INCH-POUND
A-A-59716
May 21,2002

COMMERCIAL ITEM DESCRIPTION (CID)

STAIRCASE, AIRCRAFT BOARDING – CHASSIS MOUNTED, MOTORIZED (MSTA)

1. SCOPE. This document covers a commercial, diesel engine driven, chassis-mounted, aircraft boarding staircase, to be used for passenger loading and unloading. The deck height of the staircase is adjustable to between 96 inches and 228 inches to accommodate B-707, B-727, B-737, B-747, B-757, B-767, B-777, A-300, A-320, A-330, A-340 aircraft, and their military derivatives.

2. SALIENT CHARACTERISTICS.

2.1 General. The aircraft staircase shall be constructed in accordance with the requirements of SAE ARP 1247, "General Requirements for Aerospace Ground Support Equipment, Motorized and Nonmotorized," SAE ARP 836, "Design and Safety Criteria for Passenger Boarding Stairways," and this document. In the event of a conflict between either ARP 1247 or ARP 836 and the text of this document, this document shall take precedence. Nothing in this document, however, supercedes applicable laws and regulations, unless specific exception has been obtained by the procuring agency.

2.1.1 Standard Commercial Product. The aircraft staircase, as a minimum, shall be in accordance with the requirements specified herein and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by the specification, but which are part of the manufacturer's standard product, shall be included in the unit being furnished. A standard commercial product is a product that has been sold or currently offered for sale on the commercial market through advertisements, manufacturers catalogs or brochures, and represents the latest production model. The aircraft staircase shall have been previously accepted by demonstrated satisfactory performance of boarding passengers in commercial and/or USAF Military Aircraft.

2.1.2 The aircraft staircase shall be operable by a single person. It shall be maintainable with standard tools and built with parts from commercial sources.

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data that may improve this document should be sent to: 295 Byron Street, WR-ALC/LESVS Robins AFB, GA 31098-1611

AMSC N/A **FSC 1730**

2.2 Components. The chassis-mounted aircraft staircase shall consist of the following major components:

Item or System Name	See Characteristic
Chassis	2.5
Frame	2.6
Height adjustment system	2.7
Lighting System	2.8

2.3 Design and Construction. The staircase unit shall be built to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, and service. It shall be so designed and constructed that no parts work loose in service.

2.3.1 Maintainability. The staircase unit shall be designed and constructed as specified herein and shall comply with the following:

a. There shall be a minimum number of parts consistent with reliability and performance specified herein.

b. The staircase unit shall allow adjustments, servicing, maintenance, and replacement of parts and components with minimum disturbance to other equipment, parts or components. Parts and components shall be positioned for access and ample working space shall be provided, unless performance or reliability is appreciably degraded by the access location. In performing maintenance, if engineering reasoning or data determines that physical or visual interference between items cannot be avoided, the item predicted to require the most maintenance shall be provided primary access.

c. Routine maintenance shall be performable with common tools and equipment available commercially. Special purpose tools and equipment shall be identified. Provision of special purpose tools and equipment shall be subject to approval by the procuring agency.

d. A minimum number of tools shall be required for maintenance by design practices, such as reducing the variety of bolt head sizes.

2.3.2 Access to Passenger Entrance. The staircase shall be designed to provide a safe means of access to the passenger entrance of the aircraft. The top platform shall be adjustable to all heights above ground level within the range of 96 inches to 228 inches.

2.3.3 Ramp aircraft mating. The ramp adjustment provisions shall be designed so that the staircase top platform shall mate with the aircraft passenger door opening at any height within the required operating range without forming a step or gap of more than two (2) inches between the doorsill of the aircraft and the top platform. The platform side panels shall not strike the side of the aircraft serviced by this staircase or form a gap between each side panel and the aircraft of more than three (3) inches when adjusted for the aircraft being serviced. The side panels shall lock in position with positive-type lock and hands-free operation.

2.3.3.1 Top platform side panel rollers. If rollers are utilized on the top platform side panels, the rollers shall be configured to conform to the shape of the track on which they operate and shall be of sufficient depth to prevent the rollers from coming off the track.

2.3.4 Wiring. The electrical wiring system shall be of a standard commercial, outdoor, weatherproof construction including wire, junction boxes, fixtures, and wired receptacles in accordance with ARP 1247. All 110V circuits shall be in accordance with NFPA 70. The wire shall be of adequate rating for the power load imposed and shall be securely mounted throughout the staircase.

2.3.5 Lifting system The staircase shall be provided with means to enable the stairway to be lifted from the chassis. If lifting eyes are used the inside diameter of each lifting eye shall not be less than two (2) inches. A minimum safety factor of 3:1 shall be applicable for the lifting system, based on the weight of the staircase unit.

