

LOADING AND TIEDOWN PROCEDURES FOR PRE-RIGGED AIR FORCE 463L PALLET ON M871 AND M872 TACTICAL TRAILERS

REVISIONS			DRAFTSMAN <i>BK/dh</i>	PROJ ENG <i>RSW</i>
			CHECKER <i>W. F. ERIC</i>	SMCAG-DEO
			APPROVED, U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL LOGISTICS ENGINEERING OFFICE	
			<i>William F. Ernst</i>	
			APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND (AMC)	
			<i>John Bond</i>	
			U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	
			U.S. ARMY AMC DRAWING	
			FEBRUARY 1986	
			DEF AMMO CEN & SCH DWG NO	
			D-SMCAC-4502	

DO NOT SCALE

GENERAL NOTES

(GENERAL NOTES CONTINUED)

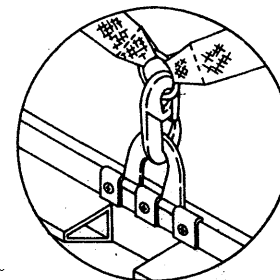
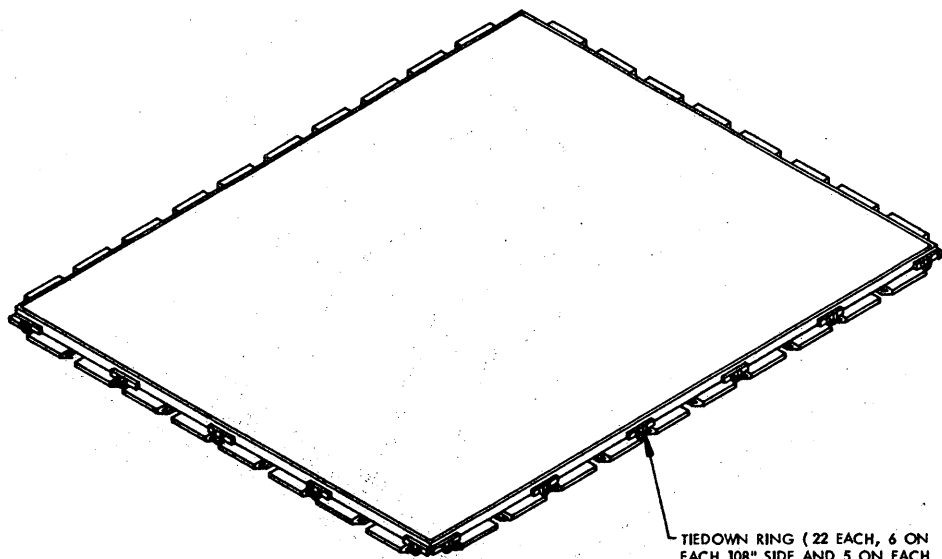
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1.
- B. THIS DRAWING COVERS PROCEDURES APPLICABLE TO THE TRANSPORT OF CLASS V AMMUNITION AND OTHER COMMODITIES PRE-RIGGED ON U.S. AIR FORCE 463L PALLETS SECURED TO M871/M872 TACTICAL AMMUNITION TRAILERS.
- C. DEPICTED PROCEDURES APPLY TO TACTICAL VEHICLES HAVING FACTORY INSTALLED OR ADDITIONALLY AUTHORIZED TIEDOWN ANCHORS. SEE PAGE 6 FOR GUIDANCE.
- D. THE LOAD DEPICTED WITHIN THIS DRAWING IS TYPICAL AND IS BASED ON TESTED PROCEDURES FOR ON/OFF HIGHWAY TRANSPORT OF AMMUNITION AND/OR OTHER COMMODITIES ON 463L PALLETS. REFER TO U.S. ARMY FM 10-553 OR U.S. AIR FORCE TO 13C7-18-41 FOR SPECIFIC 463L PALLET RIGGING PROCEDURES.
- E. SINCE THE LOAD SHOWN HEREIN IS TYPICAL IT IS MOST LIKELY THAT THE ACTUAL QUANTITY OR CONFIGURATION TO BE TRANSPORTED IS NOT DEPICTED. THE PROCEDURES, HOWEVER, MAY BE APPLIED TO ALL LOADS OF 463L PALLETS PROVIDED THE MAXIMUM LOAD WEIGHT FOR A 463L PALLET IS NOT EXCEEDED.
- F. WEB STRAP TIEDOWN ASSEMBLIES MUST BE SECURELY HOOKED INTO ANCHORING DEVICES ON THE TRANSPORTING VEHICLE AND RATCHETED TIGHT, PRIOR TO MOVING THE VEHICLE. WHEN INSTALLING STRAPS ASSURE THAT THERE ARE NO "TWISTS" AND/OR "KNOTS" IN STRAP. THE STRAP MUST FORM A STRAIGHT "LAY" ON THE RATCHET TAKE-UP SPOOL WHEN TENSIONING. PRIOR TO RATCHETING THE STRAP TIGHT PULL EXCESS LENGTH OF SLACK STRAP THROUGH THE RATCHET TAKE-UP SPOOL UNTIL ENOUGH STRAP LENGTH REMAINS TO FORM AT LEAST ONE-HALF, BUT NOT MORE THAN ONE AND ONE-HALF WRAPS OF STRAP ON THE RATCHET TAKE-UP SPOOL, AFTER STRAP-TO-STRAP CONTACT HAS BEEN MADE (STRAP-TO-STRAP CONTACT IS MADE BY ROTATING THE TAKE-UP SPOOL UNTIL NO METAL ON THE SPOOL IS SHOWING AND THE STRAP IS IN CONTACT WITH ITSELF). NOTE: WHEN THE TAKE-UP SPOOL OF THE RATCHET ASSEMBLY IS ROTATED