

LOADING AND BRACING ON FLAT BED TRAILER OF AIR FORCE BOMARC ROCKET MOTORS

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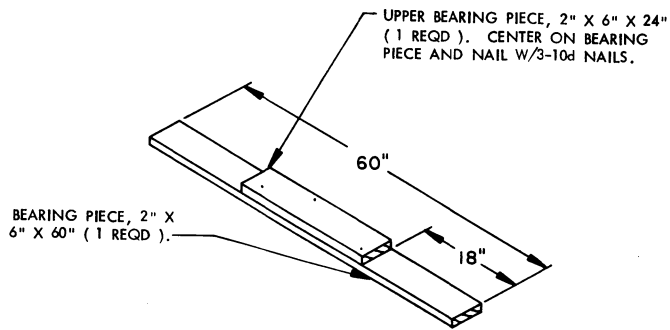
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GENERAL NOTES

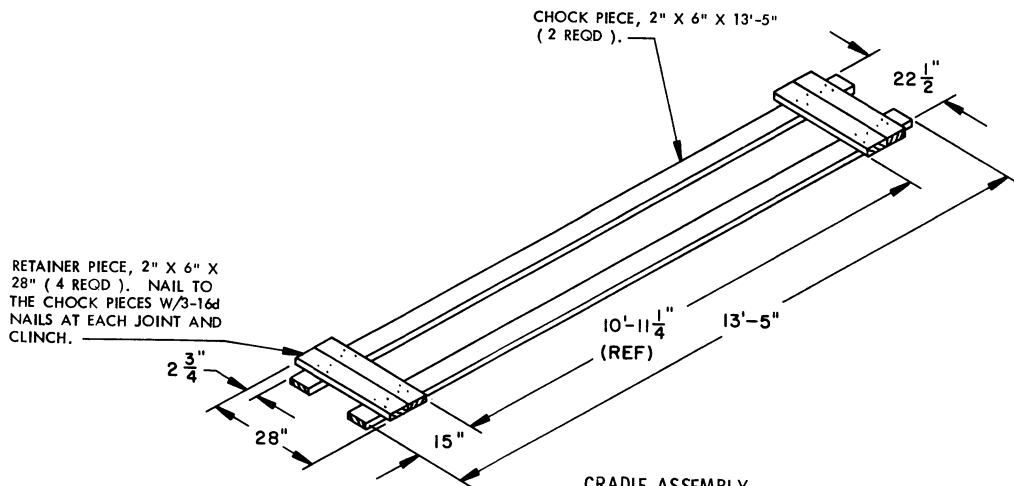
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1, AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE LOAD AS SHOWN IS BASED ON A COMMERCIAL FLAT BED TRAILER 40'-0" LONG. LONGER TRAILERS MAY BE USED.
- C. DETAIL OF THE BOMARC ROCKET MOTOR:
ITEM DIMENSIONS ----- 11'-5" LONG X 28" DIAMETER (APPROX).
GROSS WEIGHT ----- 7,780 LBS (APPROX).
- D. SELECTION OF A VEHICLE USED TO TRANSPORT THE DESIGNATED ITEMS MUST COMPLY WITH AR 55-355, CHAPTER 29, FOR EXPLOSIVES AND OTHER DANGEROUS ARTICLES, IN FULL.
- E. 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. THE SPECIFIED REFERENCE DIMENSIONS FOR LOCATION OF THE CRADLE ASSEMBLIES ARE FOR GUIDANCE ONLY AND MAY BE ADJUSTED TO SUIT.
- F. NOTICE: A SHIPMENT WILL BE POSITIONED ON A TRAILER CONSISTENT WITH THE STATE WEIGHT LAWS. THE NUMBER OF UNITS MAY BE ADJUSTED TO FIT THE QUANTITY TO BE SHIPPED; HOWEVER, THE APPROVED METHODS CONTAINED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING AND STAYING OF THE DESIGNATED ITEMS.
- G. WHEN A HOLD-DOWN STRAP IS SEALED AT AN END-OVER-END LAP JOINT, TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED TO SEAL THE JOINT.
- H. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- J. 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. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS.
- K. NOTICE: IF LADING IS TO BE SECURED BY CHAINS AND LOAD BINDERS IN LIEU OF THE SPECIFIED HOLD DOWN STRAPS, REFER TO THE "SPECIAL PROVISIONS FOR CHAIN TIE DOWN" ON PAGE 5.
- L. PLACARD BOARDS MUST BE PROVIDED FOR BOTH SIDES AND BOTH ENDS OF A LOAD AS REQUIRED BY LAW AND/OR REGULATION. CAUTION: PLACARD BOARDS AND BOARD MOUNTING BRACKETS MUST NOT BE NAILED TO THE LADING. LIKEWISE, IF LOAD COVERING TARPAILINS ARE USED, THEY MUST NOT BE NAILED TO THE LADING.
- M. OTHER TYPES OF LADING ITEMS MAY BE LOADED ON A TRAILER WHICH IS PARTIALLY LOADED WITH THE DESIGNATED ITEM, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED.

