STATIC PULL TEST OF TIEDOWN ANCHORS
ON M127 12-TON STAKE SEMITRAILER
The U.S. Army Defense Ammunition Center and School (USADACS) was requested by 3d Battalion, 9th Field Artillery, Fort Sill, OK, thru the U.S. Army Armament, Munitions and Chemical Command (AMCCDM), to evaluate the tiedown anchors on the M127, 12-ton semitrailer. The Fort Sill unit has been assigned an exercise which includes tying down of the PERSHING II, weighing almost 15,000 pounds, on the M127 semitrailer. The Fort Sill unit requested the 5,000-pound capacity tiedown fitting be pull-tested to verify its load rating.
20. (cont)

The tiedown anchor "modification kit" (FSN 2510-00-134-1130) was ordered and installed on the M127 5-ton semitrailer. Using a dynamometer to measure the pull, a static pull of 5,000 pounds was exerted in a lateral, longitudinal, vertical and 45 degree direction off the tiedown anchor. The tiedown anchor restrained the applied loads without yielding or sustaining any damage.
STATIC PULL TEST OF TIEDOWN ANCHORS
ON M127, 12-TON STAKE SEMITRAILER

REPORT NO. EVT 18-87

EVALUATION DIVISION
U.S. Army Defense Ammunition Center and School
Savanna, IL 61074-9639
The U.S. Army Defense Ammunition Center and School (USADACS) was requested by 3d Battalion, 9th Field Artillery, Fort Sill, OK, thru the U.S. Army Armament, Munitions and Chemical Command (AMCOM), to evaluate the tiedown anchors on the M127, 12-ton semitrailer. The Fort Sill unit has been assigned an exercise which includes tying down of the PERSHING II, weighing almost 15,000 pounds, on the M127 semitrailer. The Fort Sill unit requested the 5,000-pound capacity tiedown fitting be pull-tested to verify its load rating.

The tiedown anchor 'modification kit' (F1 2510-00-134-1130) was ordered and installed on the M127 5-ton semitrailer. Using a dynamometer to measure the pull, a static pull of 5,000 pounds was exerted in a lateral, longitudinal, vertical and 45 degree direction off the tiedown anchor. The tiedown anchor restrained the applied loads without yielding or sustaining any damage.
AVAILABILITY NOTICE

A copy of this report is furnished each attendee on automatic distribution. Additional copies or authority for reprinting may be obtained by written request from Director, U.S. Army Defense Ammunition Center and School. ATTN: SMCAC-DEV, Savanna, IL 61074-9639.

DISTRIBUTION INSTRUCTIONS

Destroy this report when no longer needed. Do not return.

***

Citation of trade names in this report does not constitute an official endorsement.

***

The information contained herein will not be used for advertising purposes.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>PART</th>
<th>CONTENTS</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>GENERAL</td>
<td></td>
</tr>
<tr>
<td>A.</td>
<td>INTRODUCTION</td>
<td>I-1</td>
</tr>
<tr>
<td>B.</td>
<td>AUTHORITY</td>
<td>I-1</td>
</tr>
<tr>
<td>C.</td>
<td>OBJECTIVE</td>
<td>I-1</td>
</tr>
<tr>
<td>D.</td>
<td>CONCLUSIONS</td>
<td>I-1</td>
</tr>
<tr>
<td>E.</td>
<td>RECOMMENDATIONS</td>
<td>I-2</td>
</tr>
<tr>
<td>II</td>
<td>LIST OF ATTENDEES</td>
<td>II-1</td>
</tr>
<tr>
<td>III</td>
<td>TEST PROCEDURES</td>
<td>III-1</td>
</tr>
<tr>
<td>IV</td>
<td>TEST RESULTS</td>
<td>IV-1</td>
</tr>
</tbody>
</table>
PART I

GENERAL

A. INTRODUCTION.

The Fort Sill unit has been assigned an exercise that includes tying down and movement of the PERSHING II first stage propulsion section, weighing almost 15,000 pounds. The item is to be moved on the M127, 12-ton stake semitrailer with tiedown anchors installed.

The U.S. Army Defense Ammunition Center and School (USADACS) performed static pull tests on the tiedown anchors installed on the M127. A static pull of 5,000 pounds was administered to the fitting in a longitudinal, lateral, vertical, and a 45 degree direction.

