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Incorporating corrigendum October 2012



BSI Standards Publication

All terrain vehicles (ATVs — Quads) — Safety requirements and test methods

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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Véhicules tout terrain (ATV - Quads) - Exigences de sécurité et méthodes d'essai

Geländegängige Fahrzeuge (ATV - Quads) - Sicherheitstechnische Anforderungen und Prüfverfahren

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Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....	5
Introduction	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	8
4 List of significant hazards	12
5 Safety requirements and/or protective measures	15
5.1 General.....	15
5.2 Mechanical hazards	15
5.2.1 Throttle control	15
5.2.2 Braking devices	15
5.2.3 Steering system	17
5.2.4 Moving parts.....	17
5.2.5 Sharp edges	18
5.2.6 Rider foot environment	19
5.2.7 Fuel and hydraulic systems.....	20
5.2.8 Rider's seat and handlebar	20
5.2.9 Passenger handholds	20
5.2.10 Mechanical suspension	20
5.2.11 Drive train controls	21
5.2.12 Neutral indicator	21
5.2.13 Indication of reverse drive selection	21
5.2.14 Electric starter interlock.....	21
5.2.15 Access systems to the rider's station and maintenance points.....	22
5.2.16 Foot controls	22
5.2.17 Lighting equipment (headlamps, tail lamps and stop lamps)	22
5.2.18 Stability	22
5.2.19 Category Y and Category T ATV speed capability requirements	23
5.2.20 Engine stop switch	24
5.2.21 Manual clutch control.....	24
5.2.22 Unauthorized use.....	24
5.2.23 Flag pole bracket	24
5.3 Electrical hazards	24
5.3.1 General.....	24
5.3.2 Over-current protective devices.....	25
5.3.3 Batteries.....	25
5.3.4 Protection against the neutralisation of the starter security	25
5.4 Hot surfaces	25
5.4.1 General.....	25
5.4.2 Temperature limits for touchable surfaces	26
5.5 Noise control	27
5.5.1 Noise control at source by design	27
5.5.2 Noise control by protective measures	27
5.5.3 Noise reduction by information.....	27
5.6 Vibration hazards.....	27
5.7 Material/substance hazards	27
5.8 Controls and indicators	28
5.9 Storage provisions	28
5.10 Ergonomics	28
5.11 Errors of fitting.....	28

6	Verification of the safety requirements and/or protective measures	28
6.1	Verification methods	28
6.2	Verification of final assembly	30
7	Information for use	30
7.1	General	30
7.2	Signs (pictograms), written warnings	30
7.3	Accompanying documents (in particular the instruction handbook)	31
7.4	Marking	34
Annex A	(informative) Examples of All Terrain Vehicles (ATVs - Quads)	35
Annex B	(normative) Service brake performance	37
B.1	Measuring maximum speed	37
B.2	Measuring service brake performance	37
Annex C	(normative) Parking brake/Mechanism performance	39
C.1	Test Conditions	39
C.2	Test Procedure	39
Annex D	(normative) Handlebar	40
Annex E	(normative) Rider foot environment	41
E.1	Test probe	41
E.2	Type 1 ATV Test procedure	41
E.3	ATV Type 2 test procedure	42
Annex F	(normative) Longitudinal stability	43
F.1	Test conditions	43
F.2	Test procedure	43
Annex G	(normative) Hot surfaces	45
G.1	Identification of contact zones	45
G.2	Temperature measurement procedure	50
Annex H	(normative) Noise test code	52
H.1	General	52
H.2	Operating and mounting conditions	52
H.3	Noise measurements	52
H.4	Test environment	53
H.5	Determination of A-weighted emission sound pressure level at rider's ear	53
H.6	Determining if further measurements are necessary	54
H.7	Determining the A-weighted sound pressure levels over a surface enveloping the vehicle	54
H.8	Determining the A-weighted sound power level from the A-weighted sound pressure levels over the measurement surface	56
H.9	Information to be recorded	57
H.10	Information to be reported	58
H.11	Declaration and verification of noise emission values	58
Annex I	(informative) Vibration test code	59
I.1	Background	59
I.2	Coupling the hand and body to the vibration source	60
I.3	Positioning and operating the vehicle during the test	61
I.4	Parameters to be measured	61
I.5	Determination of the vibration levels	61
I.6	Information to be recorded	61
I.7	Information to be reported	62
Annex J	(informative) Pre-delivery form	63
J.1	General	63
J.2	Dealer's declaration	63
J.3	Purchaser's declaration	64
J.4	ATV pre-delivery certificate	64
Annex K	(informative) Examples of warnings, pictograms and combinations that may be used	66
Annex L	(normative) Evaluation sheet before letting a person use the ATV	69

