



# SMARTSTEP-2

PASSENGER STEP SMARTSTEP-2

## DESCRIPTION & SPECIFICATIONS



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## **I.- DESCRIPTION**

### **A) INTRODUCTION**

The FMC model SMARTSTEP-2 (1990000), diesel powered, self-propelled passenger step is designed for universal use. It is capable of servicing aircraft with passenger doors from 2.4 to 5.8 m high.

The innovative design of the steps makes possible a combination of functional advantages and outstanding technical performances in the areas of safety, stability and load capacity.

1. Simple controls and systems - Easy accessibility of components coupled with simple systems to perform all step functions leads to easy maintenance and high customer satisfaction.
2. Stair raising cylinder - The single cylinder uses no chains, telescopic rods, or other devices to raise and lower the mobile stair flight. This simple, low-maintenance system combined with the unique flight interface geometry gives full height adjustment with no need of additional cylinders mounted in the support frame.
3. The side doors (access platform) are movable, but they can be fixed in order to allow the opening of the passenger doors.
4. Spring-mounted front section platform - This feature cushions the impact of the stairs against the aircraft in case of rough positioning and adds the advantage of eliminating any door/platform sill gap.

**B) GUIDELINE DOCUMENTS**

The SMARTSTEP-2 complies with the majority of the important specifications and requirements set out in the following documents and publications:

IATA AHM 910	(Basic Requirements for Aircraft GSE)
IATA AHM 913	(Basic Safety Requirements for Aircraft GSE)
IATA AHM 915	(Standard Controls)
IATA AHM 920	(Functional Specification for Self-Propelled Passenger Loading Steps)
ATA 101	(Manuals and Bulletins)

ISO publications, the European Directive 98/37/EC (Machinery) and draft standards CEN for aircraft GSE, have also been taken into account for the design of the SMARTSTEP-2 passenger step.

## **II. MAJOR COMPONENTS**

### **A) CHASSIS**

The chassis is purpose-designed by FMC specifically for this application. The structure consists of precision welded standard steel sections and plates.

The following assemblies are mounted on the chassis:

- 1) The power module is mounted in the center of the vehicle, allowing an excellent stability combined with ease of maintenance. The module includes hydraulic pump, hydraulic tank and filters, as well as the diesel engine, automotive type pump, cooling system and fuel tank.
- 2) The stairs assembly comprises a mobile and a fixed flight joined on an internal track. The assembly is mounted on the chassis using four articulated joints, situated so as to transmit the loads from the stairway directly to the stabilizers or wheels, thus minimizing bending stresses on the chassis.
- 3) The electric and hydraulic components are centralized in modules mounted on the chassis.
- 4) The driver's panel and seat are located in the front of the chassis to provide optimum visibility.

### **B) POWER UNIT**

The vehicle features a Deutz F4L 1011 F diesel engine as a standard power unit, directly coupled to a hydraulic pump for the vehicle traction. This pump supplies flow, depending on the diesel engine revolutions, to two "slow" traction engines connected in parallel and directly coupled to the rear wheels.

### **C) WHEELS AND TIRES**

Front radial tires - specification 7.00-R.12, max. inflation 10 bar (142 psi).

Wheel rims - specification 5.00-S.12" AC.

Rear radial tires - specification 7.00-R.12, max. Inflation 7 bar (100 psi).

Wheel rims - specification 5.00-S.12" AD.

### **D) BRAKES**

The service brake is integrated in the hydraulic installation. The brake valve, coupled the brake pedal, acts upon the shoes on the four wheels.

The parking brake acts on the rear drive wheels. It's mechanically actuated by a lever located at driver's post.

The hydrostatic brake is automatically activated when the accelerator pedal is released during traction.

## **E) STEERING SYSTEM**

The unit is equipped with integral hydraulic powered steering. An Orbitrol type steering pump acts upon a double action, double sided cylinder connected to the front axle steering bars.

## **F) AXLES**

Front axle: it is the steering axle.

The rear drive axle incorporates pneumatic type wheels. It is formed by two torque hubs and includes service and parking brakes.

## **G) STAIRWAY**

The stairway consists of two telescoping stair flights, activated directly by a hydraulic cylinder. Hydraulic and mechanical safety locks are incorporated to ensure that the desired stairs height setting is maintained. A mechanical ratchet lock is provided at each step height.

All the platform parts which come into contact with the aircraft are protected with tubular rubber bumpers, and all tread surfaces are illuminated for night operation.

## **H) HYDRAULIC SYSTEM**

### TRACTION PUMP

The hydraulic system of the SMARTSTEP-2 includes an automotive type variable flow pump that supplies the power for the traction circuit.

### SERVICES PUMP

A gear type hydraulic pump is directly coupled to the traction pump. The pump supplies the hydraulic power to the hydraulic services system.

### HYDRAULIC CYLINDERS

One double acting, double sided cylinder is provided for the steering activation. Four double acting cylinders with integral check valves are provided for stabilizer operation. One single acting, single stage cylinder with integral check valve is used for raising and lowering the mobile stair flight.

