

INCH-POUND

A-A-59889

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COMMERCIAL ITEM DESCRIPTION

STAIRCASE, AIRCRAFT BOARDING, C-5, TRUCK

The General Services Administration has authorized the use of this Commercial Item Description (CID) for all federal agencies.

1. SCOPE

1.1 Scope. This commercial item description covers the general requirements for passenger boarding staircase trucks servicing military and commercial aircraft on Government installations.

2. SALIENT CHARACTERISTICS.

2.1 Aircraft staircase description. The commercial, chassis-mounted vehicle shall be capable of servicing multiple aircraft classifications to safely load and unload passengers. It shall have the ability to quickly pull up and back away from aircraft. The lift system shall operate smoothly.

2.1.1 Aircraft Compatibility. Aircraft Staircase shall be compatible with the following aircraft.

Aircraft Accommodated**Height Range
(inches)**

C-5, KC-135, DC-10, L-1011, and their military derivatives

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2.2 Design and construction. The Aircraft Staircase shall be designed and constructed in accordance with SAE ARP836 and SAE ARP1247 and have a 12 year minimum life expectancy. The Aircraft Staircase shall be designed for safe operation with the rated capacity load at all lift heights and positions that the truck is capable of achieving. The Aircraft Staircase shall be constructed so that parts do not work loose in service and shall withstand the loads, shocks,

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strains, vibrations, and other conditions incident to operation, shipping, and storage without permanent distortion and with minimum loss of time for maintenance, repair, and servicing. It shall be weatherproof and designed to prevent the intrusion of water and sand into critical operating components. The Aircraft Staircase design shall ensure safe, efficient, and economical operation. All assemblies, controls, and installed equipment shall be located so that there is no adverse interference with each other, or with the operation, and shall be readily accessible for maintenance, operation, removal, and replacement.

2.2.1 Materials, protective coatings, and finish.

2.2.1.1 Protective coatings. Materials that deteriorate when exposed to sunlight, weather, or operational conditions normally encountered during service shall not be used or shall have a means of protection against such deterioration that does not prevent compliance with the performance requirements specified herein. Protective coatings that chip, crack, or scale with age or extremes of climatic conditions or when exposed to heat shall not be used. Ferrous structures and surfaces shall be primed with zinc rich primer in accordance with MIL-PRF-26915, Type II. Raw metal edges shall be coated with the primer before topcoating. Topcoat shall be polyurethane. Fasteners, handles, and fittings used in the assembly of the Aircraft Staircase shall also be primed and painted. Surface preparation and pretreatment shall be in accordance with the respective primer and topcoat specifications. Structures shall be cleaned, degreased and blasted prior to priming; primer shall be applied before any oxidation or rusting occurs. Topcoat shall be applied to a dry film thickness of 1.6 to 2.4 mils in all instances, regardless of the primer system utilized. The coating shall be free from runs, sags, orange peel, or other defects.

2.2.1.2 Dissimilar metals. Dissimilar metals, as defined in MIL-STD-889, shall not be in contact with each other. Metal plating or metal spraying of dissimilar base metals to provide electromotively compatible abutting surfaces is acceptable. The use of dissimilar metals only when separated by suitable insulating material is permitted, except in systems where bridging of insulation materials by an electrically conductive fluid can occur. Sealants or gel type gasket materials shall be used between faying surfaces and butt joints.

2.2.1.3 Finish. The exterior finish color of the Aircraft Staircase shall be Insignia White, Color Number 17875 of FED-STD-595. Exterior surfaces shall be prepared, primed, and painted with polyurethane paint. The interior of all compartments shall be painted with an impact resistant, textured coating that resists stains, scuffs, chips, and scratches; all exterior surfaces, excluding all normally bright metal and anodized parts, shall be painted body color. The chassis frame and running gear may be black. All interior surfaces visible with any compartment door open, excluding the interior of the cab, shall also be painted body color. This includes compartment shelves and mounting hardware, but does not include items mounted in the compartments.

2.2.1.4 Rustproofing. The vehicle chassis and cab (at minimum: seams, welds, locations where dissimilar metals contact, etc) shall be rust proofed and undercoated in accordance with FED-STD-297. When specified, the level of corrosion prevention shall be upgraded to tropical (see 6.2). Tropical protection shall be corrosion-protected with a thick, hard, black, commercially-available Corrosion Preventive Compound (CPC) that is difficult to remove. Application shall

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include the exposed chassis-frame metal underneath the Aircraft Staircase (excluding the drive train), the inside of the wheel wells, and behind the fender skirts. In addition, Aircraft Staircase that are to be shipped overseas shall be temporarily corrosion-protected from the effect of salt spray both on the ship and at port with the application of a thin, soft-film, semi-transparent, commercially-available CPC that is easily removable by washing or with a low pressure steam. Application of the temporary CPC shall be to the exterior of the Aircraft Staircase, in critical or corrosion sensitive areas of the vehicle. The overseas Air Force vehicle maintainers shall remove this temporary CPC on receipt from the shipper. The Technical Manual shall reflect the temporary CPC removal process.

2.2.1.5 Fluid traps and faying surfaces. There shall be no fluid traps on the Aircraft Staircase. Faying surfaces of all structural joints, except welded joints, shall be sealed to preclude fluid intrusion.

2.2.1.6 Drainage. Drain holes shall be provided to prevent collection or entrapment of water or other unwanted fluid in areas where exclusion is impractical. All designs shall include considerations for the prevention of water or fluid entrapment and ensure that drain holes are located to effect maximum drainage of accumulated fluids. The number and location of drain holes shall be sufficient to permit drainage of all fluids when the unit is in a one degree incline in any plane. The minimum size of the drain holes shall be 0.25 inch.