BY MOVING THE RATCHET HANDLE TO TENSION A STRAP ASSEMBLY, TWO THICKNESSES OF STRAP WILL BE WOUND ONTO THE SPOOL AT THE SAME TIME. THEREFORE, THE REQUIREMENT FOR ONE-HALF TO ONE AND ONE-HALF WRAPS OF STRAP ON THE TAKE-UP SPOOL ACTUALLY MEANS ONE-HALF TO ONE AND ONE-HALF OF DOUBLED STRAP. ONE METHOD THAT CAN BE USED TO ENSURE THERE IS ONE-HALF WRAP OF STRAP ON THE RATCHET TAKE-UP SPOOL AFTER STRAP-TO-STRAP CONTACT HAS BEEN MADE IS TO COUNT THE AUDIBLE "CLICKS" MADE BY THE RATCHET ASSEMBLY AS A WEB STRAP IS BEING RATCHETED. FOR EXAMPLE, IF THE RATCHET ASSEMBLY HAS NINE TEETH, STARTING WITH A BARE TAKE-UP SPOOL, COUNT FOURTEEN "CLICKS" AS THE TAKE-UP SPOOL IS BEING ROTATED. IF THE RATCHET ASSEMBLY HAS ELEVEN TEETH, COUNT SEVENTEEN "CLICKS". AFTER A STRAP ASSEMBLY HAS BEEN PROPERLY TENSIONED, CARE MUST BE EXERCISED TO ASSURE THAT THE TAKE-UP SPOOL LOCKING LATCH (SPRING-LOADED DEVICE WITH A LOCKING BAR ON EACH SIDE OF THE RATCHET ASSEMBLY) IS FULLY SEATED ON BOTH SIDES IN MATCHING LOCKING NOTCHES, WHICH ARE SIMILAR TO SPROCKET GEAR TEETH, LOCATED ON EACH END OF THE TAKE-UP SPOOL. AFTER TENSIONING IS COMPLETED THE LOOSE END OF STRAP MAY BE FOLDED AND SECURED TO THE TENSIONED STRAP WITH TAPE, WIRE, STRING, VELCRO STRIP, OR OTHER MEANS.
- G. ADJUSTABLE SCUFF SLEEVES, WHEN PROVIDED ON WEB STRAP ASSEMBLIES, WILL BE LOCATED TO PROVIDE A PAD WHERE STRAPS PASS OVER SHARP EDGES, OR RATCHETS AND HOOKS ON PREVIOUSLY INSTALLED WEB STRAP TIEDOWN ASSEMBLIES. METAL PARTS OF A STRAP ASSEMBLY SHOULD BE LOCATED SO AS TO AVOID CONTACT WITH THE CARGO. IF CONTACT CANNOT BE AVOIDED, A SUITABLE ANTI-CHAFING MATERIAL, AS LISTED UNDER THE MATERIAL SPECIFICATIONS BELOW, MUST BE POSITIONED BETWEEN THE METAL PARTS OF A STRAP ASSEMBLY AND THE CARGO AND IF NECESSARY, TAPED OR TIED IN POSITION.
- H. IF DESIRED, THE SIDE RACKS FOR THE M871 AND M872 SEMITRAILERS MAY BE POSITIONED IN PLACE AFTER THE LOAD HAS BEEN SECURED. AFTER ALL SIDE PANELS AND REAR PANELS ARE IN POSITION THE STAKES MUST BE SECURELY "PINNED" OR "WIRE-TIED" TO THE STAKE POCKET TO PREVENT VERTICAL DISPLACEMENT DURING TRANSPORT. ALSO, THE SIDE PANELS MUST BE SECURED AT THE TOP WITH THE CROSS-CHAINS WHICH ARE PROVIDED WITH THE VEHICLE. NOTE: THESE PROCEDURES DO NOT APPLY TO M871 AND M872 SEMITRAILERS WHICH HAVE BEEN MODIFIED WITH DROP SIDES.
- J. DURING LONG HAULS, WHEN POSSIBLE, STRAPS SHOULD BE CHECKED DURING VEHICLE STOPS AND TIGHTENED, IF NECESSARY.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

