INTERNATIONAL STANDARD

ISO/IEC 7811-1

Fourth edition
2014-09-01

Identification cards — Recording technique —

Part 1: Embossing

Cartes d'identification — Technique d'enregistrement —

Partie 1: Estampage

Reference number
ISO/IEC 7811-1:2014(E)

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is Joint Technical Committee ISO/IEC JTC 1, *Information technology*, SC 17, *Cards and personal identification*.

This fourth edition cancels and replaces the third edition (ISO/IEC 7811-1:2002), which has been technically revised. Major changes from the first edition are as follows:

— Annex D added to define the minimum spacing from embossing and IC components.

— Title of Clause 6 was changed to avoid confusion. Formerly, the title was "Visually and machine readable characters" which could be interpreted to include characters in the following clause. Reference in Table 1 was also changed.

ISO/IEC 7811 consists of the following parts, under the general title *Identification cards — Recording technique:*

— *Part 1: Embossing*

— *Part 2: Magnetic stripe — Low coercivity*

— *Part 6: Magnetic stripe — High coercivity*

— *Part 7: Magnetic stripe — High coercivity, high density*

— *Part 8: Magnetic stripe — Coercivity of 51,7 kA/m (650 Oe)*

— *Part 9: Tactile identifier mark*

Notes in this part of ISO/IEC 7811 are only used for giving additional information intended to assist in the understanding or use of the standard and do not contain provisions or requirements to which it is necessary to conform in order to be able to claim compliance to this part of ISO/IEC 7811.

Identification cards — Recording technique —

Part 1: Embossing

1 Scope

This part of ISO/IEC 7811 is one of a series of International Standards describing the parameters for identification cards as defined in the definitions clause and the use of such cards for international interchange.

This part of ISO/IEC 7811 specifies requirements for embossed characters on identification cards. The embossed characters are intended for transfer of data either by use of imprinters or by visual or machine reading. It takes into consideration both human and machine aspects and states minimum requirements.

It is the purpose of this International Standards to provide criteria to which cards shall perform. No consideration is given within these International Standards to the amount of use, if any, experienced by the card prior to test. Failure to conform to specified criteria should be negotiated between the involved parties.

ISO/IEC 10373-1 specifies the test procedures used to check cards against the parameters specified in this part of ISO/IEC 7811.

NOTE 1 Numeric values in the SI and/or Imperial measurement system in this part of ISO/IEC 7811 might have been rounded off and therefore are consistent with, but not exactly equal to, each other. Either system can be used, but the two is not intended to be intermixed or reconverted. The original design was made using the Imperial measurement system

NOTE 2 TIM (Tactile Identifier Mark) defined by ISO/IEC 7811-9 can be located in the name and address area of this part of ISO/IEC 7811. The layout of embossed characters in this area is not intended to interfere with TIM.

2 Conformance

A prerequisite for conformance with this part of ISO/IEC 7811 is conformance with ISO/IEC 7810 for the ID-1 size card. An identification card is in conformance with this part of ISO/IEC 7811 if it meets all mandatory requirements specified herein. Default values apply if no others are specified.

3 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1831, *Printing specifications for optical character recognition*

ISO/IEC 1073-1, *Alphanumeric character sets for optical recognition – Part 1: Character set OCR-A–Shapes and dimensions of the printed image*

ISO/IEC 1073-2, *Alphanumeric character sets for optical recognition– Part 2: Character set OCR-B–Shapes and dimensions of the printed image*

ISO/IEC 7810, *Identification cards — Physical characteristics*

ISO/IEC 7811-9, *Identification cards — Recording technique — Part 9: Tactile identifier mark*

ISO/IEC 7812-1, *Identification cards — Identification of issuers — Part 1: Numbering system*

ISO/IEC 7812-2, *Identification cards — Identification of issuers — Part 2: Application and registration procedures*

ISO/IEC 10373-1, *Identification cards — Test methods — Part 1: General characteristics*

4 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 7810 and the following apply.

4.1
embossing
to raise characters in relief from the front surface of the card

4.2
unused card
card which has been embossed with all the characters required for its intended purpose but has not been issued

4.3
returned card
embossed card after it has been issued to the card holder and returned for the purpose of testing

4.4
identification number
number that identifies the card holder

5 Card characteristics

Special attention shall be paid to the characteristics of the material affecting its suitability for this purpose, particularly in respect to its ability to resist crushing and collapsing of the embossed parts when operating in imprinters.

Cards shall be made of PVC (polyvinyl chloride) and/or PVCA (vinyl chloride/vinyl acetate copolymer) or materials having equal or better performance such as polyesters, polyethylenes and polycarbonates.

NOTE Refer to machine manufacturer instructions regarding card construction requirements for achieving embossed character relief heights in compliance with this part of ISO/IEC 7811. At the time of publication there was no agreed on test method for verifying the suitability of card structures for embossing. See Informative Annex C.

5.1 Card warpage

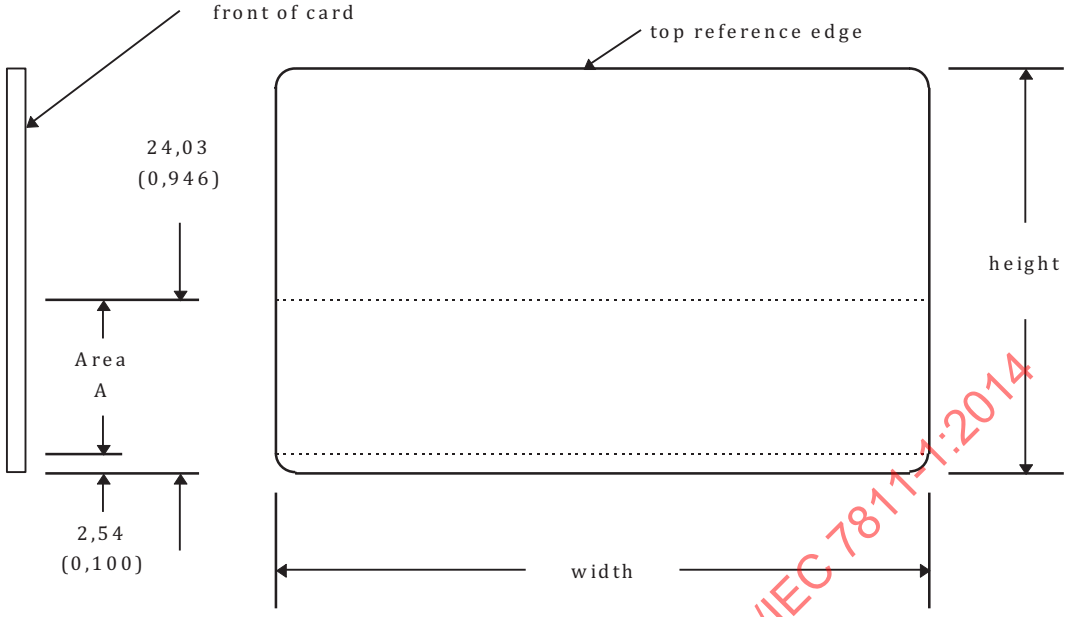
When lying convex side up on a flat rigid surface, the maximum distance from the flat surface to any non-embossed portion of the convex side of an embossed card immediately prior to issue shall not be greater than 2,5 mm (0.10 in) including the card thickness.

NOTE The amount of card warpage depends on the card material and the embossing technique used.