Annex M (informative) Instructions for tyres to be included in the instructions handbook 70
M.1 General..... 70
M.2 Instructions on use..... 70
M.3 Tyre and wheel maintenance..... 70
M.4 Tyre replacement 70
M.5 Tyre ageing..... 70
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC 71
Bibliography 72

Foreword

This document (EN 15997:2011) has been prepared by Technical Committee CEN/TC 354 "Ride-on, motorized vehicles intended for the transportation of persons and goods and not intended for use on public roads - Safety requirements", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2012, and conflicting national standards shall be withdrawn at the latest by May 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

[AC₁] This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive 2006/42/EC. For relationship with EU Directive 2006/42/EC, see informative Annex ZA, which is an integral part of this document. **[AC₁]**

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This document is a type C standard as stated in EN ISO 12100 (all parts).

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

This European Standard applies to “All Terrain Vehicles” or “ATVs” as defined in Clause 3 using liquid fuels (e.g. petrol, diesel). This European Standard does not deal with requirements relating to use on public roads ¹⁾.

This European Standard is not dealing with:

- ATVs exclusively intended for competition ²⁾;
- agricultural and forestry tractors coming under the Directive 2003/37/EC;
- accessories for additional functions (towing hook and load carrying provisions remaining within the vertical projection onto the ground of the vehicle without these load carrying provisions are not considered as accessories);
- the additional hazards due to the use of the ATV on public roads;
- the additional hazards due to the use of remote control.

This European Standard deals with all significant hazards, hazardous situations and events relevant to ATVs, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4). It deals with the significant hazards during the whole lifecycle of the product as defined in 5.3 of EN ISO 12100-1:2003.

This European Standard is not applicable to ATVs which are manufactured before the date of its publication as EN.

NOTE For the purpose of this document, any reference to the vehicle should be regarded as a reference as a machine.

2 Normative references

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

EN 614-1, *Safety of machinery — Ergonomic design principles — Part 1: Terminology and general principles*

EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

CEN/TR 15172-1, *Whole-body vibration — Guidelines for vibration hazards reduction — Part 1: Engineering methods by design of machinery*

EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

1) In general vehicles intended for use on public roads have to fulfil specific requirements and require official “type-approval”.

2) The main criterion to be applied to judge whether vehicles are to be considered as exclusively intended for competition is whether they are designed according to the technical specifications laid down by one of the officially recognised racing associations.

EN ISO 3744, *Acoustics — Determination of sound power levels and sound energy levels of noise sources using sound pressure — Engineering methods for an essentially free field over a reflecting plane (ISO 3744:2010)*

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 11201, *Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections (ISO 11201:2010)*

EN ISO 11688-1, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*

EN ISO 13857:2008, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

ISO 29802, *All terrain (AT) tyres and rims — Symbol marked pneumatic tyres on 5 degrees tapered rims — Designation, dimension, marking and load ratings*

CR 1030-1, *Hand-arm vibration — Guidelines for vibration hazards reduction — Part 1: Engineering methods by design of machinery*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 12100-1:2003 and the following apply.

3.1
all-terrain vehicle (ATV)
motorised vehicle, propelled by an internal combustion engine with liquid fuel, intended primarily to travel on unpaved surfaces on four wheels with low-pressure tyres, having a seat designed to be straddled by the rider and handlebars for steering, and subdivided into two types as designated by the manufacturer

3.1.1
ATV Type I
ATV intended for use by a single rider and no passenger and further identified by four intended usage categories as follows:

3.1.1.1
ATV Type I category G (General Use Model)
ATV Type I intended for recreational and/or utility use by a rider age 16 or older

3.1.1.2
ATV Type I category S (Sport Model)
ATV Type I intended for recreational use by an experienced rider, age 16 or older

