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ISO 6460-2

Second edition
2014-12-01

Motorcycles — Measurement method for gaseous exhaust emissions and fuel consumption —

Part 2: Test cycles and specific test conditions

Motocycles — Méthode de mesure des émissions de gaz d'échappement et de la consommation de carburant —

Partie 2: Conditions d'essai spécifiques et cycles d'essai

Reference number
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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword — Supplementary information.

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 22, *Motorcycles*.

This second edition cancels and replaces the first edition (ISO 6460-2:2007), which has been technically revised.

ISO 6460 consists of the following parts, under the general title *Motorcycles — Measurement method for gaseous exhaust emissions and fuel consumption*:

— *Part 1: General test requirements*

— *Part 2: Test cycles and specific test conditions*

— *Part 3: Fuel consumption measurement at a constant speed*

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Introduction

This part of ISO 6460 has been prepared to provide details of the typical test cycles for measurement of gaseous exhaust emissions and fuel consumption. The measurements can be carried out by referring to this part of ISO 6460 and to ISO 6460-1.

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Motorcycles — Measurement method for gaseous exhaust emissions and fuel consumption —

Part 2:
Test cycles and specific test conditions

1 Scope

This part of ISO 6460 defines test cycles for measurement for the gaseous exhaust emissions from motorcycles, as well as for determining the fuel consumption of motorcycles as defined in ISO 3833, equipped with a spark ignition engine (four-stroke engine, two-stroke engine, or rotary piston engine) or a compression ignition engine. The test cycle 1 is equivalent to the test cycle specified in the European Union Commission Directive 2003/77/EC[6] and the test cycle 2 is equivalent to the test cycle specified in global technical regulations No.2 (WMTC), United Nations Economic Commission for Europe, ECE/TRANS/180/Add.2[9]. A selection of other test cycles adopted or to be adopted by several countries is described in Annex C for information purpose.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4106, *Motorcycles — Engine test code — Net power*

ISO 6460-1, *Motorcycles — Measurement method for gaseous exhaust emissions and fuel consumption — Part 1: General test requirements*

ISO 7117, *Motorcycles — Measurement method for determining maximum speed*

3 Test cycle 1

3.1 General

The test cycle 1 is equivalent to the test cycle specified in European Union Commission Directive 2003/77/EC[6].

a) For vehicle types with an engine capacity less than 150 cm^3, the test shall be conducted by carrying out six elementary urban cycles. The emission sampling shall begin before or at the initiation of the engine start-up procedure and end on conclusion of the final idling period of the last elementary urban cycle.

b) For vehicle types with an engine capacity greater than or equal to 150 cm^3, the test shall be conducted by carrying out six elementary urban cycles and one extra-urban cycle. The emission sampling shall begin before or at the initiation of the engine start-up procedure and end on conclusion of the final idling period of the extra-urban cycle.

During the test, the exhaust gases shall be diluted with air so that the flow volume of the mixture remains constant. Throughout the test, a continuous flow of samples of the mixture shall be passed into one or more bags so that concentrations (average test values) of carbon monoxide, unburnt hydrocarbons, oxides of nitrogen, and carbon dioxide can be determined.

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3.2 Type 1 test

3.2.1 Operating cycle on the chassis dynamometer

3.2.1.1 Description of cycle

The operating cycles on the chassis dynamometer are indicated in 3.2.4.

3.2.1.2 General conditions for carrying out the cycle

Preliminary test cycles shall be carried out if necessary to determine how best to actuate the accelerator and brake controls so as to achieve a cycle approximating to the theoretical cycle within the prescribed limits.

3.2.1.3 Use of the gearbox

3.2.1.3.1 Use of the gearbox is determined as described below.

a) At constant speed, the engine speed shall as far as possible remain between 50 % and 90 % of the maximum speed. If this speed can be achieved using more than one gear, the engine is tested using the highest gear.

b) With respect to the urban cycle, during acceleration the engine shall be tested using the gear which allows maximum acceleration. The next higher gear is engaged, at the latest, when the engine speed has reached 110 % of the speed at which the maximum net power output occurs. If a motorcycle reaches a speed of 20 km/h in first gear or 35 km/h in second gear, the next higher gear shall be engaged at these speeds.

   In these cases, no other change into higher gears is permitted. If, during the acceleration phase, the gears are changed at fixed motorcycle speeds, the constant speed phase which follows shall be performed with the gear which is engaged when the motorcycle begins the constant speed phase, irrespective of the engine speed.

c) During deceleration, the next lower gear shall be engaged before the engine reaches virtual idling speed or when the engine speed has fallen to 30 % of the speed of the maximum net power, whichever occurs first. First gear shall not be engaged during deceleration.

3.2.1.3.2 Motorcycles equipped with automatic gearboxes shall be tested with the highest gear engaged (drive). The accelerator shall be operated in such a way as to obtain as steady an acceleration as possible, so that the transmission engages the different gears in the normal order. The tolerances specified in 3.2.1.4 apply.

3.2.1.3.3 For carrying out the extra-urban cycle, the gearbox shall be used in accordance with the manufacturer's recommendation.

Acceleration shall continue throughout the period represented by the straight line connecting the end of each period of idling with the beginning of the next following period of constant speed. The tolerances given in 3.2.1.4 apply.

3.2.1.4 Tolerances

3.2.1.4.1 The theoretical speed shall be maintained to a tolerance of ±2 km/h during all phases. Speed tolerances greater than those prescribed are permitted during phase changes provided that the tolerances are never exceeded for more than 0,5 s on any one occasion, in all cases subject to the provisions of 3.2.2.5.2 and 3.2.2.6.3.

3.2.1.4.2 A tolerance of ±0,5 s above or below the theoretical times shall be allowed.

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3.2.1.4.3 The speed and time tolerances are combined as indicated in 3.2.4.

3.2.1.4.4 The distance travelled during the cycle shall be measured with a tolerance of ±2 %.

3.2.2 Procedure for chassis dynamometer tests

3.2.2.1 Special conditions for carrying out the cycle

3.2.2.1.1 The temperature in the premises where the chassis dynamometer bench is situated shall be between 293 K and 303 K throughout the test, and shall be as close as possible to the temperature of the premises where the motorcycle was conditioned.

3.2.2.1.2 The motorcycle shall as far as possible be horizontal during the test so as to avoid any abnormal distribution of the fuel.

3.2.2.1.3 During the test, the motorcycle speed shall be plotted against time in order to check that the cycles have been performed correctly.

3.2.2.1.4 The temperatures of the cooling water and the crankcase oil may be recorded.

3.2.2.2 Starting up the engine

3.2.2.2.1 Once the preliminary operations on the equipment for collecting, diluting, analysing, and measuring the gases have been carried out, the engine is started up by means of the devices provided for that purpose, such as the choke, the starter valve, etc., in accordance with the manufacturer's instructions.

3.2.2.2.2 The first cycle begins when the taking of samples and the measuring of the pump rotations commence.

3.2.2.3 Use of the manual choke

The choke shall be cut out as soon as possible and in principle before acceleration from 0 km/h to 50 km/h. If this requirement cannot be met, the moment of actual cut-out shall be indicated. The choke shall be adjusted in accordance with the manufacturer's instructions.

3.2.2.4 Idling

3.2.2.4.1 Manual-shift gearbox

During periods of idling, the clutch shall be engaged and the gears shall be in neutral.

To enable the accelerations to be performed in accordance with the normal cycle, the motorcycle shall be put in first gear, with the clutch disengaged, 5 s before start of the acceleration following the idling period in question.

The first idling period at the beginning of the cycle consists of 6 s of idling in neutral with the clutch engaged and 5 s in first gear with the clutch disengaged.

For the idling periods during each cycle, the corresponding times are 16 s in neutral and 5 s in first gear with the clutch disengaged.

The last idling period in the cycle consists of 7 s in neutral with the clutch engaged.

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3.2.2.4.2 Semi-automatic gearboxes

The manufacturer's instructions for driving in town, or in their absence instructions applicable to manual gearboxes, shall be followed.

3.2.2.4.3 Automatic gearboxes

The selector shall not be operated at any time during the test unless the manufacturer specifies otherwise. In the latter case, the procedure for manual gearboxes applies.

3.2.2.5 Accelerations

3.2.2.5.1 Accelerations shall be effected so as to ensure that the rate of acceleration is as constant as possible throughout the operation.

3.2.2.5.2 If the acceleration capacities of the motorcycle are not sufficient to perform the acceleration cycles within the prescribed tolerances, the motorcycle shall be driven with the throttle completely open until the speed prescribed for the cycle has been reached. The cycle may then continue normally.

3.2.2.6 Decelerations

3.2.2.6.1 All decelerations shall be effected by completely closing the throttle, the clutch remaining engaged. The clutch shall be disengaged at a speed of 10 km/h.

3.2.2.6.2 If the period of deceleration is longer than that prescribed for the corresponding phase, the motorcycle's brakes are used to keep to the cycle.

3.2.2.6.3 If the period of deceleration is shorter than that prescribed for the corresponding phase, the timing of the theoretical cycle is restored by a steady state or an idling period merging into the following steady state or idling operation. In this case, 3.2.1.4.3 is not applicable.

3.2.2.6.4 At the end of the deceleration period (stopping motorcycle on the rollers), the gear shall be put into neutral and the clutch engaged.

3.2.2.7 Constant speeds

3.2.2.7.1 "Pumping" or the closing of the throttle shall be avoided when passing from acceleration to the following constant speed.

3.2.2.7.2 Periods of constant speed shall be achieved by keeping the accelerator position fixed.

3.2.3 Analysis

The exhaust gases contained in the bag shall be analysed as soon as possible and in any event not later than 20 min after the end of the test cycle.

3.2.4 Breakdown of the operating cycles

The operating cycle of the urban driving cycle (UDC) on the chassis dynamometer is described in Table 1, and the operation cycle of the extra-urban driving cycle (EUDC) on the chassis dynamometer is described in Table 2. The operating cycle of UDC is described in Figure 1 and the operating cycle of UDC/EUDC is described in Figure 2.

In EUDC on the chassis dynamometer, for motorcycles with a permitted maximum speed of 110 km/h, the maximum speed for EUDC shall be restricted to 90 km/h and the operation cycle on the chassis

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dynamometer is described in Table 3. The operating cycle of UDC/EUDC for motorcycles with a permitted maximum speed of 110 km/h is described in Figure 2.

Table 1 — UDC operating cycle on the chassis dynamometer

Operation no.	Operation	Phase	Acceleration m/s^2	Speed km/h	Duration of each		Cumulative time s	Distance covered m
					Operation s	Phase s		
1	Idling	1	0	0	11	11	11	0
2	Acceleration	2	1,04	0 to 15	4	4	15	8
3	Constant speed	3	0	15	8	8	23	34
4	Deceleration	4	−0,69	15 to 10	2	5	25	7
5	Deceleration, clutch disengaged		−0,92	10 to 0	3		28	4
6	Idling	5	0	0	21	21	49	0
7	Acceleration	6	0,74	0 to 32	12	12	61	54
8	Constant speed	7	0	32	24	24	85	214
9	Deceleration	8	−0,75	32 to 10	8	11	93	48
10	Deceleration, clutch disengaged		−0,92	10 to 0	3		96	4
11	Idling	9	0	0	21	21	117	0
12	Acceleration	10	0,53	0 to 50	26	26	143	183
13	Constant speed	11	0	50	12	12	155	167
14	Deceleration	12	−0,52	50 to 35	8	8	163	95
15	Constant speed	13	0	35	13	13	176	127
16	Deceleration	14	−0,68	35 to 10	9	12	185	64
17	Deceleration, clutch disengaged		−0,92	10 to 0	3		188	4
18	Idling	15	0	0	7	7	195	0
						Total distance covered		1 013

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Table 2 — EUDC operating cycle on the chassis dynamometer

Operation no.	Operation	Phase	Acceleration m/s²	Speed km/h	Duration of each		Cumulative time s	Gear to be used in the case of a manual gearbox
					Operation s	Phase s		
1	Idling	1			20	20	20	See 3.2.1.3.3; use of the gearbox over the extra-urban cycle in accordance with the manufacturer's recommendations.
2	Acceleration	2	0,47	0 to 70	41	41	61	
3	Constant speed	3		70	50	50	111	
4	Deceleration	4	−0,69	70 to 50	8	8	119	
5	Constant speed	5		50	69	69	188	
6	Acceleration	6	0,43	50 to 70	13	13	201	
7	Constant speed	7		70	50	50	251	
8	Acceleration	8	0,24	70 to 100	35	35	286	
9	Constant speed	9		100	30	30	316	
10	Acceleration	10	0,28	100 to 120	20	20	336	
11	Constant speed	11		120	10	10	346	
12	Deceleration	12	−0,69	120 to 80	16	34	362	
13	Deceleration		−1,04	80 to 50	8		370	
14	Deceleration, clutch disengaged		−1,39	50 to 0	10		380	
15	Idling	13			20	20	400	

NOTE This table is the result of reformatting Annex III, Appendix 1, Section 3 of Directive 91/441/EEC,[7] in accordance with 3.2.1.3.3.

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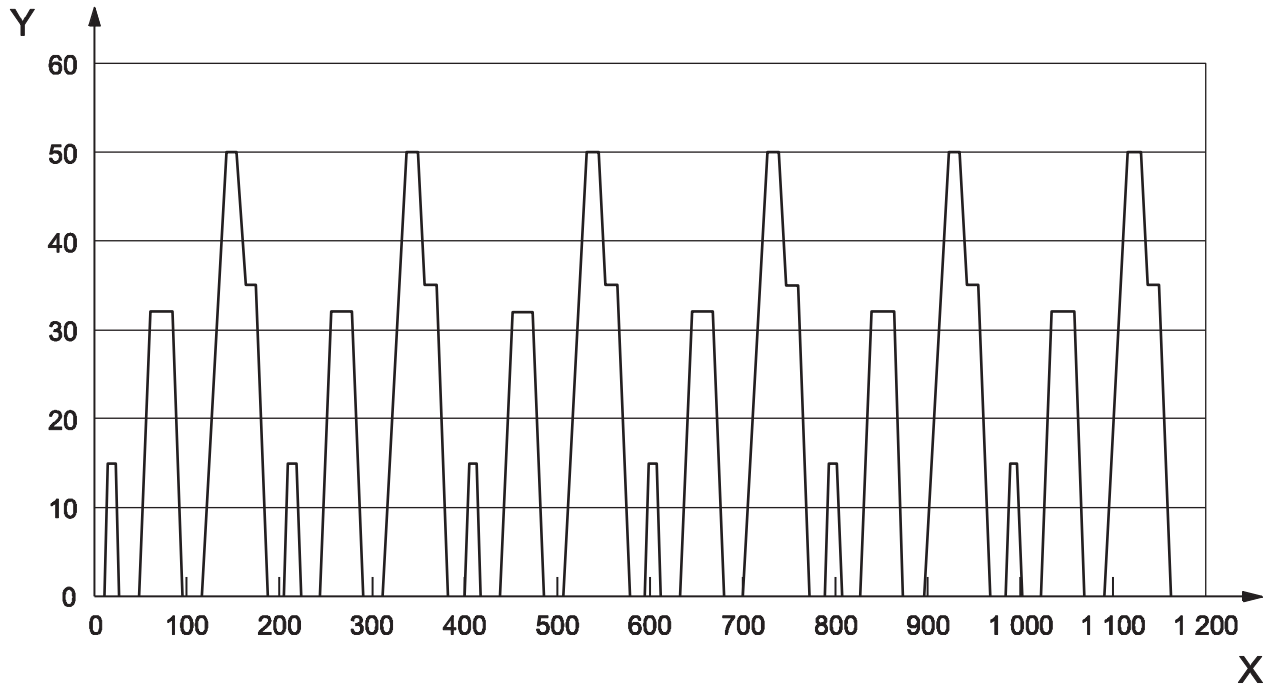
Table 3 — EUDC operating cycle on the chassis dynamometer for motorcycles with a maximum designed speed of 110 km/h

Operation no.	Operation	Phase	Acceleration m/s^2	Speed km/h	Duration of each		Cumulative time s	Gear to be used in the case of a manual gearbox
					Operation s	Phase s		
1	Idling	1			20	20	20	See 3.2.1.3.3; use of the gearbox over the extra-urban cycle in accordance with the manufacturer's recommendations.
2	Acceleration	2	0,47	0 to 70	41	41	61	
3	Constant speed	3		70	50	50	111	
4	Deceleration	4	−0,69	70 to 50	8	8	119	
5	Constant speed	5		50	69	69	188	
6	Acceleration	6	0,43	50 to 70	13	13	201	
7	Constant speed	7		70	50	50	251	
8	Acceleration	8	0,24	70 to 90	23,1	23,1	274,1	
9	Constant speed	9		90	84	84	358,1	
10	Deceleration	10	−0,69	90 to 80	3,9	21,9	362	
11	Deceleration		−1,04	80 to 50	8		370	
12	Deceleration, clutch disengaged		−1,39	50 to 0	10		380	
13	Idling	11			20	20	400	



Key

X time, s

Y speed, km/h

Figure 1 — Operating cycle on chassis dynamometer (UDC)

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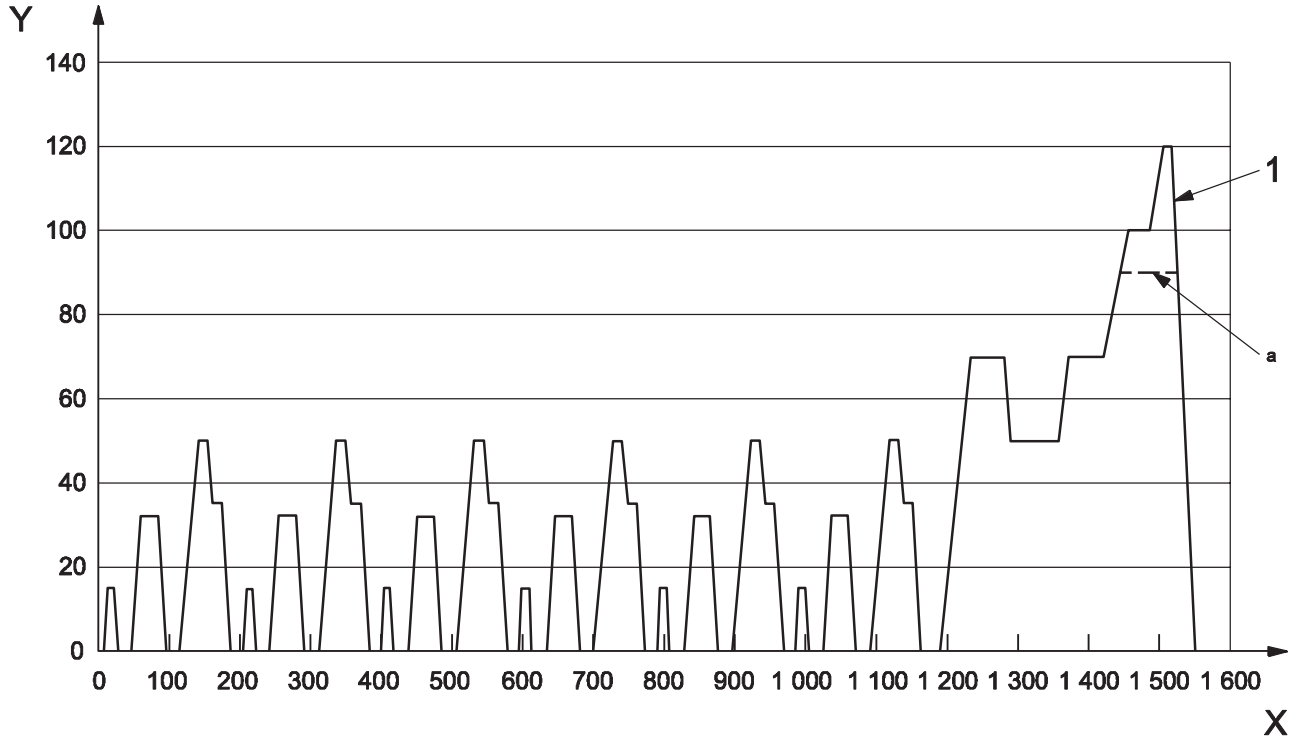

Key

1 UDC/EUDC

X time, s

Y speed, km/h

a For motorcycles with a maximum designed speed of 110 km/h or less.