5.2 Surface distortions

No raised area shall exceed 0,51 mm (0.020 in) on the front of the card in the area A as shown in Figure 1.

Dimensions in millimetres (inches)



Width		Height	
maximum	minimum	maximum	minimum
85,90 (3,382)	85,47 (3,365)	54,18 (2,133)	53,92 (2,123)

Figure 1 — Embossed card dimensions

5.3 Card width and height

All points on the edges of the embossed card in the finished state, except for the rounded corners, shall fall between two concentric, similarly aligned rectangles as defined in Figure 1 for maximum height and width, and minimum height and width.

NOTE 1 Card width and height tolerances given here are different than those in ISO/IEC 7810 to account for changes in card size due to embossing.

NOTE 2 All identification card standards use the top edge of the card as the reference edge for dimensions, except for this embossing standard which, for historical reasons, uses the bottom edge of the card as the reference.

6 Machine readable characters

6.1 Character set and type font

The numeric characters of one of the following type fonts shall be used for embossed characters intended for machine reading, either directly from the card or from card imprints (see Annex A):

— ISO/IEC 1073-1, OCR-A, Sizes I and IV;

— ISO/IEC 1073-2, OCR-B, Sizes I and IV;

— Type font Farrington 7B as described in Annex B.

NOTE To ensure system compatibility in the choice of font, the attention of intending users is drawn to the necessity of agreement with their potential interchange partners.

Print specifications are given in ISO 1831.

6.2 Character spacing

The centreline to centreline character spacing shall be 3,63 mm ± 0,15 mm (0,143 in ± 0,006 in).

6.3 Character height

Maximum height at the printing surface of the embossed characters, encompassing centreline skew, and character misalignment shall be 4,32 mm (0.170 in).

6.4 Relief height of embossed characters

Relief height of imprinting character surfaces above the card surface as measured from the non-embossed surface of the card to the highest point on the embossed character is shown in Table 1 for unused cards and for returned cards.

7 Visually readable characters

7.1 Character set and type font

A type font such as the alphanumeric, upper case characters described in ISO/IEC 1073-2, OCR-B, Size I, should be used for embossed characters intended for visually reading directly from the card or from card imprints.

7.2 Character spacing

The centreline to centreline character spacing shall be 2,54 mm ± 0,15 mm (0,100 in ± 0,006 in).

7.3 Relief height of embossed characters

Relief height of imprinting character surfaces above the card surface as measured from the non-embossed surface of the card to the highest point on the embossed character is shown in Table 1 for unused cards and for returned cards.

Table 1 — Relief height of embossed characters

Dimensions in millimetres (inches)

Type of card	Machine readable characters		Visually readable characters	
	Maximum	Minimum	Maximum	Minimum
Unused card	0,48 (0,019)	0,40 (0,016)	0,46 (0,018)	0,36 (0,014)
Returned cards	0,48 (0,019)	0,30 (0,012)	0,46 (0,018)	0,26 (0,010)

NOTE Values in the table show only the limits within which cards will function normally, and do not imply any guarantee of relief height during the valid term for issued cards.

8 Assigned embossing areas

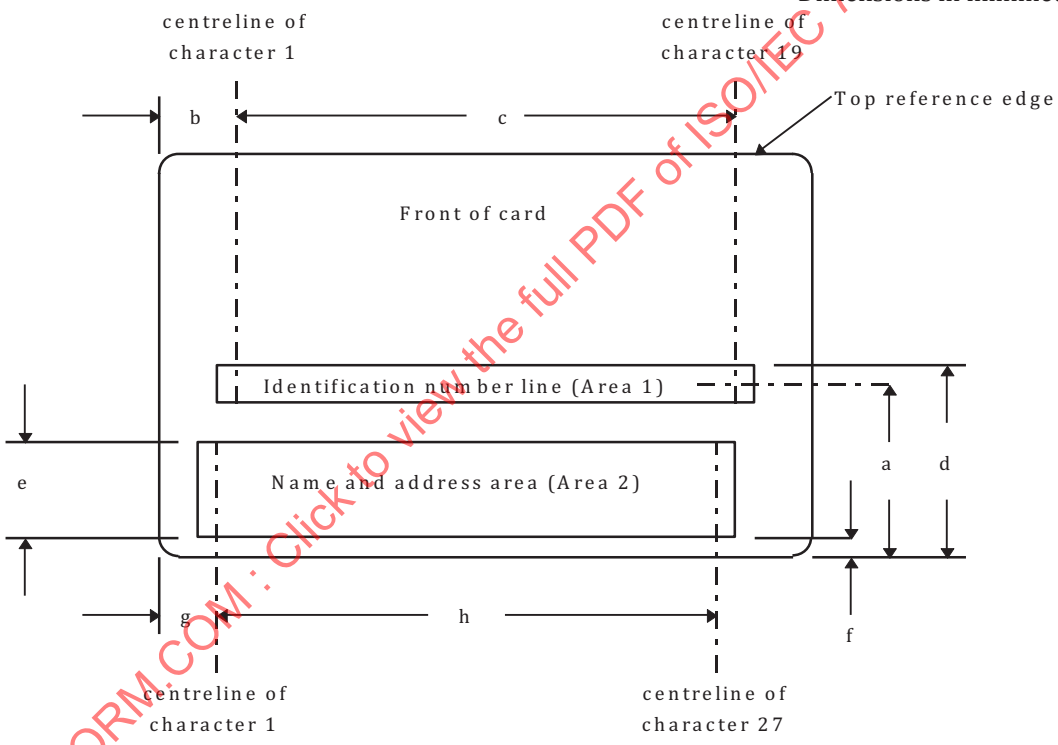
Two areas for embossing shall be assigned to the card as shown in Figure 2.

Area 1 — Area reserved for the identification number line according to ISO/IEC 7812. The characters in this area and imprints of the area are intended both for visual and machine reading;

Area 2 — Area provided for the card holder's identification data such as name, address, and other data which may be required. It is called "name and address area". Data contained in this area of the card or imprinted from the card is only intended for visual reading.

When the technology used to form the raised areas causes a physical deformation of the card such as mechanical embossing, then special care shall be taken that such deformation of the card does not adversely affect the required characteristics of the contained components such as IC, antenna, connecting wires, etc. A minimum distance of 3 mm between the contained components and any deformed part of the card is recommended.

Dimensions in millimetres (inches)



Identification number line (Area 1)		Name and address area (Area 2)	
a	21,42 ± 0,12 (0,843 ± 0,005)	e	14,53 (0,572) maximum
b	10,18 ± 0,25 (0,401 ± 0,010)	f	2,54 (0,100) minimum 3,30 (0,130) maximum
c	65,31 ± 0,76 (2,571 ± 0,030)	g	7,65 ± 0,25 (0,301 ± 0,010)
d	24,03 (0,946) maximum	h	66,04 ± 0,76 (2,600 ± 0,030)

Figure 2 — Assigned embossing area locations and tolerances

8.1 Identification number line

The identification number line provides space for a single line of characters of the type specified in 6.1 and comprises a maximum of 19 character positions at a nominal centreline to centreline spacing of 7 characters per 25,4 mm (1,00 in).

The actual number of utilised (embossed) character positions will depend upon application requirements. The location and tolerances for embossed characters shall be as shown in Figure 2.