2.2.2 Markings. All external devices which require an operational or maintenance interface shall be marked in accordance with MIL-STD-130. Markings shall be 1-inch high block letters unless prohibited by the available space. In such cases, the markings shall be the largest size possible, but shall not be less than ½-inch high. Markings, Information/Caution shall be Lusterless Black, Color Number 37038 of FED-STD-595, and Markings, Warning/Danger shall be Lusterless Red, Color Number 31136 of FED-STD-595. Plates shall not fade due to climate exposure. The center of gravity shall be stenciled on the unit within 1.0 inch of the calculated center of gravity.

2.2.3 Identification plate. An identification plate in accordance with MIL-STD-130 shall be securely attached to the Aircraft Staircase in a readily accessible location. The identification plate shall contain the following information: Manufacturer's name, model number, serial number, contract number, registration number, date of delivery, warranty expiration date or mileage, platform and step load limits, gross vehicle weight (pounds), fuel type, speed limit restrictions, Commercial and Government Entity (CAGE) code, and National Stock Number (NSN). The Aircraft Staircase and any of its components for which the Government's unit cost is more than \$5,000, is serially managed, or the procuring agency determines is mission essential, shall have Unique Identification (UID) (also known as Item Unique Identification (IUID)) information permanently affixed on or near the respective identification plate(s), marked in accordance with MIL-STD-130. UID information shall be included as both a bar code and human readable markings. Plates shall not fade due to climate exposure.

2.2.3.1 Transportation data plate. A transportation data plate shall be securely attached to the Aircraft Staircase in a readily accessible location. The plate shall contain at least the following information:

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- a. Side and rear silhouette views of the Aircraft Staircase.
- b. Horizontal and vertical location of the center of gravity of the Aircraft Staircase in air transportable configuration, marked on the silhouette views.
- c. Shipping weight.
- d. Loading cubage.
- e. Overall height, width, and length.
- f. Front and rear axle loads.
- g. Tie down information.
- h. Center of Gravity.

2.2.4 Safety. The Aircraft Staircase shall comply with all applicable requirements of the Federal Motor Carrier Safety Regulations (49 CFR 393), Federal Motor Vehicle Safety Standards (49 CFR 571) and OSHA standards in effect at the time of manufacture. The Aircraft Staircase design shall not contain any mishap risk categories greater than medium as defined in Table A-IV of MIL-STD-882.

2.2.4.1 Foreign object damage. All loose metal parts, such as pins or connector covers, shall be securely attached to the Aircraft Staircase with wire ropes or chains. "Dog tag" style beaded chains shall not be provided. Removable panels, if provided, shall be attached with captive fasteners. Tire valve stem caps shall be made of plastic.

2.2.4.2 Sound levels. The Aircraft Staircase interior sound level shall be in accordance with Federal Motor Carrier Safety Regulations 49 CFR 393.94.

2.2.4.3 Component protection. All space in which work is performed during operation, service, and maintenance shall be free of hazardous protrusions, sharp edges, or other features which may cause injury to personnel. All rotating and reciprocating parts and all parts subject to high operational temperatures or subject to being electrically energized, that are of such nature or so located as to be hazardous to personnel, shall be guarded or insulated to eliminate the hazard.

2.2.4.4 Decals. A warning decal shall be provided in the cab advising of the hazards of driving with stairs extended. This decal shall include speed limitations while the stairs are extended; in essence tipping over warning. Additionally, an overhead clearance decal shall be provided in the cab stating the minimum and maximum stair heights in plain view of the driver/operator.

2.2.4.5 Backing Safety. The Aircraft Staircase shall be equipped with a flashing beacon and a siren that automatically engages when the vehicle is placed in reverse.

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2.2.5 Electromagnetic interference. The Aircraft Staircase shall be in accordance with the following radiated emission and susceptibility requirements of MIL-STD-461: RE102 and RS103.

2.2.6 Human engineering. The Aircraft Staircase shall be designed in accordance with MIL-STD-1472 for ease of operation, inspection, and maintenance, including the use of arctic mittens and Mission-Oriented Protective Posture (MOPP) Level 4 Chemical Warfare Gear. The Aircraft Staircase shall be equipped with side steps/ running boards in order to easily enter the cab.

2.2.7 Fastening devices. All screws, bolts, nuts, pins, and other fastening devices shall be properly designed, manufactured, and installed with adequate means of preventing loss of torque or adjustment. Cotter pins, lock washers, or nylon patches shall not be used for this purpose, except for the attachment of trim items or as provided in commercial components. Tapped threads on loaded fasteners shall have a minimum thread engagement in accordance with Table I.

TABLE I. Minimum thread engagement.

Material	Minimum Thread Engagement
Steel	1.0 times the nominal fastener diameter
Aluminum, zinc, or plastic	2.0 times the nominal fastener diameter

2.2.8 Welds and welding. All welders shall be certified to weld in accordance with AWS D1.1 and AWS D1.2. The contractor shall make available to the Government certifications for all welders being utilized on the Aircraft Staircase. Welding procedures shall be in accordance with AWS D1.1 and AWS D1.2 as applicable. All welding on the Aircraft Staircase shall be completed in accordance with AWS D1.1 and AWS D1.2. The surface parts to be welded shall be free from rust, scale, paint, grease, and other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the welded parts. Welds shall transmit stress without cracking or permanent distortion when the parts connected by the welds are subjected to test, proof, and service loadings.

