CHAPARRAL

LOADING AND BRACING ⌖ ON EUROPEAN RAILCAR OF GUIDED MISSILE SYSTEM, INTERCEPT-AERIAL, M48 AND M48A1, CARRIER MOUNTED

⌖ DELINEATED LOADING AND BRACING PROCEDURES COMPLY WITH THE REQUIREMENTS OF APPENDIX C TO TM 55-601.

NOTICE: DEPICTED LOAD IS OVERSIZE, MOVEMENT MUST BE COORDINATED WITH DB OR SNCB.

1. EXCEEDS THE EUROPEAN INTERNATIONAL LOADING GAUGE.
2. EXCEEDS THE SNCB LOADING GAUGE.
3. EXCEEDS THE DB LOADING GAUGE.

U.S. ARMY MATERIEL COMMAND DRAWING

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NOT NECESSARILY DRAWN TO SCALE

PROJECT GSE 534-73

GENERAL NOTES

A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1.

B. THE OUTLOADING PROCEDURES SHOWN HEREIN ARE APPLICABLE TO EUROPEAN RAILCARS WHICH CONFORM TO RIV* REQUIREMENTS.

C. THE LOAD AS SHOWN IS BASED ON RIV RAILCARS (KBS 442/443 AND KLS 442/443) 41'-0-1/8" (12,500 MM) LONG BY 9'-1-3/64" (2,770 MM) WIDE WITH 18" (457 MM) CAR SIDES. ADDITIONAL UNITS OR OTHER ITEMS MAY BE LOADED ON THE CAR, WITH THE VIEW TOWARD FULL UTILIZATION OF CARRIER EQUIPMENT.

D. LADING DATA:

ITEM DIMENSIONS ---- 20'-0" (6,096 MM) LONG BY 8'-9" (2,667 MM) WIDE BY 9'-6" (2,896 MM) HIGH.

ITEM GROSS WEIGHT -- 26,800 POUNDS (APPROX) (12,157 KG).

E. A LIST OF RAILCARS THAT MAY BE USED FOR SHIPMENTS OF THE DEPICTED LOAD IS SHOWN IN THE CHART ON THIS PAGE. OTHER TYPES OF RAILCARS CAN BE USED PROVIDING THESE OTHER CARS ARE PROPERLY EQUIPPED FOR THE APPLICATION OF THE PRESCRIBED LOAD-SECURING BLOCKING IN ACCORDANCE WITH THE SPECIFIED PROCEDURES. MINOR DEVIATIONS FROM THE LOCATIONS SHOWN IN THE LOAD VIEWS FOR INSTALLING BLOCKING AND TIE DOWN COMPONENTS ON A CAR ARE PERMITTED. HOWEVER, THE INTENT OF THE SPECIFIED BLOCKING PROCEDURES MUST BE ACHIEVED.

F. REMOVE ALL POSTS FROM SIDE OF CAR AND PLACE IN RACKS UNDER CAR, AS APPLICABLE.

G. THE NUMBER OF UNITS MAY BE ADJUSTED TO FIT THE RAILCAR CONCERNED, OR THE QUANTITY TO BE SHIPPED; HOWEVER, THE APPROVED METHODS CONTAINED HEREIN, FOR FULL OR PARTIAL CARLOAD, MUST BE FOLLOWED FOR BLOCKING, BRACING, AND STAYING OF THIS ITEM.

H. 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 RAILCAR, 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 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.

J. NAILS USED FOR FLOOR LINE BLOCKING WILL HAVE A MINIMUM DIAMETER OF 5 MM. NAIL SIZES WILL BE SELECTED TO PROVIDE A MINIMUM OF 40 MM PENETRATION INTO THE CAR FLOOR. HOWEVER, THE LENGTH OF THE NAIL WILL BE SUCH THAT THE NAIL DOES NOT COMPLETELY PENETRATE THE CAR FLOOR. SEE THE "NAIL CHART" AT THE RIGHT AND THE "TYPICAL NAILING OF FLOOR LINE BLOCKING TO CAR FLOOR" DETAIL ON PAGE 3. NAILS WHICH ARE OF OTHER SIZES OR WHICH HAVE A NOMENCLATURE DIFFERENT THAN THAT USED HEREIN, MAY ALSO BE USED PROVIDED THEY MEET THE MINIMUM REQUIREMENTS STIPULATED WITHIN THIS DOCUMENT.