When designing a new system, it is advisable to provide for maximum flexibility of use, i.e.:

- justify the embossed identification number to the left;
- make allowances for an identification number with maximum length;
- for financial applications if a character position is available, it is recommended to insert a blank space between the issuer identification and the individual account identifier of the identification number (refer to ISO/IEC 7812).

8.2 Name and address area

The name and address area provides space for four lines of 27 characters each at a nominal centreline to centreline spacing of 10 characters per 25,4 mm (1,00 in) of the type specified in 7.1. Any information embossed in the name and address area should always be embossed as far as possible from the identification number.

The location and tolerances for embossed characters shall be as shown in Figure 2.

WARNING — Those card issuers who require embossing of four name and address lines should be aware that the imprinted documents produced from their cards may not be acceptable in an interchange environment due to OCR clear area requirements on some types of OCR reading equipment.

NOTE The first character in the name and address area need not be justified to the left. However the use of 27 character positions is based on a 7,65 mm (0,301 in) distance to the edge of the card as shown in Figure 2.

Annex A
(informative)

Pictorial representation of numeric data

Figure A.1 — OCR-A

Figure A.2 — OCR-B

Figure A.3 — Farrington 7B

Annex B
(normative)

7 B Print specifications

B.1 Character set

The 7 B font consists of numeral characters 0 to 9 inclusive.

B.2 Character dimensions and tolerances-Printed image

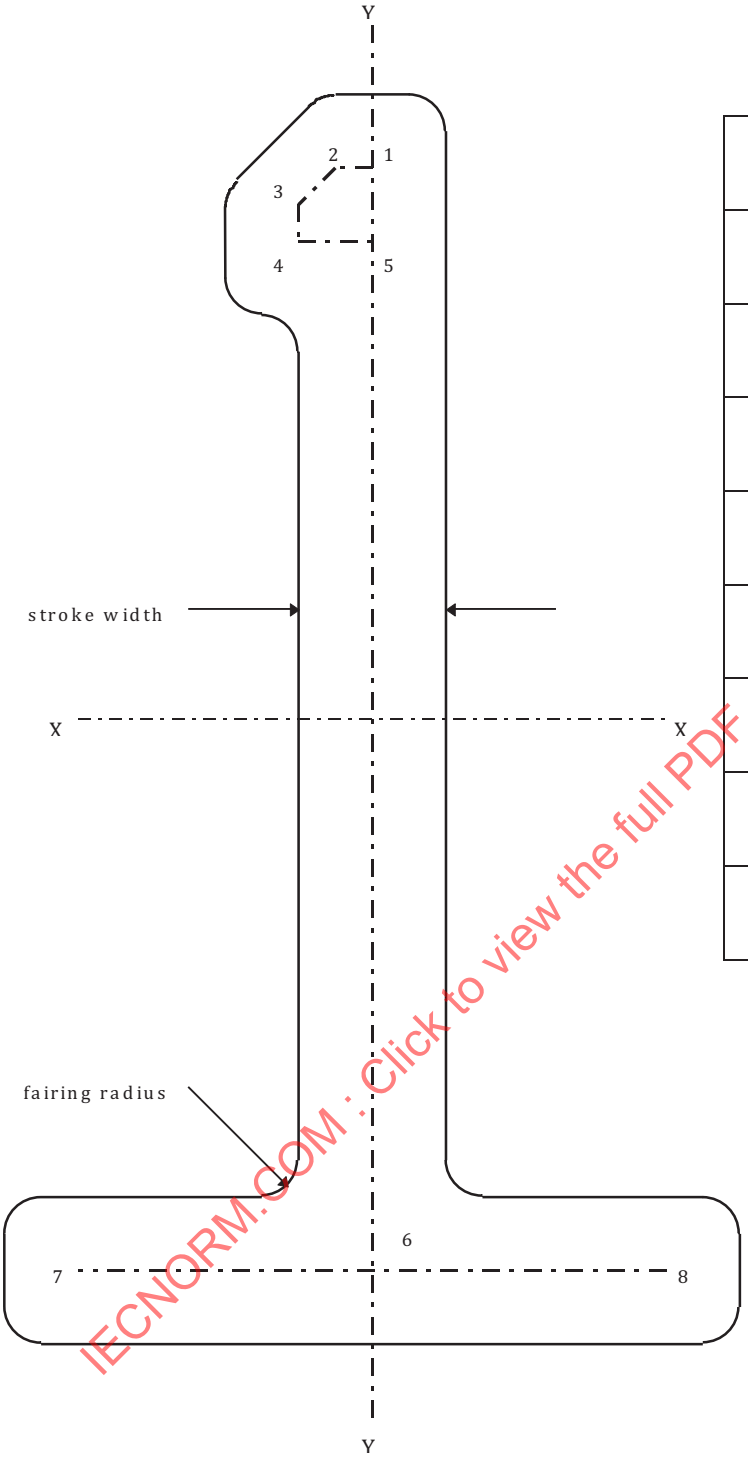
Printed images for characters are as shown in Figures B.1 to B.10. Dimensions and tolerances common to all characters are shown in Table B.1. Characters are shown as printed on document and not necessarily as embossed.

Table B.1 — Character dimensions for 7B font

Dimensions in millimetres (inches)

Feature	Dimension/tolerance
Overall character height	4,32 (0,170) nominal
Overall character width	2,54 (0,100) nominal
Stroke width for all characters	0,51 ± 0,25 (0,02 ± 0,01)
Fairing radius for all characters	0,13 ± 0,13 (0,005 ± 0,005)
Tolerances on all character centreline dimensions	±0,08 (±0,003)

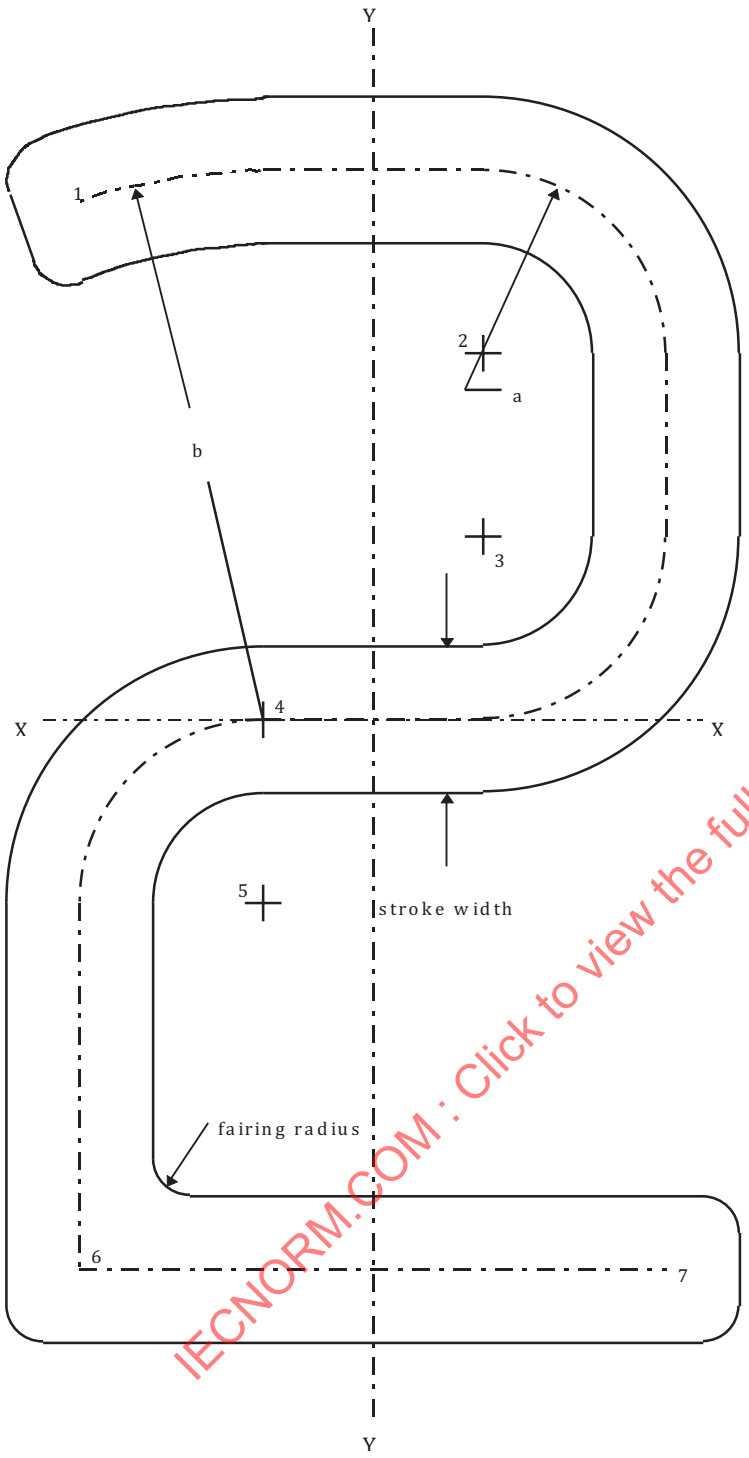
Dimensions in millimetres (inches)