Figure 2 — Operating cycle on chassis dynamometer (UDC/EUDC)

3.3 Type 2 test

3.3.1 Application

This requirement only applies to all test motorcycles powered by a positive-ignition engine.

3.3.2 Measurement conditions

The type 2 test shall be measured immediately after the type 1 test with the engine at normal idling speed and at high idle.

In the case of motorcycles with manual or semi-automatic gearboxes, the test is carried out with the gear lever in the “neutral” position and with the clutch engaged.

In the case of motorcycles with automatic transmissions, the test is carried out with the selector in position “zero” or “park”.

3.3.3 Sampling of gases

The exhaust outlet shall be fitted with a sufficiently leak-tight extension piece such that the exhaust-gas sampling probe can be inserted to at least 60 cm without increasing back pressure by more than 1,25 kPa and without affecting operation of the motorcycle. Nevertheless, the shape of the extension piece shall be such as to avoid appreciable dilution of exhaust gases by air at the point of the sampling probe. If the motorcycle is equipped with more than one exhaust outlet, either these outlets shall be

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connected up to a common pipe or carbon monoxide concentrations shall be tested at each outlet, with the results of the measurements being the arithmetical mean of these concentrations.

The concentrations for carbon monoxide, $c_{CO,e}$, and carbon dioxide, $c_{CO2,e}$, are determined by reading off the results shown by the instruments or recording devices and using the appropriate calibration tables.

The corrected concentration of carbon monoxide in two-stroke engines, $c_{CO,ec2}$, calculated in percent volume, is

$$c_{CO,ec2} = c_{CO,e} \frac{10}{c_{CO,e} + c_{CO2,e}} \quad (1)$$

The corrected concentration of carbon monoxide in four-stroke engines, $c_{CO,ec4}$, calculated in percent volume, is

$$c_{CO,ec4} = c_{CO,e} \frac{15}{c_{CO,e} + c_{CO2,e}} \quad (2)$$

It is not necessary to correct the concentration of $c_{CO,e}$ measured in accordance with Formula (1) or (2) if the sum of the concentrations measured, $c_{CO,e} + c_{CO2,e}$, is 10 or more for two-stroke engines, and 15 or more for four-stroke engines.

3.3.4 Normal and high idling speed tests

3.3.4.1 When tested in accordance with 3.3.1 and 3.3.2 at normal idling speed,

a) the carbon monoxide content by volume of the exhaust gases emitted is recorded, and

b) the engine speed during the test shall be recorded, including any tolerances.

3.3.4.2 When tested at "high idle" speed (i.e. >2 000 min^{-1}),

a) the carbon monoxide content by volume of the exhaust gases emitted is recorded, and

b) the engine speed during the test shall be recorded, including any tolerances.

The engine oil temperature at the time of the test shall be measured and recorded.

4 Test cycle 2

4.1 General

The test cycle 2 is equivalent to the test cycle specified in global technical regulations No.2 (WMTC), United Nations Economic Commission for Europe, ECE/TRANS/180/Add.2 [9]

4.2 Test room conditions

The test room with the chassis dynamometer and the gas sample collection device shall have a temperature of 298 K ±5 K. The room temperature shall be measured twice in the vicinity of motorcycle cooling blower (fan), both before and after the type 1 test.

4.3 Motorcycle classification

4.3.1 General

Figure 3 gives an overview of the motorcycle classification in terms of engine capacity and maximum motorcycle speed. The numerical values of the engine capacity and maximum motorcycle speed shall not be rounded up or down.

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4.3.2 Class 1

Motorcycles that fulfil either of the following specifications belong to class 1:

a) 50 cm^3 < engine capacity < 150 cm^3 and $v_{max} \leq 50$ km/h;

b) engine capacity < 150 cm^3 and 50 km/h < v_{max} < 100 km/h.

4.3.3 Class 2

Motorcycles that fulfil either of the following specifications belong to class 2:

a) subclass 2-1: engine capacity < 150 cm^3 and 100 km/h ≤ v_{max} < 115 km/h or engine capacity ≥ 150 cm^3 and v_{max} < 115 km/h;

b) subclass 2-2: 115 km/h ≤ v_{max} < 130 km/h.

4.3.4 Class 3

Motorcycles that fulfil either of the following specifications belong to class 3:

a) subclass 3-1: 130 km/h ≤ v_{max} < 140 km/h;

b) subclass 3-2: $v_{max} \geq 140$ km/h.

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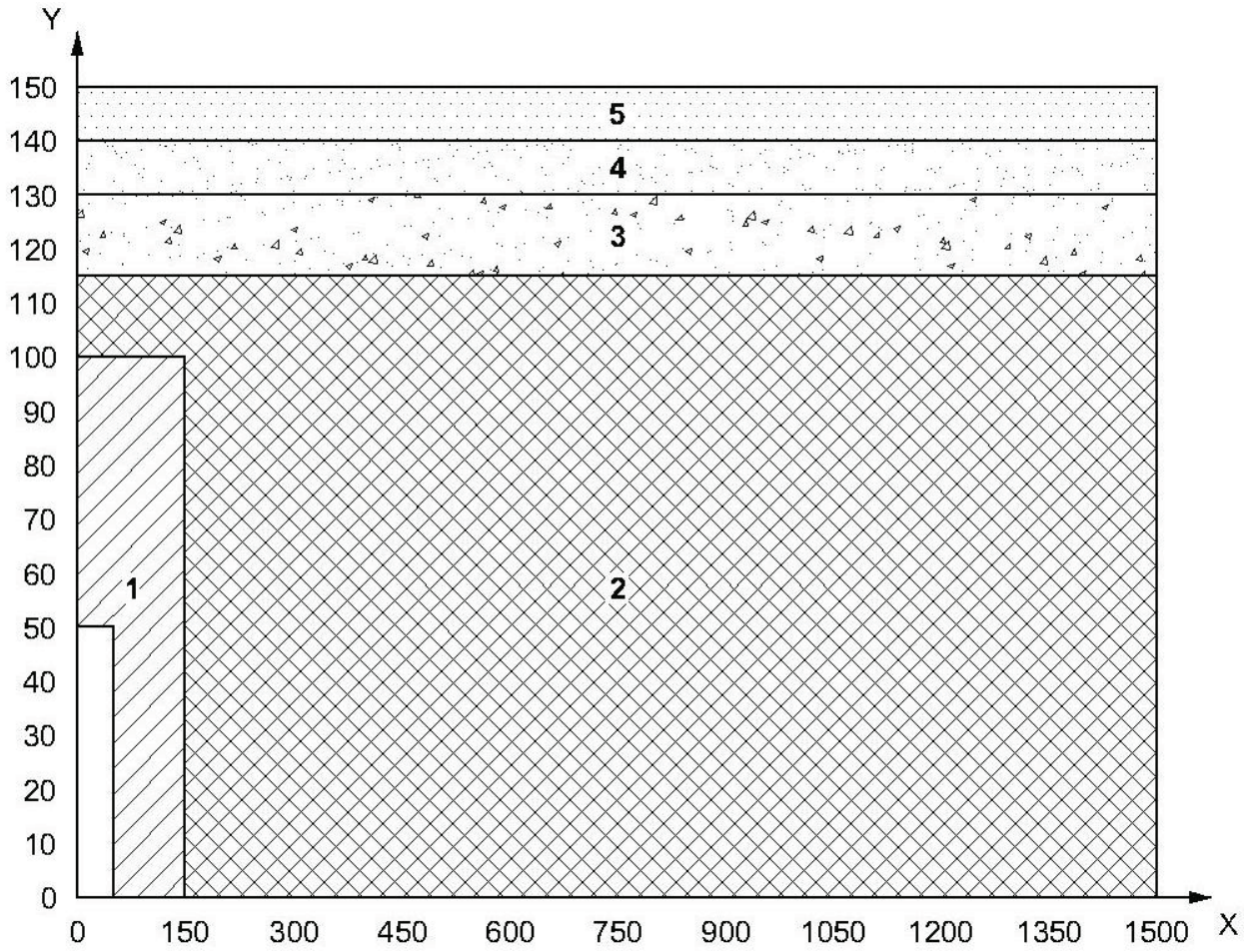

Key

1 class 1
2 class 2 subclass 2-1
3 class 2 subclass 2-2
4 class 3 subclass 3-1
5 class 3 subclass 3-2
X engine capacity, cm^3
Y maximum motorcycle speed, km/h

Figure 3 — Motorcycle classification

4.4 Type 1 tests

4.4.1 Driving schedules

4.4.1.1 Test cycles

Test cycles (motorcycle speed patterns) for the type 1 test consists of up to three parts that are shown in 4.8. Depending on the motorcycle class (see 4.3), the following test cycle parts shall be run.

a) class 1:

part 1, reduced speed in cold condition, followed by part 1 reduced speed in hot condition;

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b) class 2:

1) subclass 2-1: part 1, reduced speed in cold condition, followed by part 2, reduced speed in hot condition;

2) subclass 2-2: part 1 in cold condition, followed by part 2 in hot condition;

c) class 3

1) subclass 3-1: part 1 in cold condition, followed by part 2 in hot condition, followed by part 3 reduced speed in hot condition;

2) subclass 3-2: part 1 in cold condition, followed by part 2 in hot condition, followed by part 3 in hot condition.

4.4.1.2 Speed tolerances

The speed tolerance at any given time on the test cycle prescribed in 4.4.1.1 is defined by upper and lower limits. The upper limit is 3,2 km/h higher than the highest point on the trace within 1 s of the given time. The lower limit is 3,2 km/h lower than the lowest point on the trace within 1 s of the given time. Speed variations greater than the tolerances (such as can occur during gear changes) are acceptable provided they occur for less than 2 s on any occasion. Speeds lower than those prescribed are acceptable provided the motorcycle is operated at maximum available power during such occurrences. Figure 4 shows the range of acceptable speed tolerances for typical points.

Apart from these exceptions the deviations of the roller speed from the set speed of the cycles shall meet the requirements described above. If not, the test results shall not be used for the further analysis and the run shall be repeated.

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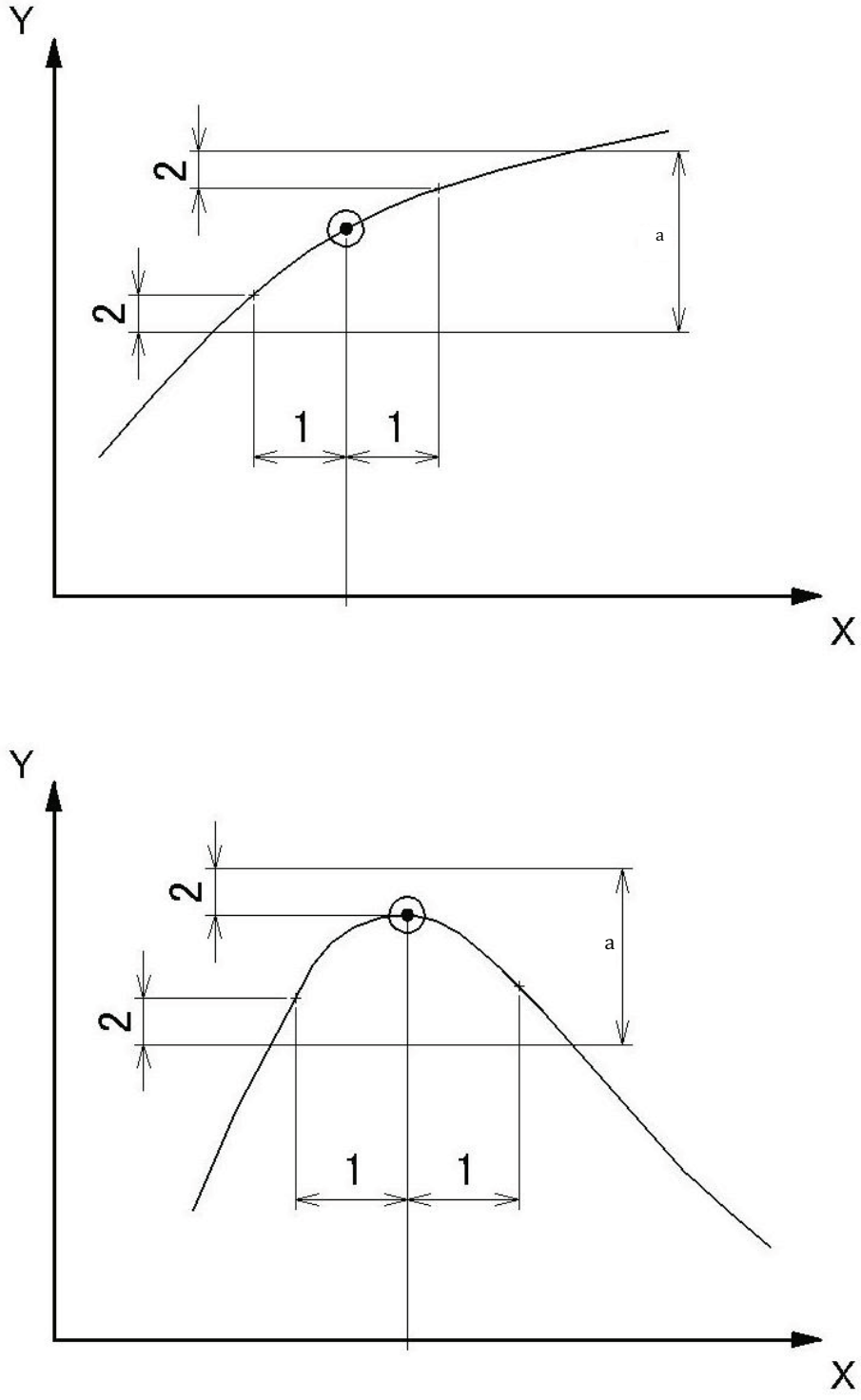

Key

1 1 s
2 3,2 km/h
X time
Y speed
a Allowable range.

Figure 4 — Drivers trace, allowable range

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4.4.2 Gearshift prescriptions

4.4.2.1 Test motorcycles with automatic transmission

Motorcycles equipped with transfer cases, multiple sprockets, etc., shall be tested in the manufacturer's recommended configuration for street or highway use.

All tests shall be conducted with automatic transmissions in "drive" (highest gear). Automatic clutch-torque converter transmissions may be shifted as manual transmissions at the option of the manufacturer.

Idle modes shall be run with automatic transmissions in "drive" and the wheels braked.

Automatic transmissions shall shift automatically through the normal sequence of gears.

The deceleration modes shall be run in gear using brakes or throttle as necessary to maintain the desired speed.

4.4.2.2 Test motorcycles with manual transmission

4.4.2.2.1 Mandatory requirements

4.4.2.2.1.1 Step 1 — Calculation of shift speeds

Upshift speeds ($v_{1\to2}$ and $v_{i\to i+1}$) in km/h during acceleration phases shall be calculated in accordance with Formulae (3) and (4).

$$v_{1\to2} = \left[\left(0{,}5753\times e^{\left(-1{,}9\times\frac{P_n}{m_k+75}\right)} - 0{,}1\right)\times\left(s - n_{idle}\right) + n_{idle}\right]\times\frac{1}{ndv_1} \tag{3}$$

$$v_{i\to i+1} = \left[\left(0{,}5753\times e^{\left(-1{,}9\times\frac{P_n}{m_k+75}\right)}\right)\times\left(s - n_{idle}\right) + n_{idle}\right]\times\frac{1}{ndv_i},\ i = 2 \text{ to } ng-1 \tag{4}$$

where

i is the gear number (≥2);

ng is the total number of forward gears;

P_n is the rated power, in kW;

m_k is the kerb mass, in kg;

n_{idle} is the idling speed, in min^{-1};

s is the rated engine speed, in min^{-1};

ndv_i is the ratio between engine speed, in min^{-1}, and motorcycle speed, in km/h, in gear i.

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Downshift speeds ($v_{i\to i-1}$) in km/h during cruise or deceleration phases in gear 4 (4th gear) to *ng* shall be calculated in accordance with Formula (5).

$$v_{i\to i-1}=\left[\left(0{,}5753\times e^{\left(-1{,}9\times\frac{P_{\mathrm{n}}}{m_{\mathrm{k}}+75}\right)}\right)\times\left(s-n_{\mathrm{idle}}\right)+n_{\mathrm{idle}}\right]\times\frac{1}{ndv_{i-2}},\ i=\ 4\ \text{to}\ ng \tag{5}$$

where

i is the gear number (≥4);

ng is the total number of forward gears;

P_{n} is the rated power, in kW;

m_{k} is the kerb mass, in kg;

n_{idle} is the idling speed, in min^{-1};

s is the rated engine speed, in min^{-1};

$ndv_{\mathrm{i-2}}$ is the ratio between engine speed, in min^{-1}, and motorcycle speed, in km/h, in gear i–2.

The downshift speed from gear 3 to gear 2 ($v_{3\to 2}$) shall be calculated in accordance with Formula (6).

$$v_{3\to 2}=\left[\left(0{,}5753\times e^{\left(-1{,}9\times\frac{P_{\mathrm{n}}}{m_{\mathrm{k}}+75}\right)}-0{,}1\right)\times\left(s-n_{\mathrm{idle}}\right)+n_{\mathrm{idle}}\right]\times\frac{1}{ndv_1} \tag{6}$$

where

P_{n} is the rated power, in kW;

m_{k} is the kerb mass, in kg;

n_{idle} is the idling speed, in min^{-1};

s is the rated engine speed, in min^{-1};

ndv_1 is the ratio between engine speed, in min^{-1}, and motorcycle speed, in km/h, in gear 1.

The downshift speed from gear 2 to gear 1 ($v_{2\to 1}$) shall be calculated in accordance with Formula (7).

$$v_{2\to 1}=\left[0{,}03\times\left(s-n_{\mathrm{idle}}\right)+n_{\mathrm{idle}}\right]\times\frac{1}{ndv_2} \tag{7}$$

where

ndv_2 is the ratio between engine speed, in min^{-1}, and motorcycle speed, in km/h, in gear 2.

