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भारतीय मानक प्रारूप

ऑटोमोबाइल के लिए विद्युत उपकरण का चिह्नांकन तथा भूसम्पर्क कनेक्शन की ध्रुवता के लिए अनुशंसा

(IS 7471 का प्रथम पुनरीक्षण)

Draft *Indian Standard*

RECOMMENDATION FOR POLARITY OF EARTH CONNECTIONS AND MARKING OF ELECTRICAL EQUIPMENT FOR AUTOMOBILES

(First Revision of IS 7471)

ICS 43.040.01

Last date for receipt of of comments is **24 07 2023**

Automotive Electrical Equipment and Instruments Sectional Committee, TED 11

FOREWORD

This draft Indian standard (First Revision) will be adopted by the Bureau of Indian Standard after the draft finalized by the Automobile Electrical Equipment and Instruments Sectional Committee is approved by the Transport engineering Division Council.

This Indian standard was first published in 1974. This first revision of the standard is being undertaken to update the standard and to incorporate latest technological advancement/ development that has taken place and to draft Indian Standard as per latest grafting guidelines.

This standard refers to electrical installations on automobiles having an earth return system.

All vehicle manufactures in this country, with one or two exceptions, have been used to positive battery earthing. Meanwhile, the rest of the world's automobile manufactures retained or changed to negative earth. Technical developments over this period, such as the introduction of semiconductor and electronic components in vehicle electrical equipment have eliminated any advantages that positive earthing may have had over negative earthing. This standard has been prepared in keeping with the trend of world-wide standardization.

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

1 SCOPE

This standard specifies the system of earthing and marking of electrical equipment for automobile having an earth return system.

2 EARTHING

2.1 Negative Earthing of Battery — Negative Earthing shall be the recommended practice for the automobiles having earth return system.

3 IDENTIFICATION OF COMPONENTS

3.1 When an automobile manufacture introduces a change from positive to negative earth, it will be necessary to identify electrical components affected, to avoid incorrect fitting in assembly and service, and to clearly mark the automobile itself.

3.2 It is important that standard means of component identification are used and understood, particularly in service.

3.2.1 The marking of components for negative earth system shall be as given in Table 1.

3.2.2 The marking of components for positive earth system shall be as given in Table 2.

Notes

1 Table 2 provides polarity marking for electrical equipment using positive earth system only for replacement market.

2 Normally the same regulator may be applied for both systems. However, if any regulator is unsuitable for any particular system, it should be marked separately.

Table 1 Polarity Marking of Electrical Equipment for Automobiles using Negative Earth System

(*Clause* 3.2.1)

Sl No	TYPE OF EQUIPEMENT	POLARITY MARKING	REMARKS
(1)	(2)	(3)	(4)
i)	dc generator	Main terminal identification a) Red and/ or '+' for main (armature) terminal b) Black or '—' for earth terminal	
ii)	dc generator control unit	Not marked	Suitable for either polarity
iii)	dc generator control unit incorporating semiconductor device	Cover marked '—' earth	
iv)	Alternator	Main terminal identification: a) Red and / or '+' for positive supply b) Black and/ or '—' for earth terminal	
v)	Alternator control unit	'+' and '—' marked on the cover	Correct connection to unit ensured by inhibited connector
vi)	Ignition coil	'+' and '—' moulded on the cover	Terminal variation as required by automobile manufacturers
vii)	Permanent magnet motor	Not marked	Correct connections to unit ensured by inhibited connectors which are marked appropriately
viii)	Fuel gauge	Marked '—' earth	
ix)	Ammeters	Not marked	Connect as necessary
x)	Batteries	'+' and '—'	
xi)	Clocks, electrical speedometer, electrical tachometer, radio	Where appropriate '+' and '—'	

*In the negative earth system internal connection of ignition coils should be such that when negative o the primary winding is connected to contact breaker of distribution, high tension terminal of ignition coil will be at negative potential. The only advantage of positive earthling for ignition voltage is longer spark plug life and it reduces the break-down voltage.

Table 2 Polarity Marking of Electrical Equipment for Automobiles using Positive Earth Return System

(*Clause* 3.2.2)

Sl No	TYPE OF EQUIPEMENT	POLARITY MARKING	REMARKS
(1)	(2)	(3)	(4)
i)	dc generator	Main terminal identification a) Black and/ or '—' for main (armature) terminal b) Red or '+' for earth terminal	
ii)	dc generator control unit	Not marked	Suitable for either polarity
iii)	Dc generator control unit Incorporating semiconductor device	Cover marked '+' earth	
iv)	Alternator	Main terminal identification: a) Black and/or '—' for negative supply b) Red and /or '+' for earth terminal	
v)	Alternator control unit	'+' and '—' marked on the cover	Correct connection to unit ensured by inhibited connector
vi)	Ignition coil	'+' and '—' moulded on the cover	Terminal variation as required by automobile manufacturers
vii)	Permanent magnet motor	Not marked	Correct connections to unit ensured by inhibited connectors which are marked appropriately
viii)	Fuel gauge	Marked '+' earth	
ix)	Ammeters	Not marked	Connect as necessary
x)	Batteries	'+' and '—'	
xi)	Clocks, electrical speedometer, electrical tachometer, radio	Where appropriate '+' and '—'	

ANNEX A
(*Foreword*)

(Will be added later)