FINAL REPORT
JULY 2007

REPORT NO. 06-04G

EVALUATION TRANSPORTABILITY TESTING OF THE JOINT MODULAR INTERMODAL PLATFORM (JMIP) UNIT #4 TP-94-01, "TRANSPORTABILITY TESTING PROCEDURES"

Prepared for:

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REPORT NO. 06-04G **JULY 2007**

EVALUATION TRANSPORTABILITY TESTING OF THE JOINT MODULAR INTERMODAL PLATFORM (JMIP) UNIT #4 TP-94-01, REV. 2, JUNE 2004, "TRANSPORTABILITY TESTING PROCEDURES"

ABSTRACT

The U.S. Army Defense Ammunition Center (DAC), Validation Engineering Division (SJMAC-DEV), was tasked by the Logistics Research and Engineering Directorate (AMSRD-AAR-AIL-F), Picatinny Arsenal, NJ to conduct evaluation transportability testing on the Joint Modular Intermodal Platform (JMIP) Unit #4 manufactured by SEA BOX, Inc, East Riverton, NJ. The testing was conducted in accordance with TP-94-01, Revision 2, June 2004 "Transportability Testing Procedures." The test payload consisted of pallets of 155MM Separate Loading Projectiles (SLPs).

The objective of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval when transportability tested in accordance with TP-94-01, Revision 2, June 2004.

The following observations resulted from the testing of JMIP Unit #4:

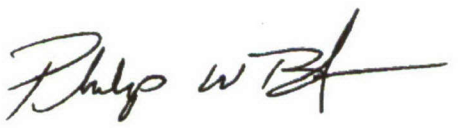
1. Forward and aft web restraints (crossing straps) were used at each end of the 155MM SLP payload to reduce the stress imposed on the intermediate gates during testing. Traditionally, forward and aft web restraints are not used on 155MM SLP payloads.
2. The SEA BOX intermediate gates were used to restrain the payload.
3. Prior to the start of testing, the bolts holding the rear bumpers were tightened. The bolts on the rear bumpers were loose at the end of the testing.

4. The JMIP slid side-to-side throughout the Shipboard Transportation Simulator (STS) testing. The movement of the adjustment bolt on the cams occurred during the testing. Future designs of the cam locking devices should prevent the bolts from moving in and out.
5. The scuff sleeve on one (1) strap was abraded due to contact with the container wall during the STS testing.
6. The intermediate gates do not have a full-height flat surface on each side. Therefore, prior to the start of testing, dunnage had to be added between the pallets and the intermediate gates.
7. The connection between the JMIC interface rings and the intermediate gates had enough tolerance to allow the gates and dunnage to go past vertical during testing.
8. The JMIC interface rings on the JMIP bent back during testing, but were still operational following removal of the payload.
9. The engage/disengage mechanism on the intermediate gate is only accessible from one side. Therefore, the gates have to be properly oriented or the mechanism may be blocked by the payload. The gate design should be uniform, with access to the mechanism on each side so that they do not have a front or back.
10. The operation of the engage/disengage mechanism was unsafe when installing/removing the intermediate gates due to the problems with finger pinching.
11. The intermediate gates need a location where nails can be driven in and cinched to prevent movement of the dunnage between the gate and the payload.

The JMIP, as currently designed, is adequate to be used to transport the 155MM SLPs when using the intermediate gates and cross straps on the end of the payload during the demonstrations.

The operational condition of the JMIP should be closely monitored during the demonstrations. Also, the Defense Ammunition Center, Transportation Engineering Division, shall be consulted for the ammunition loading and bracing instructions.

Prepared by:



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REPORT NO. 06-04G

Evaluation Transportability Testing of the
Joint Modular Intermodal Platform (JMIP) Unit #4
TP-94-01, Revision 2, June 2004 "Transportability Testing Procedures"

TABLE OF CONTENTS

PART 1 – INTRODUCTION

A. BACKGROUND. The U.S. Army Defense Ammunition Center (DAC), Validation Engineering Division (SJMAC-DEV), was tasked by the Logistics Research and Engineering Directorate (AMSRD-AAR-AIL-F), Picatinny Arsenal, NJ to conduct evaluation transportability testing on the Joint Modular Intermodal Platform (JMIP) Unit #4 manufactured by SEA BOX, Inc, East Riverton, NJ. The testing was conducted in accordance with TP-94-01, Revision 2, June 2004 "Transportability Testing Procedures." The test payload consisted of pallets of 155MM Separate Loading Projectiles (SLPs).

B. AUTHORITY. This test was conducted IAW mission responsibilities delegated by the U.S. Army Joint Munitions Command (JMC), Rock Island, IL. Reference is made to the following:

1. AR 740-1, 15 June 2001, Storage and Supply Activity Operation.

2. OSC-R, 10-23, Mission and Major Functions of U.S. Army Defense Ammunition Center (DAC) 21 Nov 2000.

C. OBJECTIVE. The objective of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval when transportability tested in accordance with TP-94-01, Revision 2, June 2004.

D. OBSERVATIONS.

1. Forward and aft web restraints (crossing straps) were used at each end of the 155MM SLPs payload to reduce the stress imposed on the intermediate gates during testing. Traditionally, forward and aft web restraints are not used on 155MM SLP payloads.