- STRAP -----: WEBBING, UNIVERSAL TIEDOWN, NSN 5340-00-980-9277, PN 10900880; OR NSN 1670-00-725-1437, PN 0376-013. ALTERNATIVE: NSN 5340-01-089-4997, PN 1166-9588.
- LUMBER -----: SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS -----: COMMON, FED SPEC FF-N-105.

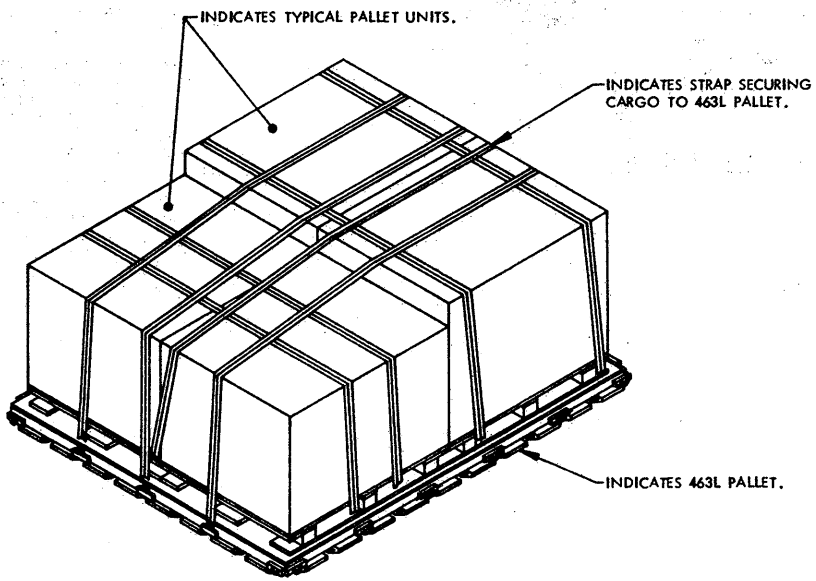
- K. PROCEDURES DEPICTED HEREIN ARE TYPICAL IN NATURE RELATIVE TO ITEM LOCATION IN/ON THE VEHICLES AND THE QUANTITIES SHOWN. ITEM LOCATION AND QUANTITIES OF THE DESIGNATED ITEM MAY BE VARIED TO SATISFY OPERATIONAL REQUIREMENTS, PROVIDED LOADING AND TIEDOWN PRINCIPLES SPECIFIED HEREIN ARE RETAINED.
- L. THE TIEDOWN METHODS WITHIN THIS DRAWING SHOW TWO HOOKS TO BE CONNECTED TO ONE TIEDOWN EYE. THIS IS AUTHORIZED AS SPECIFIED HEREIN.
- M. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM, AND ONE POUND EQUALS 0.454KG.
- N. ONLY THE CARGO BODIES OR BEDS OF THE TACTICAL TRAILERS HAVE BEEN SHOWN HEREIN TO PREVENT DISTRACTION FROM THE DELINEATED LOADING AND TIEDOWN PROCEDURES, AND ARE SHOWN IN OUTLINE FORM WITH THE STRUCTURAL PORTIONS OMITTED AS NECESSARY TO IMPROVE THE CLARITY OF THE DEPICTED PROCEDURES.
- O. WHEN ONE WEB STRAP TIEDOWN ASSEMBLY IS NOT LONG ENOUGH TO SPAN THE DISTANCE DEPICTED, TWO ASSEMBLIES MAY BE HOOKED TOGETHER TO GAIN THE NECESSARY LENGTH.
- P. DUNNAGE LUMBER SPECIFIED WITHIN THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 3" MATERIAL IS ACTUALLY 1-1/2" THICK BY 2-1/2" WIDE AND 4" X 4" MATERIAL IS ACTUALLY 3-1/2" THICK BY 3-1/2" WIDE.
- Q. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION ON PAGE 5.