Point number	X value	Y value
1	0,00 (0,000)	+ 1,91 (+ 0,075)
2	- 0,76 (- 0,003)	+ 1,91 (+ 0,075)
3	- 0,25 (- 0,010)	+ 1,73 (+ 0,068)
4	- 0,25 (- 0,010)	+ 1,65 (+ 0,065)
5	0,00 (0,000)	+ 1,65 (+ 0,065)
6	0,00 (0,000)	- 1,91 (- 0,075)
7	- 2,032 (- 0,080)	- 1,91 (- 0,075)
8	+ 2,032 (+ 0,080)	- 1,91 (- 0,075)

Figure B.1 — Printed image for 7B font-1

Dimensions in millimetres (inches)

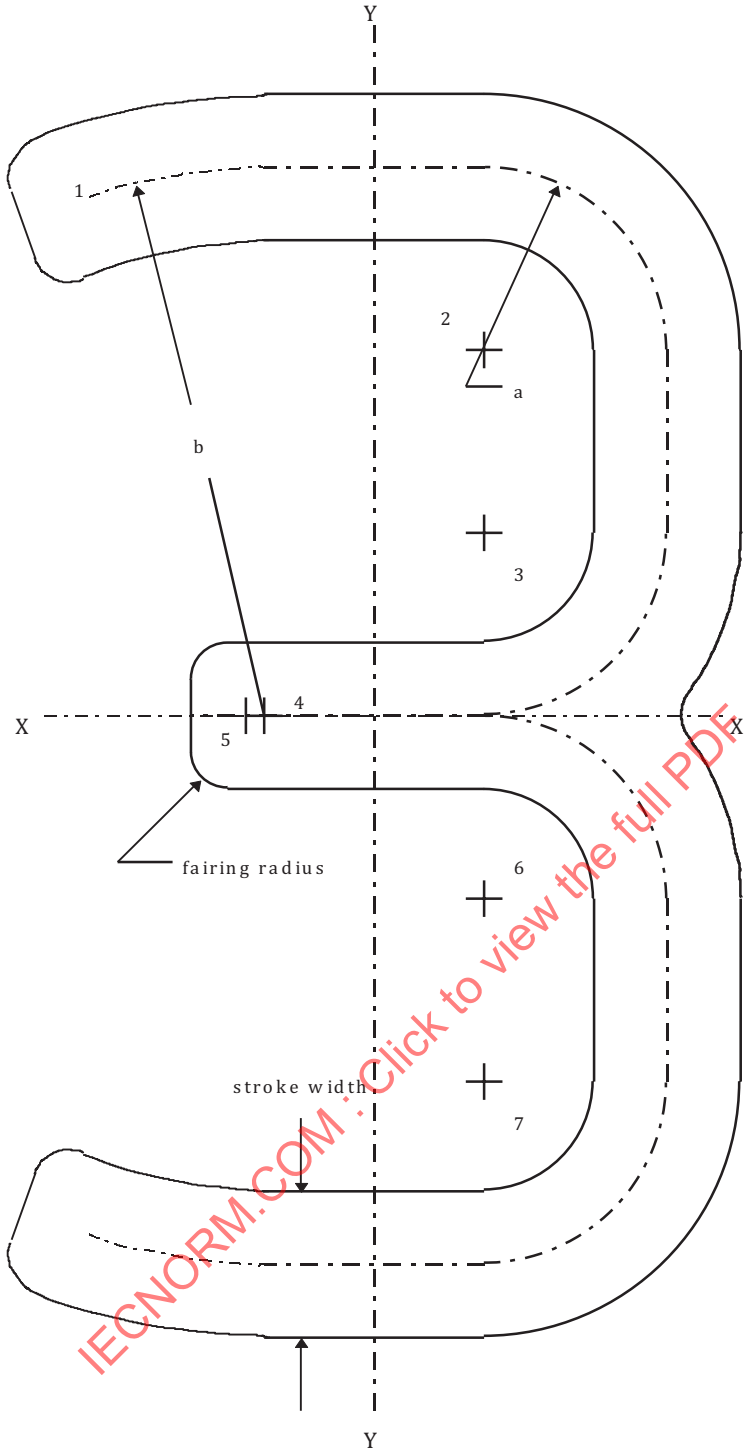


Point number	X value	Y value
1	- 0,98 (- 0,038)	---- ----
2	+ 0,38 (+ 0,015)	+ 1,27 (+ 0,050)
3	+ 0,38 (+ 0,015)	+ 0,64 (+ 0,025)
4	- 0,38 (- 0,015)	0,00 (0,000)
5	- 0,38 (- 0,015)	- 0,64 (- 0,025)
6	- 1,02 (- 0,040)	- 1,91 (- 0,075)
7	+ 1,02 (+ 0,040)	- 1,91 (- 0,075)

Centreline radius	
a	0,64 (0,025)
b	1,91 (0,075)

Figure B.2 — Printed image for 7B font-2

Dimensions in millimetres (inches)