MATERIAL SPECIFICATIONS

- LUMBER -----: SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS -----: COMMON, FED SPEC FF-N-105.
- STEEL STRAPPING -----: CLASS I, TYPE I OR IV, HEAVY DUTY, FINISH A, B (GRADE 2), OR C; FED SPEC QQ-S-781.
- SEAL, STRAP -----: TYPE D, STYLE I, II, OR IV. CLASS H, FINISH A, B (GRADE 2), OR C; FED SPEC QQ-S-781.
- CHAIN -----: NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975.
- LOAD BINDER -----: NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975.

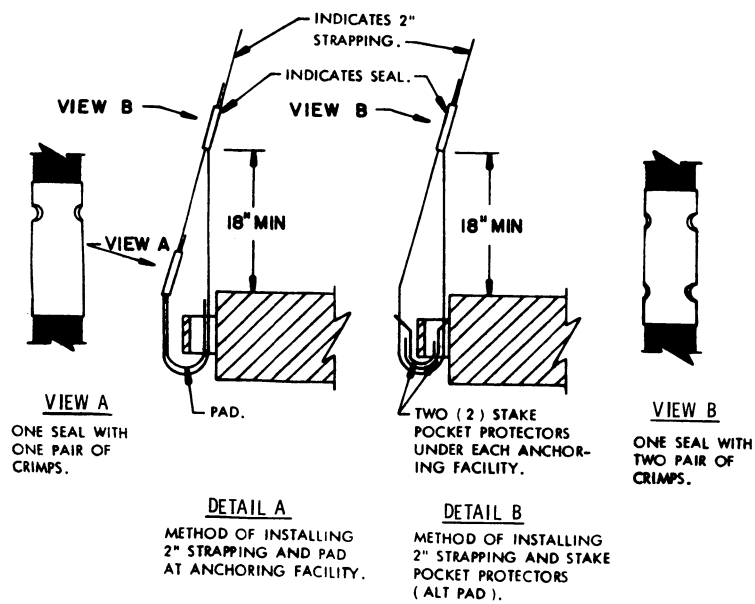


STRAPPING BOARD A

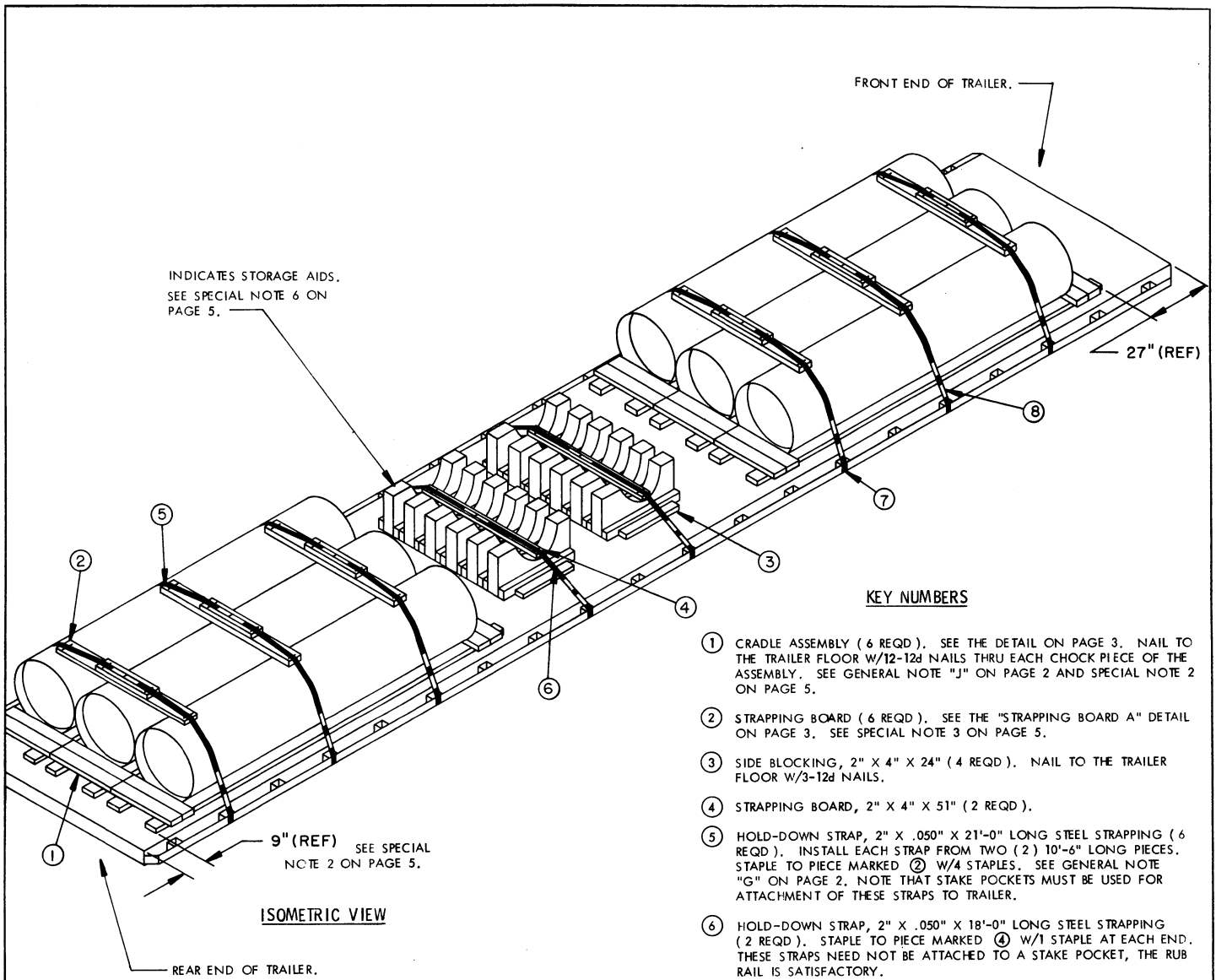


CRADLE ASSEMBLY

THE 10'-11-1/4" DIMENSION OF THE CRADLE ASSEMBLY SHOULD BE VERIFIED BY MEASURING THE LENGTH OF THE BODY PORTION OF THE MOTOR. A ONE-QUARTER INCH (1/4") SPACE SHOULD BE PROVIDED TO FACILITATE PLACEMENT OF THE MOTOR WITHIN THE CRADLE ASSEMBLY. IF IT IS NECESSARY TO INCREASE THE 10'-11-1/4" DIMENSION, THE OVERALL LENGTH OF THE CRADLE ASSEMBLY SHOULD BE INCREASED A LIKE AMOUNT.



