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***

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The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SIOAC-DEV), was tasked by the Office of the Project Manager, Ammunition Logistics (PM-AMMOLOG) to develop and evaluate overcube ammunition loads for the Apache helicopter on the M977 Heavy Expanded Mobility Tactical Truck (HEMTT) and M1075 Palletized Loading System (PLS) truck as part of the Modular Aviation Resupply/Rearm System (MARRS). The load tested consisted of a mixture of HELLFIRE, 2.75-inch rockets, and 30mm ammunition pallets stacked two high. A road hazard transportability test was conducted on the test load on each vehicle in order to assess the tiedown procedures. Results from the testing indicated that the tiedown procedures were adequate for the shipment of this Apache helicopter resupply load.
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PART 1

INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center and School (USADACS), Validation Engineering Division (SIOAC-DEV), was tasked by the Office of the Project Manager, Ammunition Logistics (PM-AMMOLOG) to develop and evaluate overcube ammunition loads for the Apache helicopter on the M977 Heavy Expanded Mobility Tactical Truck (HEMTT) and M1075 Palletized Loading System (PLS) truck as part of the Modular Aviation Resupply/Rearm System (MARRS).

B. AUTHORITY. The test was accomplished IAW mission responsibilities delegated by U.S. Army Armament, Munitions and Chemical Command (AMCCOM), Rock Island, IL. Reference is made to the following:


2. AMCCOM-R 10-17, Mission and Major Functions of USADACS, 13 January 1986.

C. OBJECTIVE. The objective of this test was to determine if the Apache helicopter resupply load developed at USADACS was adequate for safe transportation of resupply commodities on- and off-road.

D. CONCLUSION. The Apache helicopter resupply load developed by USADACS successfully passed the road hazard course test on both the M977 HEMTT and M1075 PLS truck. As tested, the Apache helicopter resupply load developed by USADACS is approved for on/off-road transportation on both the M977 HEMTT and M1075 PLS truck.
PART 2
27-28 SEPTEMBER AND 11 OCTOBER 1993

ATTENDEES

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PART 3

TEST PROCEDURES

TRANSPORTABILITY TESTS. The test procedures outlined in this section were extracted from TP-91-01. This standard identifies six steps that a load must undergo if it is considered to be acceptable. The tests that were conducted on the test specimen are synopsised below.

A. ROAD HAZARD COURSE. The specimen tested was subjected to the road hazard course (see Figure 1). Using a suitable truck/tractor or tactical vehicle, the vehicle/specimen was towed/driven over a hazard course two times at a speed of approximately 5 mph. The speed was increased or decreased, as appropriate, to produce the most violent load response.

![Figure 1](image-url)
B. **ROAD TRIP.** Using a suitable truck/tractor and trailer, or tactical vehicle, the tactical vehicle/specimen load was driven/towed for a total distance of at least 30 miles over a combination of roads surfaced with gravel, concrete, and asphalt. The test route included curves, corners, railroad crossings, cattle guards, stops, and starts. The test vehicle traveled at the maximum speed suitable for the particular road being traversed, except as limited by legal restrictions.

C. **WASHBOARD COURSE.** Using a suitable truck/tractor, and/or tactical vehicle, the specimen was towed/driven over the washboard course at a speed which produced the most violent response in the particular test load (see Figure 2).

![Figure 2](image)

**FIGURE 2**
C. **WASHBOARD COURSE.** Using a suitable truck/tractor, and/or tactical vehicle, the specimen was towed/driven over the washboard course at a speed which produced the most violent response in the particular test load (see Figure 2).
PART 4

TEST RESULTS

A. SYNOPSIS OF TEST NO. 1. In test No. 1, the rearm load for three Apache helicopters was tested on an M977 HEMTT. The load consisted of 2 pallets of 30mm ammunition, 3 pallets of HELLFIRE missiles, and 3 pallets of 2.75-inch rockets. The rearm load was secured to the HEMTT with 27 web straps. While there were several inches of racking of the pallets that were stacked two-high during the test, the pallets remained secured to the truck throughout the test. Approval was granted to this configuration on an M977 HEMTT. (See photos on pages 5-2 and 5-3, and page 10 of drawing, Project DA 16-93 in Part 6.)

ROAD TEST DATA FROM TEST NO. 1

2 NOVEMBER 1993

Rearm load for three Apache Helicopters on an M977 HEMTT:

Load weight: 19,163 pounds.

ROAD HAZARD COURSE.

Pass 1, Course A: 5.06 SEC, 6.74 MPH  
Pass 1, Course B: 5.43 SEC, 6.28 MPH

Remarks: At the end of the first pass, the HELLFIRE missile pallets were noted to have shifted backwards 1/4-inch and the 2.75-inch rocket pallets had shifted forward 1/4-inch.

Pass 2, Course A: 5.05 SEC, 6.75 MPH  
Pass 2, Course B: 5.35 SEC, 6.37 MPH

Remarks: No additional movement of the pallets was noted following completion of the second pass over the road hazard course.
30-MILE ROAD TEST. The 30-mile road test resulted in the top pallet of HELLFIRE missiles shifting backwards 1-1/2 inches.

PANIC STOPS. During the panic stops, the upper HELLFIRE and 2.75-inch rocket pallets were noted to have racked several inches but returned to original position following each stop.

ROAD HAZARD COURSE.

Pass 3, Course A: 5.36 SEC, 6.36 MPH
Pass 3, Course B: 5.68 SEC, 6.00 MPH

Remarks: No additional movement of the pallets was noted following completion of the third pass over the road hazard course.

Pass 4, Course A: 5.19 SEC, 6.57 MPH
Pass 4, Course B: 5.45 SEC, 6.26 MPH

Remarks: No additional movement of the pallets was noted following completion of the fourth pass over the road hazard course.

WASHBOARD COURSE. 51.7 SEC, 3.96 MPH

Remarks: No additional movement of the pallets was noted following completion of the washboard course.

B. SYNOPSIS OF TEST NO. 2. In test No. 2, the rearm load for three Apache helicopters was tested on an M1075 PLS truck. The load was secured to the PLS truck in the same manner in which it was secured to the M977 HEMTT. Transportability testing produced similar results for the rearm load on the PLS truck. Several inches of racking of the upper pallets were noted during the test; however, the pallets remained secured to the PLS truck throughout the test. Approval was also granted for this configuration on an M1075 PLS truck. (See photos on pages 5-4 and 5-5, and page 10 of drawing, Project DA 16-93 in Part 6.)
ROAD TEST DATA FROM TEST NO. 2
2 NOVEMBER 1993

Rearm Load for three Apache helicopters on an M1075 PLS truck:

Load weight: 19,163 pounds.

ROAD HAZARD COURSE.

Pass 1, Course A: 7.86 SEC, 4.34 MPH
Pass 1, Course B: 8.16 SEC, 4.18 MPH

Remarks: At the end of the first pass, the 2.75-inch rocket pallets had shifted backwards 1/4-inch. No additional movement was noted in the other pallets.

Pass 2, Course A: 7.84 SEC, 4.35 MPH
Pass 2, Course B: 7.97 SEC, 4.28 MPH

Remarks: No additional movement of the pallets was noted following completion of the second pass over the road hazard course.

30-MILE ROAD TEST. No additional movement was noted following completion of the 30-mile road test.

PANIC STOPS. During the panic stops, several inches of racking were noted in the upper HELLFIRE and 2.75-inch rocket pallets. Following completion of the stops, the upper 2.75-inch rocket pallet was noted to have shifted forward 1/2-inch. No additional movement was noted in the other pallets.

ROAD HAZARD COURSE.

Pass 3, Course A: 7.75 SEC, 4.40 MPH
Pass 3, Course B: 7.96 SEC, 4.28 MPH

Remarks: No additional movement of the pallets was noted following completion of the third pass over the road hazard course.
Pass 4, Course A: 7.69 MPH, 4.43 MPH
Pass 4, Course B: 7.53 MPH, 4.53 MPH

Remarks: At the end of the fourth and final pass, the top 2.75-inch rocket pallet was noted to have shifted 2 inches left of the bottom pallet. No additional movement was noted in the other pallets.

WASHBOARD COURSE. 65.5 SEC, 3.12 MPH

Remarks: No additional movement of the pallets was noted following completion of the washboard course.