2. The SEA BOX intermediate gates were used to restrain the payload.

3. Prior to the start of testing, the bolts holding the rear bumpers were tightened. The bolts on the rear bumpers were loose at the end of the testing.

4. The JMIP slid side-to-side throughout the Shipboard Transportation Simulator (STS) testing. The movement of the adjustment bolt on the cams occurred during the testing. Future designs of the cam locking devices should prevent the bolts from moving in and out.

5. The scuff sleeve on one strap was abraded due to contact with the container wall during the STS testing.

6. The intermediate gates do not have a full-height flat surface on each side. Prior to the start of testing, dunnage had to be added between the pallets and the intermediate gates.

7. The connection between the JMIC interface rings and the intermediate gates had enough tolerance to allow the gates and dunnage to go past vertical during testing.

8. The JMIC interface rings on the JMIP bent back during testing, but were still operational following removal of the payload.

9. The engage/disengage mechanism on the intermediate gate is only accessible from one side. Therefore, the gates have to be properly oriented or the mechanism may be blocked by the payload. The gate design should be uniform, with access to the mechanism on each side so that they do not have a front or back.

10. The operation of the engage/disengage mechanism was unsafe when installing/removing the intermediate gates due to the problems with finger pinching.

11. The intermediate gates need a location where nails can be driven in and cinched to prevent movement of the dunnage between the gate and the payload.

E. CONCLUSIONS.

1. The purpose of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval. Testing has identified deficiencies with the current design.

2. The JMIP, as currently designed, is adequate to be used to transport the 155MM SLPs when using the intermediate gates and cross straps on the end of the payload during the demonstrations.

3. The operational condition of the JMIP should be closely monitored during the demonstrations. Also, the Defense Ammunition Center, Transportation Engineering Division, shall be consulted for the ammunition loading and bracing instructions.

PART 2 - ATTENDEES

ATTENDEE	MAILING ADDRESS
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Tom Sieffert (973) 724-2115	U.S. Army Armament Research, Development and Engineering Center Logistics Research & Engineering Dir. ATTN: AMSRD-AAR-AIL-F Picatinny Arsenal, NJ 07806-5001

PART 3 - TEST EQUIPMENT

1. Joint Modular Intermodal Platform Unit #4
   Manufactured by SEA BOX, Inc., East Riverton, NJ
   Model Number: J-MIP
   Serial Number: 00004
   Date of Manufacture: 26 January 2007
   Tare Weight: 4,240 lbs (without straps, rings and end gates)

2. Joint Modular Intermodal Container
   Designed by Naval PHST Center - Earle, NJ
   Length: 51-3/4 inches
   Width: 43-3/4 inches
   Height: 43 inches

3. Palletized Load System Truck
   Model #: M1074
   Manufactured by Oshkosh Truck Corporation, Oshkosh, WI
   ID #: 10T2P1NH6N1044011
   NSN: 2320-01-304-2277
   Serial #: 44011
   Curb Weight: 55,000 lbs

4. Truck, Tractor, MTV, M1088 A1
   ID #: J0231
   NSN: 2320 01 447 3893
   VSN: NL1FR5
   MFG Serial #: T-018447EFJM
   Weight: 19,340 lbs

5. Truck, Tractor, MTV, M1088 A1
   ID #: J0229
   NSN: 232001-447-3893
   VSN: NL1FSC
   MFG Serial #: T-018488EFJM
   Weight: 19,340 lbs

6. Semitrailer, flatbed, breakbulk/container transporter, 22.5 ton
   Model #: M871
   Manufactured by Southwest Truck Body, St. Louis, MO
   ID #: NX03PJ – 0063
   NSN: 2330 00 122 6799
   Weight: 15,630 lbs

7. Semitrailer, flatbed, breakbulk/container transporter, 34 ton
   Model #: M872A1
   Manufactured by Heller Truck Body Corporation, Hillsdale, NJ
   ID #: 11-1505 NX05NZ
   NSN: 2330 01 109 8006
   Weight: 19,240 lbs

8. Railcar DODX 42353
   Manufactured by Thrall Car
   Length: 89 feet – 4 inches
   Empty Weight: 85,000 lbs.

7. Intermodal Container
   ID # SBIU 2123073
   Date of Manufacture: 01/06
   Tare Weight: 4,695 lbs
   Maximum Gross Weight: 67,200 lbs

PART 4 - TEST PROCEDURES

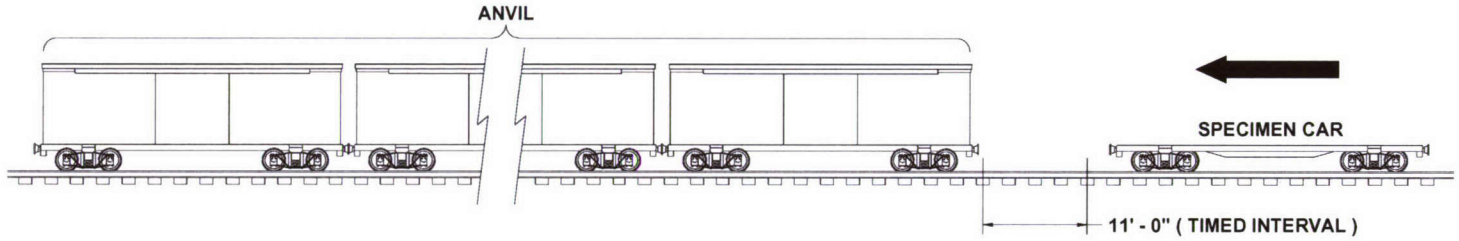
The test procedures outlined in this section were extracted from TP-94-01, "Transportability Testing Procedures," Revision 2, June 2004, for validating tactical vehicles and outloading procedures used for shipping munitions by tactical truck, railcar, and ocean-going vessel.