K. THE LADING ITEM WILL BE PREPARED FOR TRANSPORTATION IN ACCORDANCE WITH THE REQUIREMENTS OF OTHER APPLICABLE DOCUMENTS.

L. CAUTION: DURING WIRE ROPE INSTALLATION AVOID ALL CONTACT WITH ELECTRICAL WIRING, VEHICLE CONTROLS AND OTHER APPURTENANCES.

M. FIVE-EIGHTH INCH (5/8") STEEL WIRE ROPE IS SPECIFIED WHERE REQUIRED FOR TIEDOWNS TO SECURE THE ITEM. IF DESIRED, OR IF 5/8" STEEL WIRE ROPE IS NOT AVAILABLE, STEEL WIRE ROPE OF A LARGER DIAMETER MAY BE USED. 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.

N. ALL HAND BRAKES MUST BE "SET" WITH THE HAND LEVERS WIRE TIED OR BLOCKED.

(CONTINUED AT RIGHT)

* REGOLAMENTO INTERNAZIONALE VEICOLI (RIV): REGULATIONS GOVERNING THE RECIPROCAL USE OF WAGONS IN INTERNATIONAL TRAFFIC.

(GENERAL NOTES CONTINUED)

O. THE PROCEDURES DEPICTED WITHIN THIS DRAWING ARE BASED ON THE USE OF DIMENSIONAL SIZED LUMBER. IN MOST CASES THE METRIC EQUIVALENT IS GIVEN IN PARENTHESIS FOLLOWING THE DIMENSION. HOWEVER, WHERE THE METRIC EQUIVALENT IS NOT SHOWN, IT MAY BE COMPUTED BY USING 1" EQUALS 25.4 MM. METRIC EQUIVALENTS FOR WEIGHTS ARE BASED ON 1 LB EQUALS 0.454 KG. METRIC EQUIVALENTS FOR TORQUE ARE BASED ON 1 FOOT-POUND EQUALS 0.7376 NEWTON-METERS.

NAIL CHART

SIZE	LENGTH		DIAMETER
10d	3"	(76 MM)	0.1483" (3.77 MM)
12d	3-1/4"	(83 MM)	0.1483" (3.77 MM)
16d	3-1/2"	(89 MM)	0.1620" (4.11 MM)
20d	4"	(102 MM)	0.1920" (4.88 MM)
30d **	4-1/2"	(114 MM)	0.2070" (5.26 MM)
40d **	5"	(127 MM)	0.2253" (5.72 MM)
50d **	5-1/2"	(140 MM)	0.2437" (6.19 MM)
60d **	6"	(152 MM)	0.2625" (6.67 MM)

** NAILS WHICH HAVE ADEQUATE DIAMETER FOR NAILING FLOOR LINE BLOCKING. THE LENGTH OF THE NAIL MUST MEET THE REQUIREMENTS OF GENERAL NOTE "J".

LIST OF RAILCARS THAT MAY BE USED FOR SHIPMENTS

TYPE OF RAILCAR	LENGTH OF RAILCAR	NO. OF ITEMS	MAXIMUM TOTAL WEIGHT (APPROX) OF ITEMS
KLMS 440	34'-11-11/16" (10,660 MM)	1	26,800 LBS (12,157 KG)
KLM 505	30'-4-9/16" (9,260 MM)	1	26,800 LBS (12,157 KG)
KLM 506	34'-8-1/2" (10,580 MM)	1	26,800 LBS (12,157 KG)
KBS 442/443	41'-0-1/8" (12,500 MM)	2	53,600 LBS (24,312 KG)
KLS 442/443	41'-0-1/8" (12,500 MM)	2	53,600 LBS (24,312 KG)
RMMS 663/664	41'-5-51/64" (12,644 MM)	2	53,600 LBS (24,312 KG)
RS 680/681	60'-8-23/64" (18,500 MM)	3	80,400 LBS (36,471 KG)
RS 683/684	60'-8-23/64" (18,500 MM)	3	80,400 LBS (36,471 KG)