2.3.6 Drainage provisions. The staircase shall include provisions for the continuous drainage of water from the steps, platform, structural members, and other components.

2.3.7 Air transportability. The completely assembled staircase shall be air transportable in a type C-5 and C-17 cargo aircraft. MIL-HDBK-1791 and MIL-STD-1366 shall be used as references. Additional information will be provided by the procuring agency upon request.

2.3.7.1 Restraints. Aircraft cargo compartment restraint instructions shall be furnished. Restraint provisions must be marked with capacities and in sufficient number and location to restrain the unit to the requirements of MIL-HDBK-1791, i.e., 3G forward, 2G vertical (up) and 1.5G aft and lateral. In addition, all stored or installed equipment must meet these same requirements and all components must be capable of withstanding a vertical (down) load of 4.5G.

2.3.7.2 Ground clearance. The staircase shall have a minimum ground clearance of six (6) inches.

2.4 Performance. The staircase shall withstand the following conditions without detrimental effect to subsequent operation:

a. Operation in ambient temperatures ranging from +125° Fahrenheit (F) to –20° F. When specified (see 6.2-a.) a winterization package, consisting of heaters for engine coolant, oil pan, and transmission, as well as battery warmers shall be provided for operation in temperatures down to -40° F. The optional winterization system shall be designed to operate from an external 110-volt AC power source.

b. Stable with wind velocities specified in subsection 4.3 of ISO 11995, while stairs are fully extended. The horizontal movement of the top platform shall not exceed 1-5/8 inches in either director.

c. Continuous 25 mph operating velocity on horizontally level surface.

2.4.1 Concentrated load. Each step and the top platform of the staircase shall withstand a concentrated load of 500 pounds on any square foot.

2.4.2 Total static load. The fully extended staircase, unsupported by aircraft contact, shall withstand a combined static load of 250 pounds on each step and 1,000 pounds on the platform. The total deflection the staircase platform shall be less than one (1) inch from the unloaded to fully loaded condition.

2.5 Chassis. The staircase chassis shall be either a commercial truck chassis or a chassis designed and built specifically by the staircase unit manufacturer. If a commercial truck chassis is provided, modifications to satisfy requirements herein shall be accomplished by the staircase manufacturer. If a chassis specially built for the staircase unit manufacturer is provided and a cab is specified (see 6.2-b.), a one-man cabin compartment shall be provided. The chassis shall include:

2.5.1 Diesel engine. The staircase unit shall be diesel engine driven. It shall be capable of satisfactory operation with fuels JP-4, JP-5, and JP-8.

2.5.2 Batteries. Battery power shall be sufficient to start engine after two hours of continuous platform and stair light operation.

2.5.3 Cooling system. The cooling system shall withstand ambient temperatures between +125° F and -40° F and 100% relative humidity.

2.5.4 Alternator. The alternator's output at idle shall provide the continuous electrical load of the staircase.

2.5.5 Transmission. The driveline shall include an automatic transmission.

2.5.6 Tire tread. Tires shall be of all-season radial design.

2.5.7 One-man cab. When specified (see 6.2-b.) an enclosed one-man cabin shall be provided. Interior cab sound level shall not exceed 85-dBA with door(s) and windows closed. Cab instrumentation shall be of standard commercial installation and shall include: an hour meter, fuel gauge odometer, tachometer, and speedometer. Cab shall be equipped with wipers, mirrors, visors, heater/defroster, ventilation fan, interior light, and other equipment as found in standard commercial offering.

2.5.8 Roof window(s). To facilitate positioning of the staircase at the passenger entrance of the aircraft, from the driver's seat of the cabin compartment, an unobstructed view shall be provided of the entire underside of the mating area of the staircase/aircraft.

2.6 Frame. The staircase frame shall be so constructed as to provide rigid support for personnel traversing the stairs.

2.6.1 Steps. Each step shall be at least 42 inches wide. Riser heights and tread depths shall be in accordance with ARP 836B, Table 3, for fixed riser type steps. The step treads shall not deviate more than three (3) degrees from the horizontal, regardless of platform elevation. Step risers shall connect the front of each step with the rear of the next lower step at each platform height within the operating range. Step and step riser design shall insure that usable tread has a

minimum depth of nine (9) inches. The top step shall be made in the form of a platform. The width of the platform shall be at least the width of the steps and the length shall be at least 58 inches. For other than loading operations, the bottom step shall be designed such that it can easily be positioned to provide the ground clearance specified in 2.3.7.2.