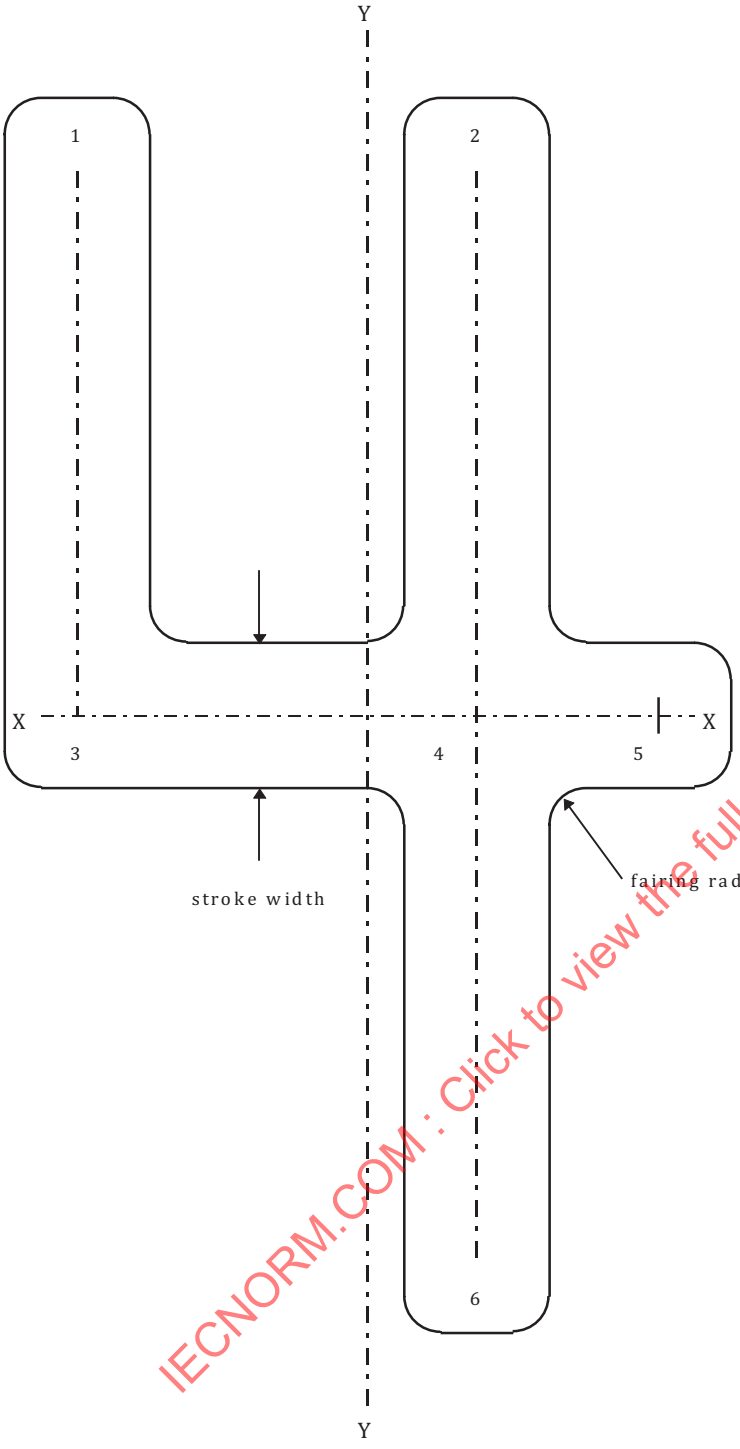


Point number	X value	Y value
1	- 0,98 (- 0,038)	---- ----
2	+ 0,38 (+ 0,015)	+ 1,27 (+ 0,050)
3	+ 0,38 (+ 0,015)	+ 0,64 (+ 0,025)
4	- 0,38 (- 0,015)	0,00 (0,000)
5	- 0,51 (- 0,020)	0,00 (0,000)
6	+ 0,38 (+ 0,015)	- 0,64 (- 0,025)
7	+ 0,38 (+ 0,015)	- 1,27 (- 0,050)

Centreline radius	
a	0,64 (0,025) 4 places
b	1,91 (0,075) 2 places

Figure B.3 — Printed image for 7B font-3

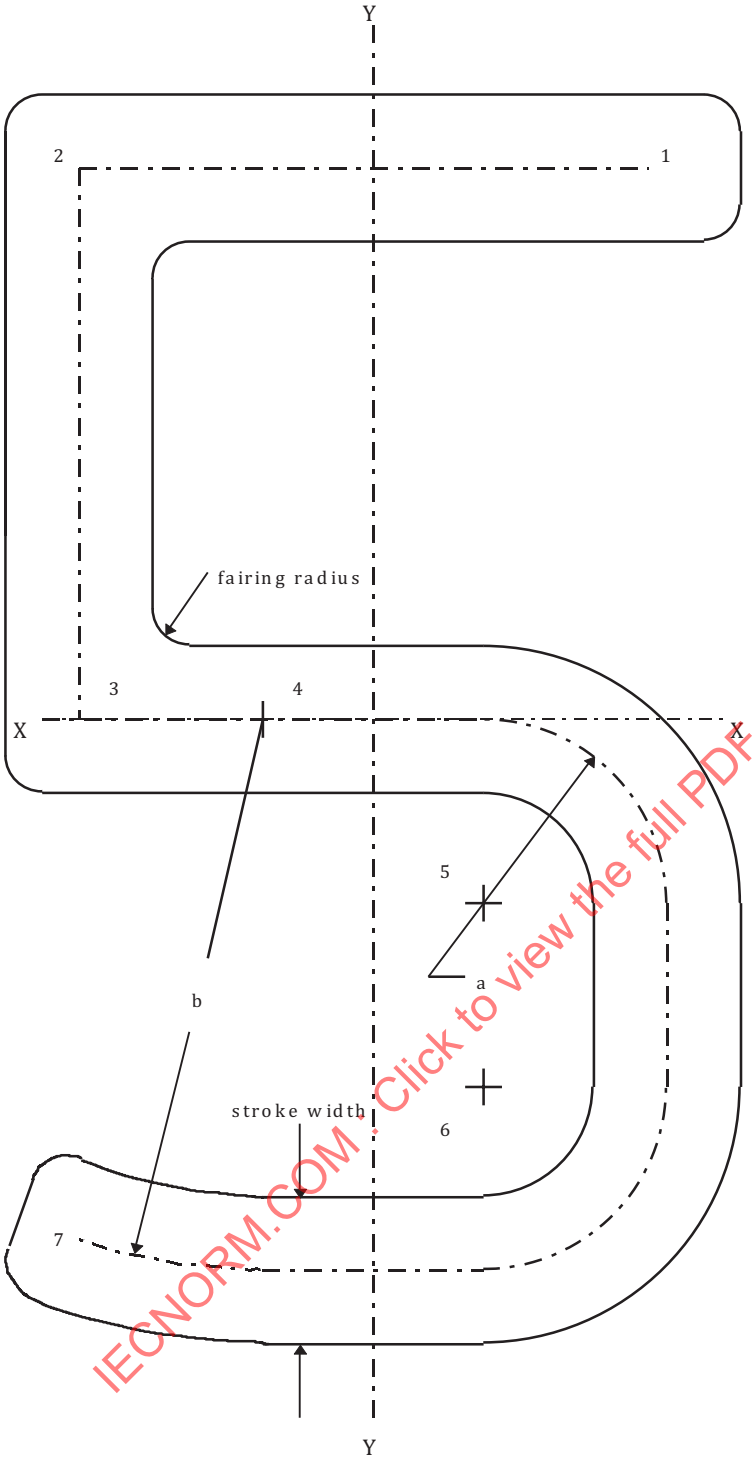
Dimensions in millimetres (inches)



Point number	X value	Y value
1	- 1,02 (- 0,040)	+ 1,91 (+0,075)
2	+ 0,38 (+ 0,015)	+ 1,91 (+0,075)
3	- 1,02 (- 0,040)	0,00 (0,000)
4	+ 0,38 (+ 0,015)	0,00 (0,000)
5	+ 1,02 (+ 0,040)	0,00 (0,000)
6	+ 0,38 (+ 0,015)	+ 1,91 (+0,075)

