

Transportability Engineering Frequently Asked Questions

Question: Are commercial standards ok for shipment of military equipment?

Most commercial equipment is designed for one time transport from the point of manufacture to the point of use. Special preparation and handling are frequently used, and the transporter may be responsible for any damages that occur. Vehicles are transported at curb weight. Commercial standards support this one time movement. Military equipment must be transported many times throughout its life. Special preparation and handling are costly on a recurring basis, and may not be feasible when time is critical. Therefore, military equipment must be ready for transport without the need for special preparation and selective routing.

We continue to review commercial standards to determine whether they can be used. For example, the military rail impact test is essentially the same as that of the Association of American Railroads, with the addition of failure criteria.

Question: Are the models validated?

Validation is a measure of the credibility of a model. None of our models go through a formal verification, validation, and accreditation process by the Defense Modeling and Simulation Office; however, the outer shell of the vehicle is typically all that is required for most transportability analysis. Individual model dimensions are verified case by case. Our 3D database of models are verified by field measurements of overall, transportability-critical dimensions.

Question: Can I deflate the tires on my vehicle to meet a rail clearance profile?

The Association of American Railroads General Rule 6.5.1 states, "Tires must be inflated as uniformly as possible to the tire manufacturer's recommended pressures." Therefore all wheeled vehicles must have their tires fully inflated to high pressure for rail transport. Flat tires have started fires on moving trains caused by the rubbing of the wheel on the pinched double layer of tire rubber against the rail deck.

Question: Do I need to contact you for any piece of equipment, even computers transported in transit cases?

No. If your equipment does not meet the definition of a transportability problem item (we refer to it as a Non-Problem Item (NPI)), then you do not need to contact us. You can, however, download and print for your records our Transportability Non-Problem Item

Statement (7 KB). It states our position that NPIs do not require our transportability engineering analysis, approval, or concurrence prior to fielding.

Question: Does SDDCTEA have to perform the modeling?

No. TEA will review and evaluate transportability models when requested. TEA will need to know the full assumptions, restraints, constraints, properties of the materials, etc. used in the modeling in order to properly evaluate the validity of the model.

Question: Does simulation eliminate a test requirement?

In certain situations where risk of failure is low, and model confidence is high, test requirements may be reduced or waived. This is reviewed on a case-by-case basis. Typically modeling and simulation only eliminates a testing requirement on slight modifications of a design in which the original design has already successfully passed physical testing.

Question: How do I get certification for transport on Air Force fixed wing aircraft?

Your service transportability agent can assist you in obtaining air transport certification. We will obtain certification for all Army programs and for those which we are performing transportability engineering. You may also contact the Air Force directly, but should keep your service transportability agent informed of this action. Contact the USAF representative at ATTLA@wpafb.af.mil.

Question: How do I get copies of your transportability analyses, references and publications and assistance on provision design and analysis?

Requests can be made by e-mail to usarmy.scott.sddc.mbx.tea-dpe@mail.mil. In addition, the latest revisions of our popular transportability modal instructions are available on our web site at our link:

<https://www.army.mil/sddc#org-tea>

then just expand the Transportability Publications and Instructions section and you will find Pamphlets/Modal Instructions.

Question: How do I get helicopter sling load certification?

MIL-STD-913 Interface Standard Requirements for the Certification of Externally Transported Military Equipment by Department of Defense Rotary-Wing Aircraft provides guidance for external air transport certification. U.S. Army DEVCOM-Soldier Center provides helicopter sling load certification for military equipment. Please contact U.S. Army – DEVCOM-SC (for questions concerning Helicopter Sling Load (HSL), Low Velocity Airdrop (LVAD), and internal transport on U.S. Army helicopters), (508) 233-5276.

Question: I'm confused over shelter and HMMWV vehicle weight ratings. Why can't I load my M1097/LMS combination to the shelter rating?

S-788 Lightweight Multipurpose Shelters (LMS) mounted on the original M1037 and M1097 HMMWVs can not carry a fully configured shelter (weight rating = 3,300 lbs) because the combined shelter/crew/trailer pintle load weights exceed available HMMWV payload (4,400 lbs). As a result, materiel developers should either remove excess equipment from their shelters and/or add additional HMMWV "chase vehicles" to carry the additional equipment. (History: This situation came to a head in one particular case where the system exceeded the HMMWV rating by 30 lbs but was refused an overload waiver by DCSOPS.)

As an alternative to removing mission equipment, materiel developers should consider replacing the M1037/M1097 with a prime mover with a higher rated payload. TACOM has developed the M1113 Expanded Capacity Vehicle (ECV), a HMMWV shelter carrier with strengthened suspension, drive train, and braking systems. As a result, the available vehicle payload is increased to 5,150 lbs, more than enough to handle projected CECOM load requirements. Bottom line: Shelter loads cannot exceed the shelter rating; however, system loads (shelter, trailer, crew, misc., etc.) can increase to the vehicle's available payload.

Question: In the past we have seen Army helicopters shrink wrapped in order to transport them. Is that still the case?

Shrink wrapping was required for vessel transport until 2004, but was suspended due to corrosion problems. It is no longer required.

Question: Is there any guidance on how to secure the heavy or armored doors on military equipment during rail transport?

There is guidance in the form of a Military Surface Deployment and Distribution Command Customer Advisory dated July 16, 2012. We will be happy to send it to you if you submit your request via our TEA e-mail contact address at usarmy.scott.sddc.mbx.tea-dpe@mail.mil.

Question: I've heard the term "transportability problem item". Just what is a transportability problem item?