2.6.2 Non-slip surfacing. The steps and top platform shall be drainable, aluminum diamond-plate or comparable non-slip design having a minimum average slip resistance of 0.68 when measured in accordance with ASTM F 1679 on a wetted surface.

2.6.3 Handrails. Handrails shall be provided on each side of the staircases, and shall extend from the base of the stairs to the aircraft end of the top platform. Handrail heights shall conform to SAE ARP 836, Table 3. The handrails shall maintain a constant height above the steps at all platform heights within the operating range of the staircase. The handrails on the top platform shall also maintain a constant height, but may be a different height than the stair handrails. The handrails on the platform shall allow opening and closing of the aircraft entrance doors with the staircase in place. Both stair and platform handrails shall withstand a horizontal load of 200 pounds applied outward to the top of the handrail at any point, without damage or permanent deflection.

2.6.4 Siding. Durable siding shall be provided and shall extend upward a minimum of five-eights the distance from the steps to the handrails and five-eights the distance from the bottom to the top of the platform side panels. It is preferred that the durable siding on the platform side panels be at least seven-eights the vertical height of the panels.

2.6.5 Bumpers. A Tubular rubber bumper shall be securely fastened to the front of the top platform to protect the aircraft from possible damage when the staircase is firmly positioned against the aircraft. Durable bumpers shall also be fastened on the front of the platform side panels to protect the aircraft from damage when the panels are extended and positioned against the aircraft.

2.7 Height adjustment system. A hydraulic height adjustment system shall be provided to elevate and lower the staircase through its entire operating range. The system shall be designed to operate the unloaded staircase from the lowest to the highest position in either direction in a maximum of two (2) minutes. The system shall conform to SAE ARP 1247, section 3.13.1.3; with the exception of 3.13.1.3.12 provided o-ring face seals are used. Relief values, preset to release at no lower than 125% of normal operating pressure of the circuit, shall be provided.

The system shall show no leaks or breakage when the staircase is subjected to the loads specified in 2.4.2. When so loaded, the platform shall not settle more than a half an inch in height in a four-hour period. Operating controls shall be provided on the instrument panel within the operator's compartment to allow for raising and lowering the stairs. Positive removal stops shall be provided to prevent over extension of the upper ramp assembly.

A non-hydraulic height adjustment system shall require approval of the procuring agency.

2.7.1 Actuating Pump. Height adjustment power shall be furnished by a hydraulic pump, which is directly driven by the chassis engine.

2.7.2 Hydraulic reservoir. The storage tank shall have a capacity of not less than 110 percent of the fluid required to operate the hydraulic system. The tank shall be equipped with a fluid level indicator, a drain plug, and an air vent. The hydraulic system and tank shall be fitted with hydraulic fluid conforming to MIL-PRF-83282. A strainer shall be installed in the hydraulic suction line. A filter system shall be installed in the pump pressure line. The filter shall be so located as to provide access for element replacement. Degree of filtration shall be from 10 to 40 microns.

2.7.3 Hydraulic cylinders. With the possible exception of the main extend cylinder, which may be fabricated by or specifically for the staircase manufacturer; standard commercial hydraulic cylinders shall be provided. Seals shall be installed to prevent the entrance of moisture into the cylinders and all cylinders shall be protected with loaded lip seals or o-rings with backup rings.

2.7.4 Lift lock. The staircase shall be provided a positive mechanism to lock the staircase in any position attainable by the lifting mechanism. A release control shall be provided on the instrument panel to disengage the lift lock. If the lift lock is not automatically unlocked by actuation of the raising and lowering control, it shall be capable of withstanding the full load as imposed through the hydraulic system up to relief valve pressures.

2.7.5 Supports. Hydraulic outriggers, spring lockouts, or other devices may be used to obtain rigidity; however, the use of such devices shall not change the platform height more than three inches after initial positioning to the aircraft. If outriggers are used a manual back-up retraction system shall be supplied in addition to hydraulic primary controls.

2.8 Lighting system. The staircase shall be equipped with lights to provide illumination for night operation. Each set of lights shall be controllable by clearly labeled separate switches located on the instrument panel within reach of the driver. The staircase shall be equipped with sufficient lighting to ensure that the platform and every step is visible at night to personnel ascending or descending the stairway. Lights shall be weatherproof and recessed flush. A high intensity, adjustable, waterproof, commercial spotlight shall be so mounted on the cab to illuminate the underside of the platform, bumper, aircraft door, and adjacent area, to facilitate positioning the staircase at the aircraft.

2.9 Canopy. When specified (see 6.2-c.) an inclement weather protective canopy shall be provided. Whether an open canvas cover or fully enclosed translucent plastic canopy is to be supplied will be specified in the contract.