DETAILS



KEY NUMBERS

- ① CRADLE ASSEMBLY (6 REQD). SEE THE DETAIL ON PAGE 3. NAIL TO THE TRAILER FLOOR W/12-12d NAILS THRU EACH CHOCK PIECE OF THE ASSEMBLY. SEE GENERAL NOTE "J" ON PAGE 2 AND SPECIAL NOTE 2 ON PAGE 5.
- ② STRAPPING BOARD (6 REQD). SEE THE "STRAPPING BOARD A" DETAIL ON PAGE 3. SEE SPECIAL NOTE 3 ON PAGE 5.
- ③ SIDE BLOCKING, 2" X 4" X 24" (4 REQD). NAIL TO THE TRAILER FLOOR W/3-12d NAILS.
- ④ STRAPPING BOARD, 2" X 4" X 51" (2 REQD).
- ⑤ HOLD-DOWN STRAP, 2" X .050" X 21'-0" LONG STEEL STRAPPING (6 REQD). INSTALL EACH STRAP FROM TWO (2) 10'-6" LONG PIECES. STAPLE TO PIECE MARKED ② W/4 STAPLES. SEE GENERAL NOTE "G" ON PAGE 2. NOTE THAT STAKE POCKETS MUST BE USED FOR ATTACHMENT OF THESE STRAPS TO TRAILER.
- ⑥ HOLD-DOWN STRAP, 2" X .050" X 18'-0" LONG STEEL STRAPPING (2 REQD). STAPLE TO PIECE MARKED ④ W/1 STAPLE AT EACH END. THESE STRAPS NEED NOT BE ATTACHED TO A STAKE POCKET, THE RUB RAIL IS SATISFACTORY.
- ⑦ PAD, 2" X .050" X 18" LONG STEEL STRAPPING (16 REQD). POSITION UNDER A STAKE POCKET AND SEAL TO HOLD-DOWN STRAPS MARKED ⑤ AND ⑥. SEE "DETAIL A" ON PAGE 3. ALT: STAKE POCKET PROTECTOR (32 REQD). USE TWO UNDER EACH STAKE POCKET WITH A HOLD DOWN STRAP. SEE "DETAIL B" ON PAGE 3.
- ⑧ SEAL FOR 2" STEEL STRAPPING (48 REQD, 6 PER STRAP). DOUBLE CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS, EXCEPT THOSE USED TO SECURE THE PADS, PIECE MARKED ⑦.

SPECIAL NOTES

1. A 6-UNIT LOAD OF BOMARC MOTORS IS SHOWN ON A 40'-0" LONG BY 8'-0" WIDE FLAT BED TRAILER. LONGER AND/OR WIDER TRAILERS MAY BE USED.
2. WHEN LOADING A FLAT BED TRAILER, THE FIRST CRADLE ASSEMBLY MUST BE CENTERED ON THE WIDTH OF THE TRAILER BED AND SHOULD BE LOCATED LONGITUDINALLY SO AS TO BEST ALIGN WITH THE STAKE POCKETS. REFERENCE DIMENSIONS ARE SHOWN ON THE ISOMETRIC VIEW WHICH WILL ALIGN THE MOTORS WITH STAKE POCKETS (24" ON CENTER) AND SHOULD ALSO PROVIDE FOR PROPER WEIGHT DISTRIBUTION. LOCATION OF THE CRADLE ASSEMBLIES MAY BE ADJUSTED TO ALIGN MOTORS WITH THE AVAILABLE STAKE POCKETS OR AS NECESSARY TO PROVIDE FOR PROPER WEIGHT DISTRIBUTION. IT IS REQUIRED THAT STAKE POCKETS BE USED FOR HOLD-DOWN STRAPS FOR THE MOTORS; RUB RAILS MUST NOT BE USED. HOLD-DOWN STRAPS MUST PASS OVER THE MOTORS NOT LESS THAN NINE INCHES (9") FROM THE END OF THE BODY PORTION.