Since the cruise phases are defined by the phase indicator, slight speed increases could occur and it can be meaningful to apply an upshift. The upshift speeds ($v_{1\to 2}$, $v_{2\to 3}$ and $v_{i\to i+1}$) in km/h during cruise phases can be calculated in accordance with Formulae (8) to (10).

$$v_{1\to 2}=\left[0{,}03\times\left(s-n_{\mathrm{idle}}\right)+n_{\mathrm{idle}}\right]\times\frac{1}{ndv_2} \tag{8}$$

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$$v_{2\to3}=\left[\left(0{,}5753\times e^{\left(-1{,}9\times\frac{P_n}{m_k+75}\right)}-0{,}1\right)\times\left(s-n_{idle}\right)+n_{idle}\right]\times\frac{1}{ndv_1} \quad (9)$$

$$v_{i\to i+1}=\left[\left(0{,}5753\times e^{\left(-1{,}9\times\frac{P_n}{m_k+75}\right)}\right)\times\left(s-n_{idle}\right)+n_{idle}\right]\times\frac{1}{ndv_{i-1}},\ i=\ 3\ \text{to}\ ng-1 \quad (10)$$

The results of shift speeds shall be mathematically rounded to the first place of the decimal point.

4.4.2.2.1.2 Step 2 — Gear choice for each cycle sample

In order to avoid different interpretations about acceleration, deceleration, cruise, and stop phases, corresponding indicators are added to the motorcycle speed pattern as integral parts of the cycles (see Tables 5 to 28).

The appropriate gear for each sample shall then be calculated according to the motorcycle speed ranges resulting from the shift speed formulae [Formulae (3) to (10)] and these phase indicators for the cycle parts appropriate for the test motorcycle as follows:

— gear choice for stop phases

  For the last 5 s of a stop phase, the gear lever shall be set to gear 1 and the clutch shall be disengaged. For the previous part of a stop phase, the gear lever shall be set to neutral or the clutch shall be disengaged.

— gear choice for acceleration phases:

  — gear 1, if $v\le v_{1\to2}$;

  — gear 2, if $v_{1\to2}<v\le v_{2\to3}$;

  — gear 3, if $v_{2\to3}<v\le v_{3\to4}$;

  — gear 4, if $v_{3\to4}<v\le v_{4\to5}$;

  — gear 5, if $v_{4\to5}<v\le v_{5\to6}$;

  — gear 6, if $v>v_{5\to6}$;

— gear choice for deceleration or cruise phases:

  — gear 1, if $v<v_{2\to1}$;

  — gear 2, if $v<v_{3\to2}$;

  — gear 3, if $v_{3\to2}\le v<v_{4\to3}$;

  — gear 4, if $v_{4\to3}\le v<v_{5\to4}$;

  — gear 5, if $v_{5\to4}\le v<v_{6\to5}$;

  — gear 6, if $v\ge v_{4\to5}$.

The clutch shall be disengaged, if

a) the motorcycle speed drops below 10 km/h,

b) the engine speed drops below n_{idle} + 0,03 × (s – n_{idle}), or

c) there is a risk of engine stalling during cold start phase.

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4.4.2.2.1.3 Step 3 — Corrections according to additional requirements

The gear choice has then to be modified according to the following requirements.

a) There shall be no gearshift at a transition from an acceleration phase to a deceleration phase. The gear that was used for the last second of the acceleration phase shall be kept for the following deceleration phase unless the speed drops below a downshift speed.

b) There shall be no upshifts or downshifts by more than one gear, except from gear 2 to neutral during decelerations down to stop.(Example: Gear 4→4→4→4→3→3→3→3→1→1→1→1 will be replaced by gear 4→4→4→4→3→3→3→3→2→1→1→1.)

c) Upshifts or downshifts for up to 4 s are replaced by the gear before, if the gears before and after are identical. (Examples: Gear 2→3→3→3→2 will be replaced by gear 2→2→2→2→2; gear 4→3→3→3→3→4 will be replaced by gear 4→4→4→4→4→4.)

   In the cases of consecutive circumstances, the gear used longer takes over. (Example: Gear 2→2→2→3→3→3→2→2→2→2→3→3→3 will be replaced by 2→2→2→2→2→2→2→2→2→2→3→3→3.)

   If used for the same time, dominate a series of succeeding gears with a series of preceding gears. (Example: 2→2→2→3→3→3→2→2→2→3→3→3 will be replaced by 2→2→2→2→2→2→2→2→2→3→3→3.)

d) There shall be no downshift during an acceleration phase.

4.4.2.2.2 Optional provisions

The gear choice may be modified according to the following provisions.

— The use of lower gears than determined by the requirements described in 4.4.2.2.1 is permitted in any cycle phase. Manufacturers' recommendations for gear use shall be followed, if they do not result in higher gears than determined by the requirements described in 4.4.2.2.1.

NOTE The calculation program to be found on the UN website at the URL below can be used as an aid for the gear selection: http://www.unece.org/trans/main/wp29/wp29wgs/wp29grpe/wmtc.html. Explanations are given in Annex 13 of the global technical regulations No.2 (WMTC), United Nations Economic Commission for Europe, ECE/TRANS/180/Add.2/Corr.3.

4.5 Type 2 tests

4.5.1 Application

This requirement only applies to all test motorcycles powered by a positive-ignition engine.

4.5.2 Measured gaseous pollutant

The content by volume of carbon monoxide shall be measured immediately after the type 1 test.

4.5.3 Engine test speeds

The test shall be carried out with the engine at normal idling speed and at "high idle" speed. High idle speed is defined by the manufacturer but it shall be higher than 2 000 min^{-1}.

4.5.4 Gear lever position

In the case of test motorcycles with manually operated or semi-automatic shift gearboxes, the test shall be carried out with the gear lever in the "neutral" position and with the clutch engaged. In the case of test motorcycles with automatic-shift gearboxes, the test shall be carried out with the gear selector in either the "zero" or the "park" position.

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4.6 Test procedures

4.6.1 Type 1 tests

4.6.1.1 Emissions tests

4.6.1.1.1 Engine starting and restarting

The engine shall be started according to the manufacturer's recommended starting procedures. The test cycle run shall begin when the engine starts.

Test motorcycles equipped with automatic chokes shall be operated according to the instructions in the manufacturer's operating instructions or owner's manual including choke setting and "kick-down" from cold fast idle. The transmission shall be placed in gear 15 s after the engine is started. If necessary, braking may be employed to keep the drive wheels from turning.

Test motorcycles equipped with manual chokes shall be operated according to the manufacturer's operating instructions or owner's manual. Where times are provided in the instructions, the point for operation may be specified, within 15 s of the recommended time.

The operator may use the choke, throttle, etc. where necessary to keep the engine running.

If the manufacturer's operating instructions or owner's manual do not specify a warm engine starting procedure, the engine (automatic and manual choke engines) shall be started by opening the throttle about half way and cranking the engine until it starts.

If, during the cold start, the test motorcycle does not start after 10 s of cranking, or 10 cycles of the manual starting mechanism, cranking shall cease and the reason for failure to start determined. The revolution counter on the constant volume sampler shall be turned off and the sample solenoid valves placed in the "standby" position during this diagnostic period. In addition, either the CVS blower shall be turned off or the exhaust tube disconnected from the tailpipe during the diagnostic period.

If failure to start is an operational error, the test motorcycle shall be rescheduled for testing from a cold start. If failure to start is caused by motorcycle malfunction, corrective action (following the unscheduled maintenance provisions) of less than 30 min duration may be taken and the test continued. The sampling system shall be reactivated at the same time cranking is started. When the engine starts, the driving schedule timing sequence shall begin. If failure to start is caused by motorcycle malfunction and the motorcycle cannot be started, the test shall be voided, the motorcycle removed from the dynamometer, corrective action taken (following the unscheduled maintenance provisions), and the motorcycle rescheduled for test. The reason for the malfunction (if determined) and the corrective action taken shall be reported.

If the test motorcycle does not start during the hot start after 10 s of cranking, or 10 cycles of the manual starting mechanism, cranking shall cease, the test shall be voided, the motorcycle removed from the dynamometer, corrective action taken, and the motorcycle rescheduled for test. The reason for the malfunction (if determined) and the corrective action taken shall be reported.

If the engine "false starts", the operator shall repeat the recommended starting procedure (such as resetting the choke, etc.).

4.6.1.1.2 Stalling

If the engine stalls during an idle period, the engine shall be restarted immediately and the test continued. If the engine cannot be started soon enough to allow the motorcycle to follow the next acceleration as

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prescribed, the driving schedule indicator shall be stopped. When the motorcycle restarts, the driving schedule indicator shall be reactivated.

If the engine stalls during some operating mode other than idle, the driving schedule indicator shall be stopped, the test motorcycle shall then be restarted and accelerated to the speed required at that point in the driving schedule and the test continued. During acceleration to this point, shifting shall be performed in accordance with 4.4.2.

If the test motorcycle will not restart within 1 min, the test shall be voided, the motorcycle removed from the dynamometer, corrective action taken, and the motorcycle rescheduled for test. The reason for the malfunction (if determined) and the corrective action taken shall be reported.

4.6.1.2 Drive instructions

4.6.1.2.1 The test motorcycle shall be driven with minimum throttle movement to maintain the desired speed. No simultaneous use of brake and throttle shall be permitted.

4.6.1.2.2 If the test motorcycle cannot accelerate at the specified rate, it shall be operated with the throttle fully opened until the roller speed reaches the value prescribed for that time in the driving schedule.

4.6.1.3 Dynamometer test runs

4.6.1.3.1 The complete dynamometer test consists of consecutive parts as described in 4.4.1.

4.6.1.3.2 The following steps shall be taken for each test.

a) Place drive wheel of motorcycle on dynamometer without starting engine.

b) Activate motorcycle cooling fan.

c) For all test motorcycles, with the sample selector valves in the “standby” position, connect evacuated sample collection bags to the dilute exhaust and dilution air sample collection systems.

d) Start the CVS (if not already on), the sample pumps and the temperature recorder. (The heat exchanger of the constant volume sampler, if used, and sample lines shall be preheated to their respective operating temperatures before the test begins.)

e) Adjust the sample flow rates to the desired flow rate and set the gas flow measuring devices to zero.

   1) For gaseous bag samples (except hydrocarbon samples), the minimum flow rate is 0,08 L/s.

   2) For hydrocarbon samples, the minimum flame ionization detection (FID) (or heated flame ionization detection (HFID) in the case of methanol-fuelled motorcycles) flow rate is 0,031 L/s.

f) Attach the flexible exhaust tube to the motorcycle tailpipe(s).

g) Start the gas flow measuring device, position the sample selector valves to direct the sample flow into the “transient” exhaust sample bag, the “transient” dilution air sample bag, turn the key on, and start cranking the engine.

h) 15 s after the engine starts, place the transmission in gear.

i) 20 s after the engine starts, begin the initial motorcycle acceleration of the driving schedule.

j) Operate the motorcycle according to the driving cycles specified in 4.4.1.

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k) At the end of the part 1 or part 1 reduced speed in cold condition, simultaneously switch the sample flows from the first bags and samples to the second bags and samples, switch off gas flow measuring device no. 1 and start gas flow measuring device no. 2.

l) In case of class 3 motorcycles, at the end of part 2, simultaneously switch the sample flows from the second bags and samples to the third bags and samples, switch off gas flow measuring device no. 2 and, start gas flow measuring device no. 3.

m) Before starting a new part, record the measured roll or shaft revolutions and reset the counter or switch to a second counter. As soon as possible, transfer the exhaust and dilution air samples to the analytical system and process the samples according to 4.7.1.1, obtaining a stabilized reading of the exhaust bag sample on all analysers within 20 min of the end of the sample collection phase of the test.

n) Turn the engine off 2 s after the end of the last part of the test.

o) Immediately after the end of the sample period, turn off the cooling fan.

p) Turn off the constant volume sampler (CVS) or critical flow venturi (CFV) or disconnect the exhaust tube from the tailpipe(s) of the motorcycle.

q) Disconnect the exhaust tube from the motorcycle tailpipe(s) and remove the motorcycle from dynamometer.

r) For comparison and analysis reasons besides the bag results also, second by second data of the emissions (diluted gas) shall be monitored. For the same reasons also, the temperatures of the cooling water and the crankcase oil as well as the catalyst temperature shall be recorded.

4.6.2 Type 2 tests

4.6.2.1 Conditions of measurement

4.6.2.1.1 The type 2 test specified in 4.5 shall be measured immediately after the type 1 test with the engine at normal idling speed and at high idle.

4.6.2.1.2 The following parameters shall be measured and recorded at normal idling speed and at high idle speed:

a) the carbon monoxide content by volume of the exhaust gases emitted;

b) the carbon dioxide content by volume of the exhaust gases emitted;

c) the engine speed during the test, including any tolerances;

d) the engine oil temperature at the time of the test.

4.6.2.2 Sampling exhaust gases

4.6.2.2.1 The exhaust outlets shall be provided with an air-tight extension, so that the sample probe used to collect exhaust gases may be inserted into the exhaust outlet at least 60 cm, without increasing the back pressure of more than 125 mm H_2O, and without disturbance of the motorcycle running. The shape of this extension shall however be chosen in order to avoid, at the location of the sample probe, any appreciable dilution of exhaust gases in the air. Where a motorcycle is equipped with an exhaust system having multiple outlets, either these shall be joined to a common pipe or the content of carbon monoxide shall be collected from each of them, the result of the measurement being reached from the arithmetical average of these contents.

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4.6.2.2.2 The concentrations in CO (c_{CO}) and CO_2 (c_{CO2}) shall be determined from the measuring instrument readings or recordings, by use of appropriate calibration curves. The results shall be corrected according to 4.7.2.

4.7 Analysis of results

4.7.1 Type 1 tests

4.7.1.1 Gaseous exhaust emission and fuel consumption analysis

4.7.1.1.1 Analysis of the samples contained in the bags

The analysis shall begin as soon as possible and in any event not later than 20 min after the end of the tests, in order to determine

— the concentrations of hydrocarbons, carbon monoxide, nitrogen oxides, and carbon dioxide in the sample of dilution air contained in bag(s) B, and

— the concentrations of hydrocarbons, carbon monoxide, nitrogen oxides, and carbon dioxide in the sample of diluted exhaust gases contained in bag(s) A.

4.7.1.2 Weighting of results

4.7.1.2.1 In case of repeated measurements, the emission results in g/km and the fuel consumption in L/100 km obtained by the calculation method described in ISO 6460-1 are averaged for each cycle part.

4.7.1.2.2 The (average) result of part 1 or part 1 reduced speed is named R_1, the (average) result of part 1 in hot condition or part 1 reduced speed in hot condition is named R_{1hot}, the (average) result of part 2 or part 2 reduced speed is named R_2, and the (average) result of part 3 or part 3 reduced speed is named R_3. Using these emission results in g/km and the fuel consumption in L/100 km; the final result R, depending on the motorcycle class as defined in 4.3, shall be calculated by means of Formulae (11) to (13).

Class 1

$$R = R_1 \times w_1 + R_{1hot} \times w_{1hot} \quad (11)$$

Class 2

$$R = R_1 \times w_1 + R_2 \times w_2 \quad (12)$$

Class 3

$$R = R_1 \times w_1 + R_2 \times w_2 + R_3 \times w_3 \quad (13)$$

4.7.1.2.3 For each pollutant, the carbon dioxide emission and the fuel consumption the weightings shown in Table 4 shall be used.

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Table 4 — Weighting factors for the final emission and fuel consumption results

Motorcycle class	Cycle	Weighting	
Class 1	Part 1, cold	w_1	50 %
	Part 1, hot	w_{1hot}	50 %
Class 2	Part 1, cold	w_1	30 %
	Part 2, hot	w_2	70 %
Class 3	Part 1, cold	w_1	25 %
	Part 2, hot	w_2	50 %
	Part 3, hot	w_3	25 %

4.7.2 Type 2 tests

4.7.2.1 The corrected concentration for carbon monoxide ($c_{CO,ec2}$ and $c_{CO,ec4}$ in per cent volume) is calculated in accordance with Formulae (1) and (2).

4.7.2.1.1 For two-stroke engines, see Formula (1).

4.7.2.1.2 For four-stroke engines, see Formula (2).

4.7.2.2 The concentration in $c_{CO,e}$ measured according to 4.6.2.2 need not be corrected if the total of the concentrations measured, $c_{CO,e} + c_{CO2,e,}$ is at least 10 for two-stroke engines and 15 for four-stroke engines.

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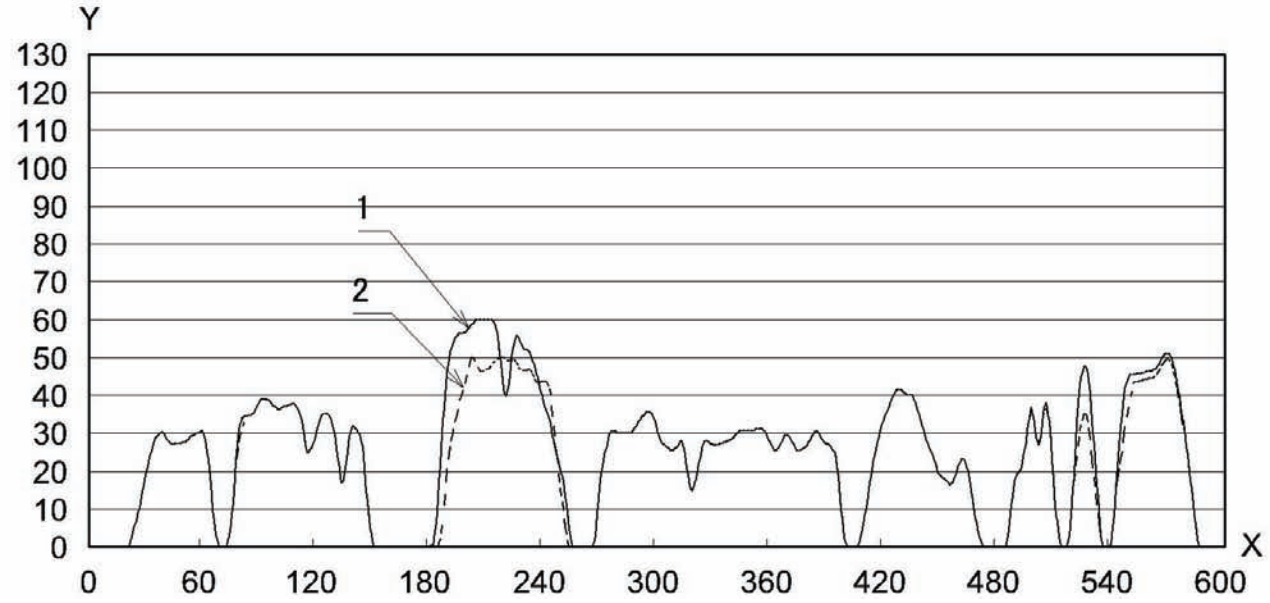
4.8 Driving cycles for type 1 tests



