

Testing Methods for Audio Cassettes —SAE J1275 JUN80

SAE Recommended Practice
Approved June 1980

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PREPRINT

Report of the Electrical Equipment Committee, approved June 1980.

1. Introduction—With the technical advances made in magnetic tape coatings and record and reproducing heads, a larger and larger portion of recorded entertainment is being put into audio cassettes. Various forms of educational subjects and information are appearing. All of these will become an increasingly important part of the information and entertainment systems in the automobile. As the number of audio cassettes in use in the automobile grows, the consumer demand for a high performance, reliable audio cassette will increase. A large amount of effort has gone into standardizing the cassette by various groups. However, only a small effort has been made toward the special requirements needed in the automobile. This recommended practice covers the physical dimensions, test methods, and procedures; and SAE J1274 covers the performance requirements. This is the first issue of this SAE Recommended Practice on the audio cassette and it is planned to revise and reissue it again in about two years.

2. Scope—This recommended practice covers the mechanical properties, mechanical dimensions, test conditions, and procedures needed to evaluate the audio cassette for automotive use. In addition, a set of cassette player/recorder interface properties which ensures satisfactory operation of the cassette in the automobile is included.

3. Applicable Documents—Reference is made to the following documents covering the audio cassette and associated player/recorder.

SAE J1274 (Available from SAE, Warrendale, PA 15096)

ANSI Y14.5-1973

ANSI C16.5-1961 (IEEE Std. 152-1953)

ANSI S4.3-1972 (IEEE Std. 193-1971)

ANSI/EIA RS-399A

(ANSI reports available from American National Standards Institute, 1430 Broadway, New York, NY 10018)

DIN Standard 45500

DIN Calibration Tape 45513/6

DIN Calibration Tape PES 12/C 521

(DIN Standards and Tapes available from Deutsches Institut für Normung eV, 8 Burggrafenstrasse, 1000 Berlin 30, West Germany)

Federal Standard W-C-1684

(Available from Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120)

IEC-94A and Amendments

IEC 368-1972

(IEC Recommendations available from ANSI)

ISO 370-1975 Standard (available from ANSI)

ITA-A-101, Audio Cassette

ITA-A-102, Audio Cassette and Associated Hardware

ITA-A-104, Duplication Guidelines

(ITA Specifications available from ITA 10 West 66th Street, New York, NY 10023)

Appreciation is expressed to ITA which extended their permission to use parts of their specification and to EIA for the use of their drawings on the cassette.

4. Physical Dimensions—Figs. 1–3 inclusive (Figs. 1A–3A inclusive for English dimensions) contain the dimensional requirements for the cassette.

4.1 Tape Winding—Magnetic coated surface of the tape shall face outward from the open end of the cassette.

4.2 Breakout Lugs—Breakout lugs shown in Fig. 3 (Fig. 3A for English dimensions) when removed shall provide protection against accidental erasure of the relevant side. Dimensions for the lug holes are shown on Fig. 1 (Fig. 1A for English dimensions). The space between the lug and hole edges shall not exceed 1.0 mm (0.04 in).

4.3 Materials—All materials for the housing and other parts which are within the tape path shall be non-magnetic and shall not require lubrication or maintenance after manufacture.

4.4 Shield—Each audio cassette shall be provided with an effective magnetic shield positioned directly behind the pressure pad.

4.5 Support Planes—The support planes for the audio cassette are shown in Fig. 2 (Fig. 2A for English dimensions) by the hatched areas. These planes determine the location of the cassette in the player.

4.6 Tape Path—The unobstructed area for the tape to travel from the

supply hub to the take-up hub is shown in Figs. 2 and 2A. The openings reserved for player/recorder components are shown in Fig. 4. These openings shall be unobstructed over the full height of the openings. Most cassettes are constructed in such a way that there is a small gap between two halves of the cassette. If this gap exists, steps shall be taken to minimize the possibility of the tape becoming trapped in this gap.

4.7 Window Area (Window Optional)—The maximum window area shall be as shown in Fig. 3 (Fig. 3A for English dimensions). The maximum allowable cassette thickness (required, for example, to accommodate marks indicating amount of wound and unwound tape) shall be as shown for each support plane. The window area, if provided, shall be covered with a clear, rigid material sealed to the housing to exclude dust and dirt and shall not interfere with the tape motion.

4.8 Tape Width—The tape shall have a width of $3.81 \pm 0.00, -0.05$ mm ($0.150 \pm 0.00, -0.002$ in).

4.9 Tape Length and Thickness—For pre-recorded tapes, the tape length shall be determined by program material. For blank tapes, the cassette shall contain a sufficient length of tape such that when playing one side at 0.0476 m/s (1.875 in/s) the measured playing time will not be less than the playing time per side or one half of the total playing time as specified on the label. Tape thickness shall be 11–20 μ (433 – 788 μ in).

4.10 Splices—Splices will not be allowed between the ends of the magnetic tape. For the splice between the leader and the tape it is recommended that the splice gap not exceed 0.4 mm (1/64 in) so that the adjacent layers of tape on the reel will not stick to the splice area.

4.11 Labels

4.11.1 The area for the label is shown in Fig. 3 (Fig. 3A for English dimensions). The maximum allowable depression in the thickness of the cassette in the label area is given for each support plane.

4.11.2 Labels shall be positioned within the recessed surface of the housing. Direct printing on the cassette housing is allowed; however, paragraphs 4.11.4 to 4.11.6 inclusive shall still apply.

4.11.3 Labels shall securely adhere to the housing and not loosen or curl after environmental and physical test conditions.