2.3 Environmental conditions. The Aircraft Staircase shall be capable of storage, start and operation under the following environmental conditions

- a. Ambient temperatures ranging from -20° F to +123° F.
- b. Exposure to relative humidity up to 100 percent.
- c. Exposure to solar radiation as encountered in desert areas.

2.3.1 Wind. The Aircraft Staircase shall be stable in accordance with 3.13.1.9 of SAE ARP 1247 while the stairs are fully extended. The horizontal movement of the top platform shall not exceed 3.0 inches in either direction.

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2.4 Transportability.

2.4.1 Surface transportability. The Aircraft Staircase shall be transportable via all modes of surface shipment (highway, rail, and water) in accordance with MIL-STD-1366, and shall be capable of withstanding the mechanical shock and vibration characteristics of highway, rail, and water transport, except that design for rail impact testing (see 5.2.5 of MIL-STD-1366) is not required.

2.4.2 Air transportability. The Aircraft Staircase shall be transportable without shoring on C-5 and C-17 aircraft. Design criteria can be found in MIL-HDBK-1791. In all air transport configurations, the Aircraft Staircase shall be capable of being restrained and withstanding, without loss of serviceability, 2.0 G up and 4.5 G down accelerations, and shall be capable of being restrained and withstanding, without loss of structural integrity, 3.0 G forward, 1.5 G aft, and 1.5 G lateral accelerations. Axle weight shall not exceed 20,000 pounds. Tire pressure shall be less than 100 pounds per square inch (psi) and shall not be reduced for air transport. The Aircraft Staircase shall be equipped with pressure relief devices or configured for air transport to prevent any part from becoming a projectile in the event of catastrophic loss of aircraft cabin pressure. The Aircraft Staircase shall drive on and off the aircraft, negotiating the required maximum ramp angles without shoring.

2.4.3 Equipment removal/reconfiguration. Preparation for air transport shall take no more than one hour for two persons using common non-powered hand tools. All equipment removed shall be stored on the Aircraft Staircase; caps and plugs shall permit moving and storage in transport configuration. The forces required for equipment removal/reconfiguration shall not exceed those allowed in MIL-STD-1472.

2.4.4 Tie downs. The Aircraft Staircase shall be symmetrically restrained during air and ground transport. Tie down points shall be rated at a minimum of 25,000 pounds, marked for capacity, with a clear opening compatible with MIL-DTL-25959 and MIL-PRF-27260 tie down devices. Each end of each tie down device shall terminate at a tie down point and not pass through any other tie down point. There shall be no interference between tie down devices and the Aircraft Staircase. The tie down provisions shall be in accordance with 4.1 through 4.12 of MIL-STD-209.

2.4.5 Lifting provisions. The Aircraft Staircase shall be equipped with sufficient attachment points so located that it can be lifted by crane; each attachment point shall be marked "Lift Point". The lifting provisions shall be in accordance with MIL-STD-209K.

2.5 Maintainability. The Aircraft Staircase and all included systems shall be designed and constructed for ease of maintenance, and shall require:

- a. Where practical, parts and components shall be located or positioned for rapid and simple inspection and recognition of excessive wear and potential failure.

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- b. Capability of performing maintenance with general-purpose tools and equipment normally available commercially. The use of special purpose tools and equipment shall be subject to approval by the procuring activity and supplied by the contractor.

2.6 Foolproofness. Where improper installation of an item causes a malfunction, an asymmetric mounting system shall be provided, where practical, to ensure proper mounting of the item.

2.7 Performance.

2.7.1 Chassis. The Aircraft Staircase shall utilize a commercial truck chassis modified as necessary to comply with the requirements herein. The Aircraft Staircase shall have a gross vehicle weight rating (GVWR) of at least 24,000 pounds. The gross vehicle weight (GVW) shall not exceed 95 percent of the GVWR.

2.7.1.1 Engine and related equipment. The Aircraft Staircase shall be equipped with a diesel engine. If a waiver is needed to purchase the engines notify the contracting office.

2.7.1.1.1 Engine. The Aircraft Staircase shall be equipped with a diesel engine that shall operate satisfactorily when using high sulfur diesel fuel (JP-8 conforming to MIL-DTL-83133F) and/or ultra low sulfur diesel fuels.

2.7.1.2 Engine starting. The engine shall start within 15 seconds cranking in any ambient temperature within the required operating range of the Aircraft Staircase. Installed glow plugs, fluid starting aids, and heat from the winterization system (if applicable; see 2.15) may be used prior to and during the start period to facilitate engine starting.

2.7.1.3 Engine cooling system. The Aircraft Staircase engine cooling system shall maintain engine coolant at a temperature below the boiling point with the unit loaded as specified and operated in an ambient air temperature of 123° F at sea level.

2.7.1.4 Fuel system and fuel tank(s). The fuel system shall be in accordance with FMCSR 49 CFR 393.67.

2.7.1.4.1 Fuel tank(s). The Aircraft Staircase shall have one or two fuel tanks with a minimum usable capacity of 60 gallons.

2.7.2 Exhaust system. The exhaust system shall be in accordance with FMCSR 49 CFR 393.83. If a vertical exhaust is provided, it shall be equipped with a hinged rain cap and a ¼-inch hole at the base of the exhaust stack to drain exhaust condensate. In addition, the exhaust system shall be shielded to prevent hydraulic fluid from leaking onto the hot exhaust system in the event of a hydraulic line rupture or leak.

2.7.3 Transmission. A fully automatic transmission with a hydraulic torque converter and at least five forward speeds shall be provided.