Key

1 part 1

2 part 1, reduced speed

X time, s

Y speed, km/h

Figure 5 — Cycle part 1

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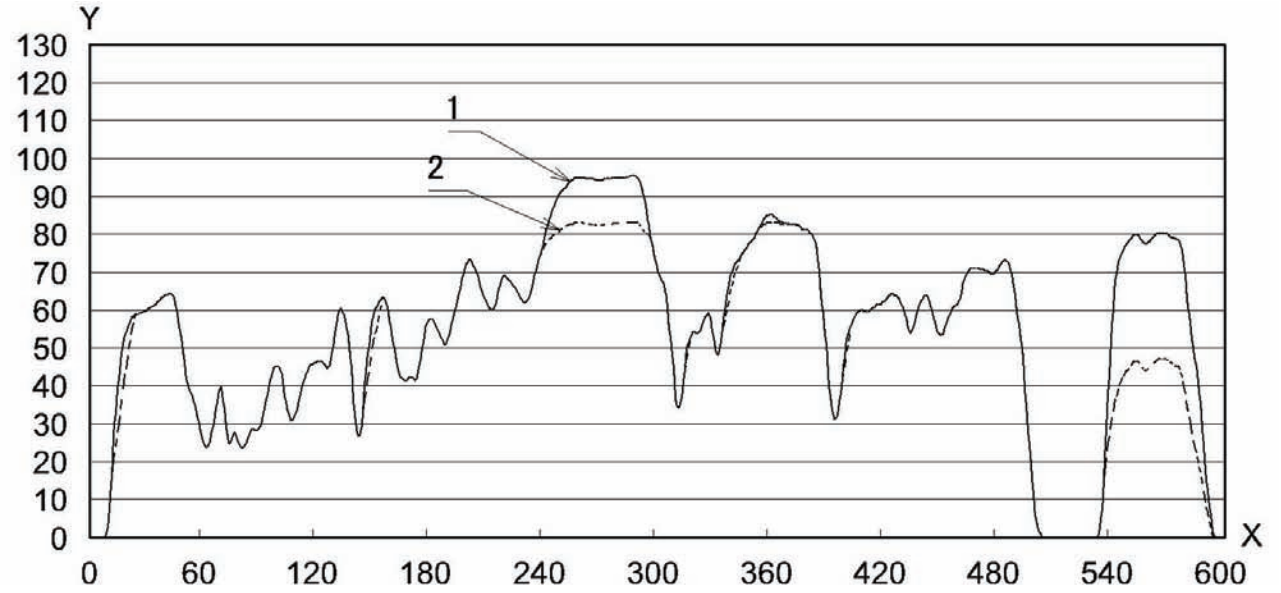

Key

1 part 2

2 part 2, reduced speed

X time, s

Y speed, km/h

Figure 6 — Cycle part 2 for motorcycle classes 2 and 3

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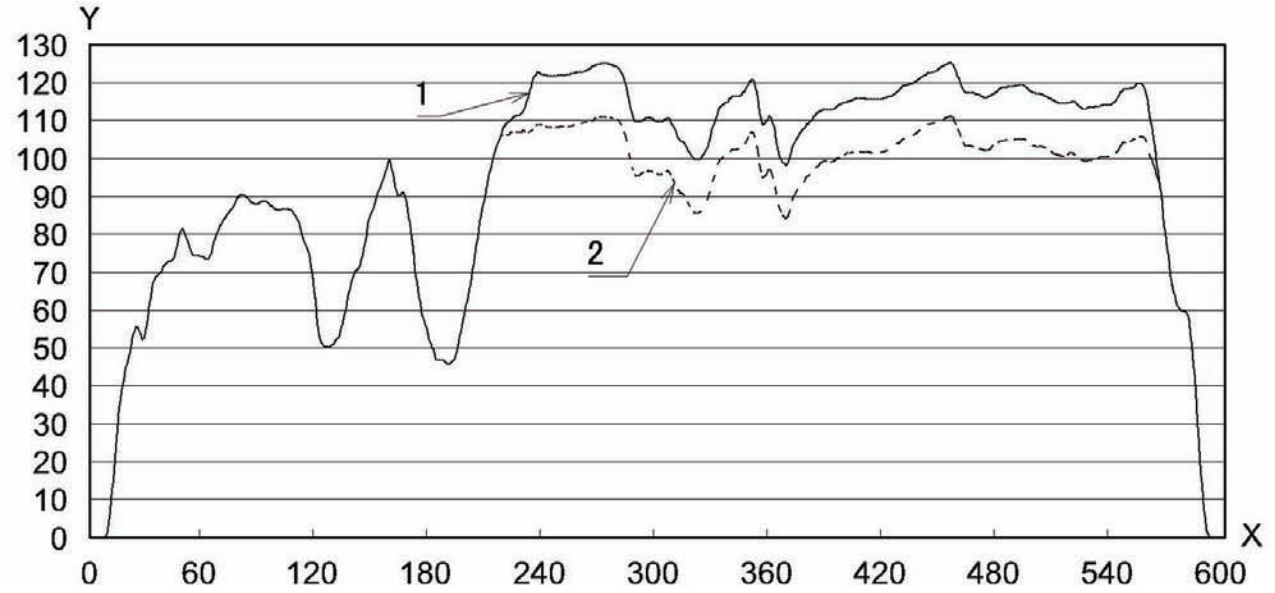

Key

1 part 3

2 part 3, reduced speed

X time, s

Y speed, km/h

Figure 7 — Cycle part 3 for motorcycle class 3

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Table 5 — Cycle part 1, reduced speed for motorcycle classes 1 and 2-1, 1 s to 180 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
0	0,0	X				41	28,7			X		82	32,9		X		
1	0,0	X				42	27,9			X		83	34,7		X		
2	0,0	X				43	27,4			X		84	34,8		X		
3	0,0	X				44	27,3			X		85	34,8		X		
4	0,0	X				45	27,3			X		86	34,9		X		
5	0,0	X				46	27,4			X		87	35,4		X		
6	0,0	X				47	27,5			X		88	36,2		X		
7	0,0	X				48	27,6			X		89	37,1		X		
8	0,0	X				49	27,6			X		90	38,0		X		
9	0,0	X				50	27,6			X		91	38,7			X	
10	0,0	X				51	27,8			X		92	38,9			X	
11	0,0	X				52	28,1			X		93	38,9			X	
12	0,0	X				53	28,5			X		94	38,8			X	
13	0,0	X				54	28,9			X		95	38,5			X	
14	0,0	X				55	29,2			X		96	38,1			X	
15	0,0	X				56	29,4			X		97	37,5			X	
16	0,0	X				57	29,7			X		98	37,0			X	
17	0,0	X				58	30,0			X		99	36,7			X	
18	0,0	X				59	30,5			X		100	36,5			X	
19	0,0	X				60	30,6				X	101	36,5			X	
20	0,0	X				61	29,6				X	102	36,6			X	
21	0,0	X				62	26,9				X	103	36,8			X	
22	1,0		X			63	23,0				X	104	37,0			X	
23	2,6		X			64	18,6				X	105	37,1			X	
24	4,8		X			65	14,1				X	106	37,3			X	
25	7,2		X			66	9,3				X	107	37,4			X	
26	9,6		X			67	4,8				X	108	37,5			X	
27	12,0		X			68	1,9				X	109	37,4			X	
28	14,3		X			69	0,0	X				110	36,9				X
29	16,6		X			70	0,0	X				111	36,0				X
30	18,9		X			71	0,0	X				112	34,8				X
31	21,2		X			72	0,0	X				113	31,9				X
32	23,5		X			73	0,0	X				114	29,0				X
33	25,6		X			74	1,7		X			115	26,9				X
34	27,1		X			75	5,8		X			116	24,7			X	
35	28,0		X			76	11,8		X			117	25,4			X	
36	28,7		X			77	17,3		X			118	26,4			X	
37	29,2		X			78	22,0		X			119	27,7			X	
38	29,8		X			79	26,2		X			120	29,4			X	
39	30,3			X		80	29,4		X			121	31,2			X	
40	29,6			X		81	31,1		X			122	33,0			X	

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Table 5 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
123	34,4			X		143	29,7				X	163	0,0	X			
124	35,2			X		144	28,1				X	164	0,0	X			
125	35,4				X	145	25,0				X	165	0,0	X			
126	35,2				X	146	20,3				X	166	0,0	X			
127	34,7				X	147	15,0				X	167	0,0	X			
128	33,9				X	148	9,7				X	168	0,0	X			
129	32,4				X	149	5,0				X	169	0,0	X			
130	29,8				X	150	1,6				X	170	0,0	X			
131	26,1				X	151	0,0	X				171	0,0	X			
132	22,1				X	152	0,0	X				172	0,0	X			
133	18,6				X	153	0,0	X				173	0,0	X			
134	16,8		X			154	0,0	X				174	0,0	X			
135	17,7		X			155	0,0	X				175	0,0	X			
136	21,1		X			156	0,0	X				176	0,0	X			
137	25,4		X			157	0,0	X				177	0,0	X			
138	29,2		X			158	0,0	X				178	0,0	X			
139	31,6		X			159	0,0	X				179	0,0	X			
140	32,1				X	160	0,0	X				180	0,0	X			
141	31,6				X	161	0,0	X									
142	30,7				X	162	0,0	X									

Table 6 — Cycle part 1, reduced speed for motorcycle classes 1 and 2–1, 181 s to 360 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
181	0,0	X				196	37,8		X			211	46,9			X	
182	0,0	X				197	39,6		X			212	47,2			X	
183	0,0	X				198	41,3		X			213	47,8			X	
184	0,0	X				199	43,3		X			214	48,4			X	
185	0,4		X			200	45,1		X			215	48,9			X	
186	1,8		X			201	47,5		X			216	49,2			X	
187	5,4		X			202	49,0		X			217	49,6			X	
188	11,1		X			203	50,0			X		218	49,9			X	
189	16,7		X			204	49,5			X		219	50,0			X	
190	21,3		X			205	48,8			X		220	49,8			X	
191	24,8		X			206	47,6			X		221	49,5			X	
192	28,4		X			207	46,5			X		222	49,2			X	
193	31,8		X			208	46,1			X		223	49,3			X	
194	34,6		X			209	46,1			X		224	49,4			X	
195	36,3		X			210	46,6			X		225	49,4			X	

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Table 6 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
226	48,6			X		267	0,5		X			308	25,7			X	
227	47,8			X		268	2,9		X			309	25,5			X	
228	47,0			X		269	8,2		X			310	25,7			X	
229	46,9			X		270	13,2		X			311	26,4			X	
230	46,6			X		271	17,8		X			312	27,3			X	
231	46,6			X		272	21,4		X			313	28,1			X	
232	46,6			X		273	24,1		X			314	27,9				X
233	46,9			X		274	26,4		X			315	26,0				X
234	46,4			X		275	28,4		X			316	22,7				X
235	45,6			X		276	29,9		X			317	19,0				X
236	44,4			X		277	30,5			X		318	16,0				X
237	43,5			X		278	30,5			X		319	14,6		X		
238	43,2			X		279	30,3			X		320	15,2		X		
239	43,3			X		280	30,2			X		321	16,9		X		
240	43,7			X		281	30,1			X		322	19,3		X		
241	43,9			X		282	30,1			X		323	22,0		X		
242	43,8				X	283	30,1			X		324	24,6		X		
243	43,0				X	284	30,2			X		325	26,8		X		
244	40,9				X	285	30,2			X		326	27,9		X		
245	36,9				X	286	30,2			X		327	28,0			X	
246	32,1				X	287	30,2			X		328	27,7			X	
247	26,6				X	288	30,5			X		329	27,1			X	
248	21,8				X	289	31,0			X		330	26,8			X	
249	17,2				X	290	31,9			X		331	26,6			X	
250	13,7				X	291	32,8			X		332	26,8			X	
251	10,3				X	292	33,7			X		333	27,0			X	
252	7,0				X	293	34,5			X		334	27,2			X	
253	3,5				X	294	35,1			X		335	27,4			X	
254	0,0	X				295	35,5			X		336	27,5			X	
255	0,0	X				296	35,6			X		337	27,7			X	
256	0,0	X				297	35,4			X		338	27,9			X	
257	0,0	X				298	35,0			X		339	28,1			X	
258	0,0	X				299	34,0			X		340	28,3			X	
259	0,0	X				300	32,4			X		341	28,6			X	
260	0,0	X				301	30,6			X		342	29,1			X	
261	0,0	X				302	29,0			X		343	29,6			X	
262	0,0	X				303	27,8			X		344	30,1			X	
263	0,0	X				304	27,2			X		345	30,6			X	
264	0,0	X				305	26,9			X		346	30,8			X	
265	0,0	X				306	26,5			X		347	30,8			X	
266	0,0	X				307	26,1			X		348	30,8			X	

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Table 6 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
349	30,8			X		353	30,8			X		357	30,8			X	
350	30,8			X		354	30,9			X		358	30,4			X	
351	30,8			X		355	30,9			X		359	29,6			X	
352	30,8			X		356	30,9			X		360	28,4			X	

Table 7 — Cycle part 1, reduced speed for motorcycle classes 1 and 2–1, 361 s to 540 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
361	27,1			X		392	26,9				X	423	36,5		X		
362	26,0			X		393	26,4				X	424	37,5		X		
363	25,4			X		394	25,7				X	425	38,6		X		
364	25,5			X		395	24,9				X	426	39,6		X		
365	26,3			X		396	21,4				X	427	40,7		X		
366	27,3			X		397	15,9				X	428	41,4		X		
367	28,3			X		398	9,9				X	429	41,7			X	
368	29,2			X		399	4,9				X	430	41,4			X	
369	29,5			X		400	2,1				X	431	40,9			X	
370	29,4			X		401	0,9				X	432	40,5			X	
371	28,9			X		402	0,0	X				433	40,2			X	
372	28,1			X		403	0,0	X				434	40,1			X	
373	27,1			X		404	0,0	X				435	40,1			X	
374	26,3			X		405	0,0	X				436	39,8			X	
375	25,7			X		406	0,0	X				437	38,9				X
376	25,5			X		407	0,0	X				438	37,4				X
377	25,6			X		408	1,2		X			439	35,8				X
378	25,9			X		409	3,2		X			440	34,1				X
379	26,3			X		410	5,9		X			441	32,5				X
380	26,9			X		411	8,8		X			442	30,9				X
381	27,6			X		412	12,0		X			443	29,4				X
382	28,4			X		413	15,4		X			444	27,9				X
383	29,3			X		414	18,9		X			445	26,5				X
384	30,1			X		415	22,1		X			446	25,0				X
385	30,4			X		416	24,7		X			447	23,4				X
386	30,2			X		417	26,8		X			448	21,8				X
387	29,5			X		418	28,7		X			449	20,3				X
388	28,6			X		419	30,6		X			450	19,3				X
389	27,9			X		420	32,4		X			451	18,7				X
390	27,5			X		421	34,0		X			452	18,3				X
391	27,2			X		422	35,4		X			453	17,8				X

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Table 7 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
454	17,4				X	483	0,0	X				512	10,7				X
455	16,8				X	484	0,0	X				513	4,7				X
456	16,3			X		485	0,0	X				514	1,2				X
457	16,5			X		486	1,4		X			515	0,0	X			
458	17,6			X		487	4,5		X			516	0,0	X			
459	19,2			X		488	8,8		X			517	0,0	X			
460	20,8			X		489	13,4		X			518	0,0	X			
461	22,2			X		490	17,3		X			519	3,0		X		
462	23,0			X		491	19,2		X			520	8,2		X		
463	23,0				X	492	19,7		X			521	14,3		X		
464	22,0				X	493	19,8		X			522	19,3		X		
465	20,1				X	494	20,7		X			523	23,5		X		
466	17,7				X	495	23,7		X			524	27,3		X		
467	15,0				X	496	27,9		X			525	30,8		X		
468	12,1				X	497	31,9		X			526	33,7		X		
469	9,1				X	498	35,4		X			527	35,2		X		
470	6,2				X	499	36,2				X	528	35,2				X
471	3,6				X	500	34,2				X	529	32,5				X
472	1,8				X	501	30,2				X	530	27,9				X
473	0,8				X	502	27,1				X	531	23,2				X
474	0,0	X				503	26,6		X			532	18,5				X
475	0,0	X				504	28,6		X			533	13,8				X
476	0,0	X				505	32,6		X			534	9,1				X
477	0,0	X				506	35,5		X			535	4,5				X
478	0,0	X				507	36,6				X	536	2,3				X
479	0,0	X				508	34,6				X	537	0,0	X			
480	0,0	X				509	30,0				X	538	0,0	X			
481	0,0	X				510	23,1				X	539	0,0	X			
482	0,0	X				511	16,7				X	540	0,0	X			

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Table 8 — Cycle part 1, reduced speed for motorcycle classes 1 and 2–1, 541 s to 600 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
541	0,0	X				561	44,4			X		581	26,0				X
542	2,8		X			562	44,5			X		582	21,8				X
543	8,1		X			563	44,6			X		583	17,7				X
544	14,3		X			564	44,9			X		584	13,5				X
545	19,2		X			565	45,5			X		585	9,4				X
546	23,5		X			566	46,3			X		586	5,6				X
547	27,2		X			567	47,1			X		587	2,1				X
548	30,5		X			568	48,0			X		588	0,0	X			
549	33,1		X			569	48,7			X		589	0,0	X			
550	35,7		X			570	49,2			X		590	0,0	X			
551	38,3		X			571	49,4			X		591	0,0	X			
552	41,0		X			572	49,3			X		592	0,0	X			
553	43,6			X		573	48,7				X	593	0,0	X			
554	43,7			X		574	47,3				X	594	0,0	X			
555	43,8			X		575	45,0				X	595	0,0	X			
556	43,9			X		576	42,3				X	596	0,0	X			
557	44,0			X		577	39,5				X	597	0,0	X			
558	44,1			X		578	36,6				X	598	0,0	X			
559	44,2			X		579	33,7				X	599	0,0	X			
560	44,3			X		580	30,1				X	600	0,0	X			

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Table 9 — Cycle part 1 for motorcycle classes 2–2 and 3, 1 s to 180 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
0	0,0	X				41	28,7			X		82	34,4		X		
1	0,0	X				42	27,9			X		83	34,5		X		
2	0,0	X				43	27,5			X		84	34,6		X		
3	0,0	X				44	27,3			X		85	34,7		X		
4	0,0	X				45	27,4			X		86	34,8		X		
5	0,0	X				46	27,5			X		87	35,2		X		
6	0,0	X				47	27,6			X		88	36,0		X		
7	0,0	X				48	27,6			X		89	37,0		X		
8	0,0	X				49	27,6			X		90	37,9		X		
9	0,0	X				50	27,7			X		91	38,6		X		
10	0,0	X				51	27,8			X		92	38,8			X	
11	0,0	X				52	28,1			X		93	38,8			X	
12	0,0	X				53	28,6			X		94	38,7			X	
13	0,0	X				54	29,0			X		95	38,5			X	
14	0,0	X				55	29,2			X		96	38,0			X	
15	0,0	X				56	29,5			X		97	37,4			X	
16	0,0	X				57	29,7			X		98	36,9			X	
17	0,0	X				58	30,1			X		99	36,6			X	
18	0,0	X				59	30,5			X		100	36,4			X	
19	0,0	X				60	30,7			X		101	36,4			X	
20	0,0	X				61	29,7				X	102	36,5			X	
21	0,0	X				62	27,0				X	103	36,7			X	
22	1,0		X			63	23,0				X	104	36,9			X	
23	2,6		X			64	18,7				X	105	37,0			X	
24	4,8		X			65	14,2				X	106	37,2			X	
25	7,2		X			66	9,4				X	107	37,3			X	
26	9,6		X			67	4,9				X	108	37,4			X	
27	12,0		X			68	2,0				X	109	37,3			X	
28	14,3		X			69	0,0	X				110	36,8			X	
29	16,6		X			70	0,0	X				111	35,8				X
30	18,9		X			71	0,0	X				112	34,7				X
31	21,2		X			72	0,0	X				113	31,8				X
32	23,5		X			73	0,0	X				114	28,9				X
33	25,6		X			74	1,7		X			115	26,7				X
34	27,1		X			75	5,8		X			116	24,6			X	
35	28,0		X			76	11,8		X			117	25,2			X	
36	28,7		X			77	18,3		X			118	26,2			X	
37	29,2		X			78	24,5		X			119	27,6			X	
38	29,8		X			79	29,4		X			120	29,2			X	
39	30,4			X		80	32,5		X			121	31,0			X	
40	29,6			X		81	34,2		X			122	32,8			X	

