

Attachment 001, Light Engineer Utility Trailer (LEUT) Performance Description

Scope: The LEUT is a pintle towed light utility trailer that provides engineer units a critically needed dedicated small equipment transport capability. The LEUT will transport those key construction enablers such as armored Skid Steer Loaders (SSL), and armored Backhoe Loaders (BHL) that allow future force units the ability to gain, control and sustain route access in a timely manner and effectively maintain momentum/mobility throughout the battlespace.

The LEUT Type I will be towed by the Family of Medium Tactical Vehicle (FMTV) Cargo/Dump/Tractor, Cargo Heavy Expanded Mobility Tactical Truck (HEMTT), Engineer Squad Vehicle, Engineer Bradley Fighting Vehicle, and M113 Armor Personnel Carrier with an attached operating Mine Clearing Line Charge (MICLIC) system. The LEUT Type I shall be compatible with the prime movers without modification to the prime mover and shall allow for a 12/24 volt electrical compatibility with the prime movers.

The LEUT Type II will be towed by M917 (20-Ton Dump Trucks), HEMTT and M1157 (Family of Medium Tactical Vehicles, 10-Ton Dump Trucks). The LEUT Type II shall be compatible with the prime movers without modification to the prime mover shall allow for a 12/24 volt electrical compatibility with the prime movers.

Performance: All requirements shall be at Gross Combined Vehicle Weight (GCVW), prime mover at Gross Vehicle Weight and trailer with full payload (Type I = five ton (5T), Type II = twelve ton (12T)), unless otherwise specified. The trailer shall evidence no part failure, deformation, permanent set, or interference between parts, as applicable, when towed, both empty and when loaded with rated payload according to the mission profile listed in Table I to include Reliability and Maintainability testing.

Payload: The Type I trailer shall have a rated payload capacity of 5T and be capable of individually transporting Type I and Type III SSL (wheeled) (8400 lbs) with devices (e.g bucket, fork). The Type II trailer shall have a rated payload capacity of 12T and individually transport a BHL (21,720 lbs) or a Type II SSL (tracked) (9100 lbs) with its devices.

Operational Mode Summary/Mission Profile (OMS/MP): Type I and Type II trailers shall meet or exceed the mission profile defined in Table 1 below:

Table 1: Mission Profile

Terrain	Type I LEUT Mileage (%)	Type II LEUT Mileage (%)	Speed Range (mph)
Primary Roads	15	20	55
Secondary Roads	25	50	45
Trail	50	N/A	30
Cross Country	10	30	15
Ninety percent (90%) of the mileage will be at full payload and ten percent (10%) of the total mileage will be with no payload.			

Attachment 001, Light Engineer Utility Trailer (LEUT) Performance Description

Fording: The trailer shall be capable of operating in fresh and salt water in depths up to 48 inches (Type I) or 30 inches (Type II) without preparation. Seals shall restrict the entrance of foreign matter into bearings which are exposed to contamination during these operations. Water contamination of bearing lubricants shall not be more than 2.0% by volume. All bearing seals shall restrict the leaking of lubricants from the bearings.

Environmental: The trailer, Type I and Type II, shall operate day or night, under a variety of weather conditions, ranging in temperatures of +120 degrees Fahrenheit (°F) to -25°F.

Construction equipment loading: The trailer, Type I and Type II, shall have rear loading ramps, adjustable side to side, with spring assist up and down. The ramps shall have the ability to be secured in place while in transport.

Landing Gear: The trailer, Type I and Type II, shall have a mechanically operated auto retractable dual front landing gear with drop legs and two removable rear pivot mount stabilizer legs. The trailers shall have landing gear which is infinitely adjustable within the necessary range for potential towing vehicles with an additional 4 inches of adjustment at each extreme.

Storage Box: The trailer, Type I and Type II, shall provide a fully enclosed storage box to store special equipment and Basic Issue Items (BII). The box shall have a hinged door with appropriate latch to secure the door closed by padlock. The box shall be fully accessible with the trailer loaded and unloaded.

Platform Flooring: The trailer, Type I and Type II, shall use full length, hardwood planks of at least 1-3/8" thick for the decking platform.

Spare Tire: The trailer, Type I and Type II, shall provide a spare tire assembly that matches the other wheels and tires used on the trailer. The spare tire assembly shall be mounted onto the trailer and be serviced using only the trailer BII.

Wheels and Tires: The trailer, Type I and Type II, shall have wheels IAW 49CFR393.205 and meet the performance requirements in FMVSS 120. The rims shall conform to Tire and Rim Association recommendations for the type and size of tires furnished. Tires and rims shall be the same size for all wheels on the trailer.

Tires: The trailer, Type I and Type II, shall have steel belted radial tubeless type tires. The tires shall be of a published rated capacity at least equal to the load imposed on each tire with the trailer fully loaded and evenly distributed. Tires and tire ratings shall conform to Tire and Rim Association recommendations and shall be manufactured in the United States. Tires shall have highway tread. Tire air pressure shall be stenciled on both sides of the trailer. Tires shall have a minimum wear out life of at least 8,000 miles. Tires furnished shall have a storage life of at least 4 years.

Wheel Requirements: The trailer, Type I and Type II, shall have hub piloted drum type wheels. The wheels shall have all surfaces cleaned, treated, and painted with CARC paint over zinc rich primer prior to mounting the tire on to the wheel. The inner and outer wheels shall be mounted with wide flanged wheel phosphate coated and CARC

Attachment 001, Light Engineer Utility Trailer (LEUT) Performance Description

painted lug nuts, one per stud. Torque wheel lug nuts with use of a torque wrench in proper commercial sequence.