The rail impact will be conducted with the test load secured directly to the railcar. Inert (non-explosive) items were used to build the load. The test loads were prepared using the blocking and bracing procedures proposed for use with munitions (***see Part 6 – Drawings for procedures***). The weight and physical characteristics (weights, physical dimensions, center of gravity, etc.) of the test loads were similar to live (explosive) ammunition.

A. RAIL TEST. RAIL IMPACT TEST METHOD. The test load or vehicle will be secured to a flatcar. The equipment needed to perform the test will include the specimen (hammer) car, four empty railroad cars connected together to serve as the anvil, and a railroad locomotive. The anvil cars will be positioned on a level section of track with air and hand brakes set and with draft gears compressed. The locomotive unit will push the specimen car toward the anvil at a predetermined speed, then disconnect from the specimen car approximately 50 yards away from the anvil cars allowing the specimen car to roll freely along the track until it strikes the anvil. This will constitute an impact. Impacting will be accomplished at speeds of 4, 6, and 8.1 mph in one direction and at a speed of 8.1 mph in the reverse direction. The tolerance for the speeds is plus 0.5 mph, minus 0.5 mph for the 4 mph and 6 mph impacts, and plus 0.5 mph, minus 0 mph for the 8.1 mph impacts. The impact speeds will be determined by using an electronic counter to measure the time for the specimen car to traverse an 11-foot distance immediately prior to contact with the anvil cars (see Figure 1).

ASSOCIATION OF AMERICAN RAILROADS (AAR)

STANDARD TEST PLAN



4 BUFFER CARS (ANVIL)
WITH DRAFT GEAR
COMPRESSED AND AIR BRAKES IN A SET POSITION

ANVIL CAR TOTAL WT. 250,000 LBS (APPROX)

SPECIMEN CAR IS RELEASED BY SWITCH ENGINE TO
ATTAIN: IMPACT NO. 1 @ 4 MPH
IMPACT NO. 2 @ 6 MPH
IMPACT NO. 3 @ 8.1 MPH

THEN THE CAR IS REVERSED AND RELEASED BY SWITCH ENGINE TO ATTAIN:

IMPACT NO. 4 @ 8.1 MPH

Figure 1. Rail Impact Sketch

B. ON/OFF ROAD TEST.

1. **HAZARD COURSE**. The test load or vehicle will be transported over the 200-foot-long segment of concrete-paved road consisting of two series of railroad ties projecting 6 inches above the level of the road surface. The hazard course will be traversed two times (see Figure 2).

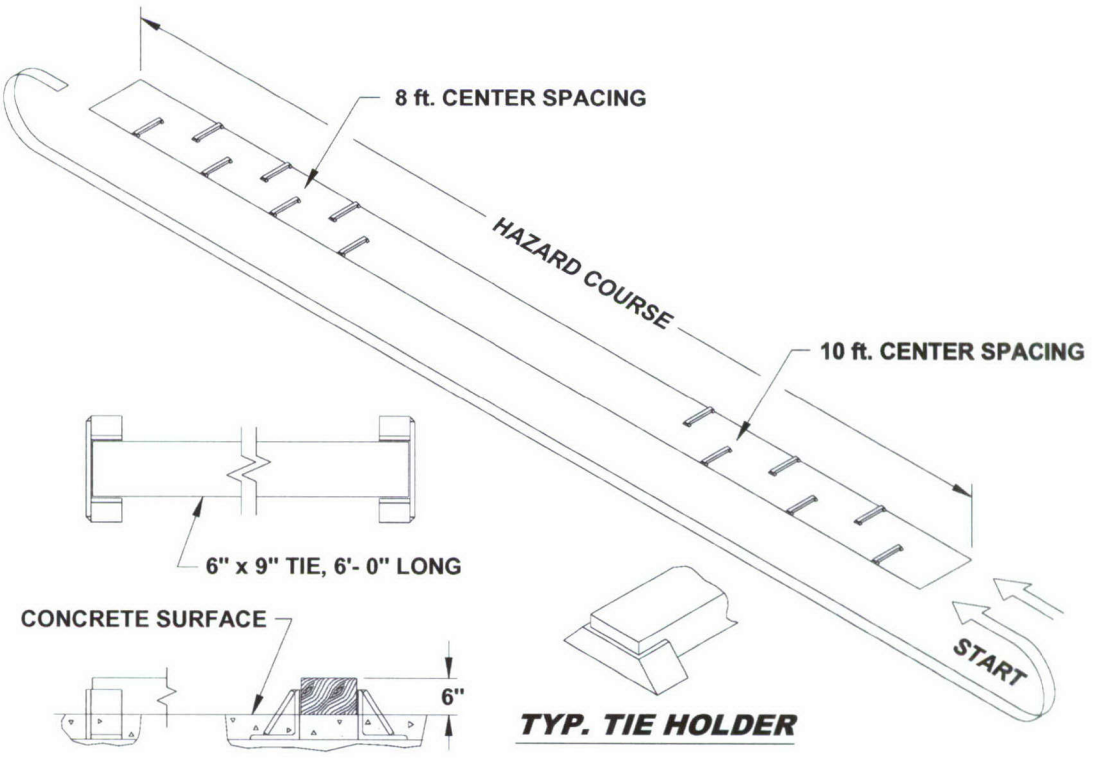


Figure 2. Hazard Course Sketch

a. The first series of 6 ties are spaced on 10-foot centers and alternately positioned on opposite sides of the road centerline for a distance of 50 feet.