Figure B.4 — Printed image for 7B font-4

Dimensions in millimetres (inches)

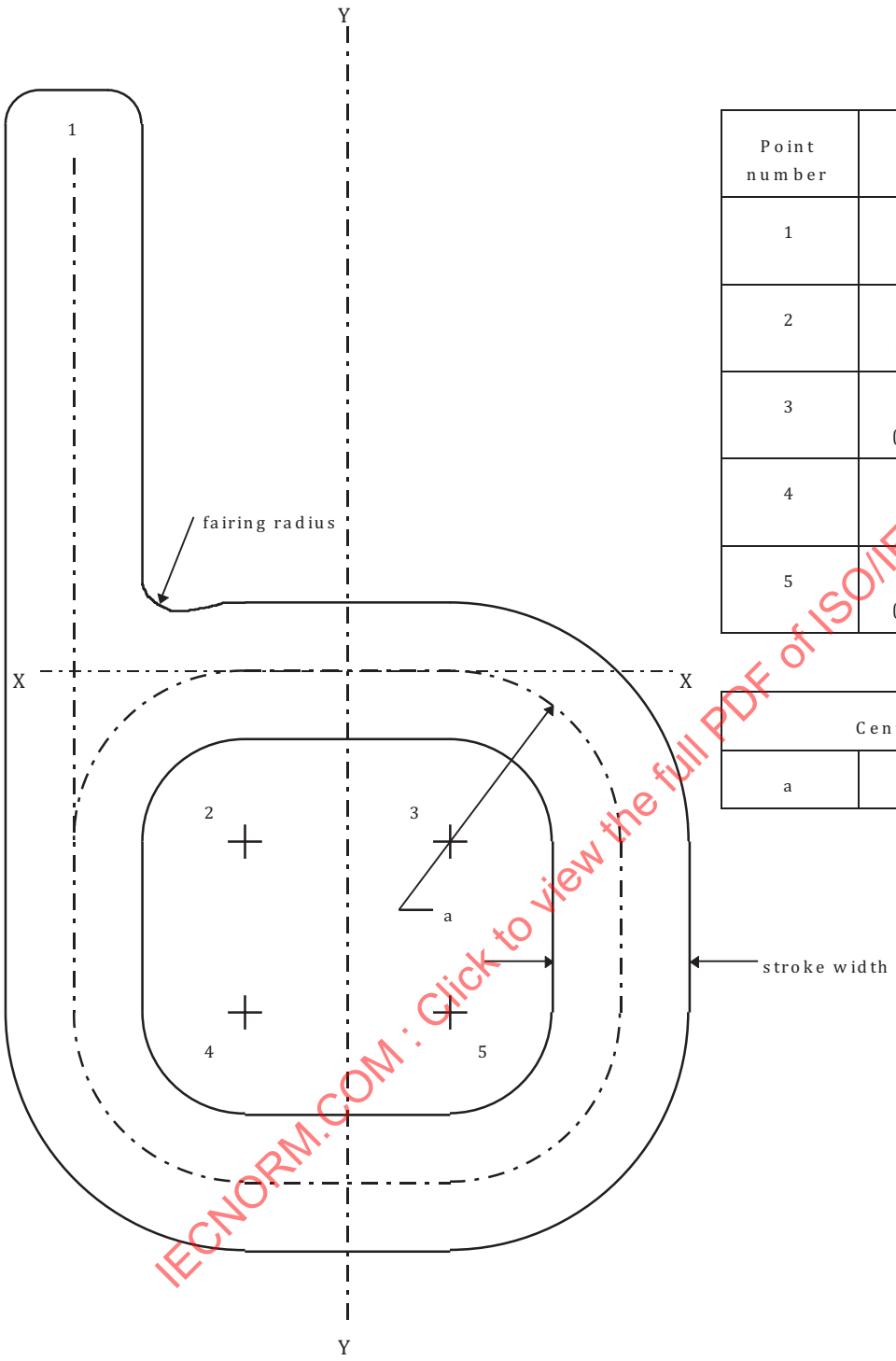


Point number	X value	Y value
1	+ 1,02 (+ 0,040)	+ 1,91 (+ 0,075)
2	- 1,02 (- 0,040)	+ 1,91 (+ 0,075)
3	- 1,02 (- 0,040)	0,00 (0,000)
4	- 0,38 (- 0,015)	0,00 (0,000)
5	+ 0,38 (+ 0,015)	- 0,64 (- 0,025)
6	+ 0,38 (+ 0,015)	- 1,27 (- 0,050)
7	- 0,98 (- 0,038)	---- ----

Centreline radius	
a	0,64 (0,025) 2 places
b	1,91 (0,075) 1 place

Figure B.5 — Printed image for 7B font-5

Dimensions in millimetres (inches)

