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# Australian Standard<sup>®</sup> 2789.9—1986

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**INTERNAL COMBUSTION ENGINES—  
PERFORMANCE**

**Part 9—ENGINES FOR  
AGRICULTURAL  
TRACTOR AND  
MACHINE USE—  
TEST CODE, NET  
POWER**

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**STANDARDS ASSOCIATION OF AUSTRALIA**  
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This Australian standard was prepared by Committee ME/20, Internal Combustion Engines. It was approved on behalf of the Council of the Standards Association of Australia on 11 March 1986 and published on 5 May 1986.

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Construction Equipment Importers and Manufacturers of Australia  
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*This standard was issued in draft form for comment as DR 85250.*

AS 2789 Parts 0-10 supersedes AS1501-1976

AS 2789 Parts 1-6 were published in May 1985 and in the May 1985 TAS they were given as superseding AS 1501-1976 which was withdrawn.

AS 2789 Parts 0 and 7-10 were published in May 1986. Information received from the technical officer, Peter Moore, is that they do supersede in part AS 1501-1976 but no information to that effect was given in the May 1986 TAS.

AUSTRALIAN STANDARD

INTERNAL COMBUSTION ENGINES—  
PERFORMANCE

Part 9

ENGINES FOR AGRICULTURAL  
TRACTOR AND MACHINE USE—  
TEST CODE, NET POWER

AS 2789.9—1986

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## PREFACE

This standard was prepared by the Association's Committee on Internal Combustion Engines. It supersedes (in part) AS 1501—1976, Method for Rating and Testing of Internal Combustion Engines. It is one of a series of 11 standards on the performance of internal combustion engines of which ten are identical with and have been reproduced from International Standards ISO 3046/1, ISO 3046/2, ISO 3046/3, ISO 3046/4, ISO 3046/5, ISO 3046/6, ISO 1585, ISO 2543, ISO 2288 and ISO 4106.

The complete series constitutes a replacement for AS 1501—1976.

The standards in the series are as follows:

- AS 2789.0 Internal Combustion Engines—Performance, Part 0—Application
- AS 2789.1 Internal Combustion Engines—Performance, Part 1—Engines for Land, Rail Traction, and Marine Use—Standard Reference Conditions and Declarations of Power, Fuel Consumption and Lubricating Oil Consumption
- AS 2789.2 Internal Combustion Engines—Performance, Part 2—Engines for Land, Rail Traction, and Marine Use—Test Methods
- AS 2789.3 Internal Combustion Engines—Performance, Part 3—Engines for Land, Rail Traction, and Marine Use—Test Measurements
- AS 2789.4 Internal Combustion Engines—Performance, Part 4—Engines for Land, Rail Traction, and Marine Use—Speed Governing
- AS 2789.5 Internal Combustion Engines—Performance, Part 5—Engines for Land, Rail Traction, and Marine Use—Torsional Vibrations
- AS 2789.6 Internal Combustion Engines—Performance, Part 6—Engines for Land, Rail Traction, and Marine Use—Overspeed Protection
- AS 2789.7 Internal Combustion Engines—Performance, Part 7—Engines for Road Vehicle Use—Test Code, Net Power
- AS 2789.8 Internal Combustion Engines—Performance, Part 8—Engines for Road Vehicle Use—Test Code, Gross Power
- AS 2789.9 Internal Combustion Engines—Performance, Part 9—Engines for Agricultural Tractor and Machine Use—Test Code, Net Power
- AS 2789.10 Internal Combustion Engines—Performance, Part 10—Engines for Motorcycle Use—Test Code, Net Power

The series of standards applies to internal combustion engines for land, rail-traction, and marine use, including engines used to propel agricultural tractors, road construction and earthmoving machines, road vehicles, and motor cycles.