3.1.1.3
ATV Type I category Y (Youth Model)
ATV Type I of appropriate size intended for recreational use under adult supervision by a rider under age 16 and further categorized as follows:

3.1.1.3.1

category Y6+

category designed for use by children age 6 or older

3.1.1.3.2

category Y10+

category designed for use by children age 10 or older

3.1.1.3.3

category Y12+

category designed for use by children age 12 or older

3.1.1.4

ATV Type I category T (Transition Model)

ATV of appropriate size that is intended for recreational use by a rider age 14 or older under adult supervision, or by a rider age 16 or older

3.1.2

ATV Type II

ATV with provisions for the rider and one passenger

NOTE 1 An ATV Type II is equipped with a designated seating position behind the rider designed to be straddled by no more than one passenger.

NOTE 2 Type II ATVs are limited to one intended usage category as follows.

3.1.2.1

ATV Type II category G (General Use Model)

ATV Type II intended for recreational and/or utility use by a rider age 16 or older with provision for one passenger

3.2

brake lever or handle

hand-operated control which, when activated, causes the brake(s) to be applied

3.3

brake pedal

foot-operated control which, when activated, causes the brake(s) to be applied

3.4

clutch lever

manual control that engages and disengages the clutch manually

3.5

rider

person who is operating the machine

3.6

gearshift control

control for selecting among a number of sets of transmission gears

3.7

handlebar

device used for steering and rider support and as a place to mount hand-operated controls

3.8

manual fuel shutoff control

manual device designed to turn the fuel flow from the fuel tank on and off

3.9

neutral indicator

light or other means of indicating when an ATV transmission is in the neutral position

3.10

throttle control

control which is located on the handlebar and which is used to control engine power

3.11

cargo area

rack(s) or other designated area(s) intended by the manufacturer to carry cargo on the ATV

3.12

tongue mass

vertical mass on towing device point

3.13

towing device

device used for the attachment of a trailer or other equipment

3.14

vehicle curb mass

total mass of an ATV, including a full load of fuel, oil, and water, but without any rider, passenger (if applicable), accessories, or cargo

3.15

vehicle load capacity (maximum mass capacity)

highest load recommended in the instructions handbook to be carried by an ATV in its “as manufactured” condition

NOTE This vehicle load capacity includes the mass of rider, passenger (if applicable), cargo, accessories, and trailer tongue mass (if applicable), but not the vehicle curb mass.

3.16

wheelbase (L)

longitudinal distance from the centre of the front axle to the centre of the rear axle

3.17

wheel travel

displacement of a reference point on the suspension (such as the wheel axle) from when the suspension is fully extended (no force applied) to when it is fully compressed

3.18

brake stopping distance (S)

distance travelled by an ATV from the start of a brake application to the point which the ATV reaches a complete stop

3.19

braking deceleration

rate of change of vehicle speed from the point of initial brake application to the point where the vehicle stops

3.20

manual clutch

device activated by the rider to disengage the engine from the gearbox

3.21

mechanical suspension

system which permits vertical motion of an ATV wheel to the chassis and provides spring and damping forces

3.22

neutral

designated transmission position where there is no continuity or direct mechanical connection between transmission input and output

3.23

parking brake

brake system which, after actuation, holds one or more brakes continuously in an applied position without further action

3.24

parking mechanism

drive train system that locks the drive train when the transmission control is placed in a designated park position

3.25

service brake

primary brake system used for slowing and stopping a vehicle

3.26

speed limiting device

device intended to limit the maximum speed of a vehicle

EXAMPLE A mechanical device limiting throttle travel.

3.27

low pressure tyre

tyre with reference inflation pressure between 25 and 45 kPa

NOTE see ISO 29802

3.28

braking device

device consisting of the control, the transmission and the brake proper whose function is progressively to reduce the speed of a moving vehicle or to bring it to a halt, or to keep it stationary if it is already halted

3.29

electric starter interlock

device that prevents the ATV engine from being started by electric cranking under certain conditions

3.30

flag pole

long, thin, semi-rigid, vertical pole with a brightly coloured pennant, usually red or orange, on the top end which attaches at the rear of the ATV to the flag pole bracket

3.31

footrests

structure, such as footpegs and footboards, supporting the rider