INDICATES TYPICAL INSTALLATION OF A CARGO NET OR WEB STRAP TIEDOWN ASSEMBLY TO SECURE LADING TO A TIEDOWN RING OF 463L PALLET. SEE ARMY FM 10-553 OR AIR FORCE TO 13C7-18-41 FOR ADDITIONAL GUIDANCE.

TIEDOWN RING (22 EACH, 6 ON EACH 108" SIDE AND 5 ON EACH 88" END.

PALLET - AF 463L SYSTEM
(HCU 6/E)

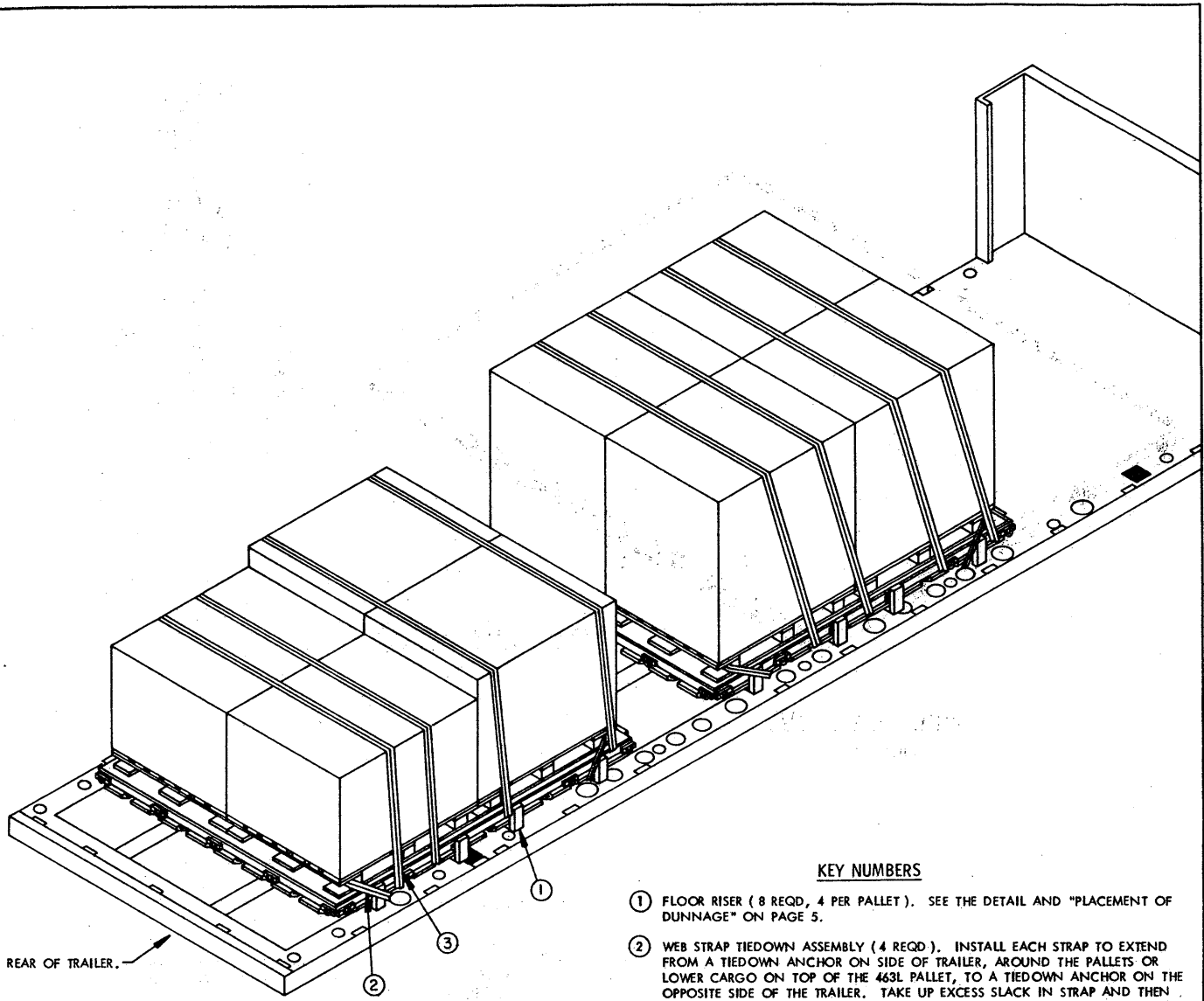


INDICATES TYPICAL PALLET UNITS.

INDICATES STRAP SECURING CARGO TO 463L PALLET.

INDICATES 463L PALLET.

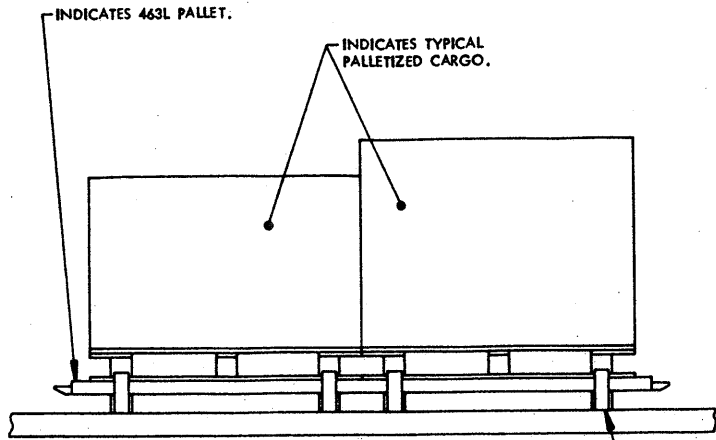
TYPICAL 4-UNIT LOAD



ISOMETRIC VIEW

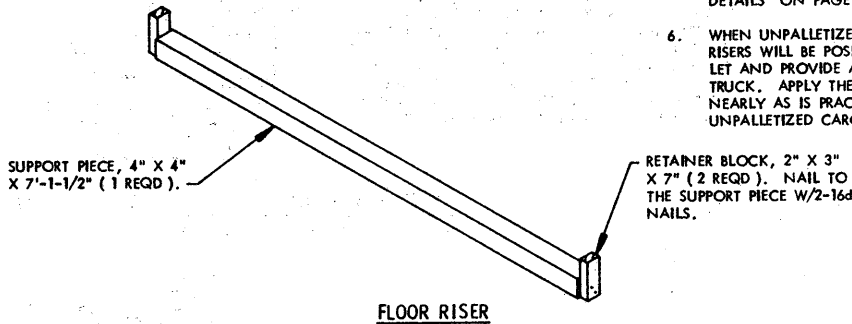
KEY NUMBERS

- ① FLOOR RISER (8 REQD, 4 PER PALLET). SEE THE DETAIL AND "PLACEMENT OF DUNNAGE" ON PAGE 5.
- ② WEB STRAP TIEDOWN ASSEMBLY (4 REQD). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF TRAILER, AROUND THE PALLETS OR LOWER CARGO ON TOP OF THE 463L PALLET, TO A TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF THE TRAILER. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2. SEE SPECIAL NOTE 3 ON PAGE 5.
- ③ WEB STRAP TIEDOWN ASSEMBLY (8 REQD). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF TRAILER, OVER TOP OF PALLETIZED LOAD UNITS, TO A TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF THE TRAILER. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT.