PLS FLATTRACK LOADING/UNLOADING. Loading and unloading of the PLS flatrack was conducted in order to verify that the pallets would remain secured to the flatrack through the operations. No major shifting of the pallets on the flatrack was noted during loading or unloading operations.
PART 5

PHOTOGRAPHS
### U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL

Photo No. AO317-SPN-94-025-220. This photo shows the side view of the rearm load for three Apache helicopters on an M977 HEMTT.
Photo No. AO317-SPN-94-025-219. This photo shows the end view of the rearm load for three Apache helicopters on an M977 HEMTT.
Photo No. AO317-SPN-94-025-223. This photo shows the side view of the rearm load for three Apache helicopters on an M1075 PLS truck.
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL

Photo No. AO317-SPN-94-025-225. This photo shows the end view of the rearm load for three Apache helicopters on an M1075 PLS truck.
LOADING AND TIEDOWN PROCEDURES
FOR THE AH64 APACHE HELICOPTER
AMMUNITION FOR THE MODULAR
AVIATION RESUPPLY/REARM SYSTEM
(MARRS) IN/ON TACTICAL VEHICLES

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<td>REARM FOR ONE THROUGH FOUR APACHE HELICOPTERS ON THE 16-1/2-TON M1077 A-FRAME FLATTRACK AND THE MI FLATTRACK</td>
<td>18-25</td>
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</tbody>
</table>
A. This document has been prepared and issued in accordance with AR 740-1.

B. This drawing covers procedures applicable to the transport of USAF Apache helicopter ammunition loaded on tactical vehicles and secured with web strap tie-down assemblies, for on and/or off highway, see page 20 for authorized armament configurations for the AH6 Apache.

C. Depicted procedures apply to tactical vehicles having factory installed tie-down anchors and/or tactical vehicles which have been modified to include the universally applicable "tie-down kit" which consists of the tie-down fittings or anchor devices for installation in/on cargo deck (top walls, if t/d end walls), and for use with web strap tie-down assemblies. See page 30 for guidance.

D. All loads shown herein are typical and are based on tested procedures for off highway transport. Combinations of procedures may be used. However, the approved methods specified herein must be followed as closely as possible.

E. Because of the fact that all loads herein are typical, it is most likely that the actual item or quantity to be transported will not be depicted. In order to maintain similarity from one load to another, installations should make an actual penciled sketch of the load, using the various typical loads and procedures shown herein for guidance. The sketch would be advantageous for maximum loads using a minimum quantity of web strap tie-down assemblies.

F. Web strap tie-down assemblies must be securely hooked into anchoring devices on the transport vehicle and firmly tensioned. Firmly tensioned means, when the operator pulls on the ratchet handle by hand, the ratchet with another notch of mechanical extension or lever will be used. Exercise care during strap application. Avoid twists in the strap to the tie-down permits (or t/d end walls), but ensure there are no knots in the strap. On the take-up spool of the ratchet, ensure straight lay of the strap when tensioning. After initial webbing-to-webbing contact has been made, by rotating the take-up spool until no metal on the spool is showing and the strap has made contact with itself, the tensioned strap must form at least 1/2 knot not more than 1/2 wraps of strap on the take-up spool of the tensioning ratchet. After tensioning is completed, ensure that the spool locking latch is fully seated at both ends of the spool in matching locking notches. Tie back the loose end of the strap after tensioning is completed (loose ends may be folded and taped, or tied to the tensioning strap if permitted). For additional guidance, see "ratchet/ratching details" on pages 26 and 27.

G. Adjustable scuff sleeves provided on web strap assemblies will be located to provide a pad where strap(s) pass over sharp edges, or ratchet and hooks on previously installed web strap tie-down assemblies.

H. Procedures depicted herein are typical in nature relative to item location (worn the flat track and the quantities shown. Item location and quantity of the designated item may be varied to satisfy operational requirements, provided loading and tie-down principles specified herein are retained.

I. When one web strap tie-down assembly is not long enough to span the distance depicted, two assemblies may be hooked together to gain the necessary length.

(Continued at right)

K. After all loading procedures are complete, check all web strap tie-down assemblies for maximum tightness and ratchet tighter if required, prior to folding up and securing the loose ends of the strap as instructed in general note "F."

L. During long hauls the web straps should be checked at all vehicle stops and tightened if necessary.

M. Due to varying reasons, such as rough terrain during off highway transport, panic stops, metal flaps, and normal stretch of web straps, loaded items may slide slightly laterally and/or longitudinally during transport. This is an acceptable characteristic and is not detrimental to load security.

N. The tie-down methods within this drawing show two strap hooks connected to the same tie-down anchor. This is authorized as specified herein.

O. 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 0.454 kg.

P. Only the cargo bodies or beds of the tactical vehicles have been shown herein to prevent distraction from the delineated loading and tie-down procedures, and are shown in outline form with the structural portions omitted as necessary to improve the clarity of the depicted procedures.

Q. The palletized loading system (PLS) M1077 A-frame flatrack has an all metal deck. The empty weight is 3,200 pounds and the load capacity is 23,000 pounds. The M110 compatible PLS flatrack (IFP) has a wood and metal deck. The empty weight is 7,500 pounds and the load capacity is 26,750 pounds.

R. Each flatrack is provided with 22 web strap tie-down assemblies. Sideboard kits and cargo covers are not provided, but are contained on the additional authorized list (AIL) and may be obtained through the Army supply system.

S. One M1 flatrack can be loaded on an M671 semitrailer, and two can be loaded on an M672 semitrailer, using the four bottom IFO corner fittings.

T. The flatracks are capable of being transported on C-130, C-141, C-5, and C-17 aircraft.

U. The flatracks are capable of being slung-lifted by a CH-47 helicopter with a reduced payload. The maximum weight for slung-lift is 22,000 pounds.

V. For additional guidance, see the "loading procedures" on page 3 and the "specific notes" on each load page.

Material Specifications

- Webbing, Universal Tie-down, NSN 5340-01-204-3002, PNSG92419, or NSN 5340-01-089-4907, PN1342342, or NSN 1870-00-729-1497, PN13478-013, or NSN 5340-00-960-9677, PN0000001.

- Canvas, burlap, tape or any other suitable material.
LOADING AND TIEDOWN PROCEDURES:

1. BEFORE LOADING A PLS FLATTRACK OR ANY OTHER TACTICAL VEHICLE WITH AMMUNITION OR EXPLOSIVES, CHECK THE OVERALL CONDITION TO ENSURE IT IS SERVICEABLE. CHECK FOR CRACKS, BLOWS, OR EXCESS CORROSION WHICH WOULD MAKE THE CARGO TIELDOWN ANCHORS AND THE FLATTRACK TIEDOWN DEVICES UNRELIABLE. MAKE SURE THEY ARE NOT CRACKED, BROKEN, OR DISTORTED TO SUCH AN EXTENT AS TO MAKE THE DEVICE UNSERVICEABLE OR UNSAFE TO USE.

2. FOR THE PLS, CHECK THE END WALLS ON THE M1 FLATTRACK TO ASSURE THAT THEY CAN BE RAISED AND/OR LOWERED WITHOUT DIFFICULTY. FOLLOW THE MANUFACTURERS STEP-BY-STEP PROCEDURE FOR RISING AND LOWERING THE END WALLS AS SERIOUS INJURY OR DEATH TO PERSONNEL COULD RESULT DUE TO THE 1,700 POUND WEIGHT OF THE FRONT WALL AND THE 1,100 POUND WEIGHT OF THE REAR WALL.

3. BOTH PLS FLATTRACKS ARE EQUIPPED WITH ELEVEN TIELDOWN ANCHORS ALONG EACH SIDE. THE TIELDOWN ANCHORS AT EACH END AND IN THE CENTER HAVE A 25,000 POUND CAPACITY AND THE REMAINING EIGHT TIELDOWN ANCHORS HAVE A 10,000 POUND CAPACITY. ALL ELEVEN TIELDOWN ANCHORS WILL ACCEPT WEB STRAP TIELDOWN ASSEMBLIES OR STEEL STRAPPING.

4. TWO SETS OF FORKLIFT POCKETS ARE PROVIDED UNDERNEATH THE PLS M1077 A-FRAME AND M1 FLATTRACKS. THE SET CLOSEST TO THE CENTER OF THE FLATTRACK IS FOR LIFTING UNLOADED FLATTRACKS ONLY. USE OF THE WRONG FORKLIFT POCKETS COULD CAUSE DAMAGE TO EQUIPMENT OR THE FORKS ON THE FORKLIFT MUST BE "70.00" LONG OR LONGER.


