

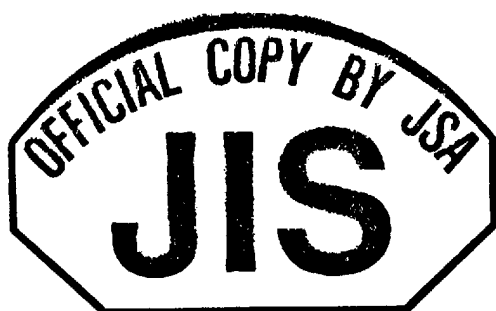
JIS

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JAPANESE INDUSTRIAL STANDARD

Starter Switches for Automobiles

JIS D 5806-1979
(Reaffirmed: 1983)



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Starter Switches for Automobiles

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1. Scope

This Japanese Industrial Standard specifies starter switches for automobiles, hereinafter referred to as the "switches".

Remark: Abovementioned starters mean the following:

- (1) Ignition starter switches of nominal voltage 12 V used for switching of ignition primary circuit, starting circuit and other circuits of electrical machinery and apparatus of gasoline automobiles.
- (2) Rotary-type starting switches used for switching of engine starting circuit and other circuits of electrical machinery and apparatus of Diesel engine automobiles.

The starting switches for Diesel engine automobiles (Rotary-type) are shown in Appendix.

- (3) The units and numerical values given in { } in this standard are in accordance with the International System of Units (SI), and are appended for reference.

2. Classification and Symbols

The switches are classified and symbolized according to the type denoting switching stages (refer to Figure), the maximum load for each connection, connecting terminal and terminal marks as shown in Table 1.

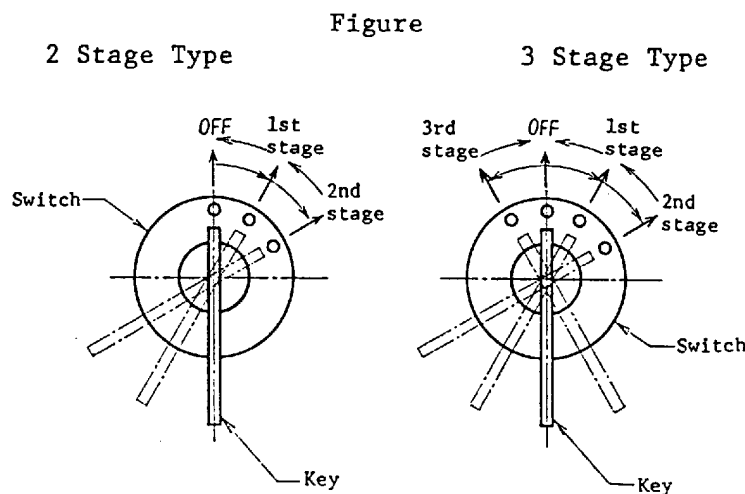


Table 1

Class	Type	Symbol	Existence of R terminal and high or low load	Connecting terminal, terminal mark and maximum load				
				Battery B	Ignition coil IG	Ignition coil (starting time) ⁽¹⁾ R	Starter relay or starter magnetic coil ST	Radio, air conditioner etc. ACC
Class G 1	2 stage type	1 LR	For low load with R	—	120	60	120	—
		1 L	For low load without R	—	120	—	120	—
		1 HR	For high load with R	—	240	60	120	—
		1 H	For high load without R	—	240	—	120	—
Class G 2	3 stage type	2 LR	For low load with R	—	120	60	120	120
		2 L	For low load without R	—	120	—	120	120
		2 HR	For high load with R	—	240	60	120	240
		2 H	For high load without R	—	240	—	120	240

Note (1) Terminal connected to ignition coil, without passing through resistor, at the time of starting.

3. Performances

3.1 Insulation Resistance The insulation resistance between outer frame and terminals as well as that between terminals each other of the switch shall be not less than 1 MΩ at ordinary temperature and ordinary humidity.

3.2 Contact Resistance The voltage drop due to contact resistance shall be not more than the appropriate value shown in Table 2, when the load current of 10 A is passed through the input terminal and output terminal, with the switch under ON condition.

Table 2

Unit: V

Item	Voltage drop
Before endurance inspection	0.15
After endurance inspection	0.25

3.3 Resistance to Temperature The switch shall not cause abnormality on each part under the temperature range of -30 to 80°C , and shall operate over the temperature range of -20 to 60°C .

Further the contact resistance shall satisfy the value of before the endurance inspection specified 3.2.

3.4 Temperature Rise Under ON condition of the switch, apply a load of 19 A for low load switches, 38 A for high load switches, between input terminal and output terminal until the temperature of each part becomes almost stabilized. The difference between the temperatures of current carrying part before and after application of load shall not exceed the appropriate value given in Table 3. However, ST terminal and I G terminal with R terminal are excluded.

