TED 2 (24454) P
Revision of IS 13029: XXXX
December 2023

BUREAU OF INDIAN STANDARDS

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भारतीय मानक मसौदा

आंतरिक दहन इंजन — स्पार्क इग्निशन इंजन में इग्निशन समय निर्धारित करना — अभ्यास संहिता

(*पहला पुनरीक्षण*)

Draft Indian Standard

INTERNAL COMBUSTION ENGINES — SETTING IGNITION TIMING IN SPARK IGNITION ENGINES — CODE OF PRACTICE

(*First Revision*)

ICS: 27.020

Last date for receipt of comments is XX/XX/XXXX

Automotive Primemovers, Transmission Systems and Internal Combustion Engine Sectional Committee, TED 2

FOREWORD
(Formal Clause to be added later)

The standard was first published in 1991.

This Indian Standard aims to standardize the procedure for aligning timing marks with ignition of fuel in the case of spark ignited automotive engines. The procedure may be extended to new and under-service engines.

While preparing this standard considerable assistance has been derived from SAE J 327 'Ignition timing' issued by the Society of Automotive Engineers, USA.

In this draft for first revision of the standard following changes have been made:

a) Referencing standards have been updated;
b) Figures have been redrawn for improved clarity; and
c) Editorial changes have been carried out to update the standard with latest BIS formatting.

The composition of the Committee responsible for the formulation of this standard is given at **Annex A (Will be added later).**

For the purpose of deciding whether a particular requirement of this standard is compiled with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2: 2022. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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Draft Indian Standard

INTERNAL COMBUSTION ENGINES — SETTING IGNITION TIMING IN SPARK IGNITION ENGINES — CODE OF PRACTICE

(*First Revision*)

1 SCOPE

1.1 This standard recommends practices applicable for ignition of fuel with respect to positioning of timing marks, increments of measurements in the case of two and four stroke spark ignited automotive engines. The method to identify the timing cylinder in a multi-cylinder engine has also been specified.

1.2 The recommended practices specify both 'contact-breaker' and 'contact breakerless' ignition systems. It aims to help in setting correct timing of engines.

2 REFERENCES

The following standard contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
IS 7451 (Part 2): 2006 / ISO 1204: 1990	Reciprocating internal combustion engines — Part 2 designation of the direction of rotation and of cylinders and valves in cylinder heads, and definition of right-hand and left-hand in-line engines and locations on an engine (*first revision*)

3 POSITIONING OF TIMING MARKS

3.1 Two Stroke Engines

3.1.1 A reference mark is to be engraved or embossed or cut into an exposed stationary part of the engine (example, crank case) to coincide with the rotating flywheel mark for ignition timing.

3.1.2 'O' mark is to be cut into the flywheel to correspond with the reference mark on the stationary engine part when the piston is at top dead centre (TDC). Also, the recommended ignition timing mark is to be cut into the flywheel to correspond to reference mark on the stationary part of the engine when the piston is at the position where ignition is to commence.

3.2 Four Stroke Engine

3.2.1 Timing marks can be placed either on the vibration damper pulley (non-principal output end) or flywheel (principal output end).

3.2.2 Each mark shall be minimum with 2° increment.

3.2.3 Numerals shall be placed after every 4° or 5° interval.

3.2.4 Top dead centre will be indicated by the letter 'O'.

3.2.5 If both 'advance' and 'retard' segments are to be used, then larger number of increments shall be shown on the 'advance' segment.

3.2.6 Block lettering of a sans-serif style be preferably used.

3.2.7 The marks, numbers and lettering shall be legible and durable.

3.2.8 It is preferable to have the pointer fixed and the quadrant movable.

NOTE — A moving pointer on a fixed-quadrant is also permitted.