For the purpose of this Australian standard, the text of the ISO standard used herein should be modified as follows:

- (a) *Terminology*: The words 'Australian Standard' should replace the words 'International Standard' wherever they appear.
- (b) *Decimal Sign*: A dot on the line should replace the comma wherever it appears as a decimal sign.
- (c) *Cross-references*: The references to the International Standard should be replaced by references to the Australian Standard as follows:

<i>Reference to International Standard</i>	<i>Appropriate Australian Standard</i>
ISO 1585, Road vehicles—Engine test code—Net power	AS 2789.7, Internal Combustion Engines—Performance, Part 7—Engines for Road Vehicle Use—Test Code, Net Power

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**Contents**

	<i>Page</i>
<b>0 Introduction</b> .....	<b>5</b>
<b>1 Scope and field of application</b> .....	<b>5</b>
<b>2 References</b> .....	<b>5</b>
<b>3 Definitions</b> .....	<b>5</b>
<b>4 Accuracy of measurements</b> .....	<b>5</b>
<b>5 Tests</b> .....	<b>7</b>
<b>6 Correction factors</b> .....	<b>9</b>
<b>7 Measurement of smoke value</b> .....	<b>10</b>
<b>8 Test report</b> .....	<b>11</b>
<b>9 Units and designation</b> .....	<b>18</b>
 <b>ANNEXES</b>	
<b>A Reference fuel CEC RF-01-T-69</b> .....	<b>19</b>
<b>B Reference fuel CEC RF-03-T-69</b> .....	<b>20</b>



# INTERNAL COMBUSTION ENGINES—PERFORMANCE

## PART 9—ENGINES FOR AGRICULTURAL TRACTOR AND MACHINE USE— TEST CODE, NET POWER

### 0 INTRODUCTION

This International Standard is in conformity with clause 7, and sub-clauses 6.1.3, 6.2 and 6.3.1 to 6.3.11 of ISO 1585; it relates to tests on an engine capable of being fitted into several types of agricultural tractors and machines.

### 1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a bench method for testing the following categories of engines which are intended for use in agricultural tractors and machines and which may be fitted with a supercharging device using a mechanical supercharger or turbo-charger :

- a) spark ignition engines;
- b) compression ignition (diesel) engines;

Engines given in a) and b) can have the following variants :

- c) reciprocating internal combustion engines;
- d) rotary piston internal combustion engines.

In particular, it allows curves to be plotted of net power and specific fuel consumption at full load as functions of engine speed.

### 2 REFERENCES

ISO 789/1, *Agricultural tractors — Test procedures — Part I: Power tests.*<sup>1)</sup>

ISO 1585, *Road vehicles — Engine test code — Net power.*

### 3 DEFINITIONS

For the purpose of this International Standard the following definitions apply :

**3.1 net power :** The power obtained on a test bed at the crankshaft or its equivalent, at the engine speed specified

by the manufacturer, the engine being equipped with the standard production auxiliaries necessary to its operation for the particular application.

**3.2 auxiliaries :** The equipment and devices listed in table 1.

**3.3 standard production equipment :** Any equipment normally provided or recommended by the manufacturer for the particular engine application.

### 4 ACCURACY OF MEASUREMENTS

#### 4.1 Torque

The dynamometer torque measuring system shall give an accuracy within  $\pm 0,5\%$  in the range of scale values required for the test.

#### 4.2 Engine speed

Engine speed shall be measured preferably with a revolution counter and an automatically synchronized chronometer (or counter timer). The accuracy of the measured value shall be  $\pm 0,5\%$ .

#### 4.3 Fuel consumption

$\pm 1\%$  overall for the apparatus used.

#### 4.4 Engine inlet air temperature

$\pm 1\text{ }^{\circ}\text{C}$ .

#### 4.5 Barometric pressure

$\pm 70\text{ Pa (0,70 mbar}^{\ast}\text{)}$ .

**4.6 Pressure in exhaust extraction duct (see note 1 to table 1.)**

$\pm 25\text{ Pa (0,25 mbar}^{\ast}\text{)}$ .

1) In preparation. (Revision of ISO/R 789-1968.)

\* 1 bar =  $10^5$  Pa