6. WHEN ATTACHING THE WEB STRAP HOOK TO THE TIELDOWN ANCHOR ON A PLS FLATTRACK ASSURE THAT THE TIELDOWN ANCHOR IS IN A RAISED OR VERTICAL POSITION PRIOR TO AND AFTER THE STRAP IS TIGHTENED. IF THE WEB STRAP IS POSITIONED AT A NEAR HORIZONTAL ANGLE, SUCH STRAP MARKED "X" ON PAGE 18, ASSURE THAT THE TIELDOWN ANCHOR IS POSITIONED IN LINE WITH THE WEB STRAP. IF THE WEB STRAP WAS ATTACHED TO THE SAME TIELDOWN ANCHOR THE VERTICAL STRAP HAS PRECEDENCE.

7. DO NOT POSITION PALLETS AGAINST THE SIDE WALLS OF THE 10-TON MK77 AND/OR MK85 HEMTT. THESE WALLS CANNOT SUPPORT THE LOAD WEIGHT AND MAY BE DAMAGED.

8. PRIOR TO LOADING ITEMS ON THE VEHICLES AND/OR FLATTRACKS, ASSURE THAT THE DECK IS FREE OF EXCESSIVE AMOUNTS OF DIRT, SAND, GRAVEL.

9. WHEN LOADING PALLETS ON THE VEHICLES AND/OR FLATTRACKS, DO NOT STACK PALLETS TWO HIGH UNLESS IT IS NEEDED TO ACHIEVE THE DESIRED RELoad QUANTITY.

10. CAUTION: WHEN TRANSPORTING LOADS HAVING PALLETS OR TIELDOWN DEVICES STACKED TOO HIGH, REDUCE SPEED AND DRIVE WITH EXTREME CARE DUE TO THE HIGHER CENTER OF GRAVITY. THE TWO HIGH LOADS ALSO MAKE THE PALLETS MORE STACKED, THEREBY REQUIRING A LOWER CENTER OF GRAVITY. FLATTRACKS OR PALLETS MAY BE STORAGE DUE TO RESTRICT MOVEMENT OVER CERTAIN ROADS WIDE.

11. IF PALLETS ARE POSITIONED TWO WIDE WITH THE LENGTH PARALLEL TO THE TRUCK OR FLATTRACK AS SHOWN IN THE LOAD ON PAGE 20, IN LIEU OF ONE WIDE WITH THE WIDTH PARALLEL TO THE LENGTH AS SHOWN ON PAGE 19, LESS WEB STRAP TIELDOWN ASSEMBLIES ARE REQUIRED TO SECURE THE LOAD.

12. WHEN LOADING LATERALLY ADJACENT PALLETS ON THE HEMTT AND HEMTT, ENSURE THAT THE TIELDOWN ANCHORS LOCATED ON EACH SIDE OF THE CARGO DECK ARE COVERED BY THE PALLETS, AND THAT THERE IS SUFFICIENT DECK TO ATTACH THE WEB STRAPS.

(Continued at right)
**ISOMETRIC VIEW**

**KEY NUMBERS**

1. **WEB STRAP TIEDOWN ASSEMBLY (6 REQD).** INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON ONE SIDE OF TRUCK, OVER TOP OF PALLETS, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF TRUCK. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2 AND SPECIAL NOTE 6 ON PAGE 5.

2. **WEB STRAP TIEDOWN ASSEMBLY (1 REQD).** INSTALL STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON ONE SIDE OF TRUCK, AROUND PALLETS BASE AT AFT END OF LOAD, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF TRUCK. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "P", "G", AND "N" ON PAGE 2.

---

**REAR FOR ONE APACHE HELICOPTER**

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<th>ITEM</th>
<th>ROUNDS REQD</th>
<th>ROUNDS PER PLT</th>
<th>PALLETS PER LOAD</th>
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<th>WEIGHT</th>
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<tbody>
<tr>
<td>30MM</td>
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<td>2,904</td>
<td>1</td>
<td>2,904</td>
<td>3,208 LBS</td>
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<tr>
<td>HELLFIRE</td>
<td>8</td>
<td>9</td>
<td>1</td>
<td>9</td>
<td>1,749 LBS</td>
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<tr>
<td>2.75 INCH ROCKET</td>
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<td>1</td>
<td>48</td>
<td>2,500 LBS</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
<td><strong>3</strong></td>
<td></td>
<td><strong>7,457 LBS</strong></td>
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</tbody>
</table>

---

**REARM FOR ONE APACHE HELICOPTER ON THE 5-TON M325A1 CARGO TRUCK**

PROJECT DA 16-93
SPECIAL NOTES:

1. A REARM LOAD FOR ONE APACHE HELICOPTER IS SHOWN LOADED ON THE 5-TON M925A1 CARGO TRUCK HAVING CARGO AREA DIMENSIONS OF 1GB" LONG BY 86" WIDE AND A MAXIMUM LOAD WEIGHT OF 10,000 POUNDS.

2. IF LOADING PALLETTIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

3. PRIOR TO LOADING THE PALLETTIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLETT IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.

4. POSITION THE LOAD TIGHT AGAINST THE FORWARD END WALL.

5. ALL PALLETS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUDINALLY. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLET UNITS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

6. EACH LATERAL ROW OF ONE OR MORE PALLET UNITS MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP OF A ROW.

7. FOR DETAILS OF THE PALLETTIZED UNITS SHOWN IN THE LOAD ON PAGE 4, SEE PAGE 20 IN THIS DRAWING.

8. A TOTAL OF SEVEN WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>WEIGHT (APPROX)</th>
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<tbody>
<tr>
<td>APACHE REARM</td>
<td>1</td>
<td>7,457 LBS</td>
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REARM FOR ONE APACHE HELICOPTER ON THE 5-TON M925A1 CARGO TRUCK

PROJECT DA 16-93
ISOMETRIC VIEW

**KEY NUMBERS**

1. WEB STRAP TIEDOWN ASSEMBLY (6 REQD). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF TRUCK, OVER TOP OF PALLETS, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF TRUCK. POSITION STRAP SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2 AND SPECIAL NOTE B ON PAGE 7.

2. WEB STRAP TIEDOWN ASSEMBLY (2 REQD). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF TRUCK, AROUND PALLET BASE AT FORWARD AND AFT END OF LOAD, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF TRUCK. POSITION STRAP SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "P", "G", AND "M" ON PAGE 2.

### REARM FOR ONE APACHE HELICOPTER

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ROUNDS REQD</th>
<th>ROUNDS PER PLT</th>
<th>PALLETS</th>
<th>ROUNDS PER LOAD</th>
<th>WEIGHT</th>
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<td>30MM</td>
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<td>1</td>
<td>2,904</td>
<td>3,208 LBS</td>
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<tr>
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<td>9</td>
<td>1</td>
<td>9</td>
<td>1,749 LBS</td>
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<tr>
<td>2.75 INCH ROCKET</td>
<td>38</td>
<td>48</td>
<td>1</td>
<td>48</td>
<td>2,500 LBS</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>7,457 LBS</td>
</tr>
</tbody>
</table>
SPECIAL NOTES:

1. A REARM LOAD FOR ONE APACHE HELICOPTER IS SHOWN LOADED ON THE 10-TON M977 AND/OR M985 HEAVY EXPANDED MOBILITY TACTICAL TRUCK (HEMTT) HAVING CARGO DECK DIMENSIONS OF 21-5/8" LONG BY 90-3/4" WIDE AND A MAXIMUM LOAD WEIGHT OF 22,000 POUNDS.

2. IF LOADING PALLETTIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

3. PRIOR TO LOADING THE PALLETTIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLETT IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.

4. ALL PALLETS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUDINALLY. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLETT UNITS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

5. EACH LATERAL ROW OF ONE OR MORE PALLETT UNITS MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP OF A ROW.

6. FOR DETAILS OF THE PALLETTIZED UNITS SHOWN IN THE LOAD ON PAGE 6, SEE PAGE 28 IN THIS DRAWING.

7. A TOTAL OF EIGHT WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>WEIGHT (APPROX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APACHE REARM</td>
<td>- - - - - 1</td>
<td>7,457 LBS</td>
</tr>
</tbody>
</table>

REARM FOR ONE APACHE HELICOPTER ON THE 10-TON M977 AND/OR M985 HEMTT
ISOMETRIC VIEW

KEY NUMBERS

1. WEB STRAP TIEDOWN ASSEMBLY (8 REEO). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDES OF TRUCK, OVER TOP OF PALLETS, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF TRUCK. POSITION STRAP SLEEVE AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2 AND SPECIAL NOTE 6 ON PAGE 9.

