This user friendly equipment is in daily reliable service with Airlines throughout the World and has a proven ability to achieve exceptionally high safe utilisation with minimum down times.

AMSS SERIES 2000-200 SELF PROPELLED STAIR.

1. GENERAL

The AMSS Series 2000-200 is a purpose designed self propelled telescopic passenger stair which will safely interface with aircraft thresholds from the B737 up to the B777-B747 and A300-A340 aircraft types, all doors.

2. CHASSIS

The stair section is mounted on an exceptionally strong corrosion resistant AMSS manufactured heavy duty chassis which is protected by an incorporated collision deflecting wrap around tubular steel bumper which restricts damage. The main fabricated items are constructed from high quality British Steel using grade 43 as a minimum requirement. All steelwork and their fitments are shotblasted to the requirements of Swedish Standard SA 2.5 prior to applications of customer defined finish paint treatment.

To ensure the long term corrosion resistance of the chassis and the fabricated stair, hollow sections are spray wax injected.

This purpose designed heavy duty stair with the in-built engineering integrity ensures a rigid frame structure which promotes both operator and passenger confidence and a sense of security especially when being utilised at the highest “wide-bodied aircraft” main deck elevations.

3. DIESEL ENGINE AND AUTOMATIC TRANSMISSION

The vehicle is powered by a Deutz F4L air cooled diesel engine which conforms to the latest EURO 2 emission requirements. This engine is close coupled to a Chrysler TF8, Torqueflyte automatic transmission controlled by a Felsted forward, neutral and reverse gear selector. The transmission is interlocked to prevent engine starting if the vehicle has been left in gear. Both engine and gearbox are suitable for operations in +50`C operating environment.

An interlock is also provided which prevents the stair being driven with the stabilisers deployed. A reversing light illuminates automatically when reverse gear is selected.

The engine is of sufficient size and horse power to be in accordance with the maximum performance requirement plus a minimum of 25% reserve.

Belt drives are kept to a minimum with only engine cooling, alternator and air conditioning compressors, if fitted, driven by this method.

The hydraulic power supply pump to elevate the stairs and the stabilisers is direct driven from the engine cam shaft.

An automatic hydraulic pressure relief valve is fitted as standard.

The engine and automatic transmission gearbox is a modular package fitted within a sturdy sub-frame assembly, secured into its protected position within the chassis enclosure. This user friendly feature allows unprecedented means of maintenance access and/or removal of these critical assemblies.

4. AXLES

Heavy duty front and rear axles are provided, securely mounted to the chassis assembly, positioned to ensure a smooth balanced ride over all apron surfaces.

The rear axle incorporates a purpose selected low ratio differential unit to provide optimum control and performance especially when approaching a positioned aircraft.

All four wheels are equipped with vacuum power assisted split circuit hydraulic braking incorporating a brake failure warning light. Large high capacity disc brakes are fitted to the front with drums to the rear.

A conveniently positioned and easily operable “Tyceley” type over centre hand brake is fitted which acts on the rear wheels.

5. POWER STEERING

The hydraulic power steering is protected by a priority valve which ensures the steering control overrides all other demands. The steering system also incorporates relief and shock valves to provide a fail-safe back up system is always available ensuring full emergency directional control in the event of engine failure.

6. FUEL TANK

A large 22 gallon fuel tank is fitted which is well protected within the chassis enclosure to prevent it being damaged by inadvertent collision.

The fuel tank is of sufficient capacity to facilitate 24 hour operation.

A large fuel filler is provided with integral strainer both of which are securely retained to prevent FOD damage.

7. ELECTRICAL SYSTEM

To ensure battery charging occurs at all times, even during periods of low engine Rpm's a specially selected heavy duty 75 Amp engine driven 12 Volt alternator is fitted.

Two heavy duty batteries are fitted as standard:-

Battery one, is for the starting and operating of the vehicle and its normal operational functions.

Battery two, supports stair lighting only.

A split charge alternator and relay ensures both batteries are maintained in a full operational state.

A lighting timer is also provided.

All cables and wiring looms are contained and protected within suitable conduit or trunking. Bushes are provided where necessary to prevent chaffing. All cables are fully identified to assist in maintenance and are resistant to grease, oil, fuel and excessive heat.

An airfield amber flashing obstruction light is also fitted at the highest point of the vehicle.

8. VEHICLE LIGHTING

The vehicle is designed and manufactured to be in strict compliance with Road Traffic Acts, Motor Vehicle and use Regulations, latest issue at time of manufacture and IATA Airport Handling Equipment Specifications AHM910, AHM913 and AHM915.

The vehicle is fitted with all necessary driving, signalling, hazard, brake and indicator lights. Reversing lights are also provided. All lights both front and rear are fully recessed and/or guarded to prevent breakage.

All lighting circuits are protected separately from other service fuses or circuit breakers.