b. Following the first series of ties, a paved roadway of 75 feet separates the first and second series of railroad ties.

c. The second series of 7 ties are spaced on 8-foot centers and alternately positioned on opposite sides of the road centerline for a distance of 48 feet.

d. The test load is driven across the hazard course at speeds that will produce the most violent vertical and side-to-side rolling reaction obtainable in traversing the hazard course (approximately 5 mph).

2. ROAD TRIP. The test load or vehicle will be transported for a distance of 30 miles over a combination of roads surfaced with gravel, concrete, and asphalt. The test route will include curves, corners, railroad crossings and stops and starts. The test load or vehicle will travel at the maximum speed for the particular road being traversed, except as limited by legal restrictions.

3. PANIC STOPS. During the road trip, the test load or vehicle will be subjected to three (3) full airbrake stops while traveling in the forward direction and one in the reverse direction while traveling down a 7 percent grade. The first three stops are at 5, 10, and 15 mph while the stop in the reverse direction is approximately 5 mph. This testing will not be required if the Rail Impact Test is performed.

4. WASHBOARD COURSE. The test load or vehicle will be driven over the washboard course at a speed that produces the most violent response in the vertical direction.

C. OCEAN-GOING VESSEL TEST. Shipboard Transportation Simulator (Test Method 5). The Shipboard Transportation Simulator (STS) is used for testing loads in 8-foot-wide by 20-foot-long intermodal freight containers. The specimen shall be positioned onto the STS and securely locked in place using the cam lock at each corner. Using the procedure detailed in the operating instructions, the STS shall begin oscillating at an angle of 30 degrees, plus or minus 2 degrees, either side of vertical center and a frequency of 2 cycles-per-

minute (30 seconds, plus or minus 2 seconds) for a duration of two (2) hours. This frequency shall be observed for apparent defects that could cause a safety hazard. The frequency of oscillation shall then be increased to 4 cycles-per-minute (15 seconds, plus or minus one second per cycle) and the apparatus operated for two (2) hours. If an inspection of the load does not indicate an impending failure, the frequency of oscillation shall be further increased to 5 cycles-per-minute (12 seconds, plus or minus one second per cycle), and the apparatus operated for four (4) hours. The operation does not necessarily have to be continuous; however, no changes or adjustments to the load or load restraints shall be permitted at any time during the test. After once being set in place, the test load (specimen) shall not be removed from the apparatus until the test has been completed or is terminated.

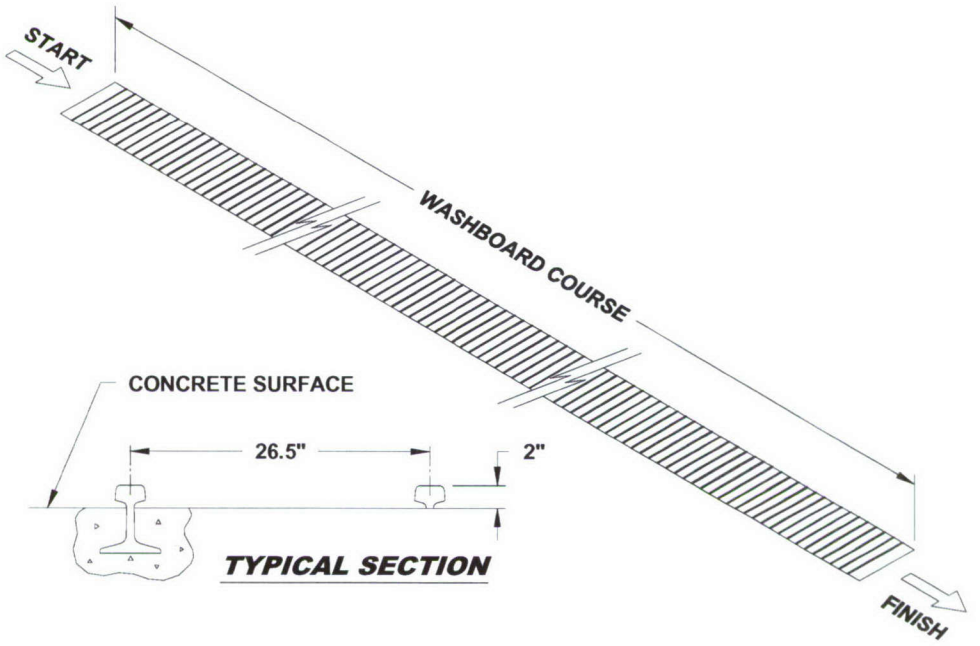


Figure 3. Washboard Course Sketch

PART 5 - TEST RESULTS

5.

