED ON THE LOAD VIEWS.
2. BEFORE AND DURING INSTALLATION, THE ANCHOR DEVICES SHALL BE INSPECTED FOR BENT HOOKS, STRETCH, GOUGES, BENT LINKS, AND WEAR IN THE CHAINS, AND FOR DAMAGED LOAD BINDERS OR WINCHES, OR ANY OTHER NOTICEABLE DEFECTS. ANY DEFICIENCY SHALL BE CAUSE FOR NOT USING AN ANCHOR AND CHAIN ASSEMBLY.
3. THE CHAIN ASSEMBLY TIE DOWN DEVICES MUST BE TENSIONED SUFFICIENTLY TO CAUSE SLIGHT VEHICLE BODY DEPRESSION.
4. CHAINS MUST NOT BE TWISTED DURING INSTALLATION. CHAINS ARE TO BE STRUCK WITH A HAMMER OR BAR AFTER TIGHTENING TO ELIMINATE ANY POSSIBLE MISALIGNMENT OF LINKS. FURTHER TIGHTENING MAY BE REQUIRED TO TAKE UP ANY SLACK THAT DEVELOPS DUE TO LINK ALIGNMENT.
5. TURNBUCKLES OR OTHER TENSIONING DEVICES NOT EQUIPPED WITH SELF-LOCKING DEVICES MUST BE WIRED OR PINNED TO PREVENT THEM FROM TURNING OR LOOSENING DURING TRANSIT.
6. OPEN HOOKS MUST BE SECURED WITH WIRE AS REQUIRED TO PREVENT THE HOOK FROM BECOMING DISENGAGED FROM THE CHAIN LINK TO WHICH IT IS ATTACHED.
7. ANTI-CHAFING MATERIAL MUST BE PLACED AND SECURED BETWEEN THE CHAINS AND THE LADING AT ALL POINTS OF CONTACT, EXCEPT AT DEFINITIVE TIE-DOWN POINTS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	54	36
2" X 6"	18	18
6" X 8"	15	60
NAILS	NO. REQD	POUNDS
12d ( 3-1/4" )	30	1/2
20d ( 4" )	144	5-1/4
40d ( 5" )	84	5
60d ( 6" )	24	2-1/2
ROPE, STEEL WIRE, 3/8"	110 <sup>o</sup> REQD	27-1/2 LBS
CLIPS, 3/8"	48 REQD	15 LBS
CLIPS, 1/2" (ALT FOR 3/8", 16 REQD)		7 LBS
THIMBLES, STANDARD, 3/8"	16 REQD	3 LBS
WATERPROOF PAPER OR BURLAP	AS REQD	NIL

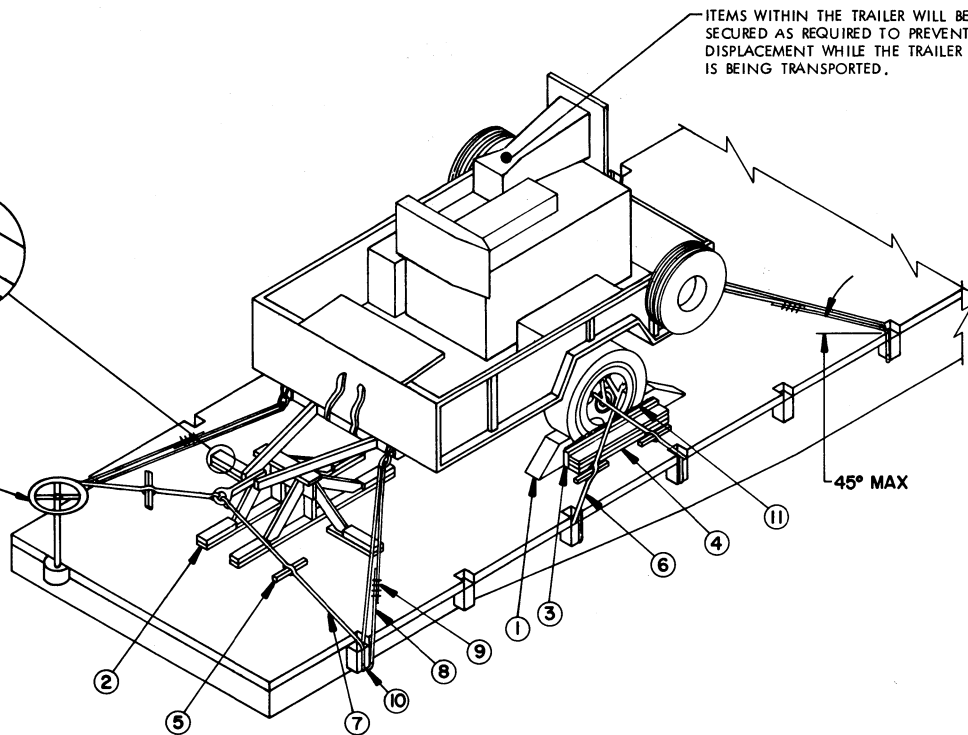
**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
RADAR SYSTEM	1	10,500 LBS
DUNNAGE		287 LBS
TOTAL WEIGHT		10,787 LBS