- **Transportability:** The trailer, Type I and Type II, shall meet the air and rail transportability performance requirements IAW MIL-STD-1366E and vehicle lift, tiedown, and cargo tiedown provisions designed to meet MIL-STD-209K requirements. Specifically, the trailers shall be air transportable by C-130 aircraft and capable of being externally slung from a CH-47 helicopter and delivered in a single lift while fully assembled. Also, the trailers shall be transportable by rail and marine modes per MIL-STD-1366E.

Service Brakes: The trailer, Type I and Type II, shall have air operated service brakes and shall conform to 49CFR393 as applicable. The braking system shall be installed so as to have protection against damage caused by objects striking components, and meet the requirements of FMVSS121.

Parking Brakes: The trailer, Type I and Type II, shall provide parking brakes IAW 49CFR393.41 and 49CFR 571.121. The parking brakes shall be on each axle and shall automatically apply upon disconnection of the emergency air lines and under emergency conditions. The parking brakes shall hold the fully loaded trailer on a 20% longitudinal grade facing both uphill and downhill.

Anti-Lock Brake System (ABS): The trailer, Type I and Type II, shall provide ABS that meets current industry and CFR49.571.121 requirements. The ABS shall operate on both 12v and 24v. Use of a voltage converter box to meet the 24v operation requirement is acceptable. The ABS Electronic Control Unit (ECU) shall include wiring provisions to transmit the trailer (cable, SAE J2394) ABS malfunction signal to the prime mover cab. ABS systems that are used on Power Line Carrier (PLC) communication technology to transmit ABS malfunction shall be provided. A diagnostic warning blink light shall be mounted on an angle at the left side front of the trailer and shall be in view of truck operator. The ABS diagnostic box shall be water proof to road splash/spray and shall be located above fording level with easy access for maintenance.

Electrical System: The trailer, Type I and Type II, shall mount and have fully operational running and black out lights and reflectors with the exception of the rear side marker lights in recessed or otherwise guarded locations for protection. The electrical end connections shall be greased to current commercial standards. The brake lights shall override the four-way emergency flashers or the two systems shall be independent of each other. Lights and reflectors shall not be mounted on vertical surfaces of the rub rail. The frame mating surfaces between lights, related harnesses, and clamps shall be cleaned, treated, primed and painted prior to installation of electrical components. Turn signal lamps shall conform to SAE J588. All electrical wiring shall conform to SAE J1292. The rear identification lights are to be located in a protected location. Grounding screws shall be to commercial standards for extended life without maintenance.

Running Light Requirements: The trailer, Type I and Type II, shall provide running lights that are of the commercial U.S. 12/24 volt (V) LED type that fully meets the DOT/FMVSS requirements when 12 or 24 volts DC operate the running lights. The license plate light and

Attachment 001, Light Engineer Utility Trailer (LEUT) Performance Description

related harness is not to be furnished. Mid-ship turn signals are not to be furnished. Conspicuity markings using reflective sheeting tape with extended life shall be furnished. Commercial aluminum frame reflectors (painted before assembly) shall be used.

LEDs: The LED's shall be IAW SAE J1889 and related electrical harness wires are to be of commercial design); currently being produced and marketed by the supplier, and fully meet the LED light requirements described herein for one LED running light system, operational with either 12 or 24 volt.

Blackout Lighting System: The trailer, Type I and Type II, shall provide a blackout 24 volt LED running light system for tail light, stop light, and turn signals (per STANAG 4381) (ref. 12258212/19207 dwg, 24 volt). The 24 volt lamp assembly shall include one, yellow, solid state lamp in the center and a pair of red, solid state lamps on each side of the center lamp.

Electrical Harness Requirements: The trailer, Type I and Type II, shall provide electrical harnesses with connections that are water tight, environmentally sealed, positive retention type to protect it from rain, road spray, power washing, etc. All wiring and harnesses shall be secured to prevent chaffing and loose connections.

Corrosion Control and Performance: The trailer, Type I and Type II, shall operate for a twenty (20) year service life, which will include varying or extended periods in corrosive environments involving one or more of the following: high humidity, salt spray, road de-icing agents, ground contact, gravel impingement, fording, atmospheric contamination and temperature extremes. During the initial 10 years there shall be no damage caused by corrosion requiring repair of or replacement of parts.

Paint Requirements: The trailer, Type I and Type II, shall be finished or painted to provide a low reflectance surface. All hardware not normally painted shall be treated to provide low reflectivity. The trailer shall be cleaned, treated, primed and top coated IAW MIL-DTL-53072. The trailer shall be CARC painted either brown chip 33446 or forest green chip 34094 per FED-STD-595 depending on the specifications in the contract or purchase order including undercarriage assemblies such as the axles and suspension.

Reliability: The trailer, Type I and Type II, shall have a reliability of 6,000 Mean Miles Between Hardware Mission Failures (MMBHMf). For calculation of MMBHMf; a failure is anything that prevents the trailer from operating, reduces performance below essential levels, indicates that further operation would be unsafe, or indicates that further operation might result in extensive damage to the equipment. Any of these conditions that cannot be corrected by the crew in one hour using the BII that are carried on the prime mover or the trailer shall be considered a failure. Maintenance and human induced failures are excluded.

Maintainability: The trailer, Type I and Type II, shall have a total maintenance time, exclusive of daily crew checks and services that does not exceed 8 man hours during 6,000 miles of specified operation over the Operational Mode Summary/Mission Profile (OMS/MP). This is a Maintenance Ratio (MR) of 0.04 at 30 miles of operation, equivalent to one hour of operation. The scheduled maintenance interval is one year, except for maintenance interval on the wheel ends which is to be three years. Maintenance and human induced failures are excluded.