B. AUTHORITY.

Testing has been accomplished in accordance with mission responsibilities delegated by the U.S. Army Armament, Munitions and Chemical Command (AMCCOM). Reference is made to the following:


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

3. Telephone request from 3d Battalion, 9th Field Artillery, Fort Sill, OK.

C. OBJECTIVE.

Based on the static pull tests performed on the tiedown anchors of the M127, it was determined the static pull of 5,000 pounds does not exceed the 5,000-pound rated capacity and is acceptable. The static pull of 5,000 pounds applied in a lateral, longitudinal, vertical and 45 degree direction.
off the tiedown anchor on the M127, 12-ton stake semitrailer created no
damage or permanent deformation.

E. RECOMMENDATIONS.

The "modification kit" (NSN 2510-00-134-1130) supplies 48 tiedown
anchors for the M127, 12-ton stake semitrailer. Based on the pull tests
performed, no problems were experienced with the tiedown anchors and a rated
capacity of 5,000 pounds per tiedown anchor is acceptable. Recommend
Drawing 19-48-8157-GM17PRI, covering procedures for PERSHING II first stage
propulsion section M-275 in metal container, remain as published.
### ATTENDEES

**PART II**

**STATIC PULL TEST, 29 MAY 1987**

<table>
<thead>
<tr>
<th>NAME</th>
<th>ORGANIZATION AND ADDRESS</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melvin Daemmer</td>
<td>U.S. Army Defense Ammunition Center and School</td>
<td>AV 585-8927</td>
</tr>
<tr>
<td></td>
<td>ATTN: SMCAC-DEO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Savanna, IL 61074-9639</td>
<td></td>
</tr>
<tr>
<td>John Simons</td>
<td>U.S. Army Defense Ammunition Center and School</td>
<td>AV 585-8927</td>
</tr>
<tr>
<td></td>
<td>ATTN: SMCAC-DEO</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Savanna, IL 61074-9639</td>
<td></td>
</tr>
<tr>
<td>Jerome Krohn</td>
<td>U.S. Army Defense Ammunition Center and School</td>
<td>AV 585-8908</td>
</tr>
<tr>
<td></td>
<td>ATTN: SMCAC-DEV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Savanna, IL 61074-9639</td>
<td></td>
</tr>
</tbody>
</table>
PART III

TEST PROCEDURES

STATIC PULL TEST

In performing the static pull test on a tiedown assembly, a predetermined force is applied to the securement device. The predetermined force, after application to the tiedown assembly, must be held at a predetermined force for a period of time.

In preparation for the static pull tests on the tiedown anchors on the M127 semitrailer, the modification kit which includes 48 tiedown anchors and frame reinforcing parts were installed on an M127 semitrailer by the USADACS Pilot Model Shop.

An arbitrary tiedown anchor was selected for testing. A 50,000-pound capacity dynamometer with a 10-inch diameter direct-read dial provided the force being applied. The dynamometer was connected to the M127 semitrailer tiedown anchor with a clevis. The opposite end of the dynamometer was secured to the 10,000-pound rough terrain forklift with a steel chain assembly. The hydraulic lifting cylinders of the 10,000-pound forklift were utilized to apply and maintain the 5,000-pound test load to the tiedown anchors. The 5,000-pound load was maintained for a period of three minutes before releasing.

The direction of force is relative to the longitudinal axis of the M127 semitrailer. The 5,000-pound pulls accomplished were a lateral, longitudinal, vertical, and 45 degree (inward and upward) from the tiedown anchor.

The load was applied in a slow, steady rate until the 5,000-pound load requirement was met. The tiedown anchor and the affected M127 semitrailer structural members were being constantly inspected and the data collected. These data are recorded in PART IV, following.
PART IV
TEST DATA
SYNOPSIS OF TEST

STATIC PULL TEST

Static pull tests of 5,000 pounds were performed on a tiedown anchor on the M127 stake semitrailer. The 5,000-pound force was applied in a lateral, longitudinal, vertical, and 45 degree directional pull inward and upward relative to the tiedown anchor. Tension was maintained at 5,000 pounds for a period of three minutes.

Inspection during and following each directional pull showed no permanent deformation or damage as a result of the test.
| Photo No. 2.  View of M127 with tiedown anchors installed. |
DEFENSE AMMUNITION CENTER AND SCHOOL - SAVANNA, IL

Photo No. 7. View of 5,000-pound static pull on a tie-down anchor in a 45 degree direction.