PLACEMENT OF DUNNAGE

THE FLOOR RISERS MUST BE POSITIONED SO THAT THEY ARE AS CLOSE AS POSSIBLE TO BEING DIRECTLY UNDERNEATH THE POSTS OF THE CARGO PALLETS WHILE ALLOWING THE RETAINER BLOCKS TO FIT IN THE VOID SPACES ALONG THE SIDE OF THE 463L PALLET.



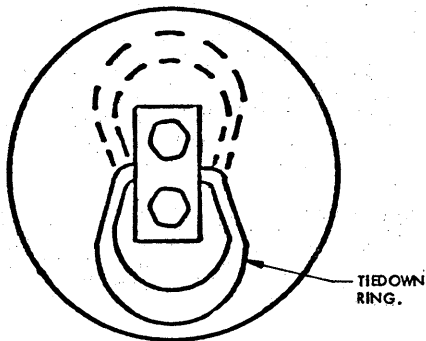
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 3"	10	5
4" X 4"	57	75
NAILS	NO. REQD	POUNDS
16d (3-1/2")	32	3/4
WEB STRAP TIEDOWN ASSEMBLY -----		12 REQD

SPECIAL NOTES:

1. A 2-UNIT TYPICAL LOAD IS DEPICTED ON A SEMITRAILER, 22-1/2-TON, M871. THESE PROCEDURES ARE ALSO APPLICABLE TO, SEMITRAILER, 34-TON, M872.
2. SELECT A LOCATION ON THE LENGTH OF THE TRAILER THAT WILL PROVIDE ADEQUATE TIEDOWN ANCHORS TO SECURE THE LOAD USING THE TIEDOWN PROCEDURES DEPICTED IN THIS DRAWING AS GUIDANCE. NOTE: WHEN THE FIXED TIEDOWN ANCHORS ON THE M871 OR THE TEE-HOOK ANCHORS ON THE M872 ARE INSUFFICIENT TO ADEQUATELY RESTRAIN THE LOADS BEING PLACED ON THE TRAILERS, ADDITIONAL ANCHORS, AS DEPICTED ON PAGE 6, MUST BE INSTALLED. REFER TO SPECIAL NOTES 4 AND 5 BELOW AND PAGE 6 FOR ADDITIONAL GUIDANCE.
3. ALL LOADS FROM ONE PALLET TO MAXIMUM PALLETS MUST BE SECURED LONGITUDINALLY WITH ONE STRAP AT EACH END, ATTACHED TO A TIEDOWN ANCHOR ON ONE SIDE OF THE TRAILER AND POSITIONED AROUND THE END OF THE PALLET/LOAD TO A MATING TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF THE TRAILER. NOTE: IF A PALLETIZED UNIT IS POSITIONED AGAINST THE FORWARD END WALL OF THE TRAILER, ONLY ONE LONGITUDINAL STRAP WILL BE REQUIRED FOR THAT PALLET UNIT.
4. THE M871 SEMITRAILER IS EQUIPPED WITH THREE DIFFERENT TYPES OF TIEDOWN FITTINGS AS INDICATED ON PAGE 4. TYPE I IS A REMOVABLE TIEDOWN FITTING THAT HAS ONE RING AND IS POSITIONED BY REACHING UNDER THE FLOOR OF THE TRAILER, INSERTING THE TIEDOWN FITTING UP THROUGH THE HOLE AND ROTATING IT INTO POSITION (NOTE THAT THIS REMOVABLE TIEDOWN FITTING IS ALSO USED ON THE M872 SEMITRAILER). TYPE II IS A REMOVABLE TIEDOWN FITTING THAT HAS TWO RINGS AND IS POSITIONED BY DEPRESSING A SPRING LOCK LEVER AND INSERTING THE TIEDOWN FITTING INTO A 1-3/4" DIAMETER HOLE FROM THE TOP. ASSURE THAT THE TIEDOWN FITTING IS FIRMLY SEATED AND ROTATED SO THE SPRING LOCK LEVER IS POINTING AWAY FROM THE DIRECTION OF PULL ON THE ATTACHED WEB STRAP TIEDOWN ASSEMBLY. TYPE III IS A FIXED TIEDOWN FITTING THAT HAS ONE RING AND IS RECESSED INTO THE FLOOR. SEE "TIEDOWN ANCHOR DETAILS" ON PAGE 6.
5. THE M872 SEMITRAILER IS EQUIPPED WITH TWO DIFFERENT TYPES OF TIEDOWN FITTINGS. TYPE I IS A REMOVABLE TIEDOWN FITTING THAT HAS ONE RING AND IS POSITIONED BY REACHING UNDER THE FLOOR OF THE TRAILER, INSERTING THE TIEDOWN FITTING UP THROUGH THE HOLE AND ROTATING IT INTO POSITION (NOTE THAT THIS REMOVABLE TIEDOWN FITTING MAY ALSO BE USED ON THE M871 SEMITRAILER). THE SECOND TYPE OF TIEDOWN FITTING IS THE "TEE-HOOK". THIS IS A REMOVABLE TIEDOWN FITTING EQUIPPED WITH ONE ELONGATED RING AND IS POSITIONED BY INSERTING IT INTO ONE OF THE ELONGATED SLOTTED HOLES WHICH ARE AT A 45° ANGLE TO THE SIDE OF THE TRAILER. ASSURE THAT THE TIEDOWN FITTING IS FIRMLY SEATED AND ROTATED APPROXIMATELY 45° TO ENGAGED POSITION BEFORE ATTACHING THE WEB STRAP TIEDOWN ASSEMBLY. SEE "TIEDOWN ANCHOR DETAILS" ON PAGE 6.
6. WHEN UNPALLETIZED CARGO IS SECURED ON THE 463L PALLETS, THE FLOOR RISERS WILL BE POSITIONED SO AS TO BEST SUPPORT THE CARGO ON THE PALLET AND PROVIDE AREAS FOR HANDLING OF THE PALLET BY A FORKLIFT TRUCK. APPLY THE "PLACEMENT OF DUNNAGE" GUIDANCE TO THE LEFT, AS NEARLY AS IS PRACTICABLE, WHEN THE FLOOR RISERS ARE USED TO SUPPORT UNPALLETIZED CARGO ON THE 463L PALLETS.