3. STRAPPING BOARDS, PIECES MARKED ②, MUST BE LOCATED SO AS TO ALIGN THE HOLD-DOWN STRAPS WITH STAKE POCKETS ON OPPOSITE SIDES OF THE TRAILER AND ALSO SO THAT THE STRAPS ARE NOT NEARER THAN NINE INCHES (9") TO THE END OF THE MOTOR BODY.
4. IF A 5-UNIT LOAD IS TO BE SHIPPED, ONE MOTOR CAN BE OMITTED FROM EITHER LOAD UNIT ALTHOUGH FROM THE FRONT LOAD UNIT IS PROBABLY PREFERRED. THE REMAINING TWO MOTORS MUST BE CENTERED ON THE WIDTH OF THE TRAILER. STRAPPING BOARDS, PIECE MARKED ②, ARE NOT REQUIRED FOR A 2-WIDE LOAD UNIT. SEE THE 2-UNIT LOAD PROCEDURES ON PAGE 6 FOR GUIDANCE.
5. IF STRAP STAPLES ARE NOT AVAILABLE, OR IF DESIRED, TWO (2) EACH PARTIALLY DRIVEN 16d NAILS, ONE PLACED ON EACH SIDE OF A STRAP AND BENT OVER THE STRAPPING, MAY BE SUBSTITUTED FOR EACH STRAP STAPLE. CAUTION: NAILS MUST NOT EXTEND THRU THE STRAPPING BOARD.
6. THE STORAGE AIDS WHICH ARE USED FOR SUPPORTING THE MOTORS IN A STORAGE MAGAZINE ARE SHOWN IN THE DEPICTED LOAD. THESE SHOULD BE INCLUDED IN A SHIPMENT FOR USE WHEN STORING THE MOTORS AT THE RECEIVING INSTALLATION.
7. CHAINS AND LOAD BINDERS MAY BE USED IN LIEU OF THE SPECIFIED HOLD-DOWN STRAPPING, IF DESIRED. SEE THE "SPECIAL PROVISIONS FOR CHAIN TIE DOWN" AT RIGHT FOR GUIDANCE. NOTE THAT AT LEAST LEAST FOUR (4) CHAINS, 5/16" (OR LARGER), GRADE 43, 70, OR 80, MUST BE USED OVER EACH LOAD UNIT. THE STRAPPING BOARD "A" MUST HAVE THE 60" LONG BEARING PIECE DOUBLED FOR USE UNDER THE CHAINS. LAMINATE W/6-10d NAILS. FOR A 2-WIDE LOAD UNIT, USE DOUBLED 2" X 6" X 32" LONG STRAPPING BOARDS UNDER THE CHAINS. CHAINS WILL BE SECURED TO THE STRAPPING BOARDS W/4-20d NAILS BY PARTIALLY DRIVING EACH NAIL INTO THE BOARD THRU AN OPENING IN THE CHAINLINKS AND BENDING IT OVER THE LINK. NOTE THAT THE TRANSPORTING VEHICLE OPERATOR SHOULD BE INSTRUCTED TO PERIODICALLY INSPECT THE TIEDOWN CHAINS AND LOAD BINDERS DURING TRANSIT AND TIGHTEN IF NECESSARY.