To assist the operator in the nightime stair/aircraft interface, the top platform assembly incorporates a halogen work lamp for door sill illumination.

9. HYDRAULIC SYSTEM

The electro-hydraulic system incorporates a stainless steel hydraulic tank complete with strainer, drain port, sight glass and UCC filler cap. All main hydraulic oil line filters are fitted with clogging indicators complete with bypass. System isolating valves are also provided to assist in efficient maintenance procedures.

Hydraulic cylinders for elevating the stair section and operating the vehicle stabilisers are fitted with pilot operated check valves to secure these systems and prevent movement in the case of any hydraulic pressure failure.

The maximum working pressure of the hydraulic system does not exceed 1200 psi and is protected from over pressure by a pre-set relief valve.

All components, fitments and hoses are continuously rated for not less than a maximum working pressure plus 50%.

Heavy duty steel hydraulic piping are extensively used in preference to flexible pipes on the main runs. Flexible pipes are kept to a minimum and only used when considered essential.

A hydraulic emergency hand pump is conveniently positioned which operates all the hydraulic cylinders in the event of no engine power being available.

All hydraulic valves and cylinders are electrically controlled by push buttons, interlocked to warning lights which clearly display to the operator all phases of operation.

10. OPERATOR CAB

The Series 2000-200 stair can be provided with either a fully enclosed weatherproof cab or open cab.

Open Cab Variant

This user friendly “walk in” driver safety cab is exceptionally strong and affords the driver protection from falling rain whilst at the same time ensures good all round visibility.

Weatherproof Cab Variant

The "walk in" user friendly weatherproof safety cab is extensively glazed with safety glass, incorporates an overhead clear view panel with opening windows fitted to both sides and the drivers door. A heater is provided for driver comfort and to ensure a clear view in all weather conditions both the front and the rear windows are electrically heated. A heavy duty double arm wiper washer system is also fitted to the front windscreen.

Instruments and Controls For Open and Weatherproof Cab Variants

These user friendly cabs are designed and manufactured to ensure efficient and safe operations.

Instrumentation and operator controls fitted to the cabs include, fuel gauge, battery volt meter and hours run indicator. An active engine monitor/warning display provides all necessary indicator lamps for oil pressure, engine temperature, alternator, brakes, headlamps, direction indicators and low fuel. Separate warning lights and switches are fitted in a dedicated stair function panel with single joystick control for tilt up/down, and stair elevation/retraction. Warning and indicator lights are also provided for stabiliser deployment and safe retract together with a transmission neutral select illumination.

A PVC covered suspension type seat maintains a comfortable ride for the operator.

The cab floor and pedals are manufactured from non-slip materials.

Two large unbreakable wing mirrors are fitted to the cab which provide clear and uninterrupted rear view vision.

11. WHEELS AND TYRES

Heavy duty pressed wheels and U-lug type ply pattern tyres are fitted which resist FOD damage.

A spare wheel and tyre can be provided as an option

12. PASSENGER STAIR SECTION

A telescopic hydraulically operated stair 1.200mm wide section ensures a stable secure walkway for the safe planeing and de-planeing of passengers.

To ensure an accurate aircraft sill interface, infinite adjustment of the stair section is accommodated by use of a dedicated tilt facility which incorporates two heavy duty hydraulic cylinders.

An automatic fail-safe locking pawl system, illuminated for night time operations, also guarantees the elevating stair is positively secured at each step position. This system together with pilot operated hydraulic check valves and safety interlocks prevent uncommanded movement of the stair section in the event of mis-use or system failure.

Another important safety feature of the AMSS Series 2000-200 Passenger Stairs is the incorporation of a vehicle speed restrictor. This automatically reduces the speed of the vehicle to the aircraft when the passenger stair section is elevated. Of additional benefit, the vehicle cannot be driven around the apron area with the stair deployed i.e. normal road speeds are not available to the driver unless the stair section has been completely retracted.

The stair treads are manufactured in 5 bar non-slip grip aluminium, tread plate floor each with drain holes to prevent the accumulation of excess water.

Both the main stair section infils and sliding top platform side panels are manufactured from corrosion resistant aluminium. The sliding top platform panels allow easy adjustment to the aircraft fuselage to suit the aircraft profile and accommodate the passenger boarding door.

The Series 2000-200 stair is fitted with a wide top platform (1350mm) which will allow safe interface for passenger boarding without any gaps or trip hazards.

The leading edge of the top platform is fitted with a sprung loaded pivoting nose.

There are no gaps or openings on the stair section or top platform which could be hazardous to passengers, crew or staff.

Stairway and top platform lighting is provided which ensures there are no shadow areas which could be hazardous to boarding or disembarking passengers.

13. FINISH PAINTING

The complete vehicle would be finish painted in your chosen livery.