Test Specimen: SEABOX Joint Modular Intermodal Platform Unit #4

Payload: 120 MM Tank Ammunition with full width end gates

Testing Date: 6-7 June 2007

Gross Weight: 25, 200 lbs (JMIP and payload)

Note:

1. Forward and aft web restraints (crossing straps) were used at each end of the 155MM SLP payload to reduce the stress imposed on the intermediate gates during testing. Traditionally crossing straps across the end are not used on 155MM SLP payloads.
2. The SEA BOX intermediate gates were used to restrain the payload.
3. Prior to the start of testing, the bolts holding the rear bumpers were tightened.

A. RAIL TEST.

Photo 1. Rail Impact Testing of the JMIP (Prior to Testing)

Description	Weight
Flatcar Number: DODX 42353	85,000 lbs.
JMIP	25,200 lbs.
M1 Flatrack with MLRS Pods	28,265 lbs.
Total Specimen Wt.	138,465 lbs.
Buffer Car (four cars)	257,900 lbs.

Figure 4.

Remarks: Figure 4 lists the test components and weights of the items used during the Rail Impact Tests.

Impact Number	Avg. Velocity (mph)
1	3.6
2	6.7
3	8.0
4	8.0
5	8.2
6	8.2

Figure 5.

Remarks:

1. Figure 5 lists the average speeds of the specimen car immediately prior to impact with the anvil. Impact #6 is the reverse impact.
2. Impacts #3 and #4 were determined to be a "no test" due to the insufficient velocity at impact. The tests were repeated.
3. The JMIP was secured directly to the railcar for testing.
4. Following Impact #2 the payload moved in the direction of impact and the payload nested. The dunnage on the non-impact end was loose. The

intermediate gates do not have provisions to nail through to hold the dunnage in place.

5. Following Impact #6 the payload slid in the direction of impact. The intermediate gate was no longer vertical.

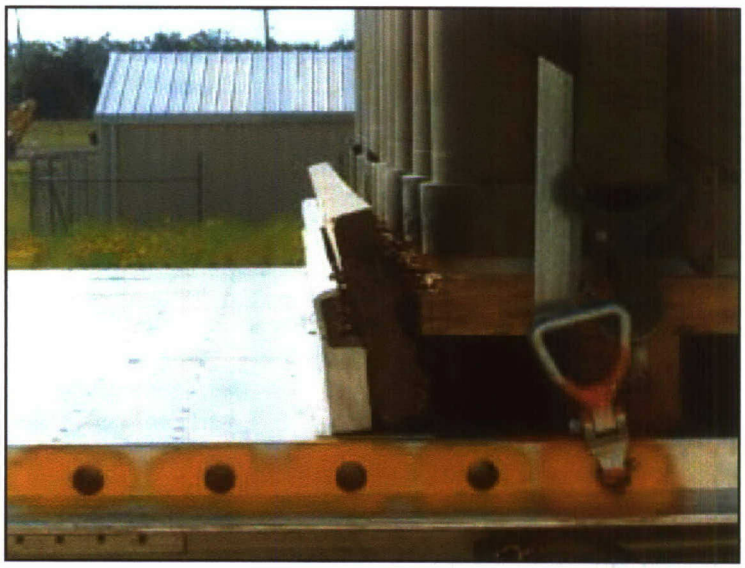


Photo 2. Intermediate Gate Following Impact

B. ON/OFF ROAD TESTS.

1. HAZARD COURSE.

Photo 3. Hazard Course Testing of the JMIP

Pass No.	Elapsed Time	Avg. Velocity (mph)
1	26 Seconds	6
2	26 Seconds	6

Figure 6.

Remarks:

1. Figure 6 lists the average speeds of the test load through the Hazard Course.
2. The JMIP was secured to the M871 trailer.
3. Inspection did not reveal any damage to the JMIP.

2. ROAD TRIP:

Remarks:

1. The Road Trip was conducted between the Hazard Course Passes #2 and #3.
2. Inspection following the Road Trip revealed no damage or movement of the JMIP.

3. PANIC STOPS: Testing was not required since the load was rail impact tested.

4. HAZARD COURSE:

Pass No.	Elapsed Time	Avg. Velocity (mph)
3	26 Seconds	6
4	25 Seconds	6

Figure 7.

Remarks:

1. Figure 7 lists the average speeds of the test load through the Hazard Course.
2. Inspection did not reveal any damage to the JMIP.

5. **WASHBOARD COURSE**:

Photo 4. Washboard Course Testing of the JMIP

Remarks: Inspection following the Washboard Course revealed no damage to the JMIP.

C. **RAIL TEST.**

Photo 5. Rail Impact Testing of the JMIP (Prior to Testing)

Description	Weight
Flatcar Number: DODX 42353	85,000 lbs.
JMIP in the Intermodal Container	29,895 lbs.
M1 Flatrack with MLRS Pods	28,265 lbs.
Total Specimen Wt.	143,160 lbs.
Buffer Car (four cars)	257,900 lbs.

Figure 8.

Remarks: Figure 8 lists the test components and weights of the items used during the Rail Impact Tests.

Impact Number	Avg. Velocity (mph)
1	4.2
2	6.9
3	8.6
4	8.6

Figure 9.