Table 3

Unit: $^{\circ}\text{C}$

Contact material	Temperature difference
Copper or copper alloys	40
Silver or silver alloys	65

3.5 Resistance to Vibration When the switch is subjected to the vibration test of Stage 4 specified in JIS D 1601 at its working position, no unsteady contact and harmful abnormal sound shall occur.

3.6 Durability The switch shall satisfy the provisions of 3.1, 3.2 and 4.3 even after use of 25000 times under the normal working condition.

The operation is counted as one time when the knob is reciprocated once.

4. Construction

4.1 General Construction The switch shall be so constructed that it is operated by a key, the handling is simple as far as possible, it is durable and does not cause loosening at each point during working.

Moreover, at each stage other than OFF position, the key shall not come out.

4.2 Circuits to which Connection is Changed-Over The circuits of switch to which connection is changed-over shall be as shown in Table 4.

Table 4

Type	Position of key	Connecting terminal														
		Without R terminal				With R terminal					With R terminal					
		B	IG	ST	ACC	B	IG	R ⁽²⁾	ST	ACC	B	IG	R	ST	ACC	
2 stage type	OFF															
	1st stage	○—○				○—○										
	2nd stage	○—○—○				○—○			○—○							
3 stage type	OFF															
	1st stage	○—○—○—○				○—○				○	○—○—○—○				○	
	2nd stage	○—○—○				○—○			○—○		○—○—○—○					
	3rd stage	○—○—○—○				○—○				○	○—○—○—○				○	

Note (2) Broken line in this table shows that the connection overlaps in the midway of switching.

4.3 Operation, Position Feeling and Automatic Return In the switch, the operation is smooth, and the correct stop positions (means the position of the key shown in Fig. of 2., hereinafter referred to as the "stop position"), of OFF and 1st stage of 2 stage type switch and of OFF, 1st stage and 3rd stage of 3 stage type switch shall easily and effectively be felt, hereinafter referred to as the "position feeling". The maximum operating torque of key at each intermediate of stop positions of OFF → 1st stage → OFF and OFF → 3rd stage → OFF shall be 1.5 to 3.5 kgf·cm {0.15 to 0.34 N·m}.

Further, at each intermediate of stop positions, there shall be no harmful scratch, rasping, play or the like.

The 2nd stage of key position of 2 stage type and 3 stage type switches shall be attained by rotating the key smoothly from 1st stage stop position in clockwise direction and during this operation, if let go of one's hold, the key shall return automatically to the stop position of 1st stage surely.

Moreover, the maximum operating torque at that time shall be not more than 6 kgf·cm {0.59 N·m}.

4.4 Shape and Dimensions The shape and principal dimensions of the switch shall be as shown in Attached Figure.

4.5 Play of Key The angle of play at each stage between outer frame and key of the switch in the rotation direction shall be not more than 10°. However, 2nd stage is excluded.

4.6 Robustness of Terminal The terminal of switch shall not caused harmful deformation, play of terminal fixed part or other abnormality, when a vertical static load of 5 kgf {49 N} is applied to the lead wire fixed part of the terminal for 1 min under the normal working condition.

Further, for the flat terminal or the ones soldered to lead wire, however, carry out the test by applying a static load of 5 kgf {49 N} in the outgoing direction of the lead wire.

4.7 Robustness of Mounting Part No abnormality on the mounting part and others shall take place, even if a vertical static load (W) of 5 kgf {49 N} is applied to the extreme point of body (refer to Attached Figure) for 1 min, with the switch mounted as in the normal working condition.

5. Materials and Electroplating

The materials and electroplating of main part of switch shall, as a rule, be as shown in Table 5.

The electroplating shall comply with the specification of JIS D 0201.

Table 5

Part name	Material	Electroplating
Key cylinder	Brass	MBCr 5
	Zinc alloys	MZCr 10 or MZNi 15
Key	Mild steel	MFNi 5 or MFCr 10
	Brass	MBCr 5 or MBNi 5
	German silver	—
	Stainless steel	—
Contact	Copper or copper alloys	MBAg 5 in the case of silver plating
	Silver or silver alloys	—
Terminal	Copper	—
	Brass	—
	Mild steel	MFZn 5
Machine screw for terminal	Brass	—
	Mild steel	MFZn 5
Outer frame	Mild steel	MFZn 5
	Aluminium	—
	Zinc alloys	
	Synthetic resin	
Face nut	Brass	MBCr 5 or MBNi 5
	Mild steel	MBNi 5 or MFCr 10
	Zinc alloys	MZCr 10 or MZNi 15
	Aluminium	MACr 20
	Synthetic resin	—
Insulation	Synthetic resin	—

Remark: In the case of MFZn 5, apply chromate treatment B or C.