## EMERGENCY PUMP

A low-speed, high-torque, manually operated hydraulic pump is provided for emergency stabilizer retraction and step lowering.

## HYDRAULIC VALVES:

All the hydraulic valves are easily accessible in the unit, protected inside panels. The vehicle includes solenoid valves for stair lifting/lowering, safety latches activation and stabilizer cylinders extension/retraction.

## **I) ELECTRIC SYSTEM**

The electric power for the vehicle is supplied by a 24 VDC system comprising of two batteries charged by the engine alternator.

## STANDARD CONTROLS AND INSTRUMENTS

- Joysticks: traction, stair lifting/lowering, parking lights, headlights, turn signal lights.
- Switches: main ignition, start enable, steps illumination, stabilizer cylinders.
- Push-button: emergency stop.
- Indicator Lights: stabilizers up/down, low oil pressure, high coolant temperature, alternator not charging, parking brake on, turn signal lights on, headlights on, traction joystick in neutral position, emergency stop activated.
- Meters: fuel gauge, hourmeter.

### **III. SAFETY AND EMERGENCY DEVICES**

- Red emergency stop pushbutton (mushroom type) located on the control panel.
- Mechanical ratchet locks at each step height.
- Check valves on all stabilizers and main lift cylinder.
- Engine does not start if traction joystick is not in neutral position.
- Start disabled when engine is running.
- Manual emergency pump to raise stabilizers and lower mobile flight.
- Engine stops if the coolant temperature is too high or/and oil pressure is too low.
- Traction disabled if stabilizers are not retracted (indicator light is not green).
- Traction disabled if parking brake is on.
- Spring-mounted front section platform.
- Tubular rubber bumpers on all platform parts which come into contact with the aircraft.
- Stabilizer cylinders extended / retracted indicator lights.
- Emergency procedures on decals.

**IV. SPECIFICATIONS****LOAD CAPACITY**

Platform:	1,710 Kg	3,770 lb
Steps (extended):	5,016 Kg	11,058 lb
Per step:	228 Kg	503 lb

**WIND RESISTANCE (Stabilizers extended)**

Steps extended	110 Km/h	68 mph
Steps lowered	130 Km/h	81 mph

**TURNING RADIUS**

Outer (swept):	10.2 m	402 in
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**SPEED**

Maximum speed:	22 km/h	13.7 mph
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**SHIPPING DATA**

Height:	3.60 m	142 in
Length:	8.18 m	322 in
Width:	3.10 m	122 in
Approx. weight:	6600 Kg	14,550 lb
Shipping cube:	91.29 m <sup>3</sup>	3,224 ft <sup>3</sup>



**WORKING DIMENSIONS**

Access platform height (min):	2.40 m	94 in
Access platform height (max):	5.7 m	224 in
Maximum platform inclination:	$\pm 3^{\circ}$	
Access platform height (maximum, with optional fine tuning). Max. platform inclination does not comply with range of +/-3°	5,840 mm	230 in
Inner access platform width:	1.60 m	110 in
Access platform width:	1.82 m	63 in
Access platform depth:	1.80 m	72 in
Step width:	1.2 m	47 in
Tread depth:	290 mm	11 in
Riser height:	178 mm	7 in
Height of step to ground (max):	260 mm	10 in

**OTHER DIMENSIONS**

Wheelbase:	4.17 m	164 in
Front track:	2.00 m	79 in
Rear track:	1.93 m	76 in
Front stabilizer spacing:	2.12 m	83 in
Rear stabilizer spacing:	1.90 m	75 in
Stabilizer base:	6.13 m	241 in
Ground clearance:	160 mm	6.3 in

**CAPACITIES**

Fuel tank	100 l	26.4 Gal
Hydraulic tank	150 l	39.6 Gal
Hydraulic fluid	ISO VG-68	

## **V. OPTIONAL EQUIPMENT**

The following optional equipment that can be provided with the SMARTSTEP –2 passenger step

### **A) Chassis**

- Open canopy for stair flights and access platform
- Enclosed canopy for stair flights and access platform
- Driver's cabin with windshield wipers and opening rear window
- Driver's cabin with door, windshield wipers and opening rear window
- Front rubber bumpers
- Headlight protection
- Cab heating system (Diesel)
- Access platform 3 m width

### **B) Controls, Lights and Alarms**

- Flashing amber beacon
- Reversing alarm
- Stair flight lowering alarm
- Hazard flashing lights
- Indicator light with alarm for extended flight
- Spotlight under access platform
- Safety barriers without traction disablement
- Stairway lights activated by motion sensor
- Speed limiter to 6 km/h with mobile flight up

### **C) Miscellaneous**

- Fire extinguisher
- Extra color paint
- Export preservation
- Special decals
- Engine protection side covers
- Spare tire and rim
- LH & RH external rear view mirrors
- Right hand adjustable sliding panel in access platform
- Rubber cover over stabilizers

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