2.10 Painting, plating, and corrosion control.

2.10.1 Color and Finish. Exterior surfaces shall be prepared, primed, and painted with poly-urethane paint. The color shall be Insignia White, color number 17875, as per Fed-Std-595 or commercial equivalent, unless otherwise specified in the contract (see 6.2-d.).

2.10.2 Dissimilar metals. Dissimilar metals, as defined in MIL-STD-889, shall not be in contact with each other. Metal plating or metal spraying of metals of dissimilar base to provide eletromotively compatible abutting surfaces shall be permitted. The use of dissimilar metals separated by suitable insulating material shall be permitted.

2.10.3 Underside corrosion. The vehicle shall have environmental sealing of the underside and all joints for corrosion resistance to moisture and other corrosives in accordance with MIL-HDBK-808.

2.11 Markings. As a minimum, the manufacturer, model number, serial number, contract number, registration number, date of delivery, and gross vehicle weight shall be permanently marked on a data plate mounted to the staircase chassis in a conspicuous location. Equipment, assemblies, and parts shall be marked for easy identification and correlation with the provided commercial manuals and parts lists.

2.12 Workmanship. The vehicle, including all parts and accessories, shall be fabricated in a thoroughly workmanlike manner. Particular attention shall be given to freedom from blemishes, burrs, defects, and sharp edges; accuracy of dimensions, radii of fillets, and marking of parts and assemblies; thoroughness of welding, brazing, soldering, riveting, and painting; alignment of parts; tightness of fasteners; et cetera. The vehicle shall be thoroughly cleaned of all foreign matter.

2.13 Technical manuals. The overall format for the manuals may be military specification, commercial, or a combination of both. Each technical manual shall have a title page. Line art shall be used to the maximum extent possible for illustrations and parts lists.

The contractor shall validate the technical manuals for accuracy prior to submission to the procuring agency for verification. The contractor shall submit one complete set to the procuring agency for verification at least 60 days prior to the first article test. Any changes or corrections noted by the procuring agency shall be corrected and updated pages or manuals shall be submitted to the procuring agency.

Once approved by the procuring agency, the contractor shall pack two complete sets with each vehicle. An additional two complete sets shall be submitted to the procuring agency for stock.

2.13.1 Operator's manual. The operator's manual shall include all information required for the safe and efficient operation of the vehicle. The operator's manual shall contain at least the following:

a. Location and function of all controls and instruments shall be illustrated and fully described.

b. Safety information that is consistent with the safety standards established by the Occupational Safety and Health Administration (OSHA).

c. Checks and adjustments in preparation for placing the vehicle for service upon receipt from the contractor.

d. Preparation for shipment or storage.

e. Warranty information and period of the warranty for the complete vehicle and for any component warranty that exceeds the warranty of the complete vehicle. Addresses and telephone numbers shall be provided for all warranty providers.

f. General description of and step-by-step instructions for the operation of the vehicle.

g. Checklists for the daily maintenance inspection and mission readiness verification that the operator is expected to perform.

h. Procedures for towing a disabled vehicle.

i. Schedules for required preventative maintenance and required periodic maintenance.

2.13.2 Service manual. The service manual shall identify any special tools and test equipment required and shall cover troubleshooting and maintenance, as well as minor and major repair procedures. The text shall contain performance specifications, tolerances, and fluid capacities; current, voltage, and resistance data; test procedures; and such illustrations and exploded views as may be required to permit proper maintenance by qualified mechanics. The manual shall contain an alphabetical subject index as well as a table of contents. The service manual shall contain at least the following, where applicable:

a. Hydraulic schematic.

b. Pneumatic schematic (if applicable).

c. Electrical schematic.

d. Winterization schematic (if applicable).

e. Schedules for required preventative maintenance and required periodic maintenance.

f. Location, procedure, and interval for parts of the truck and equipment that require lubrication.

2.13.3 Parts manual. The parts manual shall include illustrations and exploded views, as needed, to properly identify all parts, assemblies, subassemblies, and special equipment. All components and assemblies, depicted in either illustrative or exploded views, shall be identified by reference numbers that correspond to the reference numbers in the parts lists. All purchased parts shall be cross-referenced with the original manufacturer's name and part number. The parts identification manual shall provide the description, length, dimensions, and quantity of each item used per vehicle. The manual shall contain a numerical index. The parts manual shall contain a list of all of the component vendor names, addresses, and telephone numbers referenced in the parts list.