4.11.4 Inks and colors on labels shall not smear or come off under normal use and when subjected to the environmental and physical test conditions.

4.11.5 For blank tapes, labels shall specify either the total playing time or the playing time per side as well as the speed at which the tape must be played to obtain this playing time.

4.11.6 The label on blank tapes shall provide a blank area for consumer information which will readily accept lead pencil and ball point pen.

4.11.7 The label or the container insert shall contain a warning against exposing the cassettes to high temperatures from direct sunlight on both pre-recorded and blank tape cassettes.

4.12 Workmanship—The cassette shall be clean, free of cracks and molding flash, and have as small as possible a gate break off scar located in a non-critical area. A visual examination of the tape shall not show evidence of excessive tension that can occur during manufacture of the cassette.

4.13 Recording Format—The location of recorded information on the tape shall be as shown in Fig. 7. Tracks 1 and 2 shall be recorded for simultaneous reproduction for one direction of travel and shall be reproduced when playing Side 1 or Side A when inserted into the player with that side upward. Side 2 or Side B shall play in a similar manner using tracks 3 and 4.

5. Cassette Player Interface

5.1 Introduction—The performance and life of any cassette is highly dependent upon the player in which it is operating. A player not meeting certain performance standards will not play a standard cassette as defined in paragraph 5.2.1 in a satisfactory manner. Conversely, a player meeting these standards may not play a substandard cassette in a satisfactory manner. For this reason it is necessary to define certain minimum player interface standards so that the combined result is acceptable. This section describes the characteristics of a player/recorder that will successfully play/record a cassette.

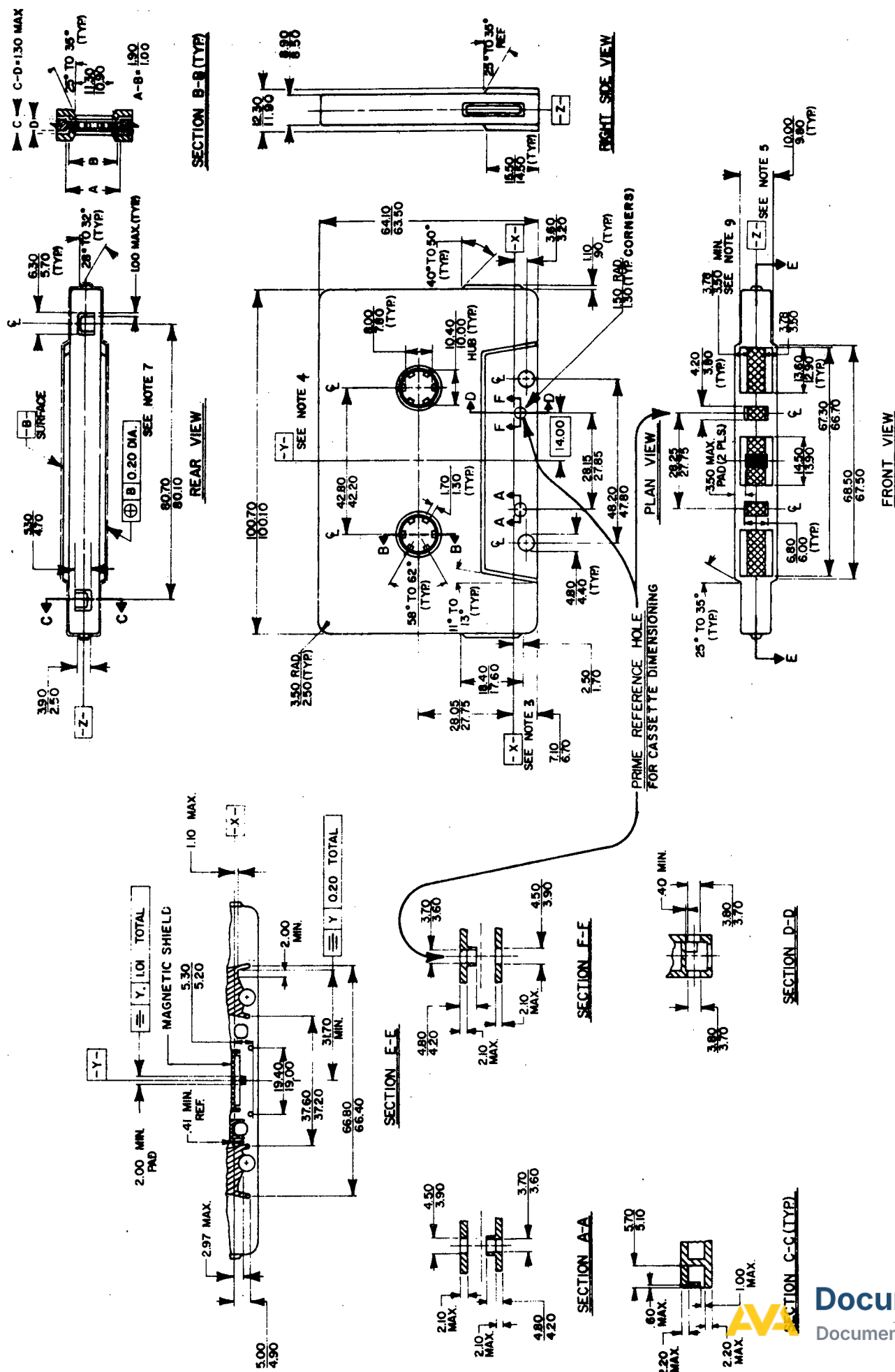


FIG. 1—COMPACT CASSETTE DIMENSIONS (MILLIMETERS)