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**Automotive parts — Test methods and
general requirements for alternators with
regulators**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Society of Automotive Engineers of Japan (JSAE) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently **JIS D 1615:1989** is replaced with this Standard.

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Automotive parts — Test methods and general requirements for alternators with regulators

Introduction

This Japanese Industrial Standard has been prepared based on the second edition of ISO 8854 published in 2012 with some modifications of the technical contents to correspond to the actual situation in Japan.

The portions given sidelines or dotted underlines are the matters in which the contents of the corresponding International Standard have been modified. A list of modifications with the explanations is given in Annex JA.

1 Scope

This Standard specifies the test methods and general requirements for alternators with regulators for automotive parts.

This Standard is applicable to alternators, cooled according to the vehicle manufacturer's specifications, to be mounted on internal combustion engines.

NOTE: The International Standard corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 8854 : 2012 *Road vehicles — Alternators with regulators — Test methods and general requirements* (MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21-1.

1.A Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standard (including amendments) indicated below shall be applied.

JIS D 0103 *Automobile parts — Devices and parts of electric equipment — Nomenclature*

2 Terms and definitions

For the purpose of this Standard, the terms and definitions given in JIS D 0103 and the following apply.

2.1 alternator frequency n_G

alternator rotational frequency in reciprocal minutes (min^{-1})

2.2 cut-in speed n_A

alternator rotational frequency at which the alternator begins to supply current when speed is increased for the first time, depending on pre-exciting power (input), speed changing velocity, battery voltage, residual flux density of the rotor, and regulator characteristics

2.3 efficiency η

alternator efficiency calculated from the measured values of voltage, current, speed and torque

2.4 minimum application speed n_L

alternator rotational frequency which corresponds approximately to the idling speed of the engine

2.5 minimum application current I_L

current which is delivered by a warmed-up alternator at minimum application speed and at test voltage

2.6 rated current I_R

minimum current which the warmed-up alternator shall supply at rated speed and at test voltage

The rated current shall be the mean product dispersion minus 2σ (σ is standard deviation), unless otherwise required by the customer.

2.7 rated speed n_R

alternator rotational frequency at which the alternator supplies its rated current [see 5.1.1 d)]

2.8 test voltage U_t

specified value, in volts, at which the current measurements shall be carried out (V)

2.9 weighted efficiency η_w

speed-evaluated mean value of efficiency at different alternator speeds

2.10 zero-amp. speed n_0

alternator rotational frequency at which the alternator reaches the specified test voltage without any current output

NOTE : When plotted on a graph, this is the point at which the current/speed characteristic $I = f(n)$ intersects the abscissa [see n_0 in Figure 7 or 5.1.1 b)].

3 Test conditions

3.1 Ambient temperature

Tests shall be carried out at an ambient temperature of $(23 \pm 5) ^\circ\text{C}$ and may optionally also be performed at higher temperatures.

3.2 Air pressure

Tests shall be carried out at the standard atmospheric pressure (86 kPa to 106 kPa).
Deviating conditions (e.g. measuring location, altitude, weather) shall be recorded.

3.3 Sense of rotation

Sense of alternator rotation shall be in accordance with the supplier's specification.

3.4 Drive control

The drive control shall meet the set alternator frequency values with a limit deviation of $\pm 5 \text{ min}^{-1}$.

3.5 Load current control

The load current control shall meet the requested set current values with a limit deviation of $\pm 1.0 \text{ A}$.

3.6 Measuring accuracy

The test equipment shall allow measurements of all parameters to be carried out within the limit deviations specified in Table 1.

Table 1 Accuracy of test equipment

Parameters	Limit deviation
Voltage	$\pm 0.1 \%$ of measured value
Current	$\pm 0.2 \%$ of measured value
Torque	$\pm 0.5 \%$ of rated value of torque sensors
Rotational frequency	$\pm 2 \text{ min}^{-1}$
Ambient temperature	$\pm 1 \text{ }^{\circ}\text{C}$
Air pressure	$\pm 5 \text{ hPa}$
Test period	$\pm 1 \text{ s}$

3.7 Measured values

All measured values shall be obtained at the end of each holding time of an operating point.

Each data record shall comprise at least the following measured values :

- alternator rotational frequency;
- alternator current;
- alternator voltage;
- alternator torque (if needed);
- ambient temperature;
- time of acquisition of measured values from start of testing.

4 Test equipment

4.1 Test equipment