2.7.4 Steering. Power steering shall be provided.

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2.7.5 Brake system. All components of the braking system shall be installed in such a manner as to provide adequate clearance when traveling over uneven or rough terrain, including objects liable to strike and cause damage to the brake system components. No part of the braking system shall extend below the bottom of wheel rims, to ensure, in case of a flat tire, that the weight of the vehicle will be supported by the rim and the flat tire and not be imposed on any component of the braking system.

2.7.5.1 Brake system. The Aircraft Staircase shall be equipped with an all-wheel antilock brake system; the brakes shall be fully air-actuated. Brakes shall be in accordance with 49 CFR 393.40 through 393.42(b) and 393.43 through 393.52. The braking system complete with all necessary components shall include:

- a. Air compressor having a capacity of not less than 12 standard cubic feet per minute (scfm).
- b. Air storage reservoir(s), each tank equipped with drain, safety, and check valves between the compressor and the reservoir tank.
- c. At least one automatic moisture ejector shall be provided in the system.
- d. Automatic slack adjusters on cam brakes or internal self-adjusting brakes on wedge and disc brakes on all axles.
- e. Spring set parking brakes.
- f. A replaceable cartridge desiccant air dryer. The dryer shall have the capability of removing not less than 95 percent of the moisture in the air being dried. The dryer shall have a filter to screen out oil and solid contaminants. The dryer shall have an automatic self-cleaning cycle and a thermostatically controlled heater to prevent icing of the purge valve.

2.7.6 Tires and wheels. Tires and wheels shall be in accordance with The Tire and Rim Association 2010 Year Book requirements for this application. The Aircraft Staircase shall be equipped with tubeless steel belted radial ply tires with all season type tread. Tire and wheel assemblies shall be identical at all positions. Valve extensions shall be included for dual tires. A spare tire and wheel assembly shall not be provided.

2.7.7 License plate bracket. A lighted license plate bracket shall be provided at the left rear of the vehicle. A second plate bracket shall be provided to the front bumper.

2.7.8 Cab. The Aircraft Staircase shall include an enclosed, heated cab for the driver and a passenger. The staircase, when fully lowered and stowed, shall not obstruct visibility through the windshield. In addition to the standard truck cab equipment (heater/defroster, lights, electric wipers and washer, rear view mirrors, et cetera), the following items shall be provided:

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- a. A minimum 36-inch X 18-inch, glare-proof, waterproof observation window with an electric wiper to be fitted to the roof of the cab. The roof window shall be sufficiently large to permit the driver of the vehicle to view from the normal driving position the entire underside of the mating area of the aircraft being serviced.
- b. Two (2) heated side view mirrors, approximately 17 inches long and 8.0 inches wide, with nominal inner convex mirror.
- c. When specified (see 6.2) asset shall be delivered with factory installed air conditioning.

2.7.9 Instruments and controls. The Aircraft Staircase shall have left-hand drive. Controls shall be complete and conveniently operable by the driver. Lever controls shall be designed and located to permit the operator to easily enter and exit from the driver's compartment. Instruments and controls shall be identified as to their function and installed in a manner to facilitate removal and servicing. Instruments shall be panel mounted and shall include:

- a. Speedometer with built-in odometer.
- b. Water temperature gauge.
- c. Oil pressure gauge.
- d. Ammeter or voltmeter.
- e. Engine hourmeter.
- f. Air pressure gauge (When air brakes are present)
- g. Low air pressure buzzer (When air brakes are present)

2.8 Staircase.

2.8.1 Aircraft interface. The Aircraft Staircase shall be designed to provide a safe means of access onto and off of the passenger entrance/exit of the aircraft. The top platform shall be adjustable to all heights above ground level within the range of 186 inches to 314 inches for interface with the following aircraft: C-5, KC-135, B-747, DC-10, L-1011, and their military derivatives. The Aircraft Staircase shall allow the aircraft doors for all airframes listed to fully open and close with the staircase completely in place and fully engaged.

2.8.1.1 Aircraft mating. The ramp adjustment provisions shall be so designed that the top platform and its sliding side panels will mate with aircraft loading doors at any height within the required operating range without forming a step or gap of more than 2.0 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 nor form a gap at the top of the panel between the side panel and aircraft of more than 3 inches when adjusted for the aircraft being serviced. The side panels shall lock in position with positive-type lock and hands-free operation.

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2.8.1.2 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. The outside diameter of the bumper shall be a minimum of 7.0 inches. 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.

2.8.2 Staircase operation. The Aircraft Staircase shall have the capability to safely drive short distances, up to 100ft, with the stairs extended to each aircraft doorsill height requirement. The Aircraft Staircase shall be equipped with a governance that restricts speed to 5mph when the stairs are extended. The control panel shall have an indicator light(s) to provide the operator real-time status of whether the lift is extended/retracted.

2.8.2.1 Pre-positioning operation. The Aircraft Staircase shall have ability to be extended, adjusted to the operational height and angled at a prepositioned site. The vehicle shall be driven to the doorsill of the aircraft in this configuration. At no time will any portion of the asset (that is outriggers) drag the ground or inhibit operation while driving to the aircraft. All controls to perform this operation shall be automated at the cab's control panel; as necessary. Neither the operator or mechanic shall be required to work outside the cab to prepare the truck for this operation.

2.8.3 Load capacity.

2.8.3.1 Concentrated load. Each step and the top platform of the staircase shall withstand a concentrated load of 500 pounds on any square foot with no permanent distortion.