Safety and operating instructions will be clearly visible in accordance with Health and Safety requirements and IATA Regulations in order to ensure the safety of personnel and passengers at all times.

14. SAFETY FEATURES

The stair will conform to the current IATA Regulations including 910, 913, 915 and 920 as applicable, the relevant CEN Regulations, Airport Directives and Health and Safety Regulations.

The vehicle is designed and manufactured to be inherently fail-safe and has a proven ability to operate reliably in the hostile aircraft apron environment.

Self locking emergency stop buttons are fitted in the operator cab.

A tilt adjustment control panel is provided on the top platform.

To ensure a safe stable vehicle in winds speeds of up to 90 mph five hydraulically powered stabilisers are fitted. The stabilisers are controlled by push button fitted within the cab. The hydraulic circuit includes pressure relief valves which enable the stabilisers to deploy and compensate for any ground irregularities. Indicator and warning lights clearly identify when the stabilisers are fully deployed or fully retracted.

The maximum drive speed is limited to 28 kph which can be factory adjusted to suit individual operator requirements.

To protect the integrity of the aircraft a throttle baulk is fitted, activated by the PTO which restricts the vehicle approach speed at this critical time.

The vehicle can safely climb and stop on a gradient of 1:20.

A keyless ignition system can be fitted as a no cost option, once the engine has started an interlock prevents inadvertent engaging of any further cranking.

Battery isolator switches are fitted as standard on both the main battery and auxiliary circuit.

The engine starter circuit includes a cold start facility.

The transmission is disabled when the stabiliser jacks are deployed or when the parking brake is in the “on” position.

The transmission selector switch is gated to prevent inadvertent movement from forward to reverse. When reverse is selected a reversing light automatically illuminates and a warning buzzer sounds.

A stair flight lowering alarm is fitted, together with stair safety chains on the top

platform and base of the stair.

All platform edges which could touch the aircraft are protected with suitably sized "D" rubber.

A registration number plate fixing is provided on the front and rear of the vehicle together with illumination light.

All gauges and instrumentation are protected to prevent the ingress of water vapour.

The vehicle can be operated at day or night, a spotlight positioned on the underside of the top platform clearly illuminates the aircraft interface area.

The vehicle has been designed to be operated by driver only.

The equipment will be stable during all stages of use.

The passenger stair section will fully raise or lower in approximately 20 seconds.

The equipment is completed so it is driveable on normal highways and will comply with Road Traffic Act Requirements.

15. GENERAL DESIGN FEATURES

The entire vehicle is a quality built product which is aesthetically pleasing in appearance.

In service the 2000-200 has displayed over many years a safety record second to none, by protecting passengers, operators and the integrity of the aircraft.

The equipment has been designed and manufactured to be user friendly in operation, easy to maintain and is compatible with existing equipment in service.

Movement of operating controls is logically related directionally to resulting operational movement of the equipment.

All components used to function the vehicle are continuously rated in accordance with the defined environmental temperature range. They are chosen for their reliability, quality and performance in their selected application.

The vehicle is equipped with self lubricating or pre-charged bearings where-ever possible. Easily accessible greasing points are provided where necessary.

16. PERSONNEL SAFETY

The complete vehicle assembly has been designed with safety of personnel and secure passenger handling as a prime consideration.

Guards and shrouds have been fitted in all areas where operating personnel are liable to come into contact with moving mechanisms or structures.

Gaps and openings which are functionally necessary have been designed so as to prevent no hazard or injury to personnel.

All controls located in shadow areas are illuminated for safe operation at night.

Exhaust smoke or irritant fumes are directed away from operators and passengers during the normal stationary operation of the vehicle.

Controls are adequately protected against accidental actuation or damage.

Smooth controlled up and down movement of the stairs is guaranteed by the logically progressive joystick conveniently positioned within the user friendly drivers cab.

17. EQUIPMENT SAFETY

Safe guards have been provided against overloads, pressure or failures which could be detrimental to the unit in general. Fail-safe features have been incorporated where necessary and facilities have been provided for limited manual operation to enable the equipment to be lowered and towed away from the aircraft in the event of systems failure.

All areas which interface with the aircraft are generously buffered to provide protection during final positioning.

The vehicle will be fitted with all the necessary signs and warning notices in full compliance with IATA and CEN Standards and Regulations.
This will include the clear marking of tyre inflation pressures in kgs/cm painted on the mudguards just above the wheel.

18. MAINTAINABILITY

The 2000-200 Series Stair guarantees long-term low cost of ownership with the minimum of maintenance.

Detailed maintenance schedules will be as defined in our operations, maintenance manual provided with each vehicle. It is difficult to quantify maintenance man hours

to operating hours, however we consider that our equipment and its reliability are second to none. Customer references can be obtained from existing fleet users, these can be provided on request.

Areas requiring routine inspection and maintenance are readily accessible, access doors and/or removable enclosures are kept to a minimum.