2. WEB STRAP TIEDOWN ASSEMBLY (2 REEO). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF TRUCK, AROUND PALLETS BASE AT FORWARD AND AFT END OF LOAD, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF TRUCK. POSITION STRAP SLEEVE AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F", "G", AND "N" ON PAGE 2.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ROUNDS REEO</th>
<th>ROUNDS PER PLT</th>
<th>PALLETS PER LOAD</th>
<th>ROUNDS PER LOAD</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>30MM</td>
<td>2,400</td>
<td>2,904</td>
<td>1</td>
<td>2,904</td>
<td>3,208 LBS</td>
</tr>
<tr>
<td>HELLFIRE</td>
<td>16</td>
<td>9</td>
<td>2</td>
<td>18</td>
<td>3,488 LBS</td>
</tr>
<tr>
<td>2.75 INCH ROCKET</td>
<td>76</td>
<td>48</td>
<td>2</td>
<td>56</td>
<td>5,000 LBS</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td>11,706 LBS</td>
</tr>
</tbody>
</table>

REARM FOR TWO APACHE HELICOPTERS ON THE 10-TON M977 AND/OR M985 HEMTT

PROJECT DA 15-93
SPECIAL NOTES:

1. A REARM LOAD FOR TWO APACHE HELICOPTERS IS SHOWN LOADED ON THE 10-TON M977 AND/OR M885 HEAVY EXPANDED MOBILITY TACTICAL TRUCK (HEMTT) HAVING CARGO DECK DIMENSIONS OF 216-3/8" LONG BY 80-3/4" WIDE AND A MAXIMUM LOAD WEIGHT OF 22,000 POUNDS.

2. IF LOADING PALLETIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

3. PRIOR TO LOADING THE PALLETIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.

4. ALL PALLET UNITS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUDINALLY. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLET UNITS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

5. EACH LATERAL ROW OF ONE OR MORE PALLET UNITS MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP OF A ROW.

6. FOR DETAILS OF THE PALLETIZED UNITS SHOWN IN THE LOAD ON PAGE B, SEE PAGE 2B IN THIS DRAWING.

7. A TOTAL OF TEN WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>WEIGHT (APPROX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APACHE REARM</td>
<td>2</td>
<td>11,700 LBS</td>
</tr>
</tbody>
</table>

REARM FOR TWO APACHE HELICOPTERS ON THE 10-TON M977 AND/OR M885 HEMTT
**ISOMETRIC VIEW**

CAUTION: LOAD HEIGHT IS 69.25" ABOVE CARGO DECK FLOOR. WHEN TRANSPORTING LOADS HAVING PALLETS, UNITS STACKED TWO HIGH, REDUCE SPEED AND DRIVE CAUTIOUSLY DUE TO THE HIGHER CENTER OF GRAVITY AND POSSIBLE CLEARANCE LIMITATIONS.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>LOADS REOED</th>
<th>LOADS PER PLT</th>
<th>PALLET PER LOAD</th>
<th>LOADS PER LOAD</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>30MM</td>
<td>3,600</td>
<td>2,904</td>
<td>2</td>
<td>5,808</td>
<td>6,418 LBS</td>
</tr>
<tr>
<td>HELLFIRE</td>
<td>24</td>
<td>9</td>
<td>3</td>
<td>27</td>
<td>5,247 LBS</td>
</tr>
<tr>
<td>2.75 INCH ROCKET</td>
<td>114</td>
<td>49</td>
<td>3</td>
<td>144</td>
<td>7,500 LBS</td>
</tr>
<tr>
<td>TOTAL</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>16,193 LBS</td>
<td></td>
</tr>
</tbody>
</table>

**KEY NUMBERS**

1. WEB STRAP TIEDOWNS ASSEMBLY (9 REOED). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWNS ANCHOR ON SIDE OF TRUCK, OVER TOP OF ONE HIGH PALLETS, TO A TIEDOWNS ANCHOR ON OPPOSITE SIDE OF TRUCK. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2.


3. WEB STRAP TIEDOWNS ASSEMBLY (2 REOED). HOOK TWO STRAPS TOGETHER AND ENCIRCLE THE TWO HIGH STACK OF 2.75 INCH ROCKET PALLETS AT TWO PLACES. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. NOTE: THESE TWO STRAPS MUST BE PREPOSITIONED UNDER THE BOTTOM PALLETS AS LOADING PROGRESSES. SEE GENERAL NOTES "F", "G" AND "J" ON PAGE 2.

4. WEB STRAP TIEDOWNS ASSEMBLY (4 REOED). HOOK TWO STRAPS TOGETHER AND INSTALL EACH ASSEMBLY TO EXTEND FROM A TIEDOWNS ANCHOR ON SIDE OF TRUCK, OVER TOP OF TWO HIGH PALLETS, TO A TIEDOWNS ANCHOR ON THE OPPOSITE SIDE OF TRUCK. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F", "G" AND "J" ON PAGE 2 AND SPECIAL NOTE 7 ON PAGE 11.

5. WEB STRAP TIEDOWNS ASSEMBLY (2 REOED). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWNS ANCHOR ON SIDE OF TRUCK, AROUND PALLETS BASES AT FORWARD AND AFT END OF LOAD, TO A TIEDOWNS ANCHOR ON OPPOSITE SIDE OF TRUCK. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2.
SPECIAL NOTES:

1. A REARM LOAD FOR THREE APACHE HELICOPTERS IS SHOWN LOADED ON THE 10-TON M977 AND/OR M985 HEAVY EXPANDED MOBILITY TACTICAL TRUCK (HEMTT) HAVING CARGO DECK DIMENSIONS OF 216-3/4" LONG BY 90-3/4" WIDE AND A MAXIMUM LOAD WEIGHT OF 22,000 POUNDS.

2. IF LOADING PALLETTIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

3. PRIOR TO LOADING THE PALLETTIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.

4. ALL PALLETS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUDINALLY. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLET UNITS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

5. WHEN POSITIONING THE HELLFIRE MISSILE PALLET ON TOP OF THE TWO 30MM CARTRIDGE PALLETS, ASSURE IT IS CENTERED LATERALLY AND LONGITUDINALLY PRIOR TO POSITIONING AND TIGHTENING STRAPS MARKED 2 AND 4.

6. EACH LATERAL ONE HIGH AND TWO HIGH ROW OF PALLET UNITS MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP OF A ROW. THE BOTTOM PALLET IN A TWO HIGH STACK MUST HAVE A MINIMUM OF ONE STRAP OVER THE TOP.

7. FOR DETAILS OF THE PALLETTIZED UNITS SHOWN IN THE LOAD ON PAGE 10, SEE PAGE 20 IN THIS DRAWING.

8. A TOTAL OF 27 WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
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<tr>
<th>ITEM</th>
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</thead>
<tbody>
<tr>
<td>Apache Ream</td>
<td>- - - - 3</td>
<td>- - - - - 19,163 LBS</td>
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</table>

REARM FOR THREE APACHE HELICOPTERS ON THE 10-TON M977 AND/OR M985 HEMTT
**Isometric View**

**Key Numbers**

1. Web strap tieown assembly (6 reqd.). Install each strap to extend from a tieown anchor on side of trailer, over top of pallets, to a tieown anchor on opposite side of trailer. Position strap scuff sleeves at sharp edges. Stake up excess slack in strap and then ratchet tight. See general notes "F" and "G" on page 2 and special note B on page 13.

2. Web strap tieown assembly (1 reqd.). Install each strap to extend from a tieown anchor on side of trailer, behind pallet base at aft end of load, to a tieown anchor on opposite side of trailer. Position strap scuff sleeves at sharp edges. Take up excess slack in strap and then ratchet tight. See general notes "F", "G" and "N" on page 2.

---

**Rearm for One Apache Helicopter**

<table>
<thead>
<tr>
<th>Item</th>
<th>Rounds Req'd</th>
<th>Rounds Per Plt</th>
<th>Pallets Per Load</th>
<th>Rounds Per Load</th>
<th>Weight</th>
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<tr>
<td>30mm</td>
<td>1,200</td>
<td>2,904</td>
<td>1</td>
<td>2,904</td>
<td>3,208 LBS</td>
</tr>
<tr>
<td>Hellfire</td>
<td>8</td>
<td>9</td>
<td>1</td>
<td>9</td>
<td>1,749 LBS</td>
</tr>
<tr>
<td>2.75 Inch Rocket</td>
<td>38</td>
<td>48</td>
<td>1</td>
<td>48</td>
<td>2,500 LBS</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>7,457 LBS</td>
</tr>
</tbody>
</table>
SPECIAL NOTES:

1. A REARM LOAD FOR ONE APACHE HELICOPTER IS SHOWN LOADED ON THE 11-TON M998A1 HEAVY EXPANDED MOBILITY AMMUNITION TRAILER (HEMAT) HAVING CARGO DECK DIMENSIONS OF 175" LONG BY 92" WIDE AND A MAXIMUM LOAD WEIGHT OF 22,000 POUNDS.