2.8.3.2 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 of the staircase platform shall be less than 1.0 inch from the unloaded to fully loaded condition.

2.8.4 Stairs. Each step shall be at least 42 inches wide. Riser heights and tread depths shall be in accordance with Table 3 of SAE ARP836 for fixed riser type steps. The step treads shall not deviate more than 3.0 degrees from the horizontal regardless of platform elevation. The step riser 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 ensure that usable tread has a minimum depth of 9.0 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. The platform shall incorporate a pivoting section to accommodate the gap between the platform and the various aircrafts caused by imperfect alignment. For other than loading operations, the bottom step shall be designed such that it can easily be positioned to provide the required ground clearance (see 2.16.3). The bottom step shall have a rise no greater than 7.0 inches for any configuration of the staircase and all airframe models. The staircase shall be constructed of non-glare material. The steps and the platforms shall be drainable, aluminum diamond plate or comparable non-slip design in accordance with SAE ARP836. To prevent slipping, step surfaces shall have a coefficient of friction of at least 0.5 for level surfaces and 0.8 for sloped surfaces.

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2.8.5 Handrails. Staircase and platform handrails shall be capable of withstanding a force of 200 pounds in any direction. There shall be clearance of at least 3.0 inches between the handrails and any other object, such as side panels (see 2.8.6). Metal tubing for the handrails shall be at least 1.5 inches in diameter.

2.8.5.1 Staircase handrails. Handrails shall be provided on each side of the staircase, extending from the base of the stairs to the aircraft end of the top platform. Handrail heights shall be in accordance with Table 3 of SAE ARP836. The handrails shall maintain a constant height above the steps at all platform heights within the operating range of the staircase.

2.8.5.2 Platform handrails. The top platform shall have handrails that are at least 42 inches in height. The handrails on the platform shall allow opening and closing of the aircraft entrance doors with the staircase in place.

2.8.6 Side panels. Vertical siding shall be provided and shall extend upward a minimum of five-eighths the distance from the steps to the handrails and five-eighths the distance from the bottom to the top of the platform side panels. It is preferred that the platform side panels be at least seven-eighths the vertical height of the panels. The side panels shall be capable of withstanding a 200-pound horizontal load at any point.

2.8.6.1 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 or out of the track. Platform side panel rollers shall be fail safe in that a redundant system shall be provided to ensure the panels remain in place under all operating conditions. Rollers shall be rustproof or similarly have sealed bearings.

2.8.7 Staircase removal provisions. The staircase shall be provided with means to enable it to be lifted from the chassis. If lifting eyes are used, the inside diameter of each lifting eye shall be a minimum of 2.0 inches. A minimum static safety factor of 3:1 shall be applicable for the lifting provisions, based on the weight of the staircase unit.

2.9 Staircase lift 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 2.0 minutes. System shall regulate rapid pressure drops when operating the lift system. Relief valves, preset to release at no lower than 125 percent 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 herein. When so loaded, the platform shall not settle more than a 0.5 inch in a 4-hour period. Operating controls shall be provided on the instrument panel within the operator's compartment as well as on the platform to allow for raising and lowering the stairs. Positive removal stops shall be provided to prevent over extension of the upper ramp assembly.

2.9.1 Actuating pump. The lift system shall be powered by a hydraulic pump which is directly driven by the chassis engine.

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2.9.2 Auxiliary pump. An auxiliary pump powered by the chassis electrical system shall be provided to allow the staircase to be lowered and stowed and the stabilizers raised and stored in the event of an actuating pump failure.

2.9.3 Lift lock. The Aircraft Staircase shall be provided with a positive mechanism to lock the staircase in any position attainable by the staircase lift. 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.

2.10 Hydraulic system design. The hydraulic system shall be in accordance with 3.13.1.3 of SAE ARP1247 except as otherwise specified herein. O-ring face seal hydraulic fittings may be used in lieu of flared fittings (see 3.13.1.3.12 of SAE ARP1247). All hydraulic system components, including the hydraulic tank, shall comply with all corrosion resistance requirements specified herein. System design should consider exposure to sand and dust particles as encountered in desert areas (seals, filters, etc.)

2.10.1 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 in accordance with 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. The degree of filtration shall be from ten to forty microns.

2.10.2 Hydraulic cylinders. With the possible exception of the main lift cylinder, 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.

2.11 Stabilizers/Outriggers. Hydraulic stabilizers/outriggers, spring lockouts, or other support devices may be used to establish rigidity; however, the use of such devices shall not change the platform height after initial positioning to the aircraft. Each retractable set (rear, center and front) shall be independently operated from automated switches located on the cab's control panel. If stabilizers/outriggers are utilized, they shall be capable of being returned to "travel" position in the event of power failure. They shall be capable of being positioned in 30 seconds and retracted in 30 seconds, with power supplied. Stabilizers/outriggers shall remain either in the fully retracted or fully extended position when left for extended periods of time. They shall not exacerbate the effects of inclined surfaces thereby making setup more difficult and cumbersome. They shall provide for maximum stability even on inclined surfaces. They shall all make equal contact with the ground and thus provide allowance for uneven surfaces.

2.12 Electrical system. The Aircraft Staircase shall have a 12 volt electrical system in accordance with 3.13.1.2 if SAE ARP1247 except where specified.

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2.12.1 Alternator. The Aircraft Staircase shall be equipped with a single or dual alternator charging system rated at not less than 60-ampere; in accordance with SAE ARP 1247. The alternator's output at engine idle speed shall provide for the continuous electrical load of the Aircraft Staircase. It shall be capable of restoring the energy expended during an engine start in less than 15 minutes of engine idle at -20°F.