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Table 9 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
123	34,3			X		143	29,5				X	163	0,0	X			
124	35,1			X		144	28,0				X	164	0,0	X			
125	35,3				X	145	24,9				X	165	0,0	X			
126	35,1				X	146	20,2				X	166	0,0	X			
127	34,6				X	147	14,8				X	167	0,0	X			
128	33,7				X	148	9,5				X	168	0,0	X			
129	32,2				X	149	4,8				X	169	0,0	X			
130	29,6				X	150	1,4				X	170	0,0	X			
131	26,0				X	151	0,0	X				171	0,0	X			
132	22,0				X	152	0,0	X				172	0,0	X			
133	18,5				X	153	0,0	X				173	0,0	X			
134	16,6		X			154	0,0	X				174	0,0	X			
135	17,6		X			155	0,0	X				175	0,0	X			
136	21,0		X			156	0,0	X				176	0,0	X			
137	25,2		X			157	0,0	X				177	0,0	X			
138	29,1		X			158	0,0	X				178	0,0	X			
139	31,4		X			159	0,0	X				179	0,0	X			
140	31,9				X	160	0,0	X				180	0,0	X			
141	31,4				X	161	0,0	X									
142	30,6				X	162	0,0	X									

Table 10 — Cycle part 1 for motorcycle classes 2–2 and 3, 181 s to 360 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
181	0,0	X				196	56,2			X		211	59,9			X	
182	0,0	X				197	56,2			X		212	59,9			X	
183	2,0		X			198	56,2			X		213	59,8			X	
184	6,0		X			199	56,7			X		214	59,6				X
185	12,4		X			200	57,2			X		215	59,1				X
186	21,4		X			201	57,7			X		216	57,1				X
187	30,0		X			202	58,2			X		217	53,2				X
188	37,1		X			203	58,7			X		218	48,3				X
189	42,5		X			204	59,3			X		219	43,9				X
190	46,6		X			205	59,8			X		220	40,3				X
191	49,8		X			206	60,0			X		221	39,5				X
192	52,4		X			207	60,0			X		222	41,3		X		
193	54,4		X			208	59,9			X		223	45,2		X		
194	55,6		X			209	59,9			X		224	50,1		X		
195	56,1			X		210	59,9			X		225	53,7		X		

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Table 10 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
226	55,8		X			261	0,0	X				296	35,5			X	
227	55,8		X			262	0,0	X				297	35,3			X	
228	54,7				X	263	0,0	X				298	34,9			X	
229	53,3				X	264	0,0	X				299	33,9			X	
230	52,3				X	265	0,0	X				300	32,4			X	
231	52,0				X	266	0,0	X				301	30,6			X	
232	52,1				X	267	0,5		X			302	28,9			X	
233	51,8				X	268	2,9		X			303	27,8			X	
234	50,8				X	269	8,2		X			304	27,2			X	
235	49,2				X	270	13,2		X			305	26,9			X	
236	47,5				X	271	17,8		X			306	26,5			X	
237	45,7				X	272	21,4		X			307	26,1			X	
238	43,9				X	273	24,1		X			308	25,7			X	
239	42,0				X	274	26,4		X			309	25,5			X	
240	40,2				X	275	28,4		X			310	25,7			X	
241	38,3				X	276	29,9		X			311	26,4			X	
242	36,4				X	277	30,5		X			312	27,3			X	
243	34,6				X	278	30,5			X		313	28,1			X	
244	32,7				X	279	30,3			X		314	27,9				X
245	30,6				X	280	30,2			X		315	26,0				X
246	28,1				X	281	30,1			X		316	22,7				X
247	25,5				X	282	30,1			X		317	19,0				X
248	23,1				X	283	30,1			X		318	16,0				X
249	21,2				X	284	30,1			X		319	14,6		X		
250	19,5				X	285	30,1			X		320	15,2		X		
251	17,8				X	286	30,1			X		321	16,9		X		
252	15,3				X	287	30,2			X		322	19,3		X		
253	11,5				X	288	30,4			X		323	22,0		X		
254	7,2				X	289	31,0			X		324	24,6		X		
255	2,5				X	290	31,8			X		325	26,8		X		
256	0,0	X				291	32,7			X		326	27,9		X		
257	0,0	X				292	33,6			X		327	28,1			X	
258	0,0	X				293	34,4			X		328	27,7			X	
259	0,0	X				294	35,0			X		329	27,2			X	
260	0,0	X				295	35,4			X		330	26,8			X	

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Table 10 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
331	26,6			X		342	29,0			X		353	30,8			X	
332	26,8			X		343	29,6			X		354	30,9			X	
333	27,0			X		344	30,1			X		355	30,9			X	
334	27,2			X		345	30,5			X		356	30,9			X	
335	27,4			X		346	30,7			X		357	30,8			X	
336	27,6			X		347	30,8			X		358	30,4			X	
337	27,7			X		348	30,8			X		359	29,6			X	
338	27,9			X		349	30,8			X		360	28,4			X	
339	28,1			X		350	30,8			X							
340	28,3			X		351	30,8			X							
341	28,6			X		352	30,8			X							

Table 11 — Cycle part 1 for motorcycle classes 2–2 and 3, 361 s to 540 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
361	27,1			X		382	28,5			X		403	0,0	X			
362	26,0			X		383	29,4			X		404	0,0	X			
363	25,4			X		384	30,2			X		405	0,0	X			
364	25,5			X		385	30,5			X		406	0,0	X			
365	26,3			X		386	30,3			X		407	0,0	X			
366	27,3			X		387	29,5			X		408	1,2		X		
367	28,4			X		388	28,7			X		409	3,2		X		
368	29,2			X		389	27,9			X		410	5,9		X		
369	29,5			X		390	27,5			X		411	8,8		X		
370	29,5			X		391	27,3			X		412	12,0		X		
371	29,0			X		392	27,0				X	413	15,4		X		
372	28,1			X		393	26,5				X	414	18,9		X		
373	27,2			X		394	25,8				X	415	22,1		X		
374	26,3			X		395	25,0				X	416	24,8		X		
375	25,7			X		396	21,5				X	417	26,8		X		
376	25,5			X		397	16,0				X	418	28,7		X		
377	25,6			X		398	10,0				X	419	30,6		X		
378	26,0			X		399	5,0				X	420	32,4		X		
379	26,4			X		400	2,2				X	421	34,0		X		
380	27,0			X		401	1,0				X	422	35,4		X		
381	27,7			X		402	0,0	X				423	36,5		X		

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Table 11 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
424	37,5		X			463	23,2				X	502	28,0				X
425	38,6		X			464	22,2				X	503	27,5		X		
426	39,7		X			465	20,3				X	504	29,5		X		
427	40,7		X			466	17,9				X	505	34,0		X		
428	41,5		X			467	15,2				X	506	37,0		X		
429	41,7			X		468	12,3				X	507	38,0				X
430	41,5			X		469	9,3				X	508	36,1				X
431	41,0			X		470	6,4				X	509	31,5				X
432	40,6			X		471	3,8				X	510	24,5				X
433	40,3			X		472	2,0				X	511	17,5				X
434	40,2			X		473	0,9				X	512	10,5				X
435	40,1			X		474	0,0	X				513	4,5				X
436	39,8				X	475	0,0	X				514	1,0				X
437	38,9				X	476	0,0	X				515	0,0	X			
438	37,5				X	477	0,0	X				516	0,0	X			
439	35,8				X	478	0,0	X				517	0,0	X			
440	34,2				X	479	0,0	X				518	0,0	X			
441	32,5				X	480	0,0	X				519	2,9		X		
442	30,9				X	481	0,0	X				520	8,0		X		
443	29,4				X	482	0,0	X				521	16,0		X		
444	28,0				X	483	0,0	X				522	24,0		X		
445	26,5				X	484	0,0	X				523	32,0		X		
446	25,0				X	485	0,0	X				524	38,8		X		
447	23,5				X	486	1,4		X			525	43,1		X		
448	21,9				X	487	4,5		X			526	46,0		X		
449	20,4				X	488	8,8		X			527	47,5				X
450	19,4				X	489	13,4		X			528	47,5				X
451	18,8				X	490	17,3		X			529	44,8				X
452	18,4				X	491	19,2		X			530	40,1				X
453	18,0				X	492	19,7		X			531	33,8				X
454	17,5				X	493	19,8		X			532	27,2				X
455	16,9				X	494	20,7		X			533	20,0				X
456	16,4			X		495	23,6		X			534	12,8				X
457	16,6			X		496	28,1		X			535	7,0				X
458	17,7			X		497	32,8		X			536	2,2				X
459	19,4			X		498	36,3		X			537	0,0	X			
460	20,9			X		499	37,1				X	538	0,0	X			
461	22,3			X		500	35,1				X	539	0,0	X			
462	23,2			X		501	31,1				X	540	0,0	X			

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Table 12 — Cycle part 1 for motorcycle classes 2–2 and 3, 541 s to 600 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
541	0,0	X				561	46,2			X		581	27,3				X
542	2,7		X			562	46,3			X		582	22,4				X
543	8,0		X			563	46,4			X		583	17,7				X
544	16,0		X			564	46,7			X		584	13,4				X
545	24,0		X			565	47,2			X		585	9,3				X
546	32,0		X			566	48,0			X		586	5,5				X
547	37,2		X			567	48,9			X		587	2,0				X
548	40,4		X			568	49,8			X		588	0,0	X			
549	43,1		X			569	50,5			X		589	0,0	X			
550	44,6		X			570	51,0			X		590	0,0	X			
551	45,2			X		571	51,1			X		591	0,0	X			
552	45,3			X		572	51,0			X		592	0,0	X			
553	45,4			X		573	50,4				X	593	0,0	X			
554	45,5			X		574	49,0				X	594	0,0	X			
555	45,6			X		575	46,7				X	595	0,0	X			
556	45,7			X		576	44,0				X	596	0,0	X			
557	45,8			X		577	41,1				X	597	0,0	X			
558	45,9			X		578	38,3				X	598	0,0	X			
559	46,0			X		579	35,4				X	599	0,0	X			
560	46,1			X		580	31,8				X	600	0,0	X			

Table 13 — Cycle part 2, reduced speed for motorcycle class 2–1, 1 s to 180 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
0	0,0	X				15	31,8		X			30	59,8			X	
1	0,0	X				16	35,6		X			31	60,2			X	
2	0,0	X				17	39,3		X			32	60,5			X	
3	0,0	X				18	42,7		X			33	60,8			X	
4	0,0	X				19	46,0		X			34	61,1			X	
5	0,0	X				20	49,1		X			35	61,5			X	
6	0,0	X				21	52,1		X			36	62,0			X	
7	0,0	X				22	54,9		X			37	62,5			X	
8	0,0	X				23	57,5		X			38	63,0			X	
9	2,3		X			24	58,4			X		39	63,4			X	
10	7,3		X			25	58,5			X		40	63,7			X	
11	13,6		X			26	58,5			X		41	63,8			X	
12	18,9		X			27	58,6			X		42	63,9			X	
13	23,6		X			28	58,9			X		43	63,8			X	
14	27,8		X			29	59,3			X		44	63,2				X

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Table 13 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
45	61,7				X	86	28,3			X		127	46,8		X		
46	58,9				X	87	28,1			X		128	49,9		X		
47	55,2				X	88	28,1		X			129	52,8		X		
48	51,0				X	89	28,6		X			130	55,6		X		
49	46,7				X	90	29,8		X			131	58,2		X		
50	42,8				X	91	31,6		X			132	60,2				X
51	40,2				X	92	33,9		X			133	59,3				X
52	38,8				X	93	36,5		X			134	57,5				X
53	37,9				X	94	39,1		X			135	55,4				X
54	36,7				X	95	41,5		X			136	52,5				X
55	35,1				X	96	43,3		X			137	47,9				X
56	32,9				X	97	44,5		X			138	41,4				X
57	30,4				X	98	45,1				X	139	34,4				X
58	28,0				X	99	45,1				X	140	30,0				X
59	25,9				X	100	43,9				X	141	27,0				X
60	24,4				X	101	41,4				X	142	26,5		X		
61	23,7		X			102	38,4				X	143	28,7		X		
62	23,8		X			103	35,5				X	144	32,7		X		
63	25,0		X			104	32,9				X	145	36,5		X		
64	27,3		X			105	31,3				X	146	40,0		X		
65	30,4		X			106	30,7				X	147	43,5		X		
66	33,9		X			107	31,0			X		148	46,7		X		
67	37,3		X			108	32,2			X		149	49,8		X		
68	39,8				X	109	34,0			X		150	52,7		X		
69	39,5				X	110	36,0			X		151	55,5		X		
70	36,3				X	111	37,9			X		152	58,1		X		
71	31,4				X	112	39,9			X		153	60,6		X		
72	26,5				X	113	41,6			X		154	62,9		X		
73	24,2				X	114	43,1			X		155	62,9				X
74	24,8				X	115	44,3			X		156	61,7				X
75	26,6				X	116	45,0			X		157	59,4				X
76	27,5				X	117	45,5			X		158	56,6				X
77	26,8				X	118	45,8			X		159	53,7				X
78	25,3				X	119	46,0			X		160	50,7				X
79	24,0				X	120	46,1			X		161	47,7				X
80	23,3			X		121	46,2			X		162	45,0				X
81	23,7			X		122	46,1			X		163	43,1				X
82	24,9			X		123	45,7			X		164	41,9			X	
83	26,4			X		124	45,0			X		165	41,6			X	
84	27,7			X		125	44,3			X		166	41,3			X	
85	28,3			X		126	44,7		X			167	40,9			X	

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Table 13 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
168	41,8			X		173	43,5		X			178	56,5		X		
169	42,1			X		174	46,5		X			179	57,1		X		
170	41,8			X		175	49,7		X			180	57,3				X
171	41,3			X		176	52,6		X								
172	41,5		X			177	55,0		X								

Table 14 — Cycle part 2, reduced speed for motorcycle class 2–1, 181 s to 360 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
181	57,0				X	211	60,4				X	241	77,5		X		
182	56,3				X	212	60,0		X			242	78,1			X	
183	55,2				X	213	60,2		X			243	78,6			X	
184	53,9				X	214	61,4		X			244	79,0			X	
185	52,6				X	215	63,3		X			245	79,4			X	
186	51,4				X	216	65,5		X			246	79,7			X	
187	50,1		X			217	67,4		X			247	80,1			X	
188	51,5		X			218	68,5		X			248	80,7			X	
189	53,1		X			219	68,7				X	249	80,8			X	
190	54,8		X			220	68,1				X	250	81,0			X	
191	56,6		X			221	67,3				X	251	81,2			X	
192	58,5		X			222	66,5				X	252	81,6			X	
193	60,6		X			223	65,9				X	253	81,9			X	
194	62,8		X			224	65,5				X	254	82,1			X	
195	64,9		X			225	64,9				X	255	82,1			X	
196	67,0		X			226	64,1				X	256	82,3			X	
197	69,1		X			227	63,0				X	257	82,4			X	
198	70,9		X			228	62,1				X	258	82,4			X	
199	72,2		X			229	61,6		X			259	82,3			X	
200	72,8				X	230	61,7		X			260	82,3			X	
201	72,8				X	231	62,3		X			261	82,2			X	
202	71,9				X	232	63,5		X			262	82,2			X	
203	70,5				X	233	65,3		X			263	82,1			X	
204	68,8				X	234	67,3		X			264	82,1			X	
205	67,1				X	235	69,2		X			265	82,0			X	
206	65,4				X	236	71,1		X			266	82,0			X	
207	63,9				X	237	73,0		X			267	81,9			X	
208	62,8				X	238	74,8		X			268	81,9			X	
209	61,8				X	239	75,7		X			269	81,9			X	
210	61,0				X	240	76,7		X			270	81,9			X	

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Table 14 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
271	81,9			X		301	68,3				X	331	47,6		X		
272	82,0			X		302	67,3				X	332	48,4		X		
273	82,0			X		303	66,1				X	333	51,4		X		
274	82,1			X		304	63,9				X	334	54,2		X		
275	82,2			X		305	60,2				X	335	56,9		X		
276	82,3			X		306	54,9				X	336	59,4		X		
277	82,4			X		307	48,1				X	337	61,8		X		
278	82,5			X		308	40,9				X	338	64,1		X		
279	82,5			X		309	36,0				X	339	66,2		X		
280	82,5			X		310	33,9				X	340	68,2		X		
281	82,5			X		311	33,9		X			341	70,2		X		
282	82,4			X		312	36,5		X			342	72,0		X		
283	82,4			X		313	40,1		X			343	73,7		X		
284	82,4			X		314	43,5		X			344	74,4		X		
285	82,5			X		315	46,8		X			345	75,1		X		
286	82,5			X		316	49,8		X			346	75,8		X		
287	82,5			X		317	52,8		X			347	76,5		X		
288	82,4			X		318	53,9		X			348	77,2		X		
289	82,3			X		319	53,9		X			349	77,8		X		
290	81,6			X		320	53,7		X			350	78,5		X		
291	81,3			X		321	53,7		X			351	79,2		X		
292	80,3			X		322	54,3		X			352	80,0		X		
293	79,9			X		323	55,4		X			353	81,0			X	
294	79,2			X		324	56,8		X			354	81,2			X	
295	79,2			X		325	58,1		X			355	81,8			X	
296	78,4				X	326	58,9				X	356	82,2			X	
297	75,7				X	327	58,2				X	357	82,2			X	
298	73,2				X	328	55,8				X	358	82,4			X	
299	71,1				X	329	52,6				X	359	82,5			X	
300	69,5				X	330	49,2				X	360	82,5			X	