APPLICATION OF STAGGERED NAILING PATTERN. SEE GENERAL NOTE "G" ON PAGE 2.



SEE GENERAL NOTE "E" ON PAGE 2.



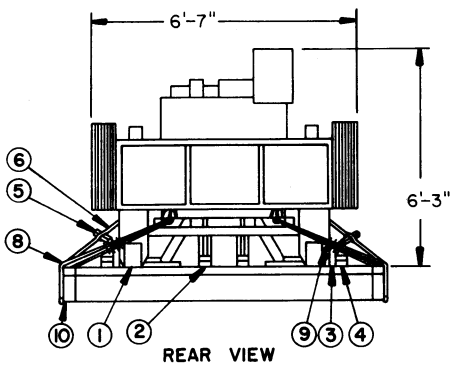
ITEMS WITHIN THE TRAILER WILL BE SECURED AS REQUIRED TO PREVENT DISPLACEMENT WHILE THE TRAILER IS BEING TRANSPORTED.

45° MAX

**ISOMETRIC VIEW**

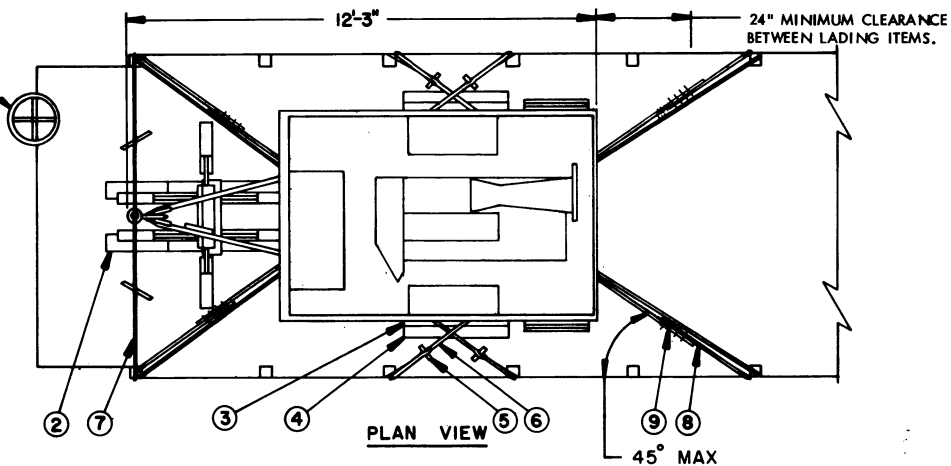
**KEY NUMBERS**

- ① CHOCK BLOCK ( 4 REQD ). SEE THE DETAIL ON PAGE 3. LOCATE THE 45° END OF A 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 THE "STANCHION" DETAIL ON PAGE 3. SEE GENERAL NOTE "G" ON PAGE 2.
- 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 THE FIRST PIECE TO THE CAR FLOOR W/8-20d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER.
- ⑤ WIRE TWISTER, 2" X 2" BY LENGTH TO SUIT ( 6 REQD ). SEE GENERAL NOTE "D" ON PAGE 2.
- ⑥ FOUR ( 4 ) STRANDS OF NO. 8 GAGE BLACK ANNEALED WIRE ( 4 REQD ). PASS THRU HOLES IN WHEEL AND A STAKE POCKET ON THE CAR TO FORM A COMPLETE LOOP. TWIST TAUT WITH PIECE MARKED ⑤. SEE GENERAL NOTES "D" AND "E" ON PAGE 2 AND THE "WHEEL SECUREMENT" DETAIL ON PAGE 7.
- ⑦ EIGHT ( 8 ) STRANDS OF NO. 8 GAGE BLACK ANNEALED WIRE ( 2 REQD ). PASS THRU THE LADING LUNETTE AND A STAKE POCKET ON THE CAR TO FORM A COMPLETE LOOP. TWIST TAUT WITH PIECE MARKED ⑤.