2.12.2 Batteries. The batteries shall be of the commercial maintenance-free type battery; addition of water shall not be required during normal service life. The battery cover and vent system shall be designed to prevent electrolyte loss during service and to keep the top of the battery free from electrolyte. The battery box shall have a drain hole and a plug.

2.12.3 Battery compartment. The batteries shall be enclosed in a weatherproof box or compartment and be readily accessible. If the batteries are located in the engine compartment, a battery box shall not be required. The battery compartment shall not be near the fuel tank or any other fuel or hydraulic system component.

2.12.4 Wiring. Wiring, except that provided with the commercial chassis, shall be accordance with the applicable portions of 3.13.1.2 of SAE ARP1247. All wiring exposed to possible physical damage, such as wiring on a compartment floor, or wiring where tools or materials may cause the wire to be frayed or shorted, shall be protected by the use of heavy wall thermoplastic conduit or steel conduit having waterproof connections. Grommets shall be used for all wiring passing through any hole or body framework.

2.13 Lighting system.

2.13.1 Step and platform lighting. The staircase shall be equipped with sufficient lights to ensure the platforms and every step will be clearly visible at night to personnel utilizing the staircase. The lights shall be recessed flush with the staircase panels, weatherproofed, and shall provide a minimum illumination of 10 foot-candles over the entire area to be traversed. The step and platform lights shall be controllable by switches in both the driver's cab and on the top platform. The use of ultra bright LED lights should be considered.

2.13.2 Spotlights. Two adjustable, waterproof, commercial spotlights shall be provided of sufficient size and capacity to illuminate the underside of the platform, the bumper, the aircraft door, and adjacent area to facilitate positioning the staircase to the aircraft. The spotlights shall be controllable by switches in both the cab's control panel and on the top of the platform.

2.14 Communications system. The Aircraft Staircase shall be equipped with a communications system that includes voice activated headsets at both the platform and at the cab controls.

2.15 Winterization system. When specified (see 6.2), a winterization system, consisting of heaters for engine coolant, oil pan, transmission, and hydraulic system, 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 and shall incorporate high-temperature shutoff switches to prevent overheating of any fluid or component.

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2.16 Mobility.

2.16.1 Operating terrain. The Aircraft Staircase shall be capable of being driven over paved and graded gravel roads.

2.16.2 Maximum speed. The fully loaded and stowed Aircraft Staircase shall be capable of being driven over paved roads at speeds up to 60 miles per hour (mph) and over graded gravel roads at speeds up to 20 mph.

2.16.3 Ground clearance. The Aircraft Staircase shall have a minimum ground clearance of 8.0 inches.

2.17 Workmanship. The Aircraft Staircase, including all parts and accessories, shall be constructed and finished in a thoroughly workmanlike manner in accordance with 3.13.7 of SAE ARP1247. Workmanship objectives shall include freedom from blemishes, defects, burrs and sharp corners and edges; accuracy of dimensions, surface finish, and radii of fillets; thoroughness of soldering, welding, brazing, painting, wiring, and riveting; marking of parts and assemblies; alignment of parts and tightness of assembly fasteners; et cetera.

2.18 Bolted connections. Bolt holes shall be accurately punched or drilled and shall be deburred. Threaded fasteners shall be tight and shall not work loose during testing or service usage.

2.19 Riveted connections. Rivet holes shall be accurately punched or drilled and shall be deburred. Rivets shall be driven with pressure tools and shall completely fill the holes. Rivet heads shall be full, neatly made, concentric with the rivet holes, and in full contact with the surface of the component.

2.20 Gear and lever assemblies. Gear and lever assemblies shall be properly aligned and meshed and shall be operable without interference, tight spots, loose spots, or other irregularities. Where required for accurate adjustment, gear assemblies shall be free of excessive backlash.

2.21 Cleaning. The Aircraft Staircase shall be thoroughly cleaned. Loose, spattered, or excess solder; welding slag; stray bolts, nuts, and washers; rust; metal particles; pipe compound; and other foreign matter shall be removed during and after final assembly.

3. REGULATORY REQUIREMENTS.

3.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with 23.403 of the Federal Acquisition Regulation (FAR). However, used, rebuilt, or refurbished items shall not be provided.

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3.2 Green Procurement Program. Green Procurement Program (GPP) is a mandatory federal acquisition program that focuses on the purchase and use of environmentally preferable products and services. GPP requirements apply to all acquisitions using appropriated funds, including services and new requirements. FAR 23.404(b) applies and states the GPP requires 100% of EPA designated product purchase that are included in the Comprehensive Procurement Guidelines list that contains recovered materials, unless the item cannot be acquired: a) competitively within a reasonable timeframe; b) meet appropriate performance standards, or c) at a reasonable price. The prime contractor is responsible for ensuring that all subcontractors comply with this requirement.

4. PRODUCT CONFORMANCE PROVISIONS

The products provided shall meet the salient characteristics of this Commercial Item Description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace, modified as necessary to comply with the requirements herein. The Government reserves the right to require proof of such conformance.

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. First production inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 First production inspection. The first production Aircraft Staircase shall be subjected to the examinations, demonstrations, tests, and analyses described in 4.5.1 through 4.6.23. The contractor shall provide or arrange for all test equipment and facilities. Except as otherwise specified, all testing in which engine is operated shall be performed using high sulfur diesel fuel.

4.3 Conformance inspection. Each production Aircraft Staircase shall be subjected to the examinations described in 4.5.1 through 4.6.23.