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Table 15 — Cycle part 2, reduced speed for motorcycle class 2–1, 361 s to 540 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
361	82,5			X		402	56,1		X			443	62,7				X
362	82,5			X		403	57,3		X			444	60,9				X
363	82,3			X		404	58,1		X			445	58,7				X
364	82,1			X		405	58,8		X			446	56,4				X
365	82,1			X		406	59,4		X			447	54,5				X
366	82,1			X		407	59,8			X		448	53,3				X
367	82,1			X		408	59,7			X		449	53,0			X	
368	82,1			X		409	59,4			X		450	53,5			X	
369	82,1			X		410	59,2			X		451	54,6			X	
370	82,1			X		411	59,2			X		452	56,1			X	
371	82,1			X		412	59,6			X		453	57,6			X	
372	82,1			X		413	60,0			X		454	58,9			X	
373	81,9			X		414	60,5			X		455	59,8			X	
374	81,6			X		415	61,0			X		456	60,3			X	
375	81,3			X		416	61,2			X		457	60,7			X	
376	81,1			X		417	61,3			X		458	61,3			X	
377	80,8			X		418	61,4			X		459	62,4			X	
378	80,6			X		419	61,7			X		460	64,1			X	
379	80,4			X		420	62,3			X		461	66,2			X	
380	80,1			X		421	63,1			X		462	68,1			X	
381	79,7				X	422	63,6			X		463	69,7			X	
382	78,6				X	423	63,9			X		464	70,4			X	
383	76,8				X	424	63,8			X		465	70,7			X	
384	73,7				X	425	63,6			X		466	70,7			X	
385	69,4				X	426	63,3				X	467	70,7			X	
386	64,0				X	427	62,8				X	468	70,7			X	
387	58,6				X	428	61,9				X	469	70,6			X	
388	53,2				X	429	60,5				X	470	70,5			X	
389	47,8				X	430	58,6				X	471	70,4			X	
390	42,4				X	431	56,5				X	472	70,2			X	
391	37,0				X	432	54,6				X	473	70,1			X	
392	33,0				X	433	53,8			X		474	69,8			X	
393	30,9				X	434	54,5			X		475	69,5			X	
394	30,9		X			435	56,1			X		476	69,1			X	
395	33,5		X			436	57,9			X		477	69,1			X	
396	37,2		X			437	59,7			X		478	69,5			X	
397	40,8		X			438	61,2			X		479	70,3			X	
398	44,2		X			439	62,3			X		480	71,2			X	
399	47,4		X			440	63,1			X		481	72,0			X	
400	50,4		X			441	63,6				X	482	72,6			X	
401	53,3		X			442	63,5				X	483	72,8			X	

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Table 15 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
484	72,7			X		503	0,0	X				522	0,0	X			
485	72,0				X	504	0,0	X				523	0,0	X			
486	70,4				X	505	0,0	X				524	0,0	X			
487	67,7				X	506	0,0	X				525	0,0	X			
488	64,4				X	507	0,0	X				526	0,0	X			
489	61,0				X	508	0,0	X				527	0,0	X			
490	57,6				X	509	0,0	X				528	0,0	X			
491	54,0				X	510	0,0	X				529	0,0	X			
492	49,7				X	511	0,0	X				530	0,0	X			
493	44,4				X	512	0,0	X				531	0,0	X			
494	38,2				X	513	0,0	X				532	0,0	X			
495	31,2				X	514	0,0	X				533	2,3		X		
496	24,0				X	515	0,0	X				534	7,2		X		
497	16,8				X	516	0,0	X				535	13,5		X		
498	10,4				X	517	0,0	X				536	18,7		X		
499	5,7				X	518	0,0	X				537	22,9		X		
500	2,8				X	519	0,0	X				538	26,7		X		
501	1,6				X	520	0,0	X				539	30,0		X		
502	0,3				X	521	0,0	X				540	32,8		X		

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Table 16 — Cycle part 2, reduced speed for motorcycle class 2–1, 541 s to 600 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
541	35,2		X			561	45,3			X		581	30,4				X
542	37,3		X			562	45,9			X		582	27,7				X
543	39,1		X			563	46,5			X		583	25,1				X
544	40,8		X			564	46,8			X		584	22,5				X
545	41,8		X			565	47,1			X		585	19,8				X
546	42,5		X			566	47,1			X		586	17,2				X
547	43,3		X			567	47,0			X		587	14,6				X
548	44,1		X			568	46,7			X		588	12,0				X
549	45,0		X			569	46,3			X		589	9,3				X
550	45,7		X			570	45,9			X		590	6,7				X
551	46,2			X		571	45,6			X		591	4,1				X
552	46,3			X		572	45,4			X		592	1,5				X
553	46,1			X		573	45,2			X		593	0,0	X			
554	45,6			X		574	45,1			X		594	0,0	X			
555	44,9			X		575	44,8				X	595	0,0	X			
556	44,4			X		576	43,5				X	596	0,0	X			
557	44,0			X		577	40,9				X	597	0,0	X			
558	44,0			X		578	38,2				X	598	0,0	X			
559	44,3			X		579	35,6				X	599	0,0	X			
560	44,8			X		580	33,0				X	600	0,0	X			

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Table 17 — Cycle part 2 for motorcycle classes 2–2 and 3, 1 s to 180 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
0	0,0	X				41	63,8			X		82	24,9			X	
1	0,0	X				42	63,9			X		83	26,4			X	
2	0,0	X				43	63,8			X		84	27,7			X	
3	0,0	X				44	63,2				X	85	28,3			X	
4	0,0	X				45	61,7				X	86	28,3			X	
5	0,0	X				46	58,9				X	87	28,1			X	
6	0,0	X				47	55,2				X	88	28,1			X	
7	0,0	X				48	51,0				X	89	28,6			X	
8	0,0	X				49	46,7				X	90	29,8			X	
9	2,3		X			50	42,8				X	91	31,6			X	
10	7,3		X			51	40,2				X	92	33,9			X	
11	15,2		X			52	38,8				X	93	36,5			X	
12	23,9		X			53	37,9				X	94	39,1			X	
13	32,5		X			54	36,7				X	95	41,5			X	
14	39,2		X			55	35,1				X	96	43,3			X	
15	44,1		X			56	32,9				X	97	44,5			X	
16	48,1		X			57	30,4				X	98	45,1				X
17	51,2		X			58	28,0				X	99	45,1				X
18	53,3		X			59	25,9				X	100	43,9				X
19	54,5		X			60	24,4				X	101	41,4				X
20	55,7		X			61	23,7		X			102	38,4				X
21	56,9			X		62	23,8		X			103	35,5				X
22	57,5			X		63	25,0		X			104	32,9				X
23	58,0			X		64	27,3		X			105	31,3				X
24	58,4			X		65	30,4		X			106	30,7				X
25	58,5			X		66	33,9		X			107	31,0			X	
26	58,5			X		67	37,3		X			108	32,2			X	
27	58,6			X		68	39,8		X			109	34,0			X	
28	58,9			X		69	39,5				X	110	36,0			X	
29	59,3			X		70	36,3				X	111	37,9			X	
30	59,8			X		71	31,4				X	112	39,9			X	
31	60,2			X		72	26,5				X	113	41,6			X	
32	60,5			X		73	24,2				X	114	43,1			X	
33	60,8			X		74	24,8				X	115	44,3			X	
34	61,1			X		75	26,6				X	116	45,0			X	
35	61,5			X		76	27,5				X	117	45,5			X	
36	62,0			X		77	26,8				X	118	45,8			X	
37	62,5			X		78	25,3				X	119	46,0			X	
38	63,0			X		79	24,0				X	120	46,1			X	
39	63,4			X		80	23,3			X		121	46,2			X	
40	63,7			X		81	23,7			X		122	46,1			X	

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Table 17 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
123	45,7			X		143	28,7		X			163	43,1				X
124	45,0			X		144	33,8		X			164	41,9			X	
125	44,3			X		145	40,3		X			165	41,6			X	
126	44,7		X			146	46,6		X			166	41,3			X	
127	46,8		X			147	50,4		X			167	40,9			X	
128	50,1		X			148	54,0		X			168	41,8			X	
129	53,6		X			149	56,9		X			169	42,1			X	
130	56,9		X			150	59,1		X			170	41,8			X	
131	59,4		X			151	60,6		X			171	41,3			X	
132	60,2				X	152	61,7		X			172	41,5		X		
133	59,3				X	153	62,6		X			173	43,5		X		
134	57,5				X	154	63,1				X	174	46,5		X		
135	55,4				X	155	62,9				X	175	49,7		X		
136	52,5				X	156	61,7				X	176	52,6		X		
137	47,9				X	157	59,4				X	177	55,0		X		
138	41,4				X	158	56,6				X	178	56,5		X		
139	34,4				X	159	53,7				X	179	57,1		X		
140	30,0				X	160	50,7				X	180	57,3				X
141	27,0				X	161	47,7				X						
142	26,5		X			162	45,0				X						

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Table 18 — Cycle part 2 for motorcycle classes 2–2 and 3, 181 s to 360 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
181	57,0				X	222	66,5				X	263	94,2			X	
182	56,3				X	223	65,9				X	264	94,1			X	
183	55,2				X	224	65,5				X	265	94,0			X	
184	53,9				X	225	64,9				X	266	94,0			X	
185	52,6				X	226	64,1				X	267	93,9			X	
186	51,4				X	227	63,0				X	268	93,9			X	
187	50,1		X			228	62,1				X	269	93,9			X	
188	51,5		X			229	61,6		X			270	93,9			X	
189	53,1		X			230	61,7		X			271	93,9			X	
190	54,8		X			231	62,3		X			272	94,0			X	
191	56,6		X			232	63,5		X			273	94,0			X	
192	58,5		X			233	65,3		X			274	94,1			X	
193	60,6		X			234	67,3		X			275	94,2			X	
194	62,8		X			235	69,3		X			276	94,3			X	
195	64,9		X			236	71,4		X			277	94,4			X	
196	67,0		X			237	73,5		X			278	94,5			X	
197	69,1		X			238	75,6		X			279	94,5			X	
198	70,9		X			239	77,7		X			280	94,5			X	
199	72,2		X			240	79,7		X			281	94,5			X	
200	72,8				X	241	81,5		X			282	94,4			X	
201	72,8				X	242	83,1		X			283	94,5			X	
202	71,9				X	243	84,6		X			284	94,6			X	
203	70,5				X	244	86,0		X			285	94,7			X	
204	68,8				X	245	87,4		X			286	94,8			X	
205	67,1				X	246	88,7		X			287	94,9			X	
206	65,4				X	247	89,6		X			288	94,8			X	
207	63,9				X	248	90,2		X			289	94,3				X
208	62,8				X	249	90,7		X			290	93,3				X
209	61,8				X	250	91,2		X			291	91,8				X
210	61,0				X	251	91,8		X			292	89,6				X
211	60,4				X	252	92,4		X			293	87,0				X
212	60,0				X	253	93,0		X			294	84,1				X
213	60,2			X		254	93,6		X			295	81,2				X
214	61,4			X		255	94,1			X		296	78,4				X
215	63,3			X		256	94,3			X		297	75,7				X
216	65,5			X		257	94,4			X		298	73,2				X
217	67,4			X		258	94,4			X		299	71,1				X
218	68,5			X		259	94,3			X		300	69,5				X
219	68,7				X	260	94,3			X		301	68,3				X
220	68,1				X	261	94,2			X		302	67,3				X
221	67,3				X	262	94,2			X		303	66,1				X

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Table 18 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
304	63,9				X	323	55,4		X			342	72,9		X		
305	60,2				X	324	56,8		X			343	73,7		X		
306	54,9				X	325	58,1		X			344	74,4		X		
307	48,1				X	326	58,9				X	345	75,1		X		
308	40,9				X	327	58,2				X	346	75,8		X		
309	36,0				X	328	55,8				X	347	76,5		X		
310	33,9				X	329	52,6				X	348	77,2		X		
311	33,9		X			330	49,2				X	349	77,8		X		
312	36,5		X			331	47,6		X			350	78,5		X		
313	41,0		X			332	48,4		X			351	79,2		X		
314	45,3		X			333	51,8		X			352	80,0		X		
315	49,2		X			334	55,7		X			353	81,0		X		
316	51,5		X			335	59,6		X			354	82,0		X		
317	53,2		X			336	63,0		X			355	83,0		X		
318	53,9		X			337	65,9		X			356	83,7		X		
319	53,9		X			338	68,1		X			357	84,2			X	
320	53,7		X			339	69,8		X			358	84,4			X	
321	53,7		X			340	71,1		X			359	84,5			X	
322	54,3		X			341	72,1		X			360	84,4			X	

Table 19 — Cycle part 2 for motorcycle classes 2–2 and 3, 361 s to 540 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
361	84,1			X		377	80,8			X		393	30,9				X
362	83,7			X		378	80,6			X		394	30,9		X		
363	83,2			X		379	80,4			X		395	33,5		X		
364	82,8			X		380	80,1			X		396	38,0		X		
365	82,6			X		381	79,7				X	397	42,5		X		
366	82,5			X		382	78,6				X	398	47,0		X		
367	82,4			X		383	76,8				X	399	51,0		X		
368	82,3			X		384	73,7				X	400	53,5		X		
369	82,2			X		385	69,4				X	401	55,1		X		
370	82,2			X		386	64,0				X	402	56,4		X		
371	82,2			X		387	58,6				X	403	57,3		X		
372	82,1			X		388	53,2				X	404	58,1		X		
373	81,9			X		389	47,8				X	405	58,8		X		
374	81,6			X		390	42,4				X	406	59,4		X		
375	81,3			X		391	37,0				X	407	59,8			X	
376	81,1			X		392	33,0				X	408	59,7			X	

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Table 19 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
409	59,4			X		450	53,5			X		491	54,0				X
410	59,2			X		451	54,6			X		492	49,7				X
411	59,2			X		452	56,1			X		493	44,4				X
412	59,6			X		453	57,6			X		494	38,2				X
413	60,0			X		454	58,9			X		495	31,2				X
414	60,5			X		455	59,8			X		496	24,0				X
415	61,0			X		456	60,3			X		497	16,8				X
416	61,2			X		457	60,7			X		498	10,4				X
417	61,3			X		458	61,3			X		499	5,7				X
418	61,4			X		459	62,4			X		500	2,8				X
419	61,7			X		460	64,1			X		501	1,6				X
420	62,3			X		461	66,2			X		502	0,3				X
421	63,1			X		462	68,1			X		503	0,0	X			
422	63,6			X		463	69,7			X		504	0,0	X			
423	63,9			X		464	70,4			X		505	0,0	X			
424	63,8			X		465	70,7			X		506	0,0	X			
425	63,6			X		466	70,7			X		507	0,0	X			
426	63,3				X	467	70,7			X		508	0,0	X			
427	62,8				X	468	70,7			X		509	0,0	X			
428	61,9				X	469	70,6			X		510	0,0	X			
429	60,5				X	470	70,5			X		511	0,0	X			
430	58,6				X	471	70,4			X		512	0,0	X			
431	56,5				X	472	70,2			X		513	0,0	X			
432	54,6				X	473	70,1			X		514	0,0	X			
433	53,8			X		474	69,8			X		515	0,0	X			
434	54,5			X		475	69,5			X		516	0,0	X			
435	56,1			X		476	69,1			X		517	0,0	X			
436	57,9			X		477	69,1			X		518	0,0	X			
437	59,7			X		478	69,5			X		519	0,0	X			
438	61,2			X		479	70,3			X		520	0,0	X			
439	62,3			X		480	71,2			X		521	0,0	X			
440	63,1			X		481	72,0			X		522	0,0	X			
441	63,6				X	482	72,6			X		523	0,0	X			
442	63,5				X	483	72,8			X		524	0,0	X			
443	62,7				X	484	72,7			X		525	0,0	X			
444	60,9				X	485	72,0				X	526	0,0	X			
445	58,7				X	486	70,4				X	527	0,0	X			
446	56,4				X	487	67,7				X	528	0,0	X			
447	54,5				X	488	64,4				X	529	0,0	X			
448	53,3				X	489	61,0				X	530	0,0	X			
449	53,0			X		490	57,6				X	531	0,0	X			

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Table 19 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
532	0,0	X				535	14,6		X			538	42,7		X		
533	2,3		X			536	23,5		X			539	51,8		X		
534	7,2		X			537	33,0		X			540	59,4		X		

Table 20 — Cycle part 2 for motorcycle classes 2–2 and 3, 541 s to 600 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
541	65,3		X			561	78,5			X		581	56,2				X
542	69,6		X			562	79,1			X		582	52,5				X
543	72,3		X			563	79,6			X		583	49,0				X
544	73,9		X			564	80,0			X		584	45,2				X
545	75,0		X			565	80,2			X		585	40,8				X
546	75,7		X			566	80,3			X		586	35,4				X
547	76,5		X			567	80,1			X		587	29,4				X
548	77,3		X			568	79,8			X		588	23,4				X
549	78,2		X			569	79,5			X		589	17,7				X
550	78,9		X			570	79,1			X		590	12,6				X
551	79,4			X		571	78,8			X		591	8,0				X
552	79,6			X		572	78,6			X		592	4,1				X
553	79,3			X		573	78,4			X		593	1,3				X
554	78,8			X		574	78,3			X		594	0,0	X			
555	78,1			X		575	78,0				X	595	0,0	X			
556	77,5			X		576	76,7				X	596	0,0	X			
557	77,2			X		577	73,7				X	597	0,0	X			
558	77,2			X		578	69,5				X	598	0,0	X			
559	77,5			X		579	64,8				X	599	0,0	X			
560	77,9			X		580	60,3				X	600	0,0	X			

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Table 21 — Cycle part 3, reduced speed for motorcycle class 3–1, 1 s to 180 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
0	0,0	X				41	73,2		X			82	90,4			X	
1	0,0	X				42	73,4		X			83	90,1			X	
2	0,0	X				43	73,8		X			84	89,7			X	
3	0,0	X				44	74,8		X			85	89,3			X	
4	0,0	X				45	76,7		X			86	89,0			X	
5	0,0	X				46	79,1		X			87	88,8			X	
6	0,0	X				47	81,1		X			88	88,9			X	
7	0,0	X				48	82,1				X	89	89,1			X	
8	0,9		X			49	81,7				X	90	89,3			X	
9	3,2		X			50	80,3				X	91	89,4			X	
10	7,3		X			51	78,8				X	92	89,4			X	
11	12,4		X			52	77,3				X	93	89,2			X	
12	17,9		X			53	75,9				X	94	88,9			X	
13	23,5		X			54	75,0				X	95	88,5			X	
14	29,1		X			55	74,7				X	96	88,0			X	
15	34,3		X			56	74,7				X	97	87,5			X	
16	38,6		X			57	74,7				X	98	87,2			X	
17	41,6		X			58	74,6				X	99	87,1			X	
18	43,9		X			59	74,4				X	100	87,2			X	
19	45,9		X			60	74,1				X	101	87,3			X	
20	48,1		X			61	73,9				X	102	87,4			X	
21	50,3		X			62	74,1		X			103	87,5			X	
22	52,6		X			63	75,1		X			104	87,4			X	
23	54,8		X			64	76,8		X			105	87,1			X	
24	55,8		X			65	78,7		X			106	86,8			X	
25	55,2		X			66	80,4		X			107	86,4			X	
26	53,9		X			67	81,7		X			108	85,9			X	
27	52,7		X			68	82,6		X			109	85,2				X
28	52,8		X			69	83,5		X			110	84,0				X
29	55,0		X			70	84,4		X			111	82,2				X
30	58,5		X			71	85,1		X			112	80,3				X
31	62,3		X			72	85,7		X			113	78,6				X
32	65,7		X			73	86,3		X			114	77,2				X
33	68,1		X			74	87,0		X			115	75,9				X
34	69,1		X			75	87,9		X			116	73,8				X
35	69,5		X			76	88,8		X			117	70,4				X
36	69,9		X			77	89,7		X			118	65,7				X
37	70,6		X			78	90,3			X		119	60,5				X
38	71,3		X			79	90,6			X		120	55,9				X
39	72,2		X			80	90,6			X		121	53,0				X
40	72,8		X			81	90,5			X		122	51,6				X