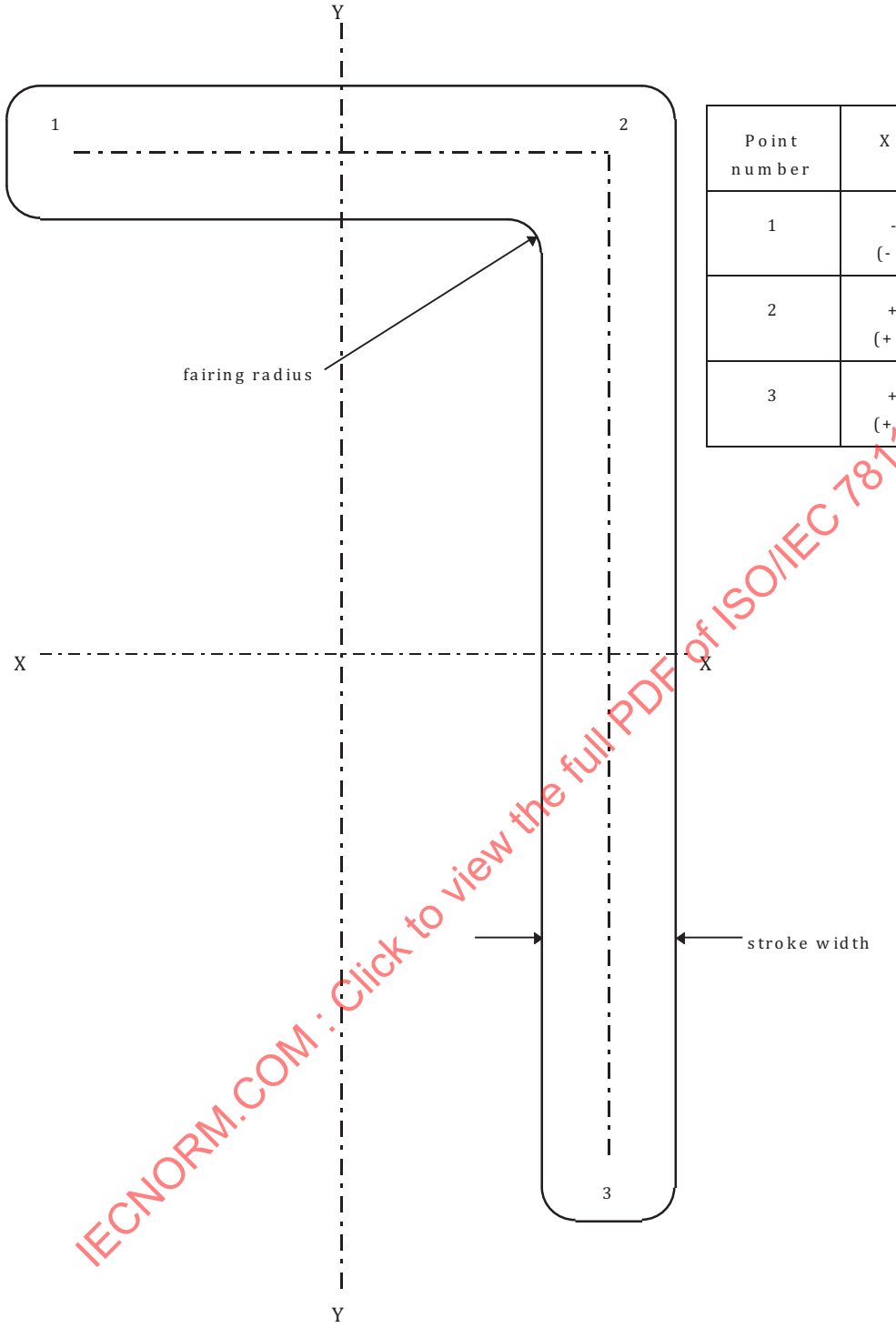


Point number	X value	Y value
1	- 1,02 (- 0,040)	+ 1,91 (+ 0,075)
2	- 0,38 (- 0,015)	- 0,64 (- 0,025)
3	+ 0,38 (+ 0,015)	- 0,64 (- 0,025)
4	- 0,38 (- 0,015)	- 1,27 (- 0,050)
5	+ 0,38 (+ 0,015)	- 1,27 (- 0,050)

Centreline radius	
a	0,64 (0,025) 4 places

Figure B.6 — Printed image for 7B font-6

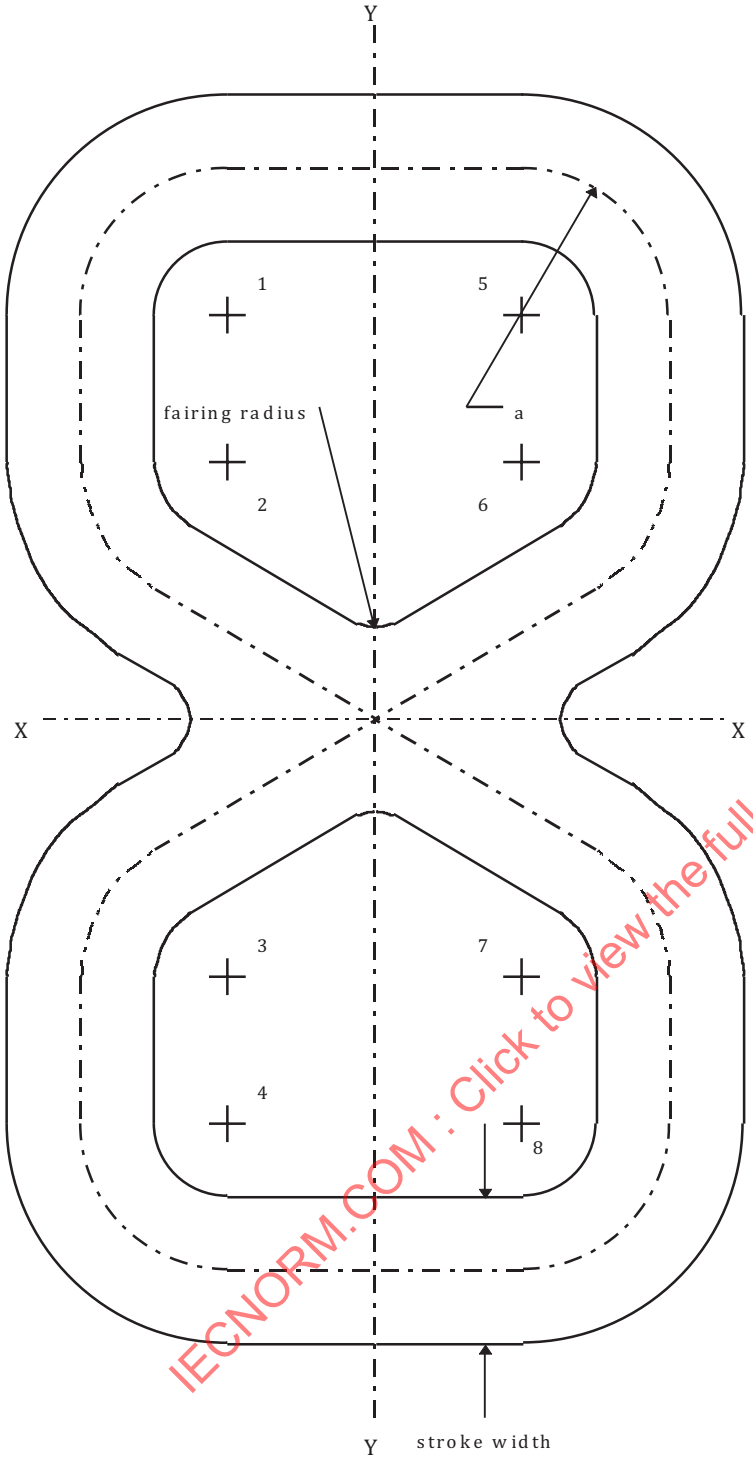
Dimensions in millimetres (inches)



Point number	X value	Y value
1	- 1,02 (- 0,040)	+ 1,91 (+ 0,075)
2	+ 1,02 (+ 0,040)	+ 1,91 (+ 0,075)
3	+ 1,02 (+ 0,040)	- 1,91 (- 0,075)

Figure B.7 — Printed image for 7B font-7

Dimensions in millimetres (inches)