MATERIAL SPECIFICATIONS

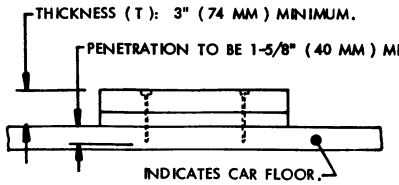
LUMBER - : DOUGLAS FIR OR COMPARABLE LUMBER WITH STRAIGHT GRAIN AND FREE OF MATERIAL DEFECTS. REF: FED SPEC MM-L-751.

NAILS -- : COMMON, REF: FED SPEC FF-N-105.

ROPE --- : STEEL WIRE, PLAIN, PREFORMED, REGULAR LAY. REF: FED SPEC RR-W-410.

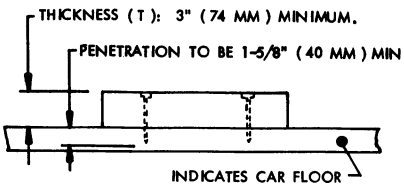
CLIPS --- : "U" BOLT, CROSBY, HEAVY DUTY (OR EQUAL). REF: FED SPEC FF-C-450, TYPE I, CLASS I.

SHACKLE : TYPE IV, CLASS 4: FED SPEC RR-C-271.
THIMBLE : COMMERCIAL GRADE.