2. IF LOADING PALLETTIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

3. PRIOR TO LOADING THE PALLETTIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.

4. POSITION THE LOAD TIGHT AGAINST THE FORWARD END WALL.

5. ALL PALLETS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUinally. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLET UNITS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

6. EACH LATERAL ROW OF ONE OR MORE PALLETS MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP OF A ROW.

7. FOR DETAILS OF THE PALLETTIZED UNITS SHOWN IN THE LOAD ON PAGE 12, SEE PAGE 20 IN THIS DRAWING.

8. A TOTAL OF SEVEN WEB STRAP TIE-DOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
<thead>
<tr>
<th>ITEM</th>
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<th>WEIGHT (APPROX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APACHE REARM</td>
<td>- - - -</td>
<td>7,457 LBS</td>
</tr>
</tbody>
</table>
ISOMETRIC VIEW
CAUTION: LOAD HEIGHT IS 87" ABOVE CARGO DECK FLOOR. WHEN TRANSPORTING LOADS HAVING PALLETS, UNITS STACKED TWO HIGH REDUCE SPEED AND DRIVE CAUTIOUSLY DUE TO THE HIGHER CENTER OF GRAVITY AND POSSIBLE CLEARANCE LIMITATIONS.

KEY NUMBERS
1. WEB STRAP TIEDOWN ASSEMBLY (5 REQD). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON ONE SIDE OF TRAILER, OVER TOP OF ONE HIGH PALLETS, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF TRAILER. POSITION STRAP SOUFF SLEEVES AT SHARP EDGES.
   TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2.

2. WEB STRAP TIEDOWN ASSEMBLY (2 REQD). HOOK TWO STRAPS TOGETHER AND ENCIRCLE THE TWO HIGH STACK OF 2.75 INCH ROCKET PALLETS AT TWO PLACES. POSITION STRAP SOUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. NOTE: THESE TWO STRAPS MUST BE PRE-POSITIONED UNDER THE BOTTOM PALLET AS LOADING PROGRESSES. SEE GENERAL NOTES "F", "G" AND "J" ON PAGE 2.

3. WEB STRAP TIEDOWN ASSEMBLY (2 REQD). HOOK TWO STRAPS TOGETHER AND INSTALL EACH ASSEMBLY TO EXTEND FROM A TIEDOWN ANCHOR ON ONE SIDE OF TRAILER OVER TOP OF TWO HIGH PALLETS, TO A TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF TRAILER. POSITION STRAP SOUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F", "G" AND "J" ON PAGE 2 AND SPECIAL NOTE 6 ON PAGE 15.

4. WEB STRAP TIEDOWN ASSEMBLY (1 REQD). INSTALL 100 STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON ONE SIDE OF TRAILER, AROUND PALLETS BASE AT AFT END OF LOAD, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF TRAILER. POSITION STRAP SOUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2.

REARM FOR TWO APACHE HELICOPTERS

<table>
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<tr>
<th>ITEM</th>
<th>ROUNDS REQD</th>
<th>ROUNDS PER PLT</th>
<th>PALLETS PER LOAD</th>
<th>ROUNDS PER LOAD</th>
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<tbody>
<tr>
<td>30MM</td>
<td>2,400</td>
<td>2,504</td>
<td>1</td>
<td>2,504</td>
<td>3,208 LBS</td>
</tr>
<tr>
<td>HELIFIRE</td>
<td>18</td>
<td>9</td>
<td>2</td>
<td>19</td>
<td>3,498 LBS</td>
</tr>
<tr>
<td>2.75 INCH ROCKET</td>
<td>76</td>
<td>48</td>
<td>2</td>
<td>96</td>
<td>5,000 LBS</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11,706 LBS</td>
</tr>
</tbody>
</table>

REARM FOR TWO APACHE HELICOPTERS ON THE 11-TON MBB91 HEMAT

PAGE 14

PROJECT DA 16-93
SPECIAL NOTES:

1. A REARM LOAD FOR TWO APACHE HELICOPTERS IS SHOWN LOADED ON THE 11-TON M998 HEMTT MOBILITY AMMUNITION TRAILER (HEMAT) HAVING CARGO DECK DIMENSIONS OF 175" LONG BY 92" WIDE AND A MAXIMUM LOAD WEIGHT OF 22,000 POUNDS.

2. IF LOADING PALLETTIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

3. PRIOR TO LOADING THE PALLETTIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.

4. POSITION THE LOAD TIGHT AGAINST THE FORWARD END WALL.

5. ALL PALLETS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUDINALLY. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLETS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

6. EACH LATERAL ONE HIGH AND TWO HIGH ROW OF PALLETT UNITS MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP OF A ROW. THE BOTTOM PALLET IN A TWO HIGH STACK MUST HAVE A MINIMUM OF ONE STRAP OVER THE TOP.

7. FOR DETAILS OF THE PALLETTIZED UNITS SHOWN IN THE LOAD ON PAGE 14, SEE PAGE 28 IN THIS DRAWING.

8. A TOTAL OF 14 WEB STRAP TIE-DOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>WEIGHT (APPROX)</th>
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</thead>
<tbody>
<tr>
<td>APACHE REARM</td>
<td>2</td>
<td>11,705 LBS</td>
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REARM FOR TWO APACHE HELICOPTERS ON THE 11-TON M998 HEMTT

PROJECT DA 16-93
ISOMETRIC VIEW
CAUTION: LOAD HEIGHT IS 109° ABOVE CARD DECK FLOOR: WHEN TRANSPORTING LOADS HAVING PALLET UNITS STACKED TWO HIGH REDUCE SPEED AND DRIVE CAUTIOUSLY DUE TO THE HIGHER CENTER OF GRAVITY AND POSSIBLE CLEARANCE LIMITATIONS.

REAR M 30MM CARTRIDGE (2 REGD). 2.75 INCH ROCKET PALLETS (3 REGD). HELLFIRE MISSILE PALLETS (3 REGD).

---

**KEY NUMBERS**

1. WEB STRAP TIEDOWN ASSEMBLY (6 REGD). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF TRAILER, OVER TOP OF ONE HIGH PALLETS, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF TRAILER. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES, TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F", "G" AND "H" ON PAGE 2.

2. WEB STRAP TIEDOWN ASSEMBLY (2 REGD). HOOK TWO STRAPS TOGETHER AND ENCIRCLE THE TWO HIGH STACK OF HELLFIRE MISSILE PALLETS AT TWO PLACES, POSITION STRAP SCUFF SLEEVES AT SHARP EDGES, TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. NOTE: THESE TWO STRAPS MUST BE PRE-POSITIONED UNDER THE BOTTOM PALLET AS LOADING PROGRESSES. SEE GENERAL NOTES "F", "G" AND "H" ON PAGE 2.

3. WEB STRAP TIEDOWN ASSEMBLY (2 REGD). HOOK TWO STRAPS TOGETHER AND ENCIRCLE THE TWO HIGH STACK OF 2.75 INCH ROCKET PALLETS AT TWO PLACES, POSITION STRAP SCUFF SLEEVES AT SHARP EDGES, TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. NOTE: THESE TWO STRAPS MUST BE PRE-POSITIONED UNDER THE BOTTOM PALLET AS LOADING PROGRESSES. SEE GENERAL NOTES "F", "G" AND "H" ON PAGE 2.

4. WEB STRAP TIEDOWN ASSEMBLY (6 REGD). HOOK TWO STRAPS TOGETHER TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF TRAILER, OVER TOP OF TWO HIGH PALLETS, TO A TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF TRAILER, POSITION STRAP SCUFF SLEEVES AT SHARP EDGES, TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F", "G" AND "H" ON PAGE 2 AND SPECIAL NOTE 7 ON PAGE 17.