- ⑧ STEEL WIRE ROPE, 3/8" DIAMETER, 6.56 TONS ( 4 REQD ). INSTALL CABLE ANGULARLY AS SHOWN AND TO FORM A COMPLETE LOOP FROM STAKE POCKET ON THE CAR THRU THE LADING TIE DOWN DEVICE AND BACK TO THE STAKE POCKET. NOTE: CABLE OF A LARGER SIZE MAY BE USED IF THE SPECIFIED CABLE IS NOT AVAILABLE. SEE THE "SPECIAL PROVISIONS" ON PAGE 7 AND GENERAL NOTE "F" ON PAGE 2.
- ⑨ CLIP, SIZE 3/8" ( 24 REQD ). USE FOUR ( 4 ) PER CABLE JOINT AND ONE ( 1 ) PER THIMBLE. SEE GENERAL NOTE "D" ON PAGE 2.
- ⑩ THIMBLE, STANDARD, SIZE 3/8" ( 8 REQD ). USE ONE ( 1 ) PER CAR STAKE POCKET AND ONE ( 1 ) PER LADING TIE DOWN DEVICE. SECURE TO WIRE ROPE MARKED ⑧ W/1-CLIP PER THIMBLE. A STANDARD THIMBLE, AS SPECIFIED, CAN BE SECURED TO A CABLE WITH A 3/8" CLIP. HOWEVER, IF DESIRED, OR IF THE 3/8" THIMBLE BEING USED IS OF A TYPE WHICH CANNOT BE SECURED TO A CABLE WITH A 3/8" CLIP, A 1/2" CLIP MAY BE USED. NOTE THAT AN "OPEN PATTERN" THIMBLE IS RECOMMENDED.
- ⑪ WATERPROOF PAPER OR BURLAP OF A SUFFICIENT SIZE TO POSITION UNDER AND EXTEND 2" ABOVE PIECE MARKED ③.



**REAR VIEW**

SEE GENERAL NOTE "E"  
ON PAGE 2.



**SPECIAL PROVISIONS FOR M101A1 TRAILER:**

LADING MAY BE SECURED ON A CUSHIONED FMS TYPE FLAT CAR WITH CHAIN TIE DOWN ASSEMBLIES IN LIEU OF USING THE DEPICTED GENERAL SERVICE FM TYPE CAR AND THE SPECIFIED TIE DOWN MATERIALS, PROVIDING THE FOLLOWING CONDITIONS ARE MET:

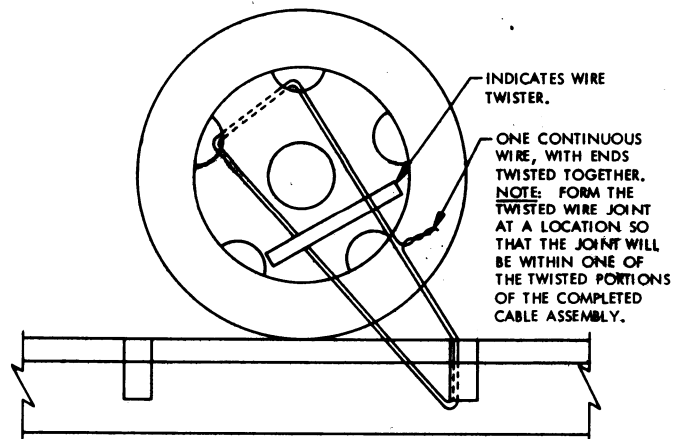
1. THE CAR MUST HAVE A WALKABLE FLOOR AREA AT LEAST 24" WIDE BETWEEN THE CENTER CHANNELS FOR THE SECUREMENT OF THE FORWARD BLOCKING ASSEMBLY.
2. ONE (1) MOVABLE ANCHOR WITH CHAIN ASSEMBLY TIE DOWN DEVICE MUST BE SUBSTITUTED FOR EACH WIRE ROPE CABLE TIE DOWN MARKED (8). CHAINS WILL BE ATTACHED TO THE LADING AT THE SAME LOCATIONS SHOWN FOR THE WIRE ROPE. ANCHOR DEVICES WILL BE LOCATED SO AS TO POSITION THE CHAINS WITHIN THE ANGULAR TOLERANCES SPECIFIED ON THE LOAD VIEWS.
3. FOR SECURING EACH WHEEL, IN LIEU OF TWO (2) STRANDED-WIRE TIE DOWNS, TWO (2) CHOCK BLOCKS AND ONE EACH OF SIDE BLOCKING PIECES MARKED (3) AND (4), TWO (2) CHAIN ASSEMBLIES WILL BE ATTACHED TO THE LIGHTENING HOLES IN THE WHEEL. HOWEVER, IF THE LIGHTENING HOLES ARE NOT LARGE ENOUGH TO RECEIVE THE CHAINS, A STEEL WIRE ROPE (CABLE) LOOP MUST BE PROVIDED FOR ATTACHMENT OF THE CHAINS. SEE THE "ALTERNATIVE WHEEL SECUREMENT" DETAIL ON PAGE 3 FOR METHOD OF APPLYING CABLE.
4. IN LIEU OF THE STRANDED WIRE TIE DOWNS MARKED (7) FOR SECURING THE LADING LUNETTE, TWO (2) CHAIN ASSEMBLIES WILL BE SUBSTITUTED.
5. THE CHAIN ASSEMBLY TIE DOWN DEVICES MUST BE TENSIONED SUFFICIENTLY TO CAUSE SLIGHT VEHICLE BODY DEPRESSION.

(CONTINUED AT RIGHT)

(SPECIAL PROVISIONS CONTINUED)

6. BEFORE AND DURING INSTALLATION, THE ANCHOR DEVICES SHALL BE INSPECTED FOR BENT HOOKS, STRETCH, GOUGES, BENT LINKS, AND WEAR IN THE CHAINS, AND FOR DAMAGED LOAD BINDERS OR WINCHES, OR ANY OTHER NOTICEABLE DEFECTS. ANY DEFICIENCY SHALL BE CAUSE FOR NOT USING AN ANCHOR AND CHAIN ASSEMBLY.
7. CHAINS MUST NOT BE TWISTED DURING INSTALLATION. CHAINS ARE TO BE STRUCK WITH A HAMMER OR BAR AFTER TIGHTENING TO ELIMINATE ANY POSSIBLE MISALIGNMENT OF LINKS. FURTHER TIGHTENING MAY BE REQUIRED TO TAKE UP ANY SLACK THAT DEVELOPS DUE TO LINK ALIGNMENT.
8. TURNBUCKLES OR OTHER TENSIONING DEVICES NOT EQUIPPED WITH SELF-LOCKING DEVICES MUST BE WIRED OR PINNED TO PREVENT THEM FROM TURNING OR LOOSENING DURING TRANSIT.
9. OPEN HOOKS MUST BE SECURED WITH WIRE AS REQUIRED TO PREVENT THE HOOK FROM BECOMING DISENGAGED FROM THE CHAIN LINK TO WHICH IT IS ATTACHED.
10. ANTI-CHAFING MATERIAL MUST BE PLACED AND SECURED BETWEEN THE CHAINS AND THE LADING AT ALL POINTS OF CONTACT, EXCEPT AT DEFINITIVE TIE-DOWN POINTS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	4	2
2" X 2"	9	3
2" X 4"	35	24
2" X 6"	26	26
6" X 8"	6	24
NAILS	NO. REQD	POUNDS
6d (2")	26	1/4
12d (3-1/4")	19	1/2
16d (3-1/2")	24	1/2
20d (4")	110	4
40d (5")	28	1-3/4
60d (6")	8	1
	8	1
ROPE, STEEL WIRE, 3/8" DIA. ——— 80' REQD ——— 20 LBS		
CLIP, 3/8" ——— 24 REQD ——— 8 LBS		
CLIP, 1/2" (ALT FOR 3/8", 8 REQD) ——— 4 LBS		
THIMBLE, STANDARD, 3/8" ——— 8 REQD ——— 1-1/2 LBS		
WIRE, NO. 8 GAGE ——— 180' REQD ——— 18 LBS		
WATERPROOF PAPER OR BURLAP — AS REQD ——— NIL		