3.2.9 Recommended dimensions for marking are given in Fig. 1 and Fig. 2.

3.2.10 The designation of direction of rotation shall be as per IS 7451 (Part 4): 1974.

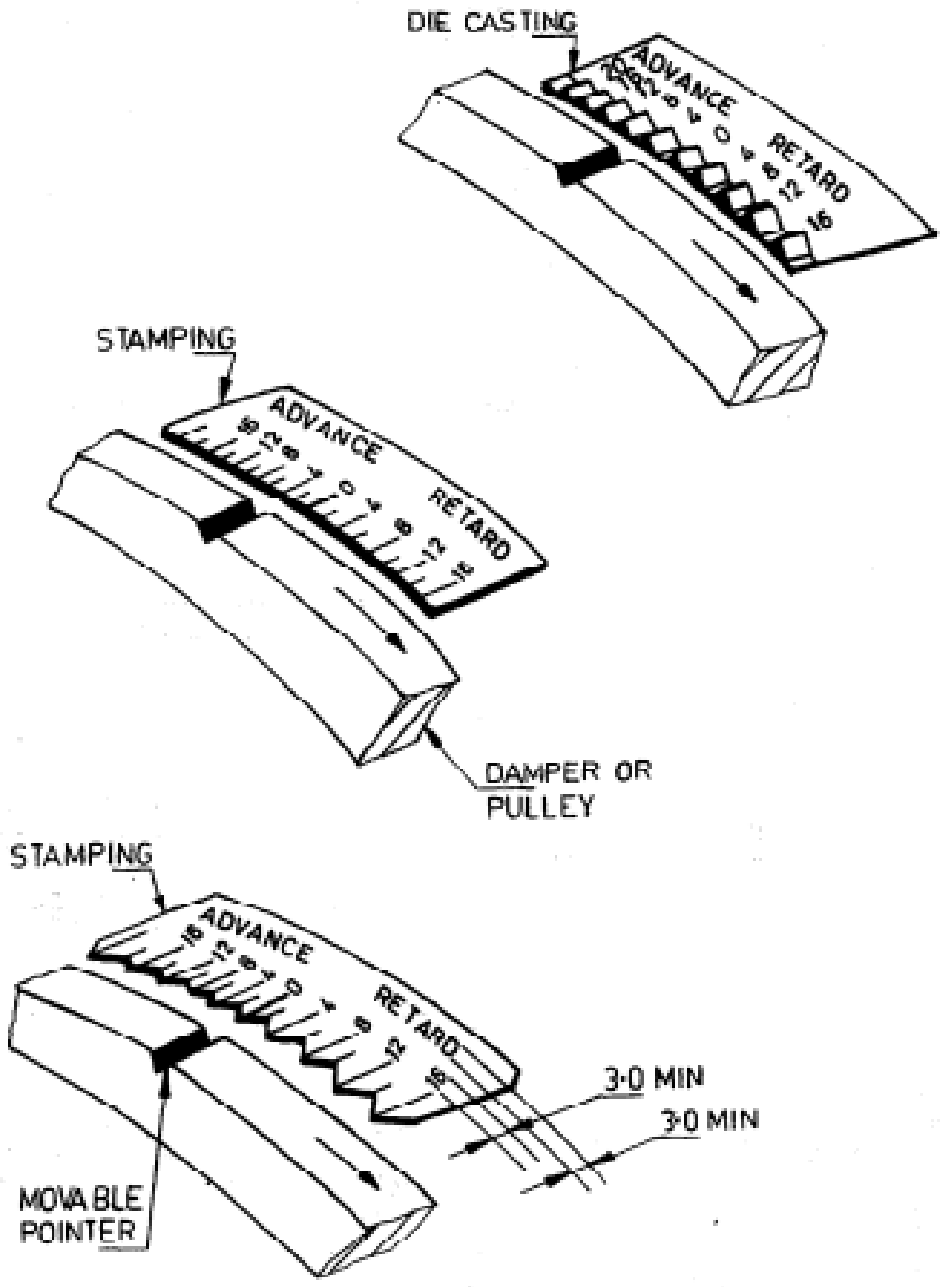
4 METHOD OF MEASUREMENT AND SETTING OF IGNITION TIMING

4.1 Static Method (Not Applicable to 'Contact Breakerless' Systems)

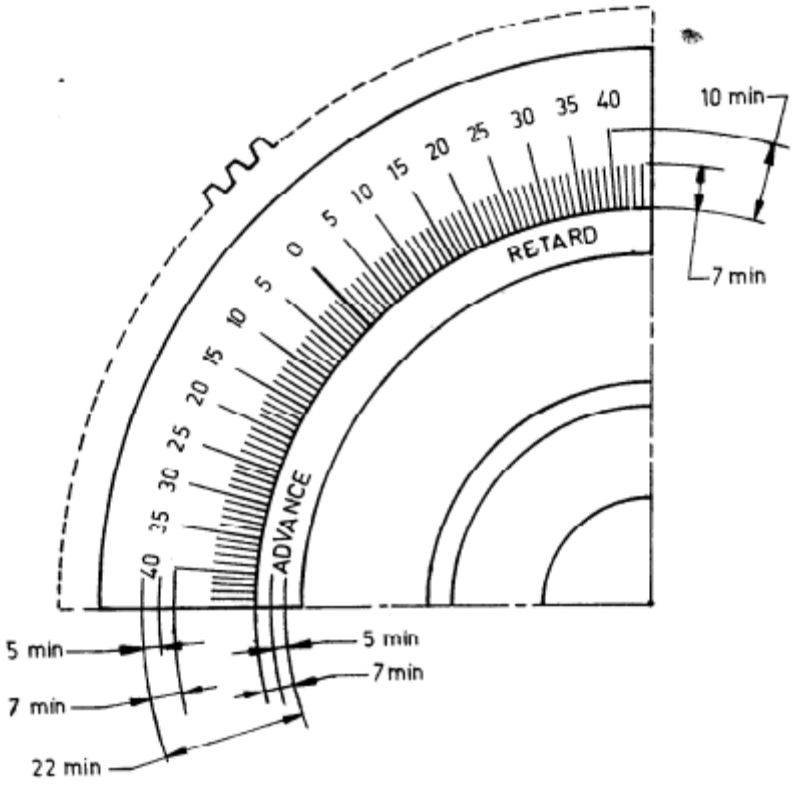
4.1.1 *Two Stroke Engines*

4.1.1.1 With the low tension lead connected to the distributor, turn on the ignition switch and connect a 6/12 volt lamp in parallel with the contact breaker, that is, one lead to the lamp from the low tension terminal and the other to earth.

4.1.1.2 Turn the engine crankshaft so that the contact breaker points are fully closed. Continue to slowly turn the engine crankshaft in the same direction until the contact breaker points just commence to open. This is indicated be the lighting up of the lamp. At this position of the engine crankshaft, check if the reference mark on the stationary part of the engine corresponds to the ignition timing mark on the flywheel. If they do not match then adjust the contact breaker points by relative rotation of the same after unscrewing and following the method recommended by the manufacturer till the reference mark on the stationary part corresponds to the ignition timing mark on the flywheel.



All dimensions in millimetres
Fig. 1 Timing Marks for Vibration Damper



All dimensions in millimetres
Fig. 2 Timing Marks for Flywheel

4.1.2 *Four Stroke Engines*