SPECIAL PROVISIONS FOR CHAIN TIE DOWN

LADING MAY BE SECURED TO THE FLATBED TRAILER BY CARRIER-OWNED CHAINS AND LOAD BINDERS IN LIEU OF SPECIFIED STRAPPING, PROVIDED THE FOLLOWING CONDITIONS ARE MET.

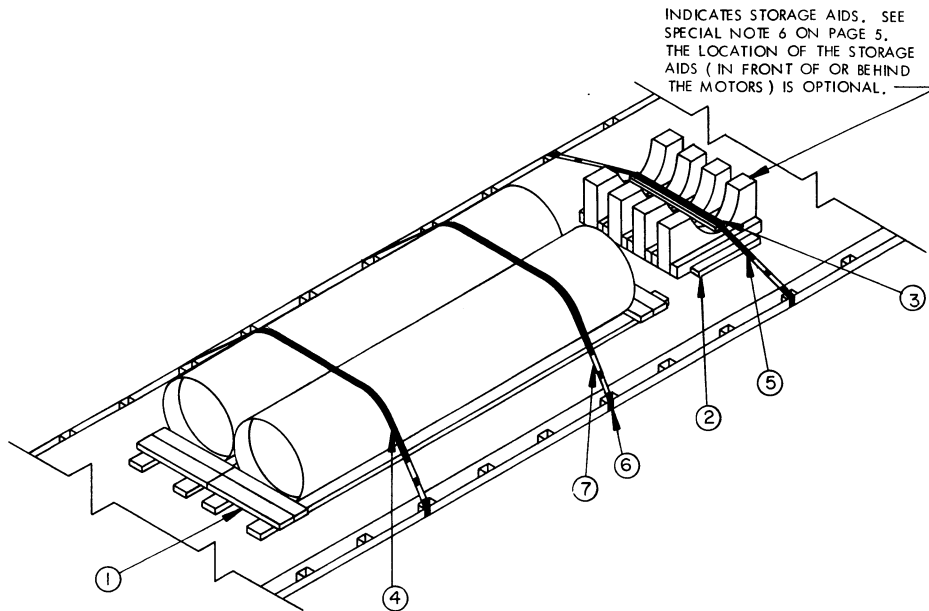
1. ONLY CHAINS AND LOAD BINDERS OF GOOD QUALITY WILL BE USED. ALL CHAINS AND LOAD BINDERS SHALL CONFORM TO THE NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975.
2. ALL CHAINS SHALL BE MARKED AS PRESCRIBED BY THE NATIONAL ASSOCIATION OF CHAIN MANUFACTURER'S WELDED CHAIN SPECIFICATION ADOPTED NOVEMBER 1975. AT LEAST ONE LINK IN EVERY 36 LINKS SHALL CARRY THE MANUFACTURER'S PERMANENT AND DISTINCTIVE MARK IDENTIFYING THE GRADE OF CHAIN. CHAINS NOT MARKED IN THIS MANNER SHALL NOT BE USED. IN ADDITION TO THE GRADE MARKING, THE CHAIN MAY ALSO CARRY LETTER MARKINGS OR SYMBOLS IDENTIFYING THE CHAIN MANUFACTURER. THE PRESENCE OF THE MANUFACTURER'S IDENTIFICATION MARKING IS NOT MANDATORY.
3. BEFORE AND DURING INSTALLATION, THE CHAINS AND LOAD BINDERS SHALL BE INSPECTED FOR BENT HOOKS, STRETCH, GOUGES, BENT LINKS, WEAR, OR ANY OTHER NOTICEABLE DEFECTS. ANY DEFICIENCY SHALL BE CAUSE FOR REJECTION OF A CHAIN OR LOAD BINDER. CHAINS MUST NOT BE TWISTED DURING INSTALLATION. CAUTION: EXTREME CARE MUST BE EXERCISED WHEN TENSIONING CHAINS TO PREVENT DAMAGE OR PERMANENT DEFORMATION TO THE LADING.
4. CHAIN SIZES AND GRADES APPROVED FOR USE WITH FLATBED TRAILER LOADS ARE AS FOLLOWS:
 - A. 3/8", GRADE 43 HIGH-TEST CHAIN.
 - B. 5/16", GRADE 70 BINDING CHAIN.
 - C. 3/8", GRADE 70 BINDING CHAIN.
 - D. 5/16", GRADE 80 ALLOY STEEL CHAIN.
 - E. 3/8", GRADE 80 ALLOY STEEL CHAIN.