4.4 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 CID.

4.5 Inspection requirements.

4.5.1 General inspection requirements. Apparatus used in conjunction with the inspections specified herein shall be laboratory precision type, calibrated at proper intervals to ensure laboratory accuracy.

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4.5.2 Test fuel. The preproduction test fuel requirement shall be Grade JP-8+100, turbine fuel, as specified in MIL-DTL-83133. An exception may be taken for truck engine fuel during cold chamber tests; as applicable. All filter elements shall be certified for use with JP-8.

4.5.3 Data. During all testing specified herein, at least the following data, unless not applicable, shall be recorded at intervals not to exceed 30 minutes. Additional data and/or shorter intervals shall be provided as appropriate for any specific test.

- a. Date.
- b. Time started.
- c. Time finished.
- d. Ambient temperature.
- e. Engine speed.
- f. Engine oil pressure.
- g. Engine coolant temperature.
- h. Engine hourmeter readings at the start and finish of each test.

4.5.4 Test rejection criteria. Throughout all tests specified herein, the Aircraft Staircase 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 truck components or between the truck, the ground, and all required obstacles, with the exception of normal contact by the tires.
- f. Misalignment of components.
- g. Evidence of undesirable roadability characteristics, including instability in handling during cornering, braking, and while traversing all required terrain.

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- h. Conditions that present a safety hazard to personnel during operation, servicing, or maintenance.
- i. Overheating of the engine or any other Aircraft Staircase component.
- j. Evidence of corrosion or deterioration.
- k. Failure of the hydraulic lift system.

4.5.5 Rejection and retest. Providing the Aircraft Staircase fails conformance testing or inspection the Aircraft Staircase will be considered rejected until the cause is determined and corrective action is taken, only then shall retesting be accomplished.

4.6 Detailed inspection requirements.

4.6.1 Examination of product. Each Aircraft Staircase shall be examined to determine compliance with the requirements herein as well as SAE ARP 836 and SAE ARP 1247. A contractor-generated, Government-approved checklist shall be used to identify each requirement not verified by an analysis, certification, demonstration, or test, and shall be used to document the examination results. 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 Aircraft Staircase function shall be verified. Certifications and analyses shall be provided in accordance with Table II. Each production Aircraft Staircase shall be inspected to a Government-approved reduced version of the checklist.

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TABLE II. Certifications and analyses.

Paragraph	Required Certifications and Analyses
2.3 Solar radiation	Contractor certification that the Aircraft Staircase performance is not adversely affected by full time exposure to solar radiation, such as those conditions encountered in desert environments.
2.4.1 Surface transportability	Contractor surface transportability analysis (see 4.6.22.1) and certification that the Aircraft Staircase is transportable via all modes of surface shipment (highway, rail, and water) in accordance with MIL-STD-1366, and shall be capable of withstanding the mechanical shock and vibration characteristics of highway, rail, and water transport.
2.4.4 Tie downs.	Contractor tie down provision analysis
2.4.5 Lifting provisions.	Contractor lifting provision analysis
2.7.1.1 Engine and related equipment., 2.7.1.1.1 Engine., 2.7.1.3 Engine cooling system.	Engine manufacturer certification that the engine is in accordance with all applicable requirements, including exhaust emissions standards and fuels. Fuel certification shall verify the engine's compatibility with high sulfur fuels (3000 parts per million); range of sulfur in the fuel. Engine manufacturer application approval for the engine and its installation, including cooling system.

4.6.2 System safety hazard analysis. A system safety hazard analysis of the Aircraft Staircase shall be conducted in accordance with 4.2 through 4.8 of MIL-STD-882D to demonstrate compliance with the mishap risk requirement of 2.2.4.

4.6.3 Sound level test. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.2.4.2.

4.6.4 EMI test. The first production Aircraft Staircase shall be tested in accordance with MIL-STD-461: RE 102 and RS 103 to demonstrate compliance with 2.2.5.

4.6.5 Welds and welding. Welds shall be inspected to ensure proper penetration and verified to be in strict accordance with the Visual Inspection criteria set forth in the AWS Codes. The inspection shall be performed by an AWS Certified Weld Inspector (CWI) during and after the construction of all Aircraft Staircases. Documentation of all inspections for the first production Aircraft Staircase shall be provided to the Government. The Government reserves the right to require verification inspection at any time during construction in accordance with 6.1.2.2 of

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AWS D1.1, 5.1.1 of AWS D1.2, and Nonspecified Non-Destructive Test (NDT) other than Visual in accordance with 6.6.5 of AWS D1.1. All welding documentation for subsequent production units shall be made available to the Government at any time during the life of the contract pursuant to AWS D1.1 and D1.2.

4.6.6 Maintainability demonstration. All recommended preventive maintenance tasks shall be performed and the task times shall be recorded. It shall be demonstrated that the forces required do not exceed those allowed in MIL-STD-1472. All preventive maintenance tasks recommended to be performed daily and at the routine PMI shall also be performed by personnel wearing arctic mittens and MOPP Level 4 Chemical Warfare Gear.

4.6.7 Stability analysis and test.

4.6.7.1 Stability analysis. The contractor shall conduct a stability analysis in accordance with SAE ARP 1328 to demonstrate compliance with 2.3.1.

4.6.7.2 Stability test. The first production Aircraft Staircase, with the stairs fully extended shall be tested in accordance with SAE ARP 1328 to demonstrate compliance with 2.3.1.