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Table 21 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
123	50,9				X	143	72,8		X			163	90,4				X
124	50,5				X	144	75,0		X			164	90,6				X
125	50,2				X	145	77,8		X			165	91,1				X
126	50,3		X			146	80,7		X			166	90,9				X
127	50,6		X			147	83,3		X			167	89,0				X
128	51,2		X			148	85,4		X			168	85,6				X
129	51,8		X			149	87,3		X			169	81,6				X
130	52,5		X			150	89,1		X			170	77,6				X
131	53,4		X			151	90,6		X			171	73,6				X
132	54,9		X			152	91,9		X			172	69,7				X
133	57,0		X			153	93,2		X			173	66,0				X
134	59,4		X			154	94,6		X			174	62,7				X
135	61,9		X			155	96,0		X			175	60,0				X
136	64,3		X			156	97,5		X			176	58,0				X
137	66,4		X			157	99,0		X			177	56,4				X
138	68,1		X			158	99,8				X	178	54,8				X
139	69,6		X			159	99,0				X	179	53,3				X
140	70,7		X			160	96,7				X	180	51,7				X
141	71,4		X			161	93,7				X						
142	71,8		X			162	91,3				X						

Table 22 — Cycle part 3, reduced speed for motorcycle class 3–1, 181 s to 360 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
181	50,2				X	196	54,8		X			211	96,3		X		
182	48,7				X	197	57,3		X			212	98,4		X		
183	47,2			X		198	59,5		X			213	100,4		X		
184	47,1			X		199	61,7		X			214	102,1		X		
185	47,0			X		200	64,4		X			215	103,6		X		
186	46,9			X		201	67,7		X			216	104,9		X		
187	46,6			X		202	71,4		X			217	106,2			X	
188	46,3			X		203	74,9		X			218	106,5			X	
189	46,1			X		204	78,2		X			219	106,5			X	
190	46,1		X			205	81,1		X			220	106,6			X	
191	46,5		X			206	83,9		X			221	106,6			X	
192	47,1		X			207	86,6		X			222	107,0			X	
193	48,1		X			208	89,1		X			223	107,3			X	
194	49,8		X			209	91,6		X			224	107,3			X	
195	52,2		X			210	94,0		X			225	107,2			X	

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Table 22 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
226	107,2			X		267	110,7			X		308	95,3				X
227	107,2			X		268	111,0			X		309	94,0				X
228	107,3			X		269	111,1			X		310	92,5				X
229	107,5			X		270	111,2			X		311	91,4				X
230	107,3			X		271	111,3			X		312	90,9				X
231	107,3			X		272	111,3			X		313	90,7				X
232	107,3			X		273	111,3			X		314	90,3				X
233	107,3			X		274	111,2			X		315	89,6				X
234	108,0			X		275	111,0			X		316	88,6				X
235	108,2			X		276	110,8			X		317	87,7				X
236	108,9			X		277	110,6			X		318	86,8				X
237	109,0			X		278	110,4			X		319	86,2				X
238	108,9			X		279	110,3			X		320	85,8				X
239	108,8			X		280	109,9			X		321	85,7				X
240	108,6			X		281	109,3				X	322	85,7				X
241	108,4			X		282	108,1				X	323	86,0			X	
242	108,3			X		283	106,3				X	324	86,7			X	
243	108,2			X		284	104,0				X	325	87,8			X	
244	108,2			X		285	101,5				X	326	89,2			X	
245	108,2			X		286	99,2				X	327	90,9			X	
246	108,2			X		287	97,2				X	328	92,6			X	
247	108,3			X		288	96,1				X	329	94,3			X	
248	108,4			X		289	95,7			X		330	95,9			X	
249	108,5			X		290	95,8			X		331	97,4			X	
250	108,5			X		291	96,1			X		332	98,7			X	
251	108,5			X		292	96,4			X		333	99,7			X	
252	108,5			X		293	96,7			X		334	100,3			X	
253	108,5			X		294	96,9			X		335	100,6			X	
254	108,7			X		295	96,9			X		336	101,0			X	
255	108,8			X		296	96,8			X		337	101,4			X	
256	109,0			X		297	96,7			X		338	101,8			X	
257	109,2			X		298	96,4			X		339	102,2			X	
258	109,3			X		299	96,1			X		340	102,5			X	
259	109,4			X		300	95,9			X		341	102,6			X	
260	109,5			X		301	95,8			X		342	102,7			X	
261	109,5			X		302	95,9			X		343	102,8			X	
262	109,6			X		303	96,2			X		344	103,0			X	
263	109,8			X		304	96,4			X		345	103,5			X	
264	110,0			X		305	96,7			X		346	104,3			X	
265	110,2			X		306	96,7			X		347	105,2			X	
266	110,5			X		307	96,3			X		348	106,1			X	

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Table 22 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
349	106,8			X		353	102,3				X	357	95,4				X
350	107,1				X	354	99,1				X	358	96,4				X
351	106,7				X	355	96,3				X	359	97,3				X
352	105,0				X	356	95,0				X	360	97,5				X

Table 23 — Cycle part 3, reduced speed for motorcycle class 3–1, 361 s to 540 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
361	96,1				X	392	99,2			X		423	102,6			X	
362	93,4				X	393	99,3			X		424	102,8			X	
363	90,4				X	394	99,5			X		425	103,1			X	
364	87,8				X	395	99,9			X		426	103,4			X	
365	86,0				X	396	100,3			X		427	103,9			X	
366	85,1				X	397	100,6			X		428	104,4			X	
367	84,7				X	398	100,9			X		429	104,9			X	
368	84,2			X		399	101,1			X		430	105,2			X	
369	85,0			X		400	101,3			X		431	105,5			X	
370	86,5			X		401	101,4			X		432	105,7			X	
371	88,3			X		402	101,5			X		433	105,9			X	
372	89,9			X		403	101,6			X		434	106,1			X	
373	91,0			X		404	101,8			X		435	106,3			X	
374	91,8			X		405	101,9			X		436	106,5			X	
375	92,5			X		406	102,0			X		437	106,8			X	
376	93,1			X		407	102,0			X		438	107,1			X	
377	93,7			X		408	102,0			X		439	107,5			X	
378	94,4			X		409	102,0			X		440	108,0			X	
379	95,0			X		410	101,9			X		441	108,3			X	
380	95,6			X		411	101,9			X		442	108,6			X	
381	96,3			X		412	101,9			X		443	108,9			X	
382	96,9			X		413	101,8			X		444	109,1			X	
383	97,5			X		414	101,8			X		445	109,2			X	
384	98,0			X		415	101,8			X		446	109,4			X	
385	98,3			X		416	101,8			X		447	109,5			X	
386	98,6			X		417	101,8			X		448	109,7			X	
387	98,9			X		418	101,8			X		449	109,9			X	
388	99,1			X		419	101,9			X		450	110,2			X	
389	99,3			X		420	102,0			X		451	110,5			X	
390	99,3			X		421	102,2			X		452	110,8			X	
391	99,2			X		422	102,4			X		453	111,0			X	

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Table 23 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
454	111,2			X		483	104,9			X		512	101,2			X	
455	111,3			X		484	105,1			X		513	101,0			X	
456	111,1			X		485	105,1			X		514	100,9			X	
457	110,4			X		486	105,2			X		515	100,9			X	
458	109,3			X		487	105,2			X		516	101,0			X	
459	108,1			X		488	105,2			X		517	101,2			X	
460	106,8			X		489	105,3			X		518	101,3			X	
461	105,5			X		490	105,3			X		519	101,4			X	
462	104,4			X		491	105,4			X		520	101,4			X	
463	103,8			X		492	105,5			X		521	101,2			X	
464	103,6			X		493	105,5			X		522	100,8			X	
465	103,5			X		494	105,3			X		523	100,4			X	
466	103,5			X		495	105,1			X		524	99,9			X	
467	103,4			X		496	104,7			X		525	99,6			X	
468	103,3			X		497	104,2			X		526	99,5			X	
469	103,1			X		498	103,9			X		527	99,5			X	
470	102,9			X		499	103,6			X		528	99,6			X	
471	102,6			X		500	103,5			X		529	99,7			X	
472	102,5			X		501	103,5			X		530	99,8			X	
473	102,4			X		502	103,4			X		531	99,9			X	
474	102,4			X		503	103,3			X		532	100,0			X	
475	102,5			X		504	103,0			X		533	100,0			X	
476	102,7			X		505	102,7			X		534	100,1			X	
477	103,0			X		506	102,4			X		535	100,2			X	
478	103,3			X		507	102,1			X		536	100,4			X	
479	103,7			X		508	101,9			X		537	100,5			X	
480	104,1			X		509	101,7			X		538	100,6			X	
481	104,5			X		510	101,5			X		539	100,7			X	
482	104,8			X		511	101,3			X		540	100,8			X	

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Table 24 — Cycle part 3, reduced speed for motorcycle class 3–1, 541 s to 600 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
541	101,0			X		561	100,5				X	581	58,0				X
542	101,3			X		562	99,2				X	582	55,0				X
543	102,0			X		563	98,0				X	583	51,0				X
544	102,7			X		564	96,4				X	584	46,0				X
545	103,5			X		565	94,8				X	585	38,8				X
546	104,2			X		566	92,8				X	586	31,6				X
547	104,6			X		567	88,9				X	587	24,4				X
548	104,7			X		568	84,9				X	588	17,2				X
549	104,8			X		569	80,6				X	589	10,0				X
550	104,8			X		570	76,3				X	590	5,0				X
551	104,9			X		571	72,3				X	591	2,0				X
552	105,1			X		572	68,7				X	592	0,0	X			
553	105,4			X		573	65,5				X	593	0,0	X			
554	105,7			X		574	63,0				X	594	0,0	X			
555	105,9			X		575	61,2				X	595	0,0	X			
556	106,0			X		576	60,5				X	596	0,0	X			
557	105,7				X	577	60,0				X	597	0,0	X			
558	105,4				X	578	59,7				X	598	0,0	X			
559	103,9				X	579	59,4				X	599	0,0	X			
560	102,2				X	580	59,4				X	600	0,0	X			

Table 25 — Cycle part 3 for motorcycle class 3–2, 1 s to 180 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
0	0,0	X				15	34,3		X			30	58,5		X		
1	0,0	X				16	38,6		X			31	62,3		X		
2	0,0	X				17	41,6		X			32	65,7		X		
3	0,0	X				18	43,9		X			33	68,1		X		
4	0,0	X				19	45,9		X			34	69,1		X		
5	0,0	X				20	48,1		X			35	69,5		X		
6	0,0	X				21	50,3		X			36	69,9		X		
7	0,0	X				22	52,6		X			37	70,6		X		
8	0,9		X			23	54,8		X			38	71,3		X		
9	3,2		X			24	55,8		X			39	72,2		X		
10	7,3		X			25	55,2		X			40	72,8		X		
11	12,4		X			26	53,9		X			41	73,2		X		
12	17,9		X			27	52,7		X			42	73,4		X		
13	23,5		X			28	52,8		X			43	73,8		X		
14	29,1		X			29	55,0		X			44	74,8		X		

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Table 25 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
45	76,7		X			86	89,0			X		127	50,6		X		
46	79,1		X			87	88,8			X		128	51,2		X		
47	81,1				X	88	88,9			X		129	51,8		X		
48	82,1				X	89	89,1			X		130	52,5		X		
49	81,7				X	90	89,3			X		131	53,4		X		
50	80,3				X	91	89,4			X		132	54,9		X		
51	78,8				X	92	89,4			X		133	57,0		X		
52	77,3				X	93	89,2			X		134	59,4		X		
53	75,9				X	94	88,9			X		135	61,9		X		
54	75,0				X	95	88,5			X		136	64,3		X		
55	74,7				X	96	88,0			X		137	66,4		X		
56	74,7				X	97	87,5			X		138	68,1		X		
57	74,7				X	98	87,2			X		139	69,6		X		
58	74,6				X	99	87,1			X		140	70,7		X		
59	74,4				X	100	87,2			X		141	71,4		X		
60	74,1				X	101	87,3			X		142	71,8		X		
61	73,9				X	102	87,4			X		143	72,8		X		
62	74,1		X			103	87,5			X		144	75,0		X		
63	75,1		X			104	87,4			X		145	77,8		X		
64	76,8		X			105	87,1			X		146	80,7		X		
65	78,7		X			106	86,8			X		147	83,3		X		
66	80,4		X			107	86,4			X		148	85,4		X		
67	81,7		X			108	85,9			X		149	87,3		X		
68	82,6		X			109	85,2				X	150	89,1		X		
69	83,5		X			110	84,0				X	151	90,6		X		
70	84,4		X			111	82,2				X	152	91,9		X		
71	85,1		X			112	80,3				X	153	93,2		X		
72	85,7		X			113	78,6				X	154	94,6		X		
73	86,3		X			114	77,2				X	155	96,0		X		
74	87,0		X			115	75,9				X	156	97,5		X		
75	87,9		X			116	73,8				X	157	99,0		X		
76	88,8		X			117	70,4				X	158	99,8				X
77	89,7		X			118	65,7				X	159	99,0				X
78	90,3			X		119	60,5				X	160	96,7				X
79	90,6			X		120	55,9				X	161	93,7				X
80	90,6			X		121	53,0				X	162	91,3				X
81	90,5			X		122	51,6				X	163	90,4				X
82	90,4			X		123	50,9				X	164	90,6				X
83	90,1			X		124	50,5				X	165	91,1				X
84	89,7			X		125	50,2				X	166	90,9				X
85	89,3			X		126	50,3		X			167	89,0				X

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Table 25 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
168	85,6				X	173	66,0				X	178	54,8				X
169	81,6				X	174	62,7				X	179	53,3				X
170	77,6				X	175	60,0				X	180	51,7				X
171	73,6				X	176	58,0				X						
172	69,7				X	177	56,4				X						

Table 26 — Cycle part 3 for motorcycle class 3–2, 181 s to 360 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
181	50,2				X	211	96,3		X			241	122,4			X	
182	48,7				X	212	98,4		X			242	122,3			X	
183	47,2			X		213	100,4		X			243	122,2			X	
184	47,1			X		214	102,1		X			244	122,2			X	
185	47,0			X		215	103,6		X			245	122,2			X	
186	46,9			X		216	104,9		X			246	122,2			X	
187	46,6			X		217	106,2		X			247	122,3			X	
188	46,3			X		218	107,5		X			248	122,4			X	
189	46,1			X		219	108,5		X			249	122,5			X	
190	46,1		X			220	109,3		X			250	122,5			X	
191	46,5		X			221	109,9		X			251	122,5			X	
192	47,1		X			222	110,5		X			252	122,5			X	
193	48,1		X			223	110,9		X			253	122,5			X	
194	49,8		X			224	111,2		X			254	122,7			X	
195	52,2		X			225	111,4		X			255	122,8			X	
196	54,8		X			226	111,7		X			256	123,0			X	
197	57,3		X			227	111,9		X			257	123,2			X	
198	59,5		X			228	112,3		X			258	123,3			X	
199	61,7		X			229	113,0		X			259	123,4			X	
200	64,4		X			230	114,1		X			260	123,5			X	
201	67,7		X			231	115,7		X			261	123,5			X	
202	71,4		X			232	117,5		X			262	123,6			X	
203	74,9		X			233	119,3		X			263	123,8			X	
204	78,2		X			234	121,0		X			264	124,0			X	
205	81,1		X			235	122,2			X		265	124,2			X	
206	83,9		X			236	122,9			X		266	124,5			X	
207	86,6		X			237	123,0			X		267	124,7			X	
208	89,1		X			238	122,9			X		268	125,0			X	
209	91,6		X			239	122,8			X		269	125,1			X	
210	94,0		X			240	122,6			X		270	125,2			X	

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Table 26 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
271	125,3			X		301	109,8			X		331	111,4			X	
272	125,3			X		302	109,9			X		332	112,7			X	
273	125,3			X		303	110,2			X		333	113,7			X	
274	125,2			X		304	110,4			X		334	114,3			X	
275	125,0			X		305	110,7			X		335	114,6			X	
276	124,8			X		306	110,7			X		336	115,0			X	
277	124,6			X		307	110,3			X		337	115,4			X	
278	124,4			X		308	109,3				X	338	115,8			X	
279	124,3			X		309	108,0				X	339	116,2			X	
280	123,9			X		310	106,5				X	340	116,5			X	
281	123,3				X	311	105,4				X	341	116,6			X	
282	122,1				X	312	104,9				X	342	116,7			X	
283	120,3				X	313	104,7				X	343	116,8			X	
284	118,0				X	314	104,3				X	344	117,0			X	
285	115,5				X	315	103,6				X	345	117,5			X	
286	113,2				X	316	102,6				X	346	118,3			X	
287	111,2				X	317	101,7				X	347	119,2			X	
288	110,1				X	318	100,8				X	348	120,1			X	
289	109,7			X		319	100,2				X	349	120,8			X	
290	109,8			X		320	99,8				X	350	121,1				X
291	110,1			X		321	99,7				X	351	120,7				X
292	110,4			X		322	99,7				X	352	119,0				X
293	110,7			X		323	100,0			X		353	116,3				X
294	110,9			X		324	100,7			X		354	113,1				X
295	110,9			X		325	101,8			X		355	110,3				X
296	110,8			X		326	103,2			X		356	109,0				X
297	110,7			X		327	104,9			X		357	109,4				X
298	110,4			X		328	106,6			X		358	110,4				X
299	110,1			X		329	108,3			X		359	111,3				X
300	109,9			X		330	109,9			X		360	111,5				X

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Table 27 — Cycle part 3 for motorcycle class 3–2, 361 s to 540 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
361	110,1				X	402	115,5			X		443	122,9			X	
362	107,4				X	403	115,6			X		444	123,1			X	
363	104,4				X	404	115,8			X		445	123,2			X	
364	101,8				X	405	115,9			X		446	123,4			X	
365	100,0				X	406	116,0			X		447	123,5			X	
366	99,1				X	407	116,0			X		448	123,7			X	
367	98,7				X	408	116,0			X		449	123,9			X	
368	98,2			X		409	116,0			X		450	124,2			X	
369	99,0			X		410	115,9			X		451	124,5			X	
370	100,5			X		411	115,9			X		452	124,8			X	
371	102,3			X		412	115,9			X		453	125,0			X	
372	103,9			X		413	115,8			X		454	125,2			X	
373	105,0			X		414	115,8			X		455	125,3			X	
374	105,8			X		415	115,8			X		456	125,1			X	
375	106,5			X		416	115,8			X		457	124,4			X	
376	107,1			X		417	115,8			X		458	123,3			X	
377	107,7			X		418	115,8			X		459	122,1			X	
378	108,4			X		419	115,9			X		460	120,8			X	
379	109,0			X		420	116,0			X		461	119,5			X	
380	109,6			X		421	116,2			X		462	118,4			X	
381	110,3			X		422	116,4			X		463	117,8			X	
382	110,9			X		423	116,6			X		464	117,6			X	
383	111,5			X		424	116,8			X		465	117,5			X	
384	112,0			X		425	117,1			X		466	117,5			X	
385	112,3			X		426	117,4			X		467	117,4			X	
386	112,6			X		427	117,9			X		468	117,3			X	
387	112,9			X		428	118,4			X		469	117,1			X	
388	113,1			X		429	118,9			X		470	116,9			X	
389	113,3			X		430	119,2			X		471	116,6			X	
390	113,3			X		431	119,5			X		472	116,5			X	
391	113,2			X		432	119,7			X		473	116,4			X	
392	113,2			X		433	119,9			X		474	116,4			X	
393	113,3			X		434	120,1			X		475	116,5			X	
394	113,5			X		435	120,3			X		476	116,7			X	
395	113,9			X		436	120,5			X		477	117,0			X	
396	114,3			X		437	120,8			X		478	117,3			X	
397	114,6			X		438	121,1			X		479	117,7			X	
398	114,9			X		439	121,5			X		480	118,1			X	
399	115,1			X		440	122,0			X		481	118,5			X	
400	115,3			X		441	122,3			X		482	118,8			X	
401	115,4			X		442	122,6			X		483	118,9			X	