Remarks:

1. Figure 9 lists the average speeds of the specimen car immediately prior to impact with the anvil. Impact #4 is the reverse impact.
2. The JMIP was secured in the intermodal container.
3. Following Impact #3 the payload moved in the direction of impact 0.5-0.75 inches.
4. Following Impact #4 the payload moved in the direction of the impact 0.5-0.75 inches. The intermediate gates bowed in the center and the rear bumpers compressed.

D. ON/OFF ROAD TESTS.

1. HAZARD COURSE.

Photo 6. Hazard Course Testing of the JMIP

Pass No.	Elapsed Time	Avg. Velocity (mph)
1	25 Seconds	6
2	24 Seconds	6

Figure 10.

Remarks:

1. Figure 10 lists the average speeds of the test load through the Hazard Course.
2. The JMIP was secured in the intermodal container.
3. Inspection did not reveal any damage to the JMIP.

2. ROAD TRIP:

Remarks:

1. The Road Trip was conducted between the Hazard Course Passes #2 and #3.

2. Inspection following the Road Trip revealed no damage or movement of the JMIP.

3. **PANIC STOPS:** Testing was not required since the load was rail impact tested.

4. **HAZARD COURSE:**

Pass No.	Elapsed Time	Avg. Velocity (mph)
3	24 Seconds	6
4	24 Seconds	6

Figure 11.

Remarks:

1. Figure 11 lists the average speeds of the test load through the Hazard Course.
2. Inspection did not reveal any damage to the JMIP.

5. **WASHBOARD COURSE:**

Photo 7. Washboard Course Testing of the JMIP

Remarks:

1. Inspection following the Washboard Course revealed no damage to the JMIP.
2. The cam on the driver's side backed off during testing.

E. SHIPBOARD TRANSPORTATION SIMULATION (STS).

Remarks:

1. The JMIP slid side-to-side throughout the STS testing. The movement of the adjustment bolt on the cams occurred during the testing. Future designs of the cam locking devices should prevent the bolts from moving in and out.

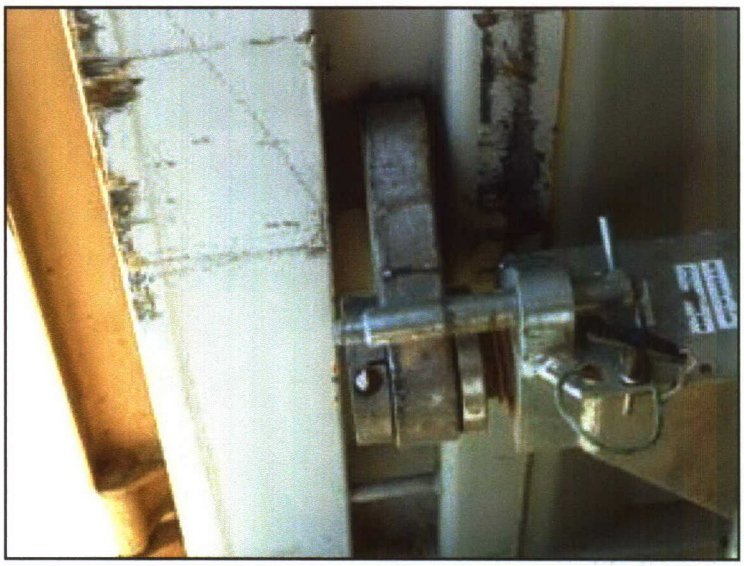


Photo 8. Gap from Cam Movement

2. The scuff sleeve on one strap was abraded due to contact with the container wall.

F. OBSERVATIONS:

1. The intermediate gates do not have a full height flat surface on each side. Prior to the start of testing dunnage had to be added between the pallets and the intermediate gates.

2. The connection between the JMIC interface rings and the intermediate gates had enough tolerance to allow the gates and dunnage to go past vertical during testing.

Photo 9. Dunnage and Gates Past Vertical

3. The JMIC interface rings on the JMIP bent back during testing, but were still operational following removal of the payload.

Photo 10. Bent JMIC Interface Rings

4. The engage/disengage mechanism on the intermediate gate is only accessible from one side. Therefore, the gates have to be properly oriented or the mechanism may be blocked by the payload. The gate design should be

uniform, with access to the mechanism on each side so that they do not have a front or back.

5. The operation of the engage/disengage mechanism was unsafe when installing/removing the intermediate gates due to the problems with finger pinching.

6. The intermediate gates need a location where nails can be driven in and cinched to prevent movement of the dunnage between the gate and the payload.

7. The bolts on the rear bumpers were loose at the end of the testing.

8. Movement of the adjustment bolt on the cams occurred during the testing. Future designs of the cam locking devices should prevent the bolts from moving in or out.

G. CONCLUSIONS:

1. The purpose of the testing was to identify the adequacy of the JMIP for demonstration use and not final approval. Testing has identified deficiencies with the current design.

2. The JMIP, as currently designed, is adequate, to be used to transport the 155MM SLPs when using the intermediate gates and cross straps on the end of the payload during the demonstrations.

3. The operational condition of the JMIP should be closely monitored during the demonstrations. Also, the Defense Ammunition Center, Transportation Engineering Division, shall be consulted for the ammunition loading and bracing instructions.

PART 6 – DRAWINGS

The following drawing represents the load configuration that was subjected to the test criteria.