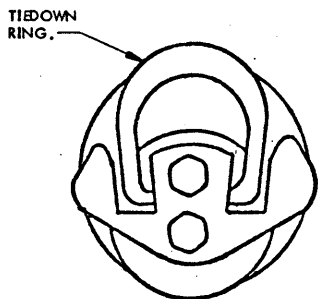
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	2	14,700 LBS
DUNNAGE-----		220 LBS
TOTAL WEIGHT-----		14,920 LBS



TYPE III, FIXED TIEDOWN ANCHOR (TOP VIEW)

THIS TIEDOWN ANCHOR IS RATED AT 10,000 POUNDS AND IS ONLY INSTALLED ON THE M871 SEMITRAILER. THERE ARE FIVE ON EACH SIDE OF THE M871 SEMITRAILER AND THEY DO NOT SWIVEL. SEE GENERAL NOTE "C" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 4.

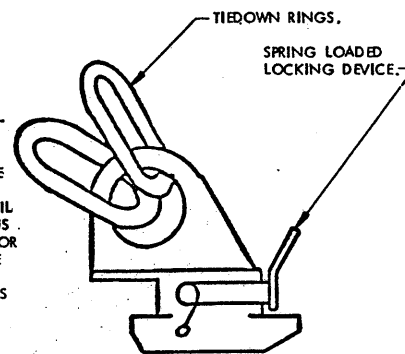


TYPE I, REMOVABLE TIEDOWN ANCHOR (TOP VIEW)