5. WEB STRAP TIEDOWN ASSEMBLY (1 REGD). INSTALL STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF TRAILER, OVER PALLETS BASES AT API END OF LOAD, TO A TIEDOWN ANCHOR ON THE OPPOSITE SIDE OF TRAILER, POSITION STRAP SCUFF SLEEVES AT SHARP EDGES, TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2. (CONTINUED AT LEFT)

---

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ROUNDS REGD</th>
<th>ROUNDS PER PLT</th>
<th>PALLETS PER LOAD</th>
<th>ROUNDS PER LOAD</th>
<th>WEIGHT</th>
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</thead>
<tbody>
<tr>
<td>30MM</td>
<td>3,600</td>
<td>2,904</td>
<td>2</td>
<td>5,808</td>
<td>6,216 LBS</td>
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<tr>
<td>HELLFIRE</td>
<td>24</td>
<td>9</td>
<td>3</td>
<td>27</td>
<td>5,247 LBS</td>
</tr>
<tr>
<td>2.75 INCH ROCKET</td>
<td>114</td>
<td>48</td>
<td>3</td>
<td>144</td>
<td>7,500 LBS</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>15,063 LBS</td>
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(KEY NUMBERS CONTINUED)
SPECIAL NOTES:

1. A REARM LOAD FOR THREE APACHE HELICOPTERS IS SHOWN LOADED ON THE 11-TON M998A1 HEAVY EXPANDED MOBILITY AMMUNITION TRAILER (HEMAT) HAVING CARGO AREA DIMENSIONS OF 175" LONG BY 92" WIDE AND A MAXIMUM LOAD WEIGHT OF 22,000 POUNDS.

2. IF LOADING PALLETTIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

3. PRIOR TO LOADING THE PALLETTIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.

4. POSITION THE LOAD TIGHT AGAINST THE FORWARD END WALL.

5. ALL PALLETS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUDINALLY. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLET UNITS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

6. WHEN POSITIONING THE 2.75 INCH ROCKET PALLETS ON TOP OF THE TWO 50MM CARTRIDGE PALLETS, ASSURE IT IS CENTERED LATERALLY AND TIGHT AGAINST THE TWO HIGH STACK OF 2.75 INCH ROCKET PALLETS PRIOR TO POSITIONING AND TIGHTENING STRAPS" and [5].

7. EACH LATERAL ONE HIGH AND TWO HIGH ROW OF PALLETS ON TOP MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP OF A ROW. THE BOTTOM PALLET IN TWO HIGH STACK MUST HAVE A MINIMUM OF ONE STRAP OVER THE TOP.

8. FOR DETAILS OF THE PALLETTIZED UNITS SHOWN IN THE LOAD ON PAGE 16, SEE PAGE 28 IN THIS DRAWING.

9. A TOTAL OF 20 WEB STRAP TIE-DOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>WEIGHT (APPROX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APACHE REARM</td>
<td>- - - - -</td>
<td>- - - - - 19,183 LBS</td>
</tr>
</tbody>
</table>
**ISOMETRIC VIEW**

**KEY NUMBERS**

1. WEB STRAP TIEDOWN ASSEMBLY (8 REO). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF FLATTRACK, OVER TOP OF PALLETS, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF FLATTRACK. POSITION STRAP SQUEEZE SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" "T" AND "M" ON PAGE 2 AND SPECIAL NOTE 7 ON PAGE 15.

2. WEB STRAP TIEDOWN ASSEMBLY (1 REO). INSTALL STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF FLATTRACK, AROUND PALLET BASE AT AFT END OF LOAD, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF FLATTRACK. POSITION STRAP SQUEEZE SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2.

<table>
<thead>
<tr>
<th>REARM FOR ONE APACHE HELICOPTER</th>
<th>ROUNDS REDD</th>
<th>ROUNDS PER PLT</th>
<th>PALLETS PER LOAD</th>
<th>ROUNDS PER LOAD</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>30MM</td>
<td>1,200</td>
<td>2,904</td>
<td>1</td>
<td>2,904</td>
<td>3,200 LBS</td>
</tr>
<tr>
<td>HELLFIRE</td>
<td>8</td>
<td>9</td>
<td>1</td>
<td>9</td>
<td>1,749 LBS</td>
</tr>
<tr>
<td>2.75 INCH ROCKET</td>
<td>38</td>
<td>48</td>
<td>1</td>
<td>48</td>
<td>2,500 LBS</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>7,457 LBS</td>
</tr>
</tbody>
</table>
SPECIAL NOTES:

1. A REAR AXLE LOAD FOR ONE APACHE HELICOPTER IS SHOWN LOADED ON THE 16-1/2-TON M1077 A-FRAME FLATTRACK HAVING CARGO DECK DIMENSIONS OF 228" LONG BY 50-1/2" WIDE AND A MAXIMUM LOAD WEIGHT OF 33,000 POUNDS.

2. THE LOAD AS SHOWN ON PAGE 18 MAY ALSO BE LOADED ON THE M1 FLATTRACK. SEE GENERAL NOTE "Q" ON PAGE 2.

3. IF LOADING PALLETTIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

4. PRIOR TO LOADING THE PALLETTIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.

5. POSITION THE LOAD TIGHT AGAINST THE A-FRAME AT THE FORWARD END OF THE FLATTRACK.

6. ALL PALLETS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUDINALLY. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLETS UNITS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

7. EACH LATERAL ROW OF ONE OR MORE PALLET UNITS MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP OF A ROW.

8. FOR DETAILS OF THE PALLETTIZED UNITS SHOWN IN THE LOAD ON PAGE 18, SEE PAGE 20 IN THIS DRAWING.

9. A TOTAL OF SEVEN WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>WEIGHT (APPROX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APACHE REARM</td>
<td>--------</td>
<td>7,457 LBS</td>
</tr>
</tbody>
</table>

REAR AXLE LOAD FOR ONE APACHE HELICOPTER ON THE 16-1/2-TON M1077 A-FRAME FLATTRACK

PROJECT DA 16-93
**ISOMETRIC VIEW**

**KEY NUMBERS**

1. **WEB STRAP TIEDOWN ASSEMBLY (6 REDD).** Install each strap to extend from a takedown anchor on side of flatrack, over top of pallets, to a takedown anchor on opposite side of flatrack. Position strap scuff sleeves at sharp edges. Take up excess slack in strap and then ratchet tight. See general notes "F" and "G" on page 2 and special note 7 on page 21.

2. **WEB STRAP TIEDOWN ASSEMBLY (1 REDD).** Install strap to extend from a takedown anchor on side of flatrack, around pallet base at aft end of load, to a takedown anchor on opposite side of flatrack. Position strap scuff sleeves at sharp edges. Take up excess slack in strap and then ratchet tight. See general notes "F" and "G" on page 2.

**REARM FOR TWO APACHE HELICOPTERS**

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ROUNDS REDD</th>
<th>ROUNDS PER PLT</th>
<th>PALLETS PER LOAD</th>
<th>ROUNDS PER LOAD</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>30MM</td>
<td>2,400</td>
<td>2,904</td>
<td>1</td>
<td>2,904</td>
<td>3,208 LBS</td>
</tr>
<tr>
<td>HELIFIRE</td>
<td>18</td>
<td>9</td>
<td>2</td>
<td>18</td>
<td>3,498 LBS</td>
</tr>
<tr>
<td>2.75 INCH ROCKET</td>
<td>76</td>
<td>48</td>
<td>2</td>
<td>96</td>
<td>5,000 LBS</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>11,706 LBS</td>
</tr>
</tbody>
</table>
SPECIAL NOTES:

1. A REARM LOAD FOR TWO APACHE HELICOPTERS IS SHOWN LOADED ON THE M1 FLATTRACK HAVING CARGO DECK DIMENSIONS OF 222" LONG BY 90-1/2" WIDE AND A MAXIMUM LOAD WEIGHT OF 26,750 POUNDS.

2. THE LOAD AS SHOWN ON PAGE 20 MAY ALSO BE LOADED ON AN M1077 FLATTRACK. SEE GENERAL NOTE "Q" ON PAGE 2.

3. IF LOADING PALLETIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

4. PRIOR TO LOADING THE PALLETIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLET IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.

5. POSITION THE LOAD TIGHT AGAINST THE FORWARD END WALL ON THE FLATTRACK.

6. ALL PALLETS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUIONALLY. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLET UNITS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

7. EACH LATERAL ROW OF ONE OR MORE PALLET UNITS MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP OF A ROW.

8. FOR DETAILS OF THE PALLETIZED UNITS SHOWN IN THE LOAD ON PAGE 20, SEE PAGE 2B IN THIS DRAWING.

9. A TOTAL OF SEVEN WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>WEIGHT (APPROX)</th>
</tr>
</thead>
</table>
| APACHE REARM | - - - - 2 - - - - | 11,705 LBS      

REARM FOR TWO APACHE HELICOPTERS ON THE M1 FLATTRACK

PROJECT DA 16-93
ISOMETRIC VIEW
CAUTION: LOAD HEIGHT IS 89.25" ABOVE CARGO DECK FLOOR. WHEN TRANSPORTING LOADS HAVING PAILLET UNITS STACKED TWO HIGH REDUCE SPEED AND DRIVE CAUTIOUSLY DUE TO THE HIGHER CENTER OF GRAVITY AND POSSIBLE CLEARANCE LIMITATIONS.