TEST SKETCH

LOADING AND BRACING OF CYLINDRICAL METAL CONTAINERS UNITIZED ON METAL PALLETS ON THE JOINT MODULAR INTERMODAL PLATFORM (JMIP)

THIS FOUR PAGE DOCUMENT DEPICTS INERTLY LOADED 155MM PROJECTILES ON A SEABOX JMIP FOR TRANSPORTABILITY TESTING

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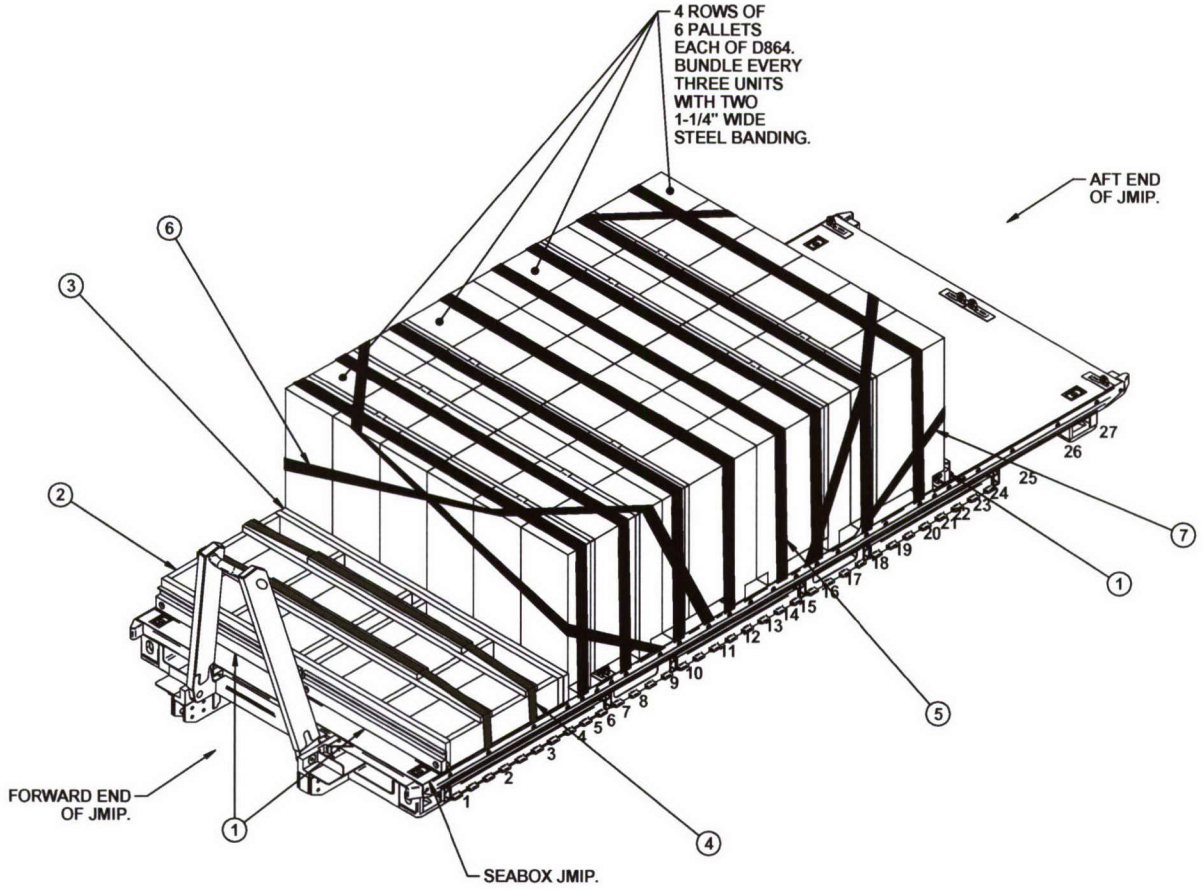


ISOMETRIC VIEW

NOTE: FORWARD AND AFT END RESTRAINTS NOT WOULD NORMALLY NOT BE REQUIRED FOR THIS LOAD ON A CROP. DUE TO ARDEC-LREDS REQUEST, THE RESTRAINT STRAPS ARE ADDED TO TRY AND PREVENT DAMAGE TO THE INTERMEDIATE GATES. EVALUTION TESTING AT THIS POINT TO IS VALIDATE ONLY FOR SOLDIER DEMONSTRATIONS.

KEY NUMBERS

① INTERMEDIATE GATE (4 REQD). ALIGN HOLES IN ENDS OF GATES WITH JMIC TIEDOWN PROVISIONS ON DECK OF THE JMIP AT THE LOCATIONS SHOWN. SEE DETAIL ON PAGE 3.

② FORWARD BLOCKING ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 3. CENTER AGAINST FORWARD INTERMEDIATE GATE.

③ FORWARD FILLER, 1" OR 2" X 8" X 7'-4" (AS REQD). CENTER AGAINST AFT INTERMEDIATE GATES. TOENAIL TO FORWARD BLOCKING ASSEMBLY W/4-10d NAILS.