5. THE GRABHOOKS ON THE ENDS OF THE CHAIN MAY BE OF THE FOLLOWING TYPES WITH GRADE MARKINGS AS INDICATED.
 - A. CLEVIS GRABHOOKS, 3/8" SIZE, DO NOT REQUIRE GRADE MARKING. ALLOY GRABHOOKS, 5/16" SIZE, SHALL CARRY THE MANUFACTURER'S GRADE MARK OF 7, 70, OR 700. THE HOOKS SHALL BE USED ON THE APPROPRIATE SIZE CHAIN.
 - B. CLOSED EYE GRABHOOKS, 3/8" AND 5/16" SIZE, MAY BE USED ON THE APPROPRIATE SIZE CHAIN IF THEY ARE A PART OF A CHAIN ASSEMBLY WHICH WAS PROVIDED BY A CHAIN MANUFACTURER, AND THE CHAIN ASSEMBLY CARRIES THE CORRECT GRADE IDENTIFICATION MARKING AS PREVIOUSLY STATED. CLOSED EYE GRABHOOKS THAT FORM A PART OF THE CHAIN ASSEMBLY ARE EXEMPT FROM GRADE MARKINGS.
6. CONNECTING LINKS USED FOR CHAIN REPAIR MUST BE CORRECTLY MARKED AND BE EQUAL TO OR GREATER IN STRENGTH THAN THE CHAIN THEY ARE REPAIRING. CHAINS WITH UNMARKED CONNECTING LINKS SHALL NOT BE USED.
7. CHAIN AND FITTING OF A HIGHER GRADE MAY BE SUBSTITUTED FOR THE GRADES SPECIFIED IN NOTE 4 ABOVE.
8. LOAD BINDERS SHALL BE 5/16" TO 3/8" SIZE AND HAVE A MINIMUM BREAKING STRENGTH OF 16,200 POUNDS (WORKING LOAD LIMIT OF 5,400 POUNDS). OVERCENTER TYPE LOAD BINDERS SHALL BE SAFETY WIRED TO PREVENT ACCIDENTAL OPENING DURING TRANSPORT. LOAD BINDER SIZE SHALL BE COMPATIBLE WITH THE SIZE OF THE CHAIN BEING USED.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	17	12
2" X 6"	260	260
NAILS	NO. REQD	POUNDS
10d (3")	18	1/2
12d (3-1/4")	156	2-3/4
16d (3-1/2")	144	3-1/4
STEEL STRAPPING, 2" X .050" - 186' REQD	-----	62 LBS
SEAL FOR 2" STRAPPING ----- 48 REQD	-----	10 LBS
STAPLE FOR 2" STRAPPING ----- 26 REQD	-----	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
BOMARC MOTOR	6	46,680 LBS
STORAGE AIDS	12	720 LBS
DUNNAGE	-----	623 LBS