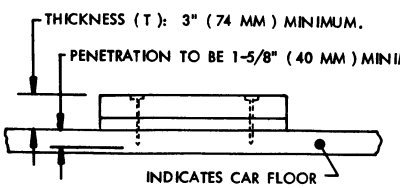
DOUBLED 2' X 6' LUMBER SHOWN

DETAIL A



4' X 6' LUMBER SHOWN

DETAIL B



MIXED THICKNESS OF LUMBER SHOWN

DETAIL C

TYPICAL NAILING OF FLOOR LINE BLOCKING TO CAR FLOOR

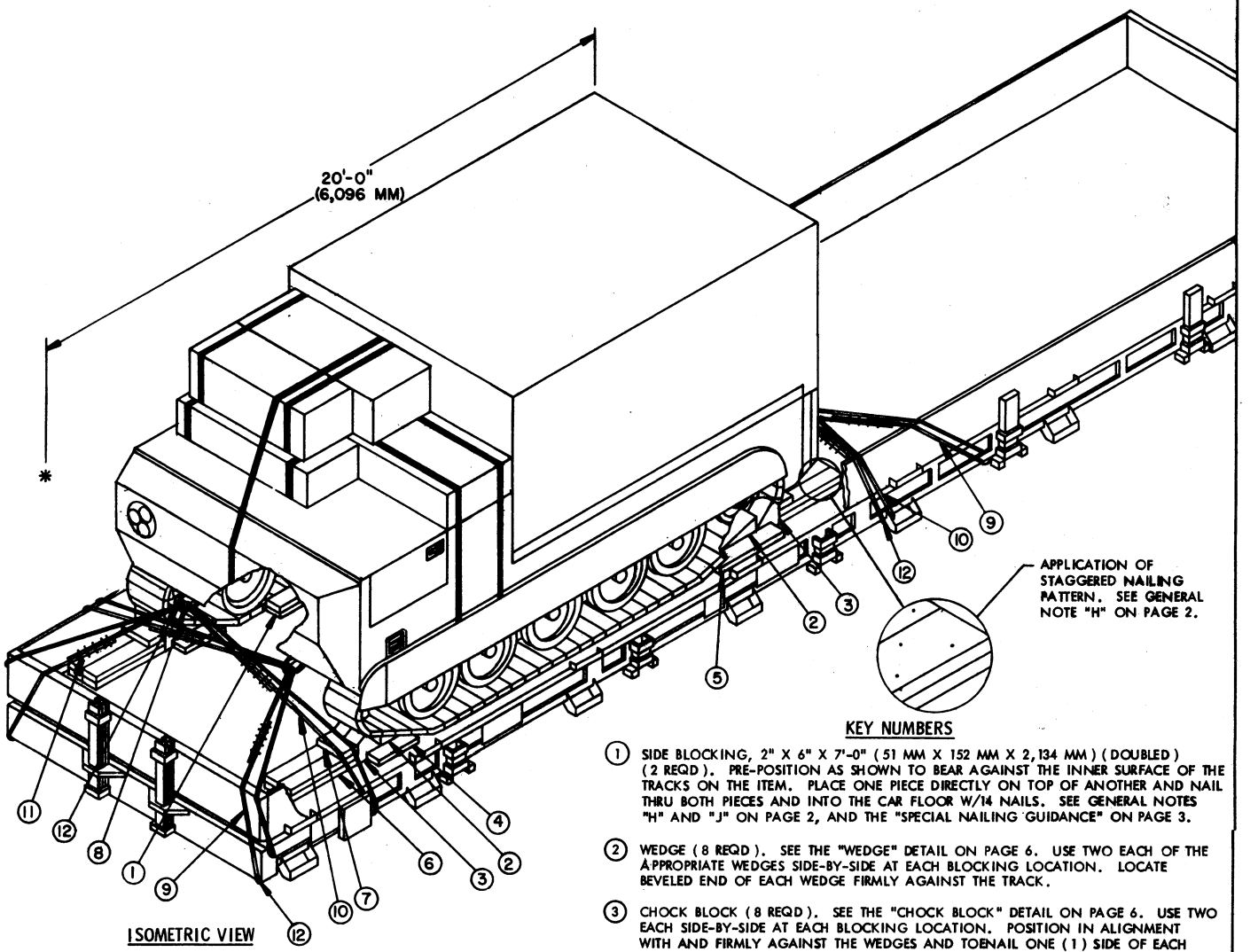
SPECIAL NOTES:

1. THE DETAILS ON THIS PAGE DEPICT POSSIBLE VARIATIONS THAT MAY RESULT FROM USING AVAILABLE LUMBER FOR FLOOR LINE BLOCKING. KEY NUMBERS THROUGHOUT THIS DOCUMENT SPECIFY DOUBLED PIECES OF LUMBER WHICH ARE 2" X 6" IN SIZE FOR HEADERS, BACK-UP CLEATS, AND SIDE-BLOCKING, AS TYPICALLY SHOWN IN DETAIL A ABOVE. IT IS PERMISSABLE TO USE 4" X 6" LUMBER, OR MIXED THICKNESSES OF LUMBER, AS TYPICALLY SHOWN IN DETAILS B AND C, IN LIEU OF THE SPECIFIED DOUBLED 2" X 6" LUMBER. THE INTENT OF THE SPECIFIED BLOCKING PROCEDURE MUST BE OBTAINED.