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Table 27 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
484	119,1			X		503	117,3			X		522	114,8			X	
485	119,1			X		504	117,0			X		523	114,4			X	
486	119,2			X		505	116,7			X		524	113,9			X	
487	119,2			X		506	116,4			X		525	113,6			X	
488	119,2			X		507	116,1			X		526	113,5			X	
489	119,3			X		508	115,9			X		527	113,5			X	
490	119,3			X		509	115,7			X		528	113,6			X	
491	119,4			X		510	115,5			X		529	113,7			X	
492	119,5			X		511	115,3			X		530	113,8			X	
493	119,5			X		512	115,2			X		531	113,9			X	
494	119,3			X		513	115,0			X		532	114,0			X	
495	119,1			X		514	114,9			X		533	114,0			X	
496	118,7			X		515	114,9			X		534	114,1			X	
497	118,2			X		516	115,0			X		535	114,2			X	
498	117,9			X		517	115,2			X		536	114,4			X	
499	117,6			X		518	115,3			X		537	114,5			X	
500	117,5			X		519	115,4			X		538	114,6			X	
501	117,5			X		520	115,4			X		539	114,7			X	
502	117,4			X		521	115,2			X		540	114,8			X	

Table 28 — Cycle part 3 for motorcycle class 3–2, 541 s to 600 s

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
541	115,0			X		557	119,7				X	573	65,5				X
542	115,3			X		558	118,4				X	574	63,0				X
543	116,0			X		559	115,9				X	575	61,2				X
544	116,7			X		560	113,2				X	576	60,5				X
545	117,5			X		561	110,5				X	577	60,0				X
546	118,2			X		562	107,2				X	578	59,7				X
547	118,6			X		563	104,0				X	579	59,4				X
548	118,7			X		564	100,4				X	580	59,4				X
549	118,8			X		565	96,8				X	581	58,0				X
550	118,8			X		566	92,8				X	582	55,0				X
551	118,9			X		567	88,9				X	583	51,0				X
552	119,1			X		568	84,9				X	584	46,0				X
553	119,4			X		569	80,6				X	585	38,8				X
554	119,7			X		570	76,3				X	586	31,6				X
555	119,9			X		571	72,3				X	587	24,4				X
556	120,0			X		572	68,7				X	588	17,2				X

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Table 28 — *(continued)*

Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators				Time s	Roller speed km/h	Phase indicators			
		Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec			Stop	Acc	Cruise	Dec
589	10,0				X	593	0,0	X				597	0,0	X			
590	5,0				X	594	0,0	X				598	0,0	X			
591	2,0				X	595	0,0	X				599	0,0	X			
592	0,0	X				596	0,0	X				600	0,0	X			

5 Presentation of results

The results of gaseous exhaust emissions shall be reported as specified in Annex A and the results of specific fuel consumption shall be reported as specified in Annex B.

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Annex A
(normative)

Presentation of results for gaseous exhaust emissions

A.1 Motorcycle

Category: two wheeler/three wheeler (*delete as applicable*)

Tradename (-mark): .....

Model: .....

Engine model: .....

Cycle: two-stroke/four-stroke (*delete as applicable*)

Number and layout of cylinders: .....

Engine displacement: ..... cm^3

Gear-box: manual/semi-automatic/automatic (*delete as applicable*)

Number of gear ratios (speeds): .....

Drive ratios: — primary: ..... — final: .....

Maximum speed, measured in accordance with ISO 7117: ..... km/h

Maximum net power, measured in accordance with ISO 4106: ..... kW at ..... min^{-1}

Idling speed: ..... min^{-1}

Mileage accumulated at test: ..... km

Rear wheel: Tyre size ..... Static radius: ..... mm

Make: .....

Motorcycle mass: — kerb: ..... kg — reference: ..... kg

Rider mass: ..... kg

Instruments mass: ..... kg

Test motorcycle mass: ..... kg

Equivalent inertia mass: ..... kg

Others, if there is any alteration: .....

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A.2 Test cycle

Description of the cycle: test cycle1 reduced speed/test cycle 1 normal speed/test cycle 2 (*delete as applicable*)

A.3 Test fuel

Test fuel: .....

Fuel density: ..... g/mL ..... at K

Octane number or cetane number: .....

Hydrogen/carbon atom number ratio: .....

Oxygen/carbon atom number ratio: .....

Mixed with lubrication oil: yes/no (*delete as applicable*)

If yes, the volume ratio of fuel to lubrication oil: .....

A.4 Chassis dynamometer

Chassis dynamometer with: polygonal function/coefficient control/F^* polygonal digital setter/f^*_0, f^*_2 coefficient digital setter (*delete as applicable*)

Road-load curve fitting formula $f=a+bv^2$: a ..... N b ..... N/(km/h)^2

Cooling fan wind speed is proportional to the roller speed: yes/no (*delete as applicable*)

A.5 Test room conditions

Test room dry-bulb temperature: start ..... K end ..... K

Test room wet-bulb temperature: start ..... K end ..... K

Test room mean humidity: ..... %

Test room mean barometric pressure: ..... kPa

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A.6 Sampling and analysing systems

Exhaust gas emission analyser: .....

CVS system: positive displacement pump/critical flow venturi (*delete as applicable*)

If other sampling system is used, detailed description: .....

Pressure at exhaust pipe outlet: ..... Pa

Hydrogen/carbon atom number ratio in exhaust gas: .....

Oxygen/carbon atom number ratio in exhaust gas: .....

A.7 Test results

A.7.1 Type 1 test results

Sampling volume: ..... m^3/min

Dilution factor: .....

Diluted exhaust mixture volume: ..... L/km

	Concentration in diluted exhaust mixture A	Concentration in dilution air B	Quantity
CO:	..... ppm	..... ppm	..... g/km
THC:	..... ppmC	..... ppmC	..... g/km
NO_X:	..... ppm	..... ppm	..... g/km
CO_2:	..... %	..... %	..... g/km

Driving distance: ..... km

A.7.2 Type 2 test results

Idling speed: ..... min^{-1}

CO: ..... %

HC (if necessary): ..... ppm

High idling speed (if applicable): ..... min^{-1}

CO: ..... %

HC (if necessary): ..... ppm

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Annex B
(normative)

Presentation of results of fuel consumption

B.1 Motorcycle

Category: two wheeler/three wheeler (*delete as applicable*)

Tradename (-mark): .....

Model: .....

Engine model: .....

Cycle: two-stroke/four-stroke (*delete as applicable*)

Number and layout of cylinders: .....

Engine displacement: ..... cm^3

Gear-box: manual/semi-automatic/automatic (*delete as applicable*)

Number of gear ratios (speeds): .....

Drive ratios: — primary: ..... — final: .....

Maximum speed, measured in accordance with ISO 7117: ..... km/h

Maximum net power, measured in accordance with ISO 4106: ..... kW at ..... min^{-1}

Idling speed: ..... min^{-1}

Mileage accumulated at test : ..... km

Rear wheel: Tyre size ..... Static radius: ..... mm

Make: .....

Motorcycle mass: — kerb : ..... kg — reference: ..... kg

Rider mass: ..... kg

Instruments mass: ..... kg

Test motorcycle mass: ..... kg

Equivalent inertia mass: ..... kg

Others, if there is any alteration: .....

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B.2 Test cycle

Description of the cycle: test cycle1 reduced speed/test cycle 1 normal speed/test cycle 2 (*delete as applicable*)

B.3 Test fuel

Test fuel: .....

Fuel density: ..... g/mL ..... at K

Octane number or cetane number: .....

Hydrogen/carbon atom number ratio: .....

Oxygen/carbon atom number ratio: .....

Mixed with lubrication oil: yes/no (*delete as applicable*)

If yes, the volume ratio of fuel to lubrication oil: .....

B.4 Chassis dynamometer

Chassis dynamometer with: polygonal function/coefficient control/ F^* polygonal digital setter/f^*_0, f^*_2 coefficient digital setter (*delete where inapplicable*)

Road-load curve fitting formula $f=a+bv^2$: a ..... N b ..... $N/(km/h)^2$

Cooling fan wind speed is proportional to the roller speed: yes/no (*delete as applicable*)

B.5 Test room conditions

Test room dry-bulb temperature: start ..... K end ..... K

Test room wet-bulb temperature: start ..... K end ..... K

Test room mean humidity: ..... %

Test room mean barometric pressure: ..... kPa

B.6 Fuel consumption measurement system

Fuel consumption measurement: carbon balance method/fuel flow measurement method

(*delete as applicable*)

B.7 Carbon balance method

If the test is carried out by the fuel flow measurement method, B.7 shall be omitted.

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B.7.1 Sampling and analysing systems

Exhaust gas emission analyser: .....

CVS system: positive displacement pump/critical flow venture (*delete as applicable*)

If other sampling system is used, detailed description: .....

Pressure at exhaust pipe outlet: ..... Pa

Hydrogen/carbon atom number ratio in exhaust gas: .....

Oxygen/carbon atom number ratio in exhaust gas: .....

B.7.2 Test results

Sampling volume: ..... m^3/min

Dilution factor: .....

Diluted exhaust mixture volume: ..... L/km

	Concentration in diluted exhaust mixture A		Concentration in dilution air B		Quantity	
CO:	.....	ppm	.....	ppm	.....	g/km
THC:	.....	ppmC	.....	ppmC	.....	g/km
NO_X:	.....	ppm	.....	ppm	.....	g/km
CO_2:	.....	%	.....	%	.....	g/km

Driving distance: ..... km

Fuel consumption: L

Specific fuel consumption: ..... km/L ..... L/100 km

B.8 Fuel flow measurement method

If the test is carried out by the carbon balance method, B.8 shall be omitted.

B.8.1 Fuel consumption measurement method

Fuel consumption measurement method: volumetric method/gravimetricmethod/flow meter method (*delete as applicable*)

Other method: .....

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B.8.2 Test results

Driving distance: ..... km

Fuel consumption: L

Specific fuel consumption: ..... km/L ..... L/100 km

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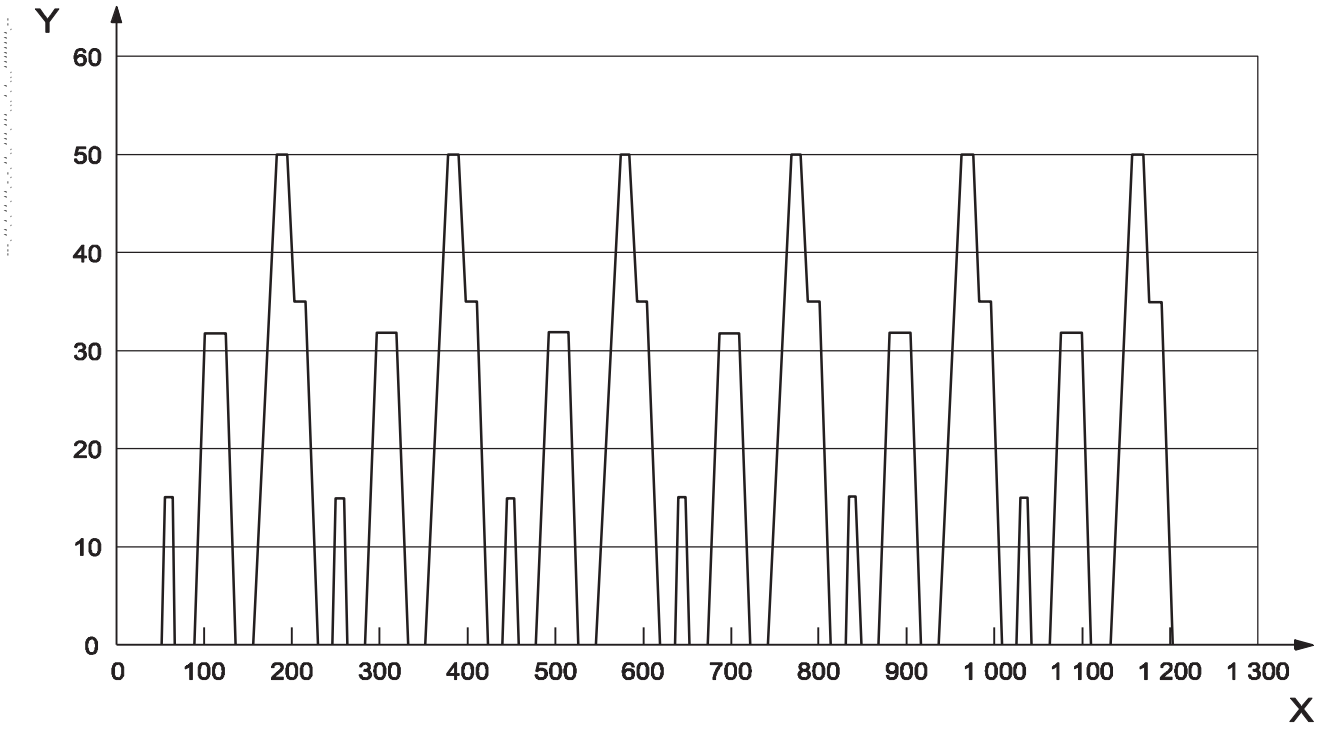
Annex C
(informative)

Test cycles

C.1 Test cycle C.1

Test cycle C.1 is equivalent to the test cycle specified in UNECE Regulation No. 40 (E/ECE/TRANS/505/Rev.1/Add.39 of 7 May 1979).[5]

The operating cycle of test cycle C.1 is illustrated in Figure C.1.



Key

X time, s

Y speed, km/h

Figure C.1 — Operating cycle on a chassis dynamometer for test cycle C.1

C.2 Test cycle C.2

Test cycle C.2 is equivalent to the test cycle specified in the Directive 2002/51/EC[8] of the European Parliament and of the Council of 19 July 2002 (Official Journal of the European Communities L252 of 20 September 2002).

The operating cycle of test cycle C.2 is illustrated in Figure C.2.

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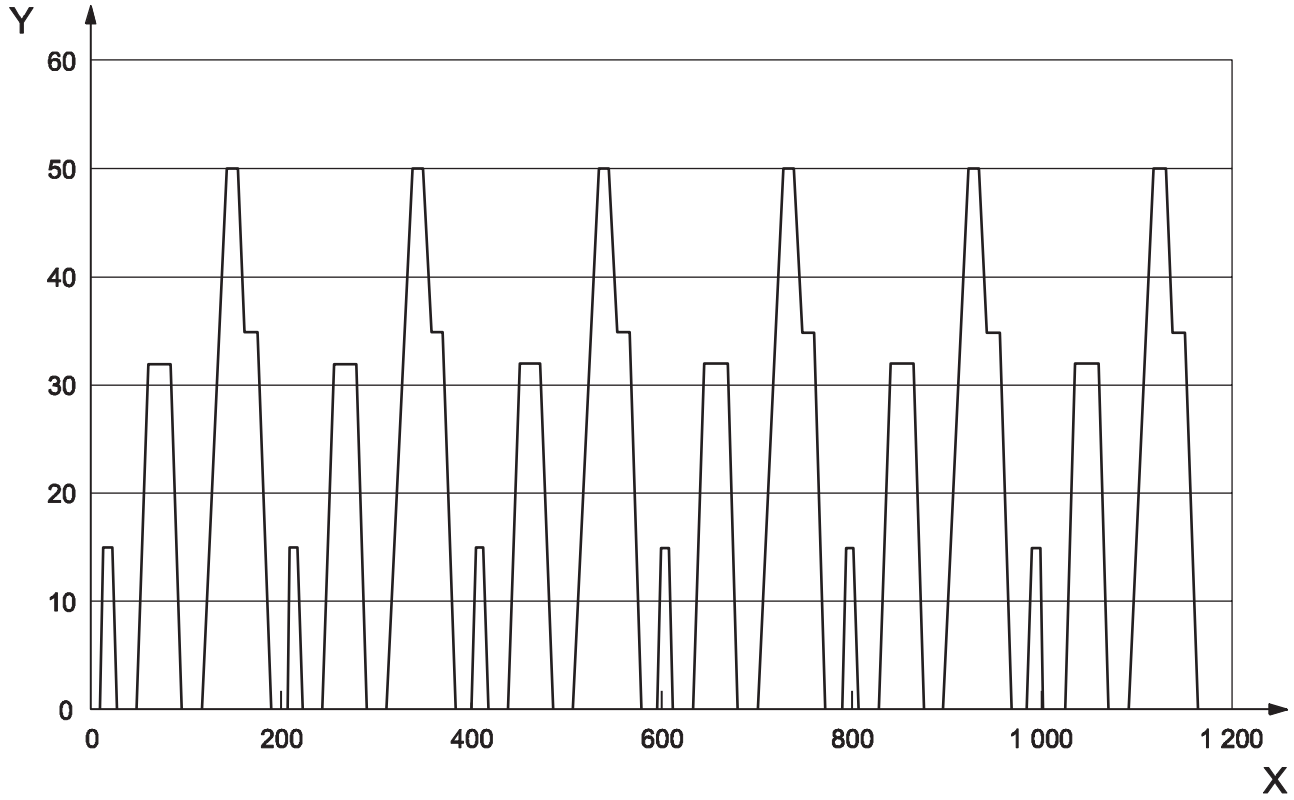

Key

X time, s

Y speed, km/h

Figure C.2 — Operating cycle on a chassis dynamometer for test cycle C.2

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[4] ISO 11486, *Motorcycles — Methods for setting running resistance on a chassis dynamometer*

[5] UNECE Regulation No. 40,01, Economic Commission for Europe, United Nations, Uniform provisions concerning the approval of motorcycles equipped with a positive-ignition engine with regard to the emission of gaseous pollutants by the engine

[6] Commission Directive 2003/77/EC of 11 August 2003 amending Directives 97/24/EC and 2002/24/EC of the European Parliament and of the Council relating to the type-approval of two- or three-wheel motor vehicles

[7] Council Directive 91/441/EEC of 26 June 1991 amending Directive 70/220/EEC on the approximation of the laws of the Member States relating to measures to be taken against air pollution by emissions from motor vehicles

[8] Directive 2002/51/EC of the European Parliament and of the Council of 19 July 2002 on the reduction of the level of pollutant emissions from two- and three-wheel motor vehicles and amending Directive 97/24/EC

[9] Global technical regulation No.2 (ECE/TRANS/180/Add.2 of 30 August 2005) Measurement procedure for two-wheeled motorcycles equipped with a positive or compression ignition engine with regard to the emission of gaseous pollutants, CO_2 emissions and fuel consumption

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