4.1.2.1 With the low tension lead connected to the distributor turn on the ignition switch and connect a 12 volt lamp in parallel with the contact breaker, that is, one lead to the lamp will be from the low tension terminal on the distributor and the other to earth.

4.1.2.2 Repeat the procedure as per **4.1.2** till the ignition timing pointer corresponds to the ignition timing specified by the manufacturer.

4.2 Dynamic Method (Applicable to Both with and without Contact Breaker Systems)

4.2.1 *Two Stroke Engines*

4.2.1.1 The procedure shall be as follows:

a) Connect the ignition timing measuring instrument to the engine as required;
b) Start the engine;
c) Set the engine to the required speed as recommended by the manufacturer;

d) Measure the ignition timing using the timing marks on the engine as described in 2 above or by reading the value by manufacturer; and
e) If it does not match with the recommended value by manufacturer, adjust with the provisions made by the manufacturer.

4.2.2 *Four Stroke Engine*

4.2.2.1 The procedure shall be the same as in **4.2.1.1**.

5 TIMING CYLINDER IDENTIFICATION

5.1 The numbering of cylinders in single or multibank engines shall be in accordance with IS 7451 (Part 2).

5.2 Timing Cylinder

5.2.1 It is preferable to use the first cylinder as the timing cylinder. For identification a number '1' shall be embossed on the engine intake manifold.

ANNEX A
(*Foreword*)

COMMITTEE COMPOSITION

AUTOMOTIVE PRIMEMOVERS, TRANSMISSION SYSTEMS AND INTERNAL COMBUSTION ENGINE SECTIONAL COMMITTEE, TED 02

Will be added later