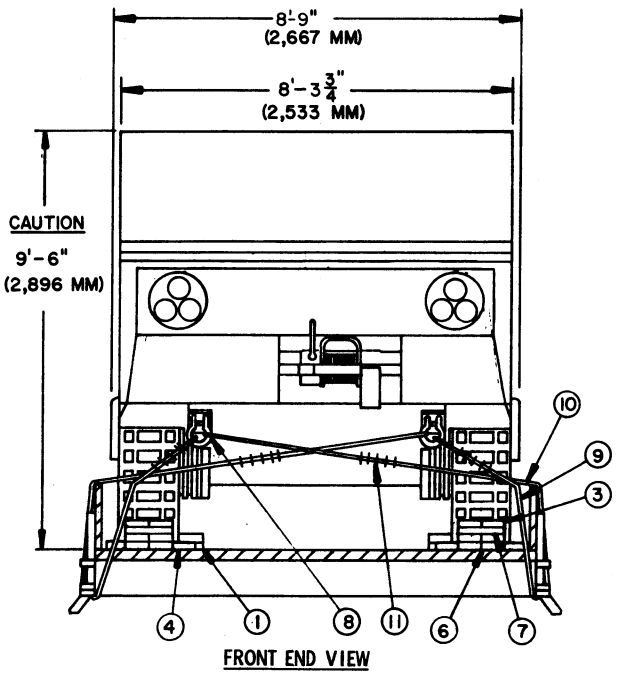
2. THE NUMBER OF NAILS USED TO SECURE EACH PIECE OF BLOCKING WILL BE AS SPECIFIED IN THE KEY NUMBERS FOR EACH SPECIFIC PROCEDURE. THE LENGTH OF THE NAILS SELECTED WILL BE ADEQUATE TO NAIL THROUGH THE BLOCKING AND ACHIEVE THE PENETRATION OF THE CAR FLOOR AS SPECIFIED. WHEN NAILING FLOOR LINE BLOCKING TO THE CAR FLOOR, AS DEPICTED IN DETAILS A, B, AND C, THE FOLLOWING APPLIES.

THICKNESS (T) OF BLOCKING		SIZE OF NAIL
MINIMUM	MAXIMUM	
3" (74 MM)	3" (74 MM)	30d (4-1/2") (114 MM)
3" (74 MM)	3-3/8" (87 MM)	40d (5") (127 MM)
3-3/8" (87 MM)	4" (100 MM)	50d (5-1/2") (140 MM)
4" (100 MM)	4-3/8" (112 MM)	60d (6") (152 MM)

3. WHEN NAILING CHOCK BLOCKS TO THE CAR FLOOR, THE NAILING SHALL COMPLY WITH THE PENETRATION REQUIREMENTS, AS TYPICALLY SHOWN ABOVE, AND AS SPECIFIED IN GENERAL NOTE "J" ON PAGE 2.



ISOMETRIC VIEW



FRONT END VIEW

END WALL OF RAILCAR OMITTED FOR CLARITY PURPOSES.

KEY NUMBERS

(1) SIDE BLOCKING, 2" X 6" X 7'-0" (51 MM X 152 MM X 2,134 MM) (DOUBLED) (2 REQD). PRE-POSITION AS SHOWN TO BEAR AGAINST THE INNER SURFACE OF THE TRACKS ON THE ITEM. PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/14 NAILS. SEE GENERAL NOTES "H" AND "J" ON PAGE 2, AND THE "SPECIAL NAILING GUIDANCE" ON PAGE 3.

(2) WEDGE (8 REQD). SEE THE "WEDGE" DETAIL ON PAGE 6. USE TWO EACH OF THE APPROPRIATE WEDGES SIDE-BY-SIDE AT EACH BLOCKING LOCATION. LOCATE BEVELED END OF EACH WEDGE FIRMLY AGAINST THE TRACK.

(3) CHOCK BLOCK (8 REQD). SEE THE "CHOCK BLOCK" DETAIL ON PAGE 6. USE TWO EACH SIDE-BY-SIDE AT EACH BLOCKING LOCATION. POSITION IN ALIGNMENT WITH AND FIRMLY AGAINST THE WEDGES AND TOENAIL ONE (1) SIDE OF EACH BLOCK TO THE CAR FLOOR W/2 NAILS.

(4) FORWARD SIDE CLEAT, 2" X 6" X 16" (51 MM X 152 MM X 406 MM) (4 REQD). POSITION TO BEAR AGAINST THE SIDES OF PIECES MARKED (2) AND (3) AS SHOWN AND NAIL TO THE CAR FLOOR W/3 NAILS.