KEY NUMBERS
1. WEB STRAP TIEDOWN ASSEMBLY (5 REQD). INSTALL EACH STRAP TO EXTEND FROM A TIE-DOWN ANCHOR ON SIDE OF FLATRACK, OVER TOP OF ONE HIGH PAILLETS, TO A TIE-DOWN ANCHOR ON OPPOSITE SIDE OF FLATRACK. POSITION STRAP SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2 AND SPECIAL NOTE 8 ON PAGE 23.


3. WEB STRAP TIEDOWN ASSEMBLY (2 REQD). HOOK TWO STRAPS TOGETHER AND INSTALL EACH ASSEMBLY TO EXTEND FROM A TIE-DOWN ANCHOR ON SIDE OF FLATRACK, OVER TOP OF THE HELIFIRE MISSLE PALLETS, TO A TIE-DOWN ANCHOR ON OPPOSITE SIDE OF FLATRACK. POSITION STRAP SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F", "G", "J" AND "N" ON PAGE 2.

4. WEB STRAP TIEDOWN ASSEMBLY (1 REQD). INSTALL STRAP TO EXTEND FROM A TIE-DOWN ANCHOR ON SIDE OF FLATRACK, AROUND PALLETS BASES AT AFT END OF LOAD, TO A TIE-DOWN ANCHOR ON OPPOSITE SIDE OF FLATRACK. POSITION STRAP SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2.

REARM FOR THREE APACHE HELICOPTERS

<table>
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<tr>
<th>ITEM</th>
<th>ROUNDS REDD</th>
<th>ROUNDS PER PLT</th>
<th>PALLET PER LOAD</th>
<th>ROUNDS PER LOAD</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>30MM</td>
<td>3,600</td>
<td>2,804</td>
<td>2</td>
<td>5,008</td>
<td>6,416 LBS</td>
</tr>
<tr>
<td>HELIFIRE</td>
<td>24</td>
<td>9</td>
<td>3</td>
<td>27</td>
<td>5,247 LBS</td>
</tr>
<tr>
<td>2.75 INCH ROCKET</td>
<td>114</td>
<td>48</td>
<td>3</td>
<td>144</td>
<td>7,500 LBS</td>
</tr>
</tbody>
</table>

TOTAL                            | 8           |                | 16,163 LBS

REARM FOR THREE APACHE HELICOPTERS ON THE 16-1/2 TON M1077 A-FRAME FLATRACK

PROJECT DA 16-93
SPECIAL NOTES:

1. A REARM LOAD FOR THREE APACHE HELICOPTERS IS SHOWN LOADED ON THE M1077 A-FRAME FLATrack HAVING CARGO DECK DIMENSIONS OF 228" LONG BY 90-1/2" WIDE AND A MAXIMUM LOAD WEIGHT OF 33,000 POUNDS.

2. THE LOAD AS SHOWN ON PAGE 22 MAY BE ALSO BE LOADED ON THE M1 FLATrack. SEE GENERAL NOTE "Q" ON PAGE 2.

3. IF LOADING PALLETTIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

4. PRIOR TO LOADING THE PALLETTIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLETT IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.


6. ALL PALLETIZED MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUDINALY. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLET UNITS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

7. WHEN POSITIONING THE HELIFIRE MISSILE PALLETS ON TOP OF THE TWO 30MM CARTRIDGE PALLET, ASSURE IT IS CENTERED LATERALLY AND LONGITUDINALLY PRIOR TO POSITIONING AND TIGHTENING STRAPS Marked 2 AND 3.

8. EACH LATERAL ONE HIGH AND TWO HIGH ROW OF PALLET UNITS MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP ATP A ROW. THE BOTTOM PALLET IN A TWO HIGH STACK HAVING A DIFFERENT PALLET ON TOP MUST HAVE TWO STRAPS OVER THE TOP AS SHOWN.

9. FOR DETAILS OF THE PALLETTIZED UNITS SHOWN IN THE LOAD ON PAGE 22, SEE PAGE 26 IN THIS DRAWING.

10. A TOTAL OF 15 WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>WEIGHT (APPROX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APACHE REARM</td>
<td>- - - - -</td>
<td>3 - - - - -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19,163 LBS</td>
</tr>
</tbody>
</table>

REARM FOR THREE APACHE HELICOPTERS ON THE 16-1/2-TON M1077 A-FRAME FLATTRACK

PROJECT DA 16-93
WEB STRAP TIEDOWN ASSEMBLY (1 REQD). HOOK TWO STRAPS TOGETHER AND INSTALL TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF TRAILER, AROUND Pallet BASE OF SECOND LAYER 2.75 INCH ROCKET Pallet, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF TRAILER. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F", "G", "J" AND "N" ON PAGE 2.

(continued below)

WEB STRAP TIEDOWN ASSEMBLY (1 REQD). INSTALL STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF FLATTRACK, AROUND Pallet BASES AT AFT END OF LOAD, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF FLATTRACK. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. NO SPECIAL ATTENTION IS GIVEN TO THIS TIE-DOWN WORK AS THE HEIGHT ABOVE DECK IS 10 FT. SEE GENERAL NOTES "F" AND "G" ON PAGE 2.

WEB STRAP TIEDOWN ASSEMBLY (2 REQD). HOOK TWO STRAPS TOGETHER AND ENSURE THE TWO HIGH STACK OF HELLFIRE MISSILE PALLETS AT TWO PLACES. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. NO SPECIAL ATTENTION IS GIVEN TO THIS TIE-DOWN WORK AS THE HEIGHT ABOVE DECK IS 10 FT. SEE GENERAL NOTES "F", "G" AND "J" ON PAGE 2.

WEB STRAP TIEDOWN ASSEMBLY (2 REQD). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF FLATTRACK, OVER TOP OF ONE HIGH PALLETS, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF FLATTRACK. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F", "G" AND "J" ON PAGE 2.

WEB STRAP TIEDOWN ASSEMBLY (2 REQD). HOOK TWO STRAPS TOGETHER AND ENSURE THE 30MM CARTRIDGE Pallet AND THE HELLFIRE MISSILE Pallet AT TWO PLACES. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. NO SPECIAL ATTENTION IS GIVEN TO THIS TIE-DOWN WORK AS THE HEIGHT ABOVE DECK IS 10 FT. SEE GENERAL NOTES "F", "G" AND "J" ON PAGE 2.

WEB STRAP TIEDOWN ASSEMBLY (2 REQD). HOOK TWO STRAPS TOGETHER AND ENSURE THE TWO HIGH STACK OF 2.75 INCH ROCKET PALLETS AT TWO PLACES. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. NO SPECIAL ATTENTION IS GIVEN TO THIS TIE-DOWN WORK AS THE HEIGHT ABOVE DECK IS 10 FT. SEE GENERAL NOTES "F", "G" AND "J" ON PAGE 2.

WEB STRAP TIEDOWN ASSEMBLY (4 REQD). INSTALL EACH STRAP TO EXTEND FROM A TIEDOWN ANCHOR ON SIDE OF FLATTRACK, OVER TOP OF TWO HIGH HELLFIRE MISSILE PALLETS, TO A TIEDOWN ANCHOR ON OPPOSITE SIDE OF FLATTRACK. POSITION STRAP SCUFF SLEEVES AT SHARP EDGES. TAKE UP EXCESS SLACK IN STRAP AND THEN RATCHET TIGHT. SEE GENERAL NOTES "F", "G" AND "J" ON PAGE 2.

(continued at left)
SPECIAL NOTES:

1. A REARM LOAD FOR FOUR APACHE HELICOPTERS IS SHOWN LOADED ON THE M1077 A-FRAME FLATTRACK HAVING CARGO DECK DIMENSIONS OF 220" LONG BY 50-1/2" WIDE AND A MAXIMUM LOAD WEIGHT OF 33,000 POUNDS.