Generally speaking, a transportability problem item (often referred to as just a "problem item") is any wheeled or tracked vehicle, any item requiring special handling procedures, or any item exceeding certain physical limits. Please contact us at usarmy.scott.sddc.mbx.tea-dpe@mail.mil to request a copy of our Transportability Non-Problem Item Statement.

Question: We have heard there is new chain guidance for transport of military equipment on rail flat cars. How can we get a copy of this guidance?

The most recent chain guidance for transporting equipment on flat cars is available at usarmy.scott.sddc.mbx.tea-dpe@mail.mil. Please send us your request for this information and we will be happy to forward it to you.

Question: What are the standards and handbooks used for transportability during procurement?

- MIL-STD-209K (478 KB) Interface Standard Lifting and Tiedown Provisions and Change Notice 1.
- MIL-STD-814 Interface Standard Requirement Requirements for Tiedown, Suspension and Extraction Provisions on Military Materiel for Airdrop.
- MIL-STD-1366E (1.58 MB) Interface Standard Transportability Criteria.
- MIL-STD-669 is being replaced with MIL-HDBK-669 Handbook for Loading Environment and Related Requirements for Platform Rigged Airdrop Materiel.
- MIL-STD-810F (5.12 MB) Military Standard Environmental Test Methods and Engineering Guidelines.
- MIL-STD-913 Interface Standard Requirements for the Certification of Externally Transported Military Equipment by Department of Defense Rotary-Wing Aircraft.
- MIL-STD-1791 Handbook for Designing for Internal Aerial Delivery in Fixed Wing Aircraft is our guideline for fixed wing aircraft. Any questions regarding this handbook or air certifications can be submitted to ATTLA at ATTLA@wpafb.af.mil.

Question: What information needs to be provided to perform transportability modeling?

Computer aided engineering models of the item of interest are required to conduct a simulation. We use existing models to the greatest extent possible. When models do not exist, we can create them ourselves from data you provide. Our two primary software packages are Solid Edge for 3D modeling and ANSYS for structural analysis.

Question: What is a Military Load Classification?

Each vehicle is assigned a military load classification (MLC) based on both empty and fully loaded weights. Unit commanders use vehicle MLC's to determine whether a route, especially bridges, is suitable for unit movement. The U.S. Army Engineer School, Doctrine Development Division has developed a MLC table for most common vehicles in the Army's inventory.

Question: What is modeling and simulation (M&S)?

A model is a representation of some real thing, process, or behavior. A simulation is the exercising of that model. For transportability, our M&S tools are computer aided engineering software packages that we use to address issues early in the acquisition process. These tools help identify shortcomings and improve design solutions prior to physical prototyping and testing. By applying these tools, we can reduce risk, costs, schedules, and eliminate the need for some testing.

Question: What is the rail impact test and why is it required?

The American Association of Railroads (AAR's) Open Top Loading Rules (OTLRs) requires that military vehicles that will be secured to chain flatcars for rail transport must also meet the rail impact test requirements outlined in MIL-STD-810, test method 526. This testing simulates "rail humping operations" that could occur during the life of the rail transport of the vehicle. This test is conducted at 4, 6, and 8 mph in the forward direction and 8 mph in the reverse direction. The 4 and 6 mph impacts are conducted for safety reasons and the true objective of the test which is to successfully pass the 8 mph forward and 8 mph reverse impacts. The vehicle or item must be fully functional after the completion of the impact tests.

If during rail impact testing a vehicle requires securement that deviates from the general rules or a specific figure in the AAR's OTLRs, those testing results must be submitted to the AAR OTLR committee for review and possible generation of a new figure within the OTLRs. SDDCTEA has membership on the AAR's OTLRs committee. If you desire a copy of the Section 6 of the OTLRs that cover Military Equipment and Materiel, please contact usarmy.scott.sddc.mbx.tea-dpe@mail.mil.

Question: What is Transportability?

The inherent capability of an item to be moved efficiently by towing, self-propulsion, or carrier, using existing equipment or equipment that is planned for the movement of the item via rail, highway, water, and air. (Full consideration of available and projected transportation assets, mobility plans and schedules, and the impact of system equipment and support items on the strategic mobility of operating military forces is required to achieve this capability.)

Question: What transportation modes can you model?

SDDCTEA has collection of modeling capabilities employed by SDDCTEA to assess the transportability characteristics of military equipment in virtual environments. Files can be

transferred to SDDCTEA via file-transfer-protocol "ftp" or mailed to us by CD. Please direct questions to transportability at: usarmy.scott.sddc.mbx.tea-dpe@mail.mil.

Question: Where can I find testing information and costs?

Aberdeen Test Center (ATC), a component of Test and Evaluation Command (TECOM), is a good source for transportability test information.

Question: Why are nylon tiedowns not acceptable for rail transport in CONUS?

See Rail under 'Modes'.

Question: Will modeling prevent failures during testing/transport?

Models identify design shortfalls and potential solutions. Proper application of modeling and simulation will reduce failures.

Question: You have a pamphlet, TEA MI-23, Tiedown Handbook for Containerized Movements which covers a great deal of information relating to container movement, but do you have any guidance for the inspection of commercial and military intermodal containers?

Although inspections are not an area we oversee, MIL-STD-3037, Department of Defense Standard Practice, INSPECTION CRITERIA FOR INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO) CONTAINERS AND DEPARTMENT OF DEFENSE STANDARD FAMILY OF ISO SHELTERS is available. We can forward that to you if you submit an e-mail request to us at usarmy.scott.sddc.mbx.tea-dpe@mail.mil, or you may contact the proponent of the handbook directly at:

Director,

U.S. Army Defense Ammunition Center;

ATTN: ATCL-ACE

McAlester, OK 74501-9002;

or by e-mail to usarmy.mcalester.usamc.mbx.dac-det@mail.mil.