(5) REAR SIDE CLEAT, 2" X 6" X 30" (51 MM X 152 MM X 762 MM) (4 REQD). POSITION TO BEAR AGAINST THE SIDES OF PIECES MARKED (2) AND (3) AS SHOWN AND NAIL TO THE CAR FLOOR W/5 NAILS.

(6) BACK-UP CLEAT, 2" X 6" X 30" (51 MM X 152 MM X 762 MM) (DOUBLED) (8 REQD). POSITION TWO DOUBLED CLEATS SIDE-BY-SIDE IN ALIGNMENT WITH PIECE MARKED (3), AS SHOWN. PLACE ONE PIECE DIRECTLY ON TOP OF ANOTHER AND NAIL THRU BOTH PIECES AND INTO THE CAR FLOOR W/6 NAILS.

(7) BUFFER CLEAT, 2" X 6" X 12" (51 MM X 152 MM X 305 MM) (4 REQD). POSITION AS SHOWN AT THE END OF THE CHOCK BLOCK. NAIL TO PIECES MARKED (6) W/3 NAILS AT EACH JOINT.

(8) SHACKLE, SIZE 1" (25.4 MM) (4 REQD). INSTALL ONE EACH AT TWO FRONT AND TWO REAR TIEDOWN POINTS ON VEHICLE. NOTE: NOT REQUIRED IF VEHICLE IS ALREADY EQUIPPED WITH SHACKLES WHEN OFFERED FOR SHIPMENT. SEE SPECIAL NOTE 3 ON PAGE 5.

(9) STEEL WIRE ROPE, 5/8" (15.875 MM) DIAMETER, 17.9 TONS (16,217 KG) (4 REQD). INSTALL CABLE AS SHOWN TO FORM A COMPLETE LOOP FROM TIEDOWN FACILITY ON THE RAILCAR THRU LADING TIEDOWN DEVICE AND BACK TO THE RAILCAR TIEDOWN FACILITY. SEE GENERAL NOTES "K", "L", AND "N" ON PAGE 2. SEE SPECIAL NOTES 2, 4, AND 5 ON PAGE 5.

(10) STEEL WIRE ROPE, 5/8" (15.875 MM) DIAMETER, 17.9 TONS (16,217 KG) (4 REQD). INSTALL CABLE AS SHOWN TO FORM A COMPLETE LOOP FROM A LADING TIEDOWN DEVICE ON ONE SIDE TO A RAILCAR TIEDOWN FACILITY ON THE OPPOSITE SIDE. SEE GENERAL NOTES "K", "L", AND "N" ON PAGE 2. SEE SPECIAL NOTES 2, 4, AND 5 ON PAGE 5.

(CONTINUED ON PAGE 5)

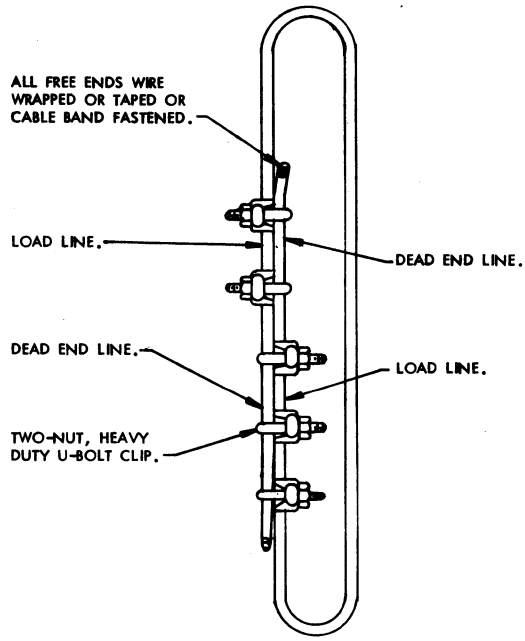
SPECIAL NOTES:

1. A ONE UNIT LOAD IS SHOWN ON A 9'-1-3/64" (2,770 MM) WIDE EUROPEAN RAILCAR. SEE GENERAL NOTE "E" ON PAGE 2.
2. THE NUTS ON THE CABLE CLIPS SHALL BE TIGHTENED TO A TORQUE OF 135 TO 150 FOOT-POUNDS. A PROPER TORQUE CAN BE ACHIEVED BY USING A WRENCH WHICH HAS A HANDLE THAT IS AT LEAST 24" LONG. SECURE EACH THIMBLE, PIECE MARKED (12) WITH A CLIP OR BY EQUIVALENT MEANS. NOTE: CABLE WILL BE TENSIONED SUFFICIENTLY TO CAUSE THE BODY OF THE TRACK VEHICLE TO DEPRESS APPROXIMATELY ONE INCH (1"). SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
3. MORE DISTANCE MAY BE REQUIRED BETWEEN THE DRILLED PADS AT THE OPEN END OF A SHACKLE SO THAT IT WILL FIT PROPERLY OVER THE THICKNESS OF THE TOWING/TIEDOWN BRACKET ON THE VEHICLE. TO PROVIDE THE NEEDED CLEARANCE, EQUAL AMOUNTS OF MATERIAL MAY BE REMOVED FROM THE SHACKLE PADS BY GRINDING OR MACHINING.
4. IF DESIRED, OR IF 5/8" STEEL WIRE ROPE IS NOT AVAILABLE, A LARGER DIAMETER STEEL WIRE ROPE MAY BE USED FOR ITEM SECUREMENT (SEE KEY NUMBERS (9) AND (10)).
5. AT ANY LOCATION WHERE THE STEEL WIRE ROPE HOLD-DOWN PASSES AROUND A SHARP CORNER, PROVIDE SUITABLE CUSHIONING OR BUFFERING MATERIAL TO PROTECT THE WIRE FROM BEING CUT ON THE SHARP CORNER.

(KEY NUMBERS CONTINUED FROM PAGE 4)

(11) CLIP, WIRE ROPE, SIZE 5/8" (56 REQD). FIVE (5) PER CABLE JOINT AND ONE (1) PER THIMBLE.

(12) THIMBLE, STANDARD SIZE 5/8" (16 REQD). ONE (1) PER RAILCAR TIEDOWN FACILITY AND ONE (1) PER LADING TIEDOWN DEVICE (SHACKLE). SECURE TO WIRE ROPE MARKED (9) AND/OR (10) W/1 CLIP PER THIMBLE. A STANDARD THIMBLE AS SPECIFIED CAN BE SECURED TO A CABLE WITH A 5/8" CLIP. HOWEVER, IF DESIRED OR IF THE 5/8" THIMBLE BEING USED IS OF A TYPE WHICH CANNOT BE SECURED TO A CABLE WITH A 5/8" CLIP, A 7/8" CLIP MAY BE USED.



CABLE JOINT

PROPER TIGHTENING OF THE WIRE ROPE CLIP NUTS CAN BE ACCOMPLISHED BY UTILIZING A PROPER SIZED TORQUE WRENCH. AFTER THE NUTS HAVE BEEN INITIALLY TIGHTENED, THE "U" SIDE OF EACH CLIP MUST BE STRUCK SEVERAL TIMES WITH A HAMMER TO INSURE PROPER SEATING INTO THE DEAD END LINE. FINAL TORQUE WILL BE ACQUIRED BY REPEATEDLY AND ALTERNATELY TIGHTENING EACH CLIP NUT.