2. THE LOAD SHOWN ON PAGE 24 IS TOO LONG TO BE LOADED ON THE M1 FLATTRACK. SEE GENERAL NOTE "G" ON PAGE 2.

3. IF LOADING PALLETTIZED UNITS OF OTHER ITEMS, SIZES, OR QUANTITIES, FOLLOW THESE SAME PROCEDURES.

4. PRIOR TO LOADING THE PALLETTIZED UNITS, ASSURE THAT ALL STEEL STRAPPING ON EACH PALLETT IS IN POSITION AND IS TIGHT. MISSING AND/OR LOOSE STEEL STRAPPING SHOULD BE REPLACED.

5. POSITION THE LOAD TIGHTLY AGAINST THE A-FRAME AT THE FORWARD END OF THE FLATTRACK.

6. ALL PALLETS MUST BE POSITIONED TIGHTLY AGAINST EACH OTHER LATERALLY AND LONGITUDINALLY. THIS WILL REDUCE LOAD MOVEMENT AND THE QUANTITY OF WEB STRAPS REQUIRED TO SECURE THE LOAD. VOID SPACES BETWEEN PALLETT UNITS WILL FILL IN DURING TRANSPORT CAUSING WEB STRAPS TO BECOME LOOSE.

7. ASSURE THAT TOP PALLETS ON TWO HIGH STACKS ARE CENTERED LATERALLY AND LONGITUDINALLY ON TOP OF BOTTOM PALLETS PRIOR TO POSITIONING AND RATCHETING TIGHT STRAPS MARKED (2), (3), AND (4).

B. EACH LATERAL ONE HIGH AND TWO HIGH ROW OF PALLETT UNITS MUST BE SECURED WITH TWO WEB STRAPS OVER THE TOP AS SHOWN. THESE TWO STRAPS MAY BE CROSSED AND/OR POSITIONED STRAIGHT ACROSS THE TOP OF A ROW. THE BOTTOM PALLETT IN A TWO HIGH STACK MUST HAVE A MINIMUM OF ONE STRAP OVER THE TOP. HOWEVER, THE BOTTOM PALLETT IN A TWO HIGH STACK HAVING A DIFFERENT PALLETT ON TOP MUST HAVE TWO STRAPS OVER THE TOP.

8. FOR DETAILS OF THE PALLETTIZED UNITS SHOWN IN THE LOAD ON PAGE 24, SEE PAGE 20 IN THIS DRAWING.

9. A TOTAL OF 36 WEB STRAP TIEDOWN ASSEMBLIES ARE REQUIRED FOR THE LOAD SHOWN.

LOAD AS SHOWN

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>WEIGHT (APPROX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>APACHE REARM</td>
<td>- - - - 4</td>
<td>23,412 LBS</td>
</tr>
</tbody>
</table>

REARM FOR FOUR APACHE HELICOPTERS ON THE 16-1/2-TON M1077 A-FRAME FLATTRACK
STEP 1

In this view part of the ratchet housing is shown broken away to depict webbing-to-webbing contact on the take-up spool of the ratchet. Webbing-to-webbing contact is achieved when the operator holds the double line of webbing in an "in line plane to the ratchet" and it makes contact with the single line of webbing.

STEP 2

This view depicts the location of the fixed mark on the ratchet handle, with another matching mark on the take-up spool, after webbing-to-webbing contact has been made.

STEP 3

This view depicts the location of the mark on the end of the take-up spool after the spool has been rotated one-half turn, after webbing-to-webbing contact has been made.

STEP 4

This view depicts the location of the mark on the end of the take-up spool after the spool has been rotated one full turn, after webbing-to-webbing contact has been made.
This view depicts the location of the mark on the end of the take-up spool after the spool has been rotated one and one-half turns. After webbing-to-webbing contact has been made. Also in this view, part of the ratchet handle is broken away to show the locking bar fully seated in the matching locking notch (sprocket gear teeth).

**STEP 5**

**SPECIAL NOTES:**

1. The purpose of the ratchet details on page 26 and the detail and notes on this page are to augment the guidance set forth within General Note "F" on page 2.

2. The requirements for 1/2 but not more than 1-1/2 wraps of strap on the take-up spool of the tensioning ratchet, as specified within General Note "F" on page 2, actually means 1/2 to 1-1/2 wraps of double webbing. Also, the 1/2 to 1-1/2 wraps (turns) are to be accomplished only after enough webbing has been wound onto the spool to achieve a webbing-to-webbing contact configuration, as shown in the "STEP 1" detail on page 26.

3. One method that can be used to ensure that the 1/2 to 1-1/2 wraps are wound onto the take-up spool, after webbing-to-webbing contact has been made, is to place a fixed mark (paint or similar material) on the side of the ratchet handle, with the handle in its closed (down) position, and another short matching mark on the end of the spool, as shown in the "STEP 2" detail on page 26. As the spool is rotated to tension a tie-down strap assembly, the number of wraps (turns) can be determined visually by comparing the "Mark" location on the spool to the "Mark" location on the ratchet handle in closed position. See the "STEP 3" and "STEP 4" details on page 26, and "STEP 5" above.

4. Another method that can be used to ensure that the 1/2 to 1-1/2 wraps are achieved, after webbing-to-webbing contact has been made, is to count the audible clicks made by the ratchet assembly as a web strap assembly is being tensioned. The ratchet assembly on most web strap assemblies have 11 teeth on the gear-like device on each end of the take-up spool. Some other strap assemblies have only 9 teeth. Therefore, after initial webbing-to-webbing contact has been made, rotate (turn) the spool through a minimum of 8 to a maximum of 10 clicks (1/2 to 1-1/2 wraps) when the gear has 11 teeth, and rotate (turn) the spool through a minimum of 5 to a maximum of 13 clicks (1/2 to 1-1/2 wraps) if the gear has 9 teeth.

5. 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, that are located on each end of the take-up spool. See "STEP 5" detail above. The locking latch is "fully seated" when the handle will close and the locking bar, or similar device on the handle, prevents the accidental withdrawal of the locking latch. See "STEP 1" detail on page 26. If the fully seated condition cannot be achieved, the strap must be released and hand retensioned as tight as possible to achieve the fully seated condition.

6. Another visual method of determining when there is 1/2 to 1-1/2 wraps of webbing on the take-up spool, after initial webbing-to-webbing contact has been made, is to look at the spool when a tie-down is complete, the strap webbing on the spool of the ratchet should be above the lower curve of the locking notch, and should be below the tips of the teeth of the ratchet as identified in "STEP 5" above. It should be noted that any procedures that ensure proper tensioning are acceptable and the methods on the drawing only provide some of the approved acceptable ones.
HELLFIRE MISSILE PALLETT

9 CONTAINERS (9 MISSILES) -- 1,575 LBS (APPROX)
PALLET AND DUNNAGE -- 174 LBS

TOTAL WEIGHT -- 1,749 LBS (APPROX)
CUBE -- 103.4 CUBIC FEET (APPROX)

30MM CARTRIDGE PALLET

24 BOXES OF 30MM CARTRIDGES (2904 RDS) -- 3,204 LBS (APPROX)
PALLET AND DUNNAGE -- 164 LBS

TOTAL WEIGHT -- 3,308 LBS (APPROX)
CUBE -- 48.0 CUBIC FEET (APPROX)

2.75 INCH ROCKETF PALLETT

12 CONTAINERS (48 ROCKETS) -- 2,500 LBS (APPROX)
CUBE -- 57.1 CUBIC FEET (APPROX)

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PALLETT UNIT DETAILS
PROJECT DA 16-93
### Authorized Armament Configurations for the AH64 Apache Helicopter

<table>
<thead>
<tr>
<th>Number</th>
<th>Right Wing Stores</th>
<th>Turret</th>
<th>Left Wing Stores</th>
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<td>Outboard</td>
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<td>1,200 AOS 30MM CTG</td>
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**Note:** Armament configuration number 4 is depicted within this drawing as one Apache rear arm. If loading other armament configurations follow these same procedures.
UNIVERSAL TIEDOWN ANCHOR (FRONT VIEW)

UNIVERSAL TIEDOWN ANCHOR: IF THE TACTICAL VEHICLES BEING USED ARE NOT EQUIPPED WITH TIEDOWN ANCHORS, THE UNIVERSAL TIEDOWN ANCHOR SHOWN ABOVE MAY BE INSTALLED. SEE TB 9-2300-280-30 FOR VEHICLE MODIFICATION PROCEDURES AND INSTALLATION OF THE TIEDOWN ANCHOR. THESE TIEDOWN ANCHORS ARE TO BE INSTALLED IN THE SIDE WALLS AND END WALLS OF CARGO TRUCKS AND CARGO TRAILERS HAVING A LOAD CAPACITY OF 5 TONS OR LESS.