④ HOLD-DOWN STRAP, 3-INCH WIDE WEB STRAP (9 REQD). INSTALL EACH STRAP TO EXTEND FROM THE DESIGNATED TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, OVER THE TOP OF THE D864 PALLET UNITS, TO THE CORRESPONDING TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

⑤ FORWARD RETAINER STRAP, 2-INCH WIDE WEB STRAP ASSEMBLY (2 REQD). INSTALL TO EXTEND FROM THE SECOND TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, OVER THE TOP OF THE FORWARD BLOCKING ASSEMBLY STRAPPING BOARD, TO THE SECOND TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. INSTALL SECOND STRAP TO EXTEND FROM THE THIRD TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, OVER THE TOP OF THE FORWARD BLOCKING ASSEMBLY STRAPPING BOARD, TO THE THIRD TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION STRAP.

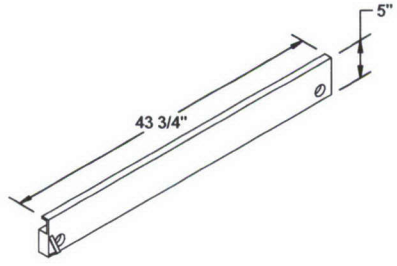
⑥ FORWARD END RESTRAINT STRAP, 3-INCH WIDE WEB STRAP (2 REQD). INSTALL EACH STRAP TO EXTEND FROM THE NINTH TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, AROUND THE SIDE OF THE FORWARD D864 PALLET UNITS, OVER THE TOP OF THE D864 PALLET UNITS, TO THE ELEVENTH TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION.

⑦ AFT END RESTRAINT STRAP, 3-INCH WIDE WEB STRAP (2 REQD). INSTALL EACH STRAP TO EXTEND FROM THE EIGHTEENTH TIEDOWN PROVISION ON ONE SIDE OF THE JMIP, AROUND THE SIDE OF THE AFT D864 PALLET UNITS, OVER THE TOP OF THE AFT D864 PALLET UNITS, TO THE SIXTEENTH TIEDOWN PROVISION ON THE OPPOSITE SIDE OF THE JMIP. ALIGN SCUFF SLEEVES OVER ALL SHARP EDGES AND FIRMLY TENSION.

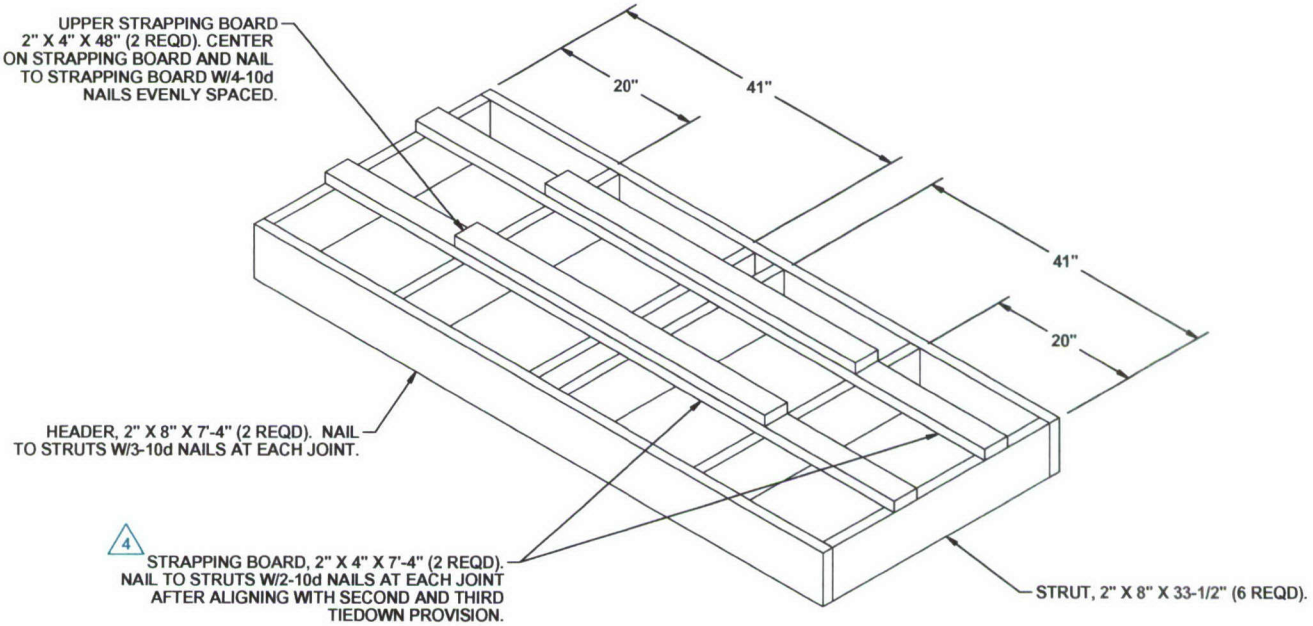
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 8"	23 39	16 52
NAILS	NO. REQD	POUNDS
10d (3")	60	.91
2" WEB STRAP TIEDOWN ASSEMBLY - 2 REQD - - - - - - 12 LBS INTERMEDIATE GATE - - - - - - - - 4 REQD - - - - - 33 LBS		

LOAD AS SHOWN ON PAGE 2

ITEM	QUANTITY	WEIGHT (APPROX)
D864 PALLET UNIT	24	20,976 LBS
DUNNAGE		182 LBS
JMIP		4,240 LBS
TOTAL WEIGHT		25,398 LBS (APPROX)



INTERMEDIATE GATES
(4 REQD)



FORWARD BLOCKING ASSEMBLY
(1 REQD)