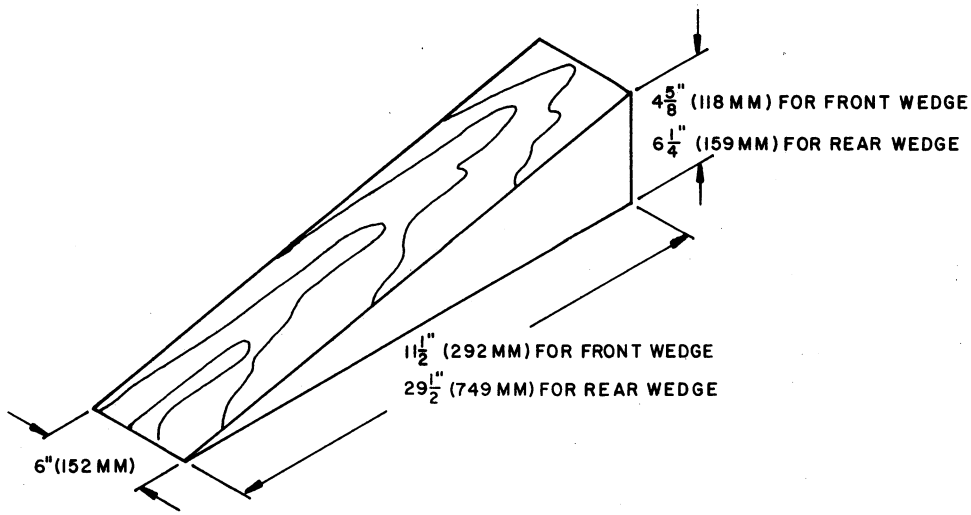
BILL OF MATERIAL

LUMBER	LENGTH	BOARD FEET
2" X 6" (51 MM X 152 MM)	80 FT (24,384 MM)	80
6" X 8" (152 MM X 203 MM)	6 FT (1,829 MM)	24
6" X 12" (152 MM X 305 MM)	5 FT (1,524 MM)	30
NAILS	NO. REQD	WEIGHT
SIZE AS REQD	148	11 LBS

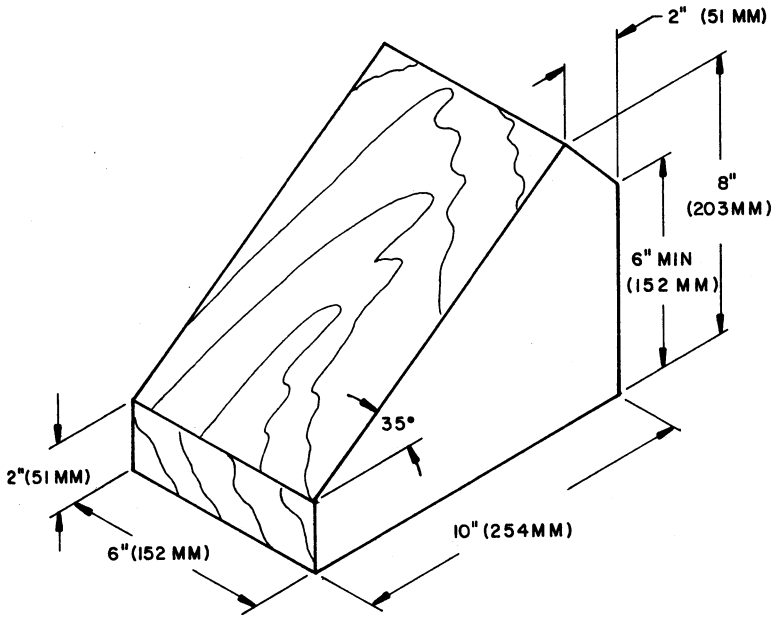
ROPE, STEEL WIRE, 5/8"	200' REQD	137-1/2 LBS
CLIP, 5/8"	56 REQD	35 LBS
SHACKLE, 1"	4 REQD	22 LBS
THIMBLE, 5/8"	16 REQD	5 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
INTERCEPT-AERIAL CARRIER MOUNTED	1	26,800 LBS (12,156 KG)
DUNNAGE		541 LBS (245 KG)
TOTAL WEIGHT		27,341 LBS (12,401 KG)



WEDGE



CHOCK BLOCK