



Designation: F 1159 – 97a

Standard Practice for the Design and Manufacture of Amusement Rides and Devices¹

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1. Scope

1.1 This practice establishes information and procedures for the design and manufacture of amusement rides and devices.

1.2 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

F 846 Guide for Testing Performance of Amusement Rides and Devices²

2.2 Federal Documents:³

Dept. of Health, Education, and Welfare *Pediatric Growth Development Chart*, 1983

USDA Agricultural Handbook 72, Rev. 0—*The Wood Handbook*, by the U.S. Dept. of Agricultural Forest Products Laboratory

2.3 Society of Automotive Engineers Standards:⁴

SAE J 833 Recommended Practice for USA Human Physiological Dimensions

SAE Hydraulic Fluid Standards

SAEJ-10 Pneumatic Storage Tanks

SAE Pneumatic Tubing Standards

2.4 American Society of Mechanical Engineers Documents:⁵

ASME Boiler and Pressure Vessel Code, Section VIII, Division 1

ASME Welding Standards

2.5 American Institute of Steel Construction Document:⁶

AISC Manual on Steel Construction

2.6 *American Welding Society Standard:*⁷

ANSI/AWS D1.1 Structural Welding Code

2.7 *National Fire Protection Association Standard:*⁸

National Electrical Code

2.8 *ANSI Standard:*⁹

ANSI (NFPA/JIC) T2.24.1–1991 Hydraulic Fluid Power Systems Standard for Stationary Industrial Machinery,⁹

3. Significance and Use

3.1 This practice provides designers and manufacturers of amusement rides and devices with design references and criteria to use in designing and manufacturing amusement rides and devices.

4. Procedures for Developing Documentation and Records

4.1 *Design and Calculations*—Manufacturers' basic documentation and engineering analysis shall include, but not be limited to, the following:

4.1.1 Performance characteristics of structural, mechanical, and electrical components, and

4.1.2 Forces on passengers due to the action of the ride based on design loading.

4.2 *Drawings and Records*—Records shall be kept on the characteristics and forces explained in 4.1.1 and 4.1.2 for all versions and revisions of a ride or device so long as deemed appropriate by the designer/manufacturer.

4.3 *Testing*—Document and record the testing performance of amusement rides and devices in accordance with the tests given in Guide F 846.

DESIGN PROCEDURES

5. Designing in Accordance with Passenger Weights

5.1 The weight assigned to an adult passenger, for design purposes, shall be 170 lb (77 kg) or 12 lb/in. (5.4 kg/25.4 mm) of hip width at the seat, whichever is greater. Reference SAE

¹ This practice is under the jurisdiction of ASTM Committee F-24 on Amusement Rides and Devices and is the direct responsibility of Subcommittee F24.24 on Design and Manufacture.

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² *Annual Book of ASTM Standards*, Vol 15.07.

³ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁴ Available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.

⁵ Available from Society of Mechanical Engineers, 345 East 47th St., New York, NY 10017.

⁶ Available from the Institute of Steel Construction, P.O. Box 4588, Chicago, IL 60680.

⁷ Available from the American Welding Society, 550 N. LeJeune Rd., Miami, FL 33126.

⁸ Available from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

⁹ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.