2.13.4 Video. When specified (see 6.2-e.) a product familiarization video shall be provided.

3. REGULATORY REQUIREMENTS.

3.1 The offerer/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulations (FAR).

4. QUALITY ASSURANCE PROVISIONS.

4.1 Product conformance. The product provided shall meet the salient characteristics of this PD, conform to the producer's own drawings, specifications, standards, and quality assurance practices or as required in the contract, and shall be the same staircase unit offered for sale in the commercial marketplace. The government reserves the right to require proof of such conformance prior to first delivery and thereafter as needed.

4.2 Commercial item requirement. The vehicle furnished shall comply with the "commercial item" definition of FAR 2.101 as of the date of award. The government reserves the right to require the offeror/contractor to prove that their product complies with the referenced commerciality requirements and each salient characteristic of this PD.

The offeror/contractor shall provide an itemized technical proposal that describes how the proposed model complies with each salient characteristic of this PD; a paragraph by paragraph response to the salient characteristics section of this PD shall be provided. The offeror/contractor shall provide two copies of their commercial descriptive catalogs with their offer as supporting reference to the itemized technical proposal. The offeror/contractor shall identify all modifications made to their commercial model in order to comply with the requirements herein.

4.3 Inspection requirements.

4.3.1 General inspection requirements. Product sample(s) are required for examination and testing, to determine whether the staircase unit meets the requirements of this PD, provides accurate and repeatable measurements, and has acceptable form, fit, function, and suitability for use. Apparatus used in conjunction with the inspections specified herein shall be laboratory precision type, calibrated at proper intervals to ensure laboratory accuracy.

4.3.2 Test rejection criteria. Throughout all tests specified herein, the vehicle shall be closely observed for the following conditions, which shall be cause for rejection:

a. Failure to conform to design or performance requirements specified herein or in the contractor's technical proposal.

b. Any spillage or leakage of any liquid, including fuel, coolant, lubricant, or hydraulic fluid, under any condition, except as allowed herein.

c. Structural failure of any component, including permanent deformation, or evidence of impending failure.

d. Evidence of excessive wear.

e. Interference between the vehicle components or between the vehicle, the ground, and all required obstacles, with the exception of normal contact by the tires.

f. Misalignment of components.

g. Evidence of undesirable road-ability characteristics, including instability in handling during cornering, braking, and while traversing all required terrain.

h. Conditions that present a safety hazard to personnel during operation, servicing, or maintenance.

i. Overheating of the engine, transmission, or any other vehicle component.

j. Evidence of corrosion.

4.3.3 Detailed inspection requirements.

4.3.3.1 Examination of product. The vehicle shall be examined to verify compliance with the salient characteristics herein. A contractor-generated checklist that identifies each relevant requirement and the inspection results shall be used. Particular attention shall be given to materials, workmanship, dimensions, surface finishes, protective coatings and sealants and their application, welding, fastening, and markings. Proper operation of each vehicle's functions shall be verified. Each production vehicle shall be inspected to a reduced version of the checklist that has been approved by the procuring agency.

4.3.3.2 Road tests. The first production vehicle shall be tested for road-ability as per subsection 3.2.2 of SAE ARP 1247 and subsection 2.4 (c.) of this document.

4.3.3.3 Staircase elevation tests. The vehicle shall be tested for proper height adjustment within its operating parameters, as described in subsection 2.3.2 of this document. The time required to fully elevate or retract stairway shall be within two minutes, as per subsection 2.7.

4.3.3.4 Platform operational test. The top platform shall be operationally tested to verify compliance with subsection 2.3.3 of this document.

4.3.3.5 Static load tests. The first production vehicle shall be tested for static load deflection, as specified in subsections 2.4.1 and 2.4.2 of this document.

4.3.3.6 Wind load calculations and deflection test. Wind load calculations shall be performed as per ISO 11995 or SAE ARP 1328 to determine compliance with subsection 2.4 (b) of this document. The first production vehicle shall be tested in accordance with subsection seven within both reference documents.

4.3.3.7 Air transportability analysis. An engineering analysis shall be performed and presented to demonstrate compliance with 2.3.7.

5. PACKAGING.

5.1 Preservation, packing, and marking shall be as specified in the contract or order.

6. NOTES.

6.1 Intended use. The staircase unit allows personnel to board and de-board various airframes at Air Force and other military installations around the world.

6.2 Ordering data. The contract or order should specify the following:

a. Whether a winterization package is required, as specified in 2.4 (a).

b. Whether an operator cab is required, as specified in 2.5.7.

c. Whether a canopy is required, as specified in 2.9.

d. Finish color required if not white, as specified in 2.10.1.

e. Whether a product familiarization video is required, as specified in 2.13.4.

Custodians:
Army – AV
Air Force – 99

Preparing activity:
Air Force – 84

Agent
Air Force – 99

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