**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,

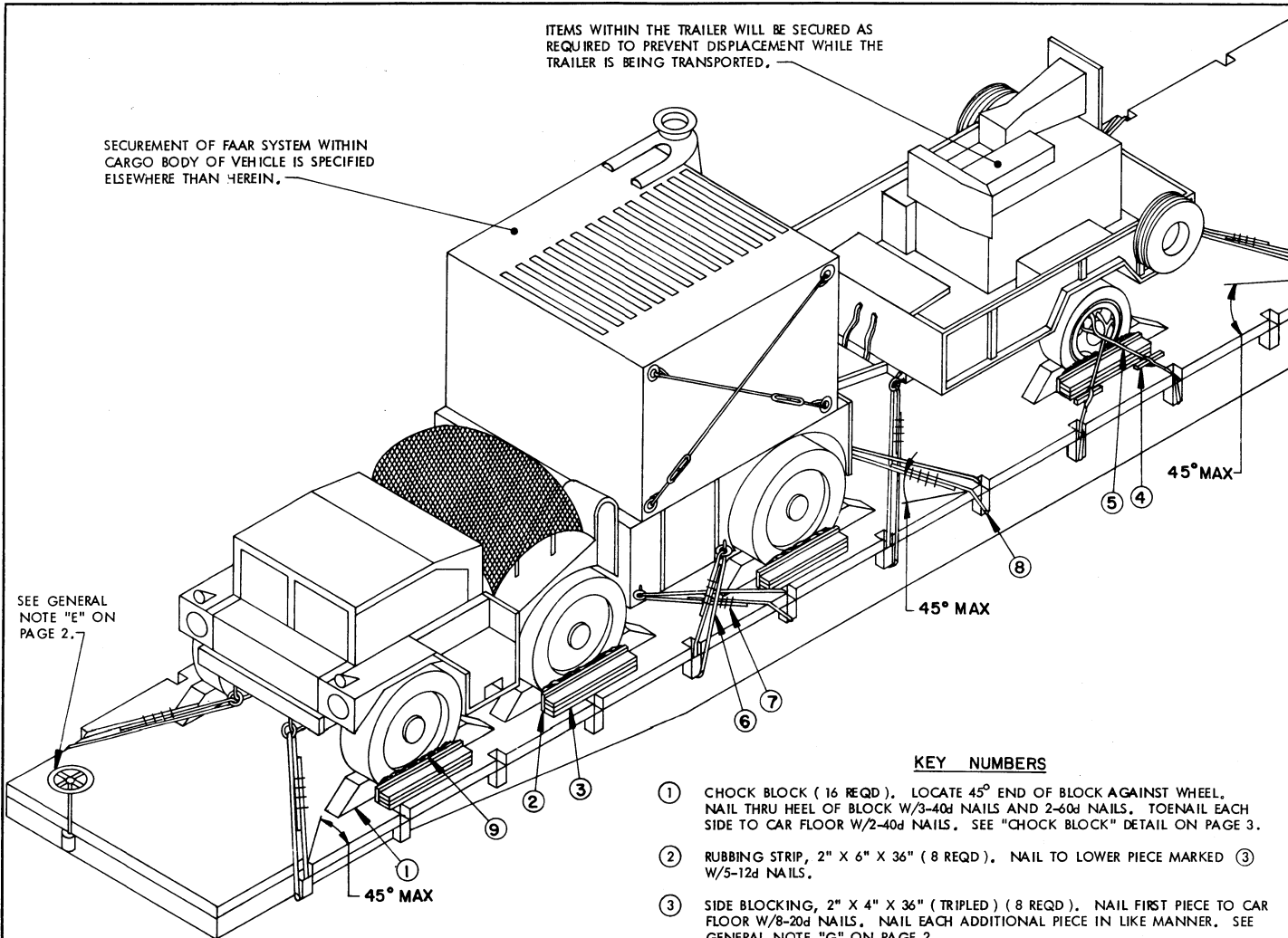
**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
COMPONENT EQUIP-		
MENT	1	2,660 LBS
DUNNAGE		214 LBS
<b>TOTAL WEIGHT</b>		<b>2,874 LBS</b>

ITEMS WITHIN THE TRAILER WILL BE SECURED AS REQUIRED TO PREVENT DISPLACEMENT WHILE THE TRAILER IS BEING TRANSPORTED.