4.6.8 Staircase operation test. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.8.1 through 2.8.2.1.

4.6.9 Load capacity tests.

4.6.9.1 Staircase concentrated load test. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.8.3.1.

4.6.9.2 Staircase static load test. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.8.3.2.

4.6.9.3 Handrail load test. The first production Aircraft Staircase shall be tested to demonstrate compliance with all handrails under 2.8.5.

4.6.9.4 Side panel load test. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.8.6.

4.6.10 Staircase removal provision analysis. An engineering analysis shall be performed to demonstrate compliance with the lifting provision requirements of 2.8.7.

4.6.11 Actuating pump test. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.9.1.

4.6.12 Auxiliary pump test. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.9.2.

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4.6.13 Lift lock test. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.9.3.

4.6.14 Hydraulic system and components. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.10 and subparts.

4.6.15 Stabilizer operation test. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.11.

4.6.16 Electrical system. . The first production Aircraft Staircase shall be tested to demonstrate compliance with all of 2.12.

4.6.17 Lighting system. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.13 and its subparts.

4.6.18 Communications system test. The first production Aircraft Staircase shall be tested to demonstrate compliance with 2.14.

4.6.19 Winterization. The first production Aircraft Staircase shall be tested to demonstrate compliance with all of 2.15.

4.6.20 Road tests. The first production Aircraft Staircase shall be driven 35 miles to demonstrate compliance with 2.16.1, 2.16.2, and 2.7.1.1.1.

4.6.21 Weight and center of gravity test. The weight and center of gravity of a first production Aircraft Staircase shall be measured to demonstrate compliance with the weight requirement of 2.7.1.

4.6.22 Transportability verification.

4.6.22.1 Surface transportability verification. Surface transportability analysis. An engineering analysis shall be performed to demonstrate compliance with 2.4.1. The engineering analysis shall utilize the data for road transportation in accordance with MIL-STD-810, Method 514.6, Table 514.6C-II.

4.6.22.2 Air transportability verification.

4.6.22.2.1 Air transportability analysis. An engineering analysis shall be performed to demonstrate compliance with the air transportability requirements of 2.4.2 and 2.4.3. The analysis shall include the tie downs and all major components and their ability to withstand the accelerations specified in 2.4.2. The analysis shall demonstrate the accessibility and structural adequacy. The evaluation shall also include a dimensional analysis for the Aircraft Staircase while traversing the ramp and while loaded aboard C-5 and C-17 aircraft.

4.6.22.2.2 Equipment removal and reconfiguration demonstration. A first production Aircraft Staircase shall be configured for transport on C-5 and C-17 aircraft and then reconfigured for

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operation to demonstrate compliance with 2.4.3. It shall be demonstrated that the forces required do not exceed those allowed in MIL-STD-1472.

4.6.22.2.3 Tie down provision analysis. An engineering analysis shall be performed to demonstrate compliance with the tie down provision requirements of 2.4.4.

4.6.22.2.4 Tie down provision test. A first production Aircraft Staircase shall be tested to demonstrate compliance with the tie down provision requirements of 2.4.4.

4.6.23 Lifting provision analysis. An engineering analysis shall be performed to demonstrate compliance with the lifting provision requirements of 2.4.5.

5. PACKAGING.

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

6. NOTES.

6.1 Source of documents.

6.1.1 Department of Defense and Federal documents. Department of Defense and Federal documents, except for MIL-HDBK-1791 C-17 Appendix and GOST 10227-86, are available online at <http://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. A copy of MIL-HDBK-1791 C-17 Appendix can be obtained from the Procuring Contracting Officer (PCO) or requested by contacting Air Transportability Test Loading Agency (ATTLA) at 937-255-6296. A copy of GOST 10227-86 can be obtained from the PCO.

6.1.2 FAR. FAR may be obtained from the Superintendent of Documents, P.O. Box 371954, Pittsburgh PA 15250-7954. Electronic copies of the FAR may be obtained from <http://www.arnet.gov/far/>.

6.1.3 AWS documents. Application for copies should be addressed to American Welding Society, 550 N.W. LeJeune Road, Miami FL 33126, <http://www.aws.org>

6.1.4 SAE documents. Application for copies should be addressed to SAE, Inc., 400 Commonwealth Drive, Warrendale PA 15096, www.sae.org/servlets/index .

6.1.5 CFR documents. The CFR is available online at: <http://www.fmcsa.dot.gov/rules-regulations/administration/fmcsr/393.htm> or from the Superintendent of Documents, U.S. Government Printing Office, Washington DC 20402.

6.1.6 TRA documents. Application for copies should be addressed to The Tire and Rim Association, Inc., 175 Montrose West Ave., Suite 150, Copley OH 44321, <http://www.us-tra.org/>

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6.1.7 Occupational Safety and Health Association (OSHA) copies may be obtained online at <http://www.osha.gov/> or from OSHA, 200 Constitution Ave., Washington, D.C. 20210.

6.2 Ordering data. Acquisition documents must specify the following:

- a. Title, number, and date of this purchase description.
- b. When tropical rustproofing is required (see 2.2.1.4)
- c. When air conditioning is required (see 2.7.8)
- d. When winterization system is required (see 2.15).

6.3 Intended use. The Aircraft Staircase is intended for personnel to board and de-board various airframes at Air Force, other military and civilian installations around the world.

6.4 Previous nomenclature. Previously referred to as Type II Staircase Truck or C-5 Staircase Truck.

6.5 Key Words.

Type II
Work Vehicle

MILITARY INTEREST

Custodian:
Air Force - 84

Preparing activity:
Air Force – 84

Agent:
Air Force – 99

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