THIS TIEDOWN ANCHOR IS RATED AT 10,000 POUNDS AND IS INSTALLED ON THE M871 AND M872 SEMITRAILERS. IT IS COMMONLY REFERRED TO AS "MICKY MOUSE". THIS TIEDOWN ANCHOR IS POSITIONED BY REACHING UNDER SIDE RAIL OF SEMITRAILER AND INSERTING THE TIEDOWN ANCHOR UP THROUGH THE HOLE AND ROTATING IT INTO POSITION. THERE ARE 10 LOCATIONS ON EACH SIDE RAIL OF THE M871 SEMITRAILER AND APPROXIMATELY 28 LOCATIONS ON EACH SIDE RAIL OF THE M872 SEMITRAILER FOR INSTALLATION OF THIS TIEDOWN ANCHOR. SEE GENERAL NOTE "C" ON PAGE 2 AND SPECIAL NOTES 4 AND 5 ON PAGE 4. THIS TIEDOWN ANCHOR IS FURTHER IDENTIFIED AS NSN 2540-01-112-1732.

NOTE ⊕ :

THIS TIEDOWN ANCHOR IS RATED AT 10,000 LBS AND IS ONLY FOR USE ON THE M871 SEMITRAILER. IT IS COMMONLY REFERRED TO AS "BIG FOOT". THIS TIEDOWN ANCHOR HAS A SPRING LOADED LOCKING DEVICE TO HOLD IT IN PLACE AND IT IS INSERTED, FROM THE TOP, INTO A 1-3/4" DIAMETER HOLE LOCATED IN THE SIDE RAIL OF THE SEMITRAILER. THERE ARE TEN LOCATIONS ON EACH SIDE RAIL OF THE M871 SEMITRAILER FOR INSTALLATION OF THIS TIEDOWN ANCHOR. SEE GENERAL NOTE "C" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 4. THIS TIEDOWN ANCHOR IS FURTHER IDENTIFIED AS NSN 2540-01-117-3043.

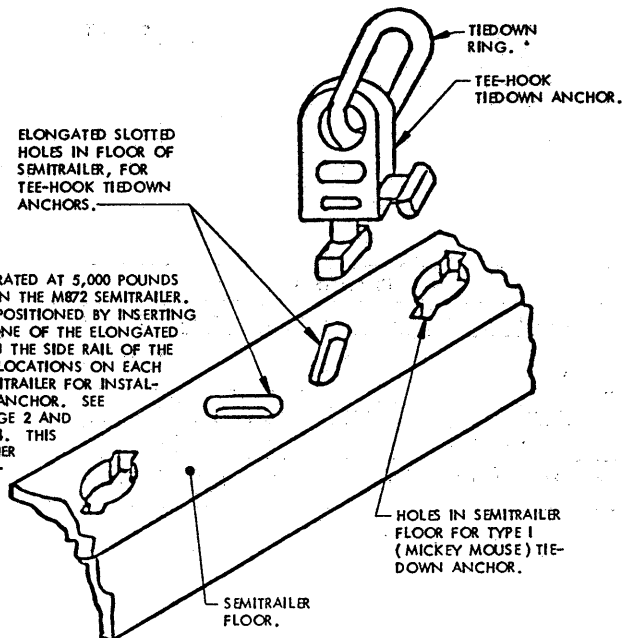


TYPE II, REMOVABLE TIEDOWN ANCHOR (SIDE VIEW)

(SEE "NOTE ⊕" ABOVE)

NOTE ▲ :

THIS TIEDOWN ANCHOR IS RATED AT 5,000 POUNDS AND IS ONLY INSTALLED ON THE M872 SEMITRAILER. THIS TIEDOWN ANCHOR IS POSITIONED BY INSERTING IT, FROM THE TOP, INTO ONE OF THE ELONGATED SLOTTED HOLES IN THE FLOOR OF THE SEMITRAILER. THERE ARE 5 LOCATIONS ON EACH SIDE RAIL OF THE M872 SEMITRAILER FOR INSTALLATION OF THIS TIEDOWN ANCHOR. SEE GENERAL NOTE "C" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 4. THIS TIEDOWN ANCHOR IS FURTHER IDENTIFIED AS NSN 2540-01-113-9285.



REMOVABLE TEE-HOOK TIEDOWN ANCHOR (ISOMETRIC VIEW)

(SEE "NOTE ▲" ABOVE)