SECUREMENT OF FAAR SYSTEM WITHIN CARGO BODY OF VEHICLE IS SPECIFIED ELSEWHERE THAN HEREIN.

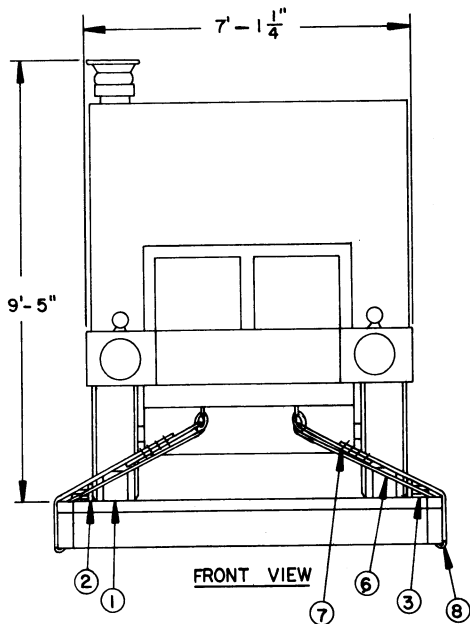
SEE GENERAL NOTE "E" ON PAGE 2.



ISOMETRIC VIEW

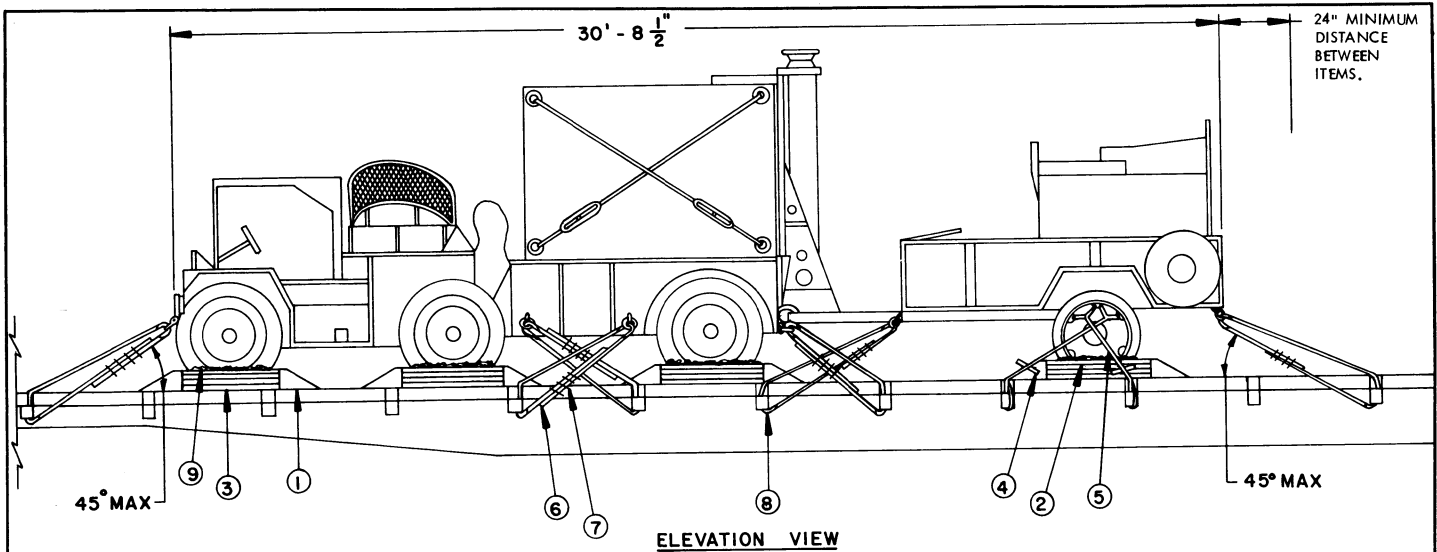
KEY NUMBERS

- ① CHOCK BLOCK ( 16 REQD ). LOCATE 45° END OF BLOCK AGAINST WHEEL. NAIL THRU HEEL OF BLOCK W/3-40d NAILS AND 2-60d NAILS. TOENAIL EACH SIDE TO CAR FLOOR W/2-40d NAILS. SEE "CHOCK BLOCK" DETAIL ON PAGE 3.
- ② RUBBING STRIP, 2" X 6" X 36" ( 8 REQD ). NAIL TO LOWER PIECE MARKED ③ W/5-12d NAILS.
- ③ SIDE BLOCKING, 2" X 4" X 36" ( TRIPLED ) ( 8 REQD ). NAIL FIRST PIECE TO CAR FLOOR W/8-20d NAILS. NAIL EACH ADDITIONAL PIECE IN LIKE MANNER. SEE GENERAL NOTE "G" ON PAGE 2.
- ④ WIRE TWISTER, 2" X 2" BY LENGTH TO SUIT ( 4 REQD ). SEE GENERAL NOTE "D" ON PAGE 2.
- ⑤ FOUR ( 4 ) STRANDS OF NO. 8 GAGE BLACK ANNEALED WIRE ( 4 REQD ). PASS THRU HOLES IN WHEEL AND A STAKE POCKET ON THE CAR TO FORM A COMPLETE LOOP. TWIST TAUT WITH PIECE MARKED ④. SEE GENERAL NOTES "D" AND "E" ON PAGE 2 AND THE "WHEEL SECUREMENT" DETAIL ON PAGE 7.
