



ACCESS SYSTEMS FOR CONSTRUCTION AND INDUSTRIAL EQUIPMENT—SAE J185

SAE Recommended Practice

Report of Construction and Industrial Machinery Technical Committee approved July 1970.

1. Purpose—This recommended practice is intended as a guide for designing access systems to the operating station and service points on all types of machines used in construction, material handling, mining, logging, and other similar industries, primarily to aid in preventing accidents and reducing injury to personnel getting on, off, or moving about on vehicles while servicing and/or preparing to operate them.

2. Scope

2.1 This recommended practice covers the criteria for steps, ladders, walkways, platforms, grab rails (handrails), grab irons, guardrails, and entrance openings as they relate to aiding the operator and/or servicemen in performing their functions on the vehicle.

2.2 This recommended practice does not include any criteria for the floor of the operating compartment.

3. Definitions

3.1 Step—A device designed for foot placement.

3.2 Ladder—A system consisting of a series of steps that are uniformly spaced and will accommodate either/or both feet.

3.2.1 VERTICAL LADDER—A ladder slanted not less than 75 deg from horizontal.

3.2.2 INCLINED LADDER—A ladder slanted less than 75 deg from horizontal.

3.3 Walkways—A surface designed for personnel to move about on the vehicle.

3.4 Platform—A surface on which personnel are required to perform a service function, or a machine function other than operating.

3.5 Grab Rail (Handrail) and Grab Iron—Devices that may be grasped by the hand for body support.

3.5.1 GRAB RAIL (HANDRAIL)—A device designed specifically to permit movement of the hand to a different location without removing the hand from the device (Fig. 4).

3.5.2 GRAB IRON—A device designed specifically for single placement of a hand (Fig. 3).

3.6 Guardrail—A rail above the outside edge of walkways or platforms (Fig. 6).

3.7 Entrance Opening—The opening providing entry to the operating compartment. (See also SAE J925.)

4. General Criteria

4.1 The design of these devices and the means of attachment should provide adequate strength for the purpose intended.

4.2 The designer should design for both the 95th percentile group and the 5th percentile groups. (See SAE J833.)

4.3 The designs and attachment means should be such as to minimize the probability of the user becoming lodged inadvertently, for example, the lodging of a finger, hand, foot, or wearing apparel.

4.4 Devices designed for hand contact should be free of roughness, such as sharp corners or weld spatter.

4.5 The design and placement of these devices should be such as to minimize protrusions that could increase injury in case of a fall.

4.6 These devices may be portable to provide convenient storage on the vehicle; but, when in use position, they should not move under load (see paragraph 5.13).

4.7 Steps, ladders, and grab rails to, on, and from platforms and walkways, should be designed to invite the person using them to have three limbs on the system at all times. (Two hands and one foot, or two feet and one hand.)

5. Steps and Ladders

5.1 The maximum height of the first step from the ground to the machine should not exceed 30 in. when the machine is in the normal parked condition. The preferred height of this step is 16 in.

5.2 The maximum distance between steps of vertical ladders on machines is 16 in. The preferred distance between steps is 12 in.

5.3 Where lateral movement is necessary from the top step of a vertical ladder to a walkway or a platform, the vertical distance should be no more than 12 in.

5.4 It is preferred that all steps have the width capacity to hold both feet. The minimum width for such design is 12 in. The preferred width is 15 in.

5.5 In those cases where only one foot is used on a step, that step should be no less than 6 in. wide. Steps 7.5 in. wide are preferred. The use of such steps dictates that they be coordinated with properly positioned grab rails to force the use of the proper foot.

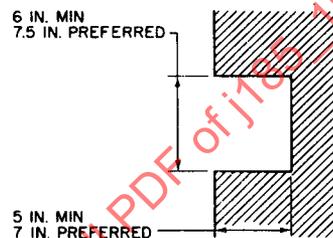


FIG. 1

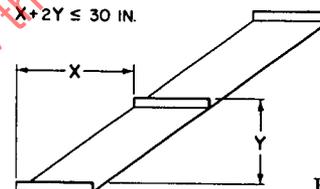


FIG. 2

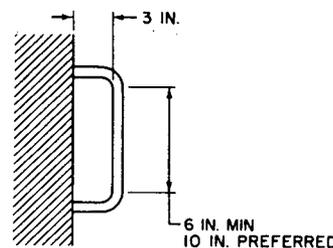


FIG. 3

5.6 The minimum toe clearance from the outside edge of the step should be 5 in. The preferred distance is 7 in. (Fig. 1).

5.7 The minimum clearance height at the instep is 6 in. The preferred height is 7½ in. (Fig. 1).

5.8 Wherever a foot may contact a moving part by protruding through the step, a shield should be provided between the step and the moving part. (See SAE J907.)

5.9 Where steps are in series to form an inclined ladder, they should be spaced such that two times the rise plus the stride distance (the horizontal distance from the leading edge of one step to the leading edge of the next step) should be no more than 30 in. (Fig. 2).

5.10 The tread surface of a step should not be designed for use as a grab iron. The leading edge of steps should have no protrusions capable of snagging a finger, ring, or clothing.

5.11 The design of steps should minimize the accumulation of debris. The tread surface should be a high slip resistant surface and should aid in the cleaning of mud and debris from the shoe sole.

5.12 Flexibly mounted steps should be avoided whenever possible.