All major components and sub assemblies are easily removable without the need to disassemble other items.

The anticipated life span of the equipment is 10 years, dependent on the operating environment, good housekeeping, and maintenance conducted in accordance with that as defined within our servicing schedules.

Parts availability and after sales service is guaranteed for a period of 10 years from date of commissioning.

19. ENVIRONMENTAL

Vehicle performance will not be affected by wind, sand, grit, salt air, precipitation, de-icing fluids or other normally encountered airport atmospheric conditions.

The entire unit is operable in temperature conditions ranging from -20`C to +50`C and relative humidity up to 100%. No damage will be suffered by the equipment through prolonged static exposure to temperatures of -40`C.

All controls can be operated while heavy gloves and protective clothing is being worn by the operators.

20. MANUALS AND PUBLICATIONS

Operating, maintenance, overhaul and illustrated parts manuals are provided printed in English.

21. TOOLS AND EQUIPMENT

Standard tools only are required for maintenance of the complete vehicle.

A fire extinguisher is provided conveniently mounted and secured on the chassis.

22. PRELIMINARY QUALIFICATION TESTS

After final assembly has been completed at our works, suitable function tests will be performed in accordance with the requirements of your specification, and to our

inspectors satisfaction. The customer will subsequently be advised of its availability for acceptance. Facilities will be made available for customers engineers to conduct type approval and qualification tests as required.

A certificate of conformity for each unit will be issued.

The passenger stairs is delivered fully assembled and with the minimum of preparation is ready for use.

23. TRAINING

Our price includes for operator/maintenance training and familiarisation at any U.K. Airport.

24. CORROSION AND METAL PARTS

The equipment is manufactured so as to be corrosion resistant, all steelwork is shotblasted to the requirements of Swedish Standard SA 2.5. All hollow chassis sections can be injected with a wax inhibitor to prevent internal corrosion. Water drainage is provided in all areas where rain can collect, all other parts will be suitably protected to ensure lasting appearance during the anticipated life span of the equipment.

25. EXTERIOR FINISH

The complete passenger stairs would be painted in two coats of heavy duty weather resistant undercoat, and finished in two pack polyurethane gloss paint to your chosen livery.

26. NOISE AND VIBRATION

The complete vehicle will not emit noise at a level in excess of 85 dba measured at 15 foot distance from the perimeter of the vehicle.

Careful attention has been afforded to the engineering fit of the passenger stair to ensure a stable assembly without movement or sway. All pivot points are retained by machined bearing assemblies.

All assemblies and attachments are suitably retained to prevent FOD and are secured so as they cannot work loose in service.

Where structural skinning is liable to “drum”, every precaution has been taken to prevent vibration.

27. IDENTIFICATION AND MARKING

All instruments and controls are suitably identified.

Non fading operating instruction placards are permanently attached in relation to all controls.

Electrical terminals, cables and wiring are permanently lettered or numbered.

All filling points are clearly labelled with the identity of the respective fluids.

A metal nameplate would be permanently fitted to the equipment defining the relevant product support data.

28. PRODUCT SUPPORT

We consider it essential to provide first class product support for our manufactured equipment. Technical and maintenance cover is available 7 days per week and spare parts despatched within 24 hours of demand. Issued service bulletins form part of our standard procedure.

AMSS product support is considered second to none, our airlines customers throughout the World tell us so.

29. WARRANTY

The equipment is guaranteed for a period of 12 months from date of commissioning.

30. PERFORMANCE GUARANTEE

In accordance with our specification AMSS undertake that the equipment shall perform to its design function, be safe in operations and is maintainable for a minimum period of 10 years from date of commissioning.

31. HUMAN ENGINEERING

The passenger stairs can be easily and safely operated by personnel possessing no special skills, having received prior training on the equipment.

All controls have been designed and located in accordance with modern Ergonomic principles.

32. BUILD STANDARD AND WORKMANSHIP

Build quality, workmanship, compatibility and traceability will be in accordance with British Standard BSEN/ISO 9001 registration number 93/2346.

This high quality standard ensures that all manufacturing assembly processes are strictly monitored and controlled ensuring the finish product is to an exceptionally high quality which embodies the highest standard of engineering integrity.

Insofar as practical, commercially available standard parts are used complying with the relevant British Standard Specifications (BS) and all military standards.

The equipment is manufactured using fungus inert material and if deemed necessary suitable protection is applied to prevent dissimilar metal reaction in accordance with good engineering practice.

All components, assemblies and sub-assemblies incorporated within the equipment are designed and manufactured to dimensional tolerances which permits interchangeability and facilitates ease of replacement parts.

33. ELECTROMAGNETIC INTERFERENCE

The equipment is manufactured and suppressed to conform to BS3G100 Broad Band, Narrow Band and Radiated Emissions.