- ⑥ STEEL WIRE ROPE, 3/8" DIA., 6.56 TONS ( 12 REQD ). INSTALL CABLE ANGULARLY AS SHOWN AND TO FORM A COMPLETE LOOP FROM STAKE POCKET ON CAR TO POINT OF ATTACHMENT ON LADING AND BACK TO STAKE POCKET. CAUTION: DO NOT TIE TO LADING BUMPER OR BUMPERETTES. NOTE: CABLE OF A LARGER SIZE MAY BE USED IF AVAILABLE, WHEN SPECIFIED CABLE IS NOT AVAILABLE. SEE THE "SPECIAL PROVISIONS" ON PAGE 9 AND GENERAL NOTE "D" AND "F" ON PAGE 2.
- ⑦ CLIP, SIZE 3/8" ( 72 REQD ). USE FOUR ( 4 ) PER CABLE JOINT AND ONE ( 1 ) PER THIMBLE. SEE GENERAL NOTE "D" ON PAGE 2.
- ⑧ THIMBLE, STANDARD, SIZE 3/8" ( 24 REQD ). USE ONE ( 1 ) PER CAR STAKE POCKET AND ONE ( 1 ) PER LADING TIE DOWN DEVICE. SECURE TO WIRE ROPE MARKED ⑥ W/1-CLIP PER THIMBLE. A STANDARD THIMBLE, AS SPECIFIED, CAN BE SECURED TO A CABLE WITH A 3/8" CLIP. HOWEVER, IF DESIRED, OR IF THE 3/8" THIMBLE BEING USED IS OF A TYPE WHICH CANNOT BE SECURED TO A CABLE WITH A 3/8" CLIP, A 1/2" CLIP MAY BE USED. NOTE THAT AN "OPEN PATTERN" THIMBLE IS RECOMMENDED.
- ⑨ WATERPROOF PAPER OR BURLAP OF A SUFFICIENT SIZE TO POSITION UNDER AND EXTEND 2" ABOVE PIECE MARKED ②.



FRONT VIEW





ELEVATION VIEW

**SPECIAL PROVISIONS FOR GAMMA GOAT WITH TRAILER ATTACHED:**

LADING MAY BE SECURED ON A CUSHIONED FMS TYPE FLAT CAR WITH CHAIN TIE DOWN ASSEMBLIES IN LIEU OF USING THE DEPICTED GENERAL SERVICE FM TYPE CAR AND THE SPECIFIED TIE DOWN MATERIALS, PROVIDING THE FOLLOWING CONDITIONS ARE MET:

1. ONE (1) MOVABLE ANCHOR WITH CHAIN ASSEMBLY TIE DOWN DEVICE MUST BE SUBSTITUTED FOR EACH WIRE ROPE CABLE TIE DOWN MARKED (6). CHAINS WILL BE ATTACHED TO THE LADING AT THE SAME LOCATIONS SHOWN FOR THE WIRE ROPE. ANCHOR DEVICES WILL BE LOCATED SO AS TO POSITION THE CHAINS WITHIN THE ANGULAR TOLERANCES SPECIFIED ON THE LOAD VIEWS.
2. FOR SECURING EACH WHEEL OF THE M101A1 TRAILER, IN LIEU OF TWO (2) STRANDED-WIRE TIE DOWNS, TWO (2) CHOCK BLOCKS AND ONE EACH OF SIDE BLOCKING PIECES MARKED (2) AND (3), TWO (2) CHAIN ASSEMBLIES WILL BE ATTACHED TO THE LIGHTENING HOLES IN THE WHEEL. HOWEVER, IF THE LIGHTENING HOLES ARE NOT LARGE ENOUGH TO RECEIVE THE CHAINS, A STEEL WIRE ROPE (CABLE) LOOP MUST BE PROVIDED FOR ATTACHMENT OF THE CHAINS. SEE THE "ALTERNATIVE WHEEL SECUREMENT" DETAIL ON PAGE 3 FOR METHOD OF APPLYING CABLE.
3. BEFORE AND DURING INSTALLATION, THE ANCHOR DEVICES SHALL BE INSPECTED FOR BENT HOOKS, STRETCH, GOUGES, BENT LINKS, AND WEAR IN THE CHAINS, AND FOR DAMAGED LOAD BINDERS OR WINCHES, OR ANY OTHER NOTICEABLE DEFECTS. ANY DEFICIENCY SHALL BE CAUSE FOR NOT USING AN ANCHOR AND CHAIN ASSEMBLY.
4. THE CHAIN ASSEMBLY TIE DOWN DEVICES MUST BE TENSIONED SUFFICIENTLY TO CAUSE SLIGHT VEHICLE BODY DEPRESSION.
5. CHAINS MUST NOT BE TWISTED DURING INSTALLATION. CHAINS ARE TO BE STRUCK WITH A HAMMER OR BAR AFTER TIGHTENING TO ELIMINATE ANY POSSIBLE MISALIGNMENT OF LINKS. FURTHER TIGHTENING MAY BE REQUIRED TO TAKE UP ANY SLACK THAT DEVELOPS DUE TO LINK ALIGNMENT.
6. TURNBUCKLES OR OTHER TENSIONING DEVICES NOT EQUIPPED WITH SELF-LOCKING DEVICES MUST BE WIRED OR PINNED TO PREVENT THEM FROM TURNING OR LOOSENING DURING TRANSIT.
7. OPEN HOOKS MUST BE SECURED WITH WIRE AS REQUIRED TO PREVENT THE HOOK FROM BECOMING DISENGAGED FROM THE CHAIN LINK TO WHICH IT IS ATTACHED.
8. ANTI-CHAFING MATERIAL MUST BE PLACED AND SECURED BETWEEN THE CHAINS AND THE LADING AT ALL POINTS OF CONTACT, EXCEPT AT DEFINITIVE TIE-DOWN POINTS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 2"	6	2
2" X 4"	72	48
2" X 6"	24	24
6" X 8"	21	84
NAILS	NO. REQD	POUNDS
12d	40	3/4
20d	192	7
40d	112	6-3/4
60d	32	3-1/4
ROPE, STEEL WIRE, 3/8" DIA ----- 190' REQD ----- 47-1/2 LBS		
CLIP, 3/8" ----- 72 REQD ----- 22-1/2 LBS		
CLIP, 1/2" (ALT FOR 3/8", 24 REQD) ----- 10-1/2 LBS		
THIMBLE, STANDARD, 3/8" ----- 24 REQD ----- 4-1/2 LBS		
WIRE, NO. 8 GAGE ----- 80' REQD ----- 7-1/2 LBS		
WATERPROOF PAPER OR BURLAP ----- AS REQD ----- NIL		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
M561 VEHICLE ( W/RADAR SYSTEM )	1	10,500 LBS
M101A1 TRAILER ( W/COMPONENT EQUIP )	1	2,660 LBS
DUNNAGE		416 LBS

TOTAL WEIGHT-----13,576 LBS ( APPROX )