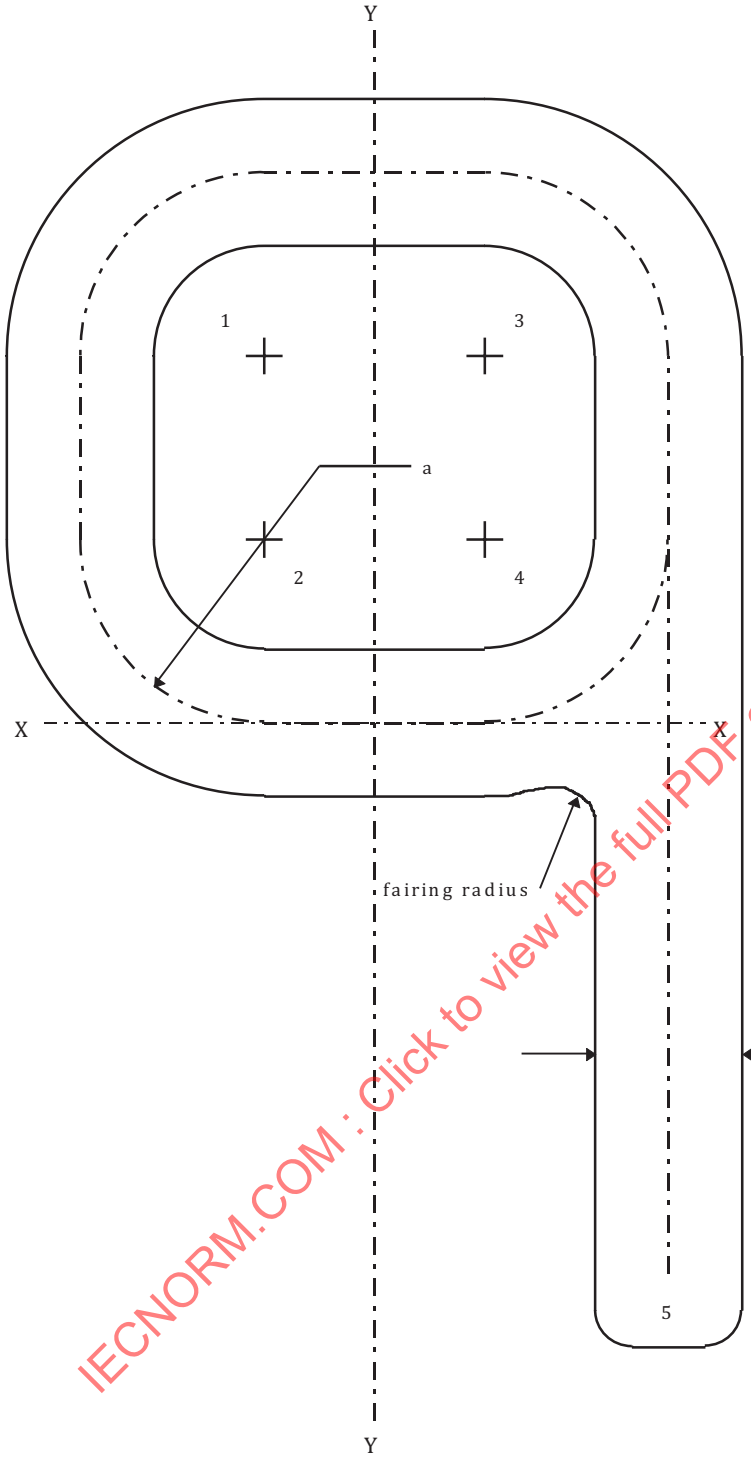


Point number	X value	Y value
1	- 0,51 (- 0,020)	+ 1,35 + (0,055)
2	- 0,51 (- 0,020)	+ 0,88 (+ 0,035)
3	- 0,51 (- 0,020)	- 0,88 (- 0,035)
4	- 0,51 (- 0,020)	- 1,35 - (0,055)
5	+ 0,51 (+ 0,020)	+ 1,35 + (0,055)
6	+ 0,51 (+ 0,020)	+ 0,88 (+ 0,035)
7	+ 0,51 (+ 0,020)	- 0,88 (- 0,035)
8	+ 0,51 (+ 0,020)	- 1,35 - (0,055)

Centreline radius	
a	0,51 (0,020) 8 places

Figure B.8 — Printed image for 7B font-8

Dimensions in millimetres (inches)

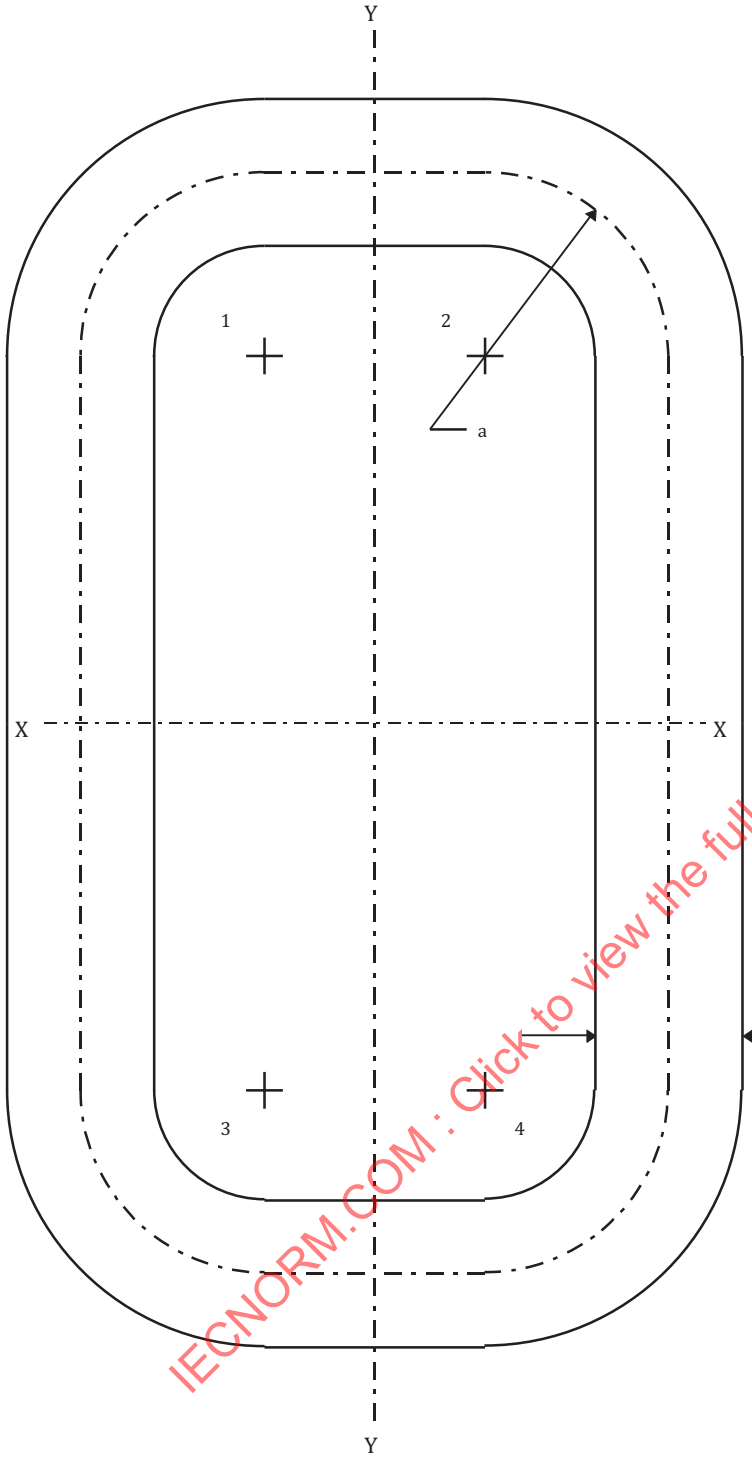


Point number	X value	Y value
1	- 0,38 (- 0,015)	+ 1,27 (+ 0,050)
2	- 0,38 (- 0,015)	+ 0,64 (+ 0,025)
3	+ 0,38 (+ 0,015)	+ 1,27 (+ 0,050)
4	+ 0,38 (+ 0,015)	+ 0,64 (+ 0,025)
5	+ 1,02 (+ 0,040)	- 1,91 (- 0,075)

Centreline radius	
a	0,64 (0,025)

Figure B.9 — Printed image for 7B font-9

Dimensions in millimetres (inches)



Point number	X value	Y value
1	- 0,38 (- 0,015)	+ 1,27 (+ 0,050)
2	+ 0,38 (+ 0,015)	+ 1,27 (+ 0,050)
3	- 0,38 (- 0,015)	- 1,27 (- 0,050)
4	+ 0,38 (+ 0,015)	- 1,27 (- 0,050)

Centreline radius	
a	0,64 (0,025)

Figure B.10 — Printed image for 7B font-0

B.3 Character spacing and alignment