TOTAL WEIGHT -----48,023 LBS



ISOMTERIC VIEW

SPECIAL NOTES:

1. A 2-UNIT LOAD OF BOMARC MOTORS IS SHOWN ON AN 8'-0" WIDE FLAT BED TRAILER.
2. THE CRADLE ASSEMBLIES MUST BE CENTERED ON THE WIDTH OF THE TRAILER BED AND SHOULD BE LOCATED LONGITUDINALLY SO AS TO BEST ALIGN WITH THE STAKE POCKETS. IT IS REQUIRED THAT STAKE POCKETS BE USED FOR ALL HOLD-DOWN STRAPS OVER THE MOTORS; RUB RAILS MUST NOT BE USED. HOLD-DOWN STRAPS MUST PASS OVER THE MOTORS NOT LESS THAN NINE INCHES (9") FROM THE END OF THE BODY PORTION.
3. SECURE A HOLD-DOWN STRAP, PIECE MARKED ④ OR ⑤, TO A STAKE POCKET ON ONE SIDE OF THE TRAILER, PASS THE STRAP OVER THE TOP OF THE LOAD, THROUGH A STAKE POCKET ON THE OPPOSITE SIDE OF THE TRAILER, AND BACK UP ABOVE THE TRAILER FLOOR, WHERE IT CAN BE TENSIONED AND SEALED.
4. THESE PROCEDURES MAY BE USED IN CONJUNCTION WITH THOSE ON PAGE 4 FOR THE SHIPMENT OF A 5-UNIT LOAD.

KEY NUMBERS

- ① CRADLE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 3. NAIL TO THE TRAILER FLOOR W/12-12d NAILS THRU EACH CHOCK PIECE OF THE ASSEMBLY. SEE GENERAL NOTE "J" ON PAGE 2 AND SPECIAL NOTE 2 AT LEFT.
- ② SIDE BLOCKING, 2" X 4" X 24" (2 REQD). NAIL TO THE TRAILER FLOOR W/3-12d NAILS.
- ③ STRAPPING BOARD, 2" X 4" X 33" (1 REQD).
- ④ HOLD-DOWN STRAP, 2" X .050" X 18'-0" LONG STEEL STRAPPING (2 REQD). INSTALL FROM ONE PIECE. SEE GENERAL NOTE "G" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ⑤ HOLD-DOWN STRAP, 2" X .050" X 17'-0" LONG STEEL STRAPPING (1 REQD). STAPLE TO PIECE MARKED ③ W/1 STAPLE AT EACH END.
- ⑥ PAD, 2" X .050" STEEL STRAP 18" LONG (6 REQD). POSITION UNDER A STAKE POCKET AND SEAL TO HOLD-DOWN STRAP MARKED ④. SEE "DETAIL A" ON PAGE 3. ALT: STAKE POCKET PROTECTOR (12 REQD). USE TWO UNDER EACH STAKE POCKET WITH A HOLD-DOWN STRAP. SEE "DETAIL B" ON PAGE 3.
- ⑦ SEAL FOR 2" STRAPPING (12 REQD, 4 PER STRAP). EXCEPT FOR THE SEALS USED TO SECURE THE PADS, PIECE MARKED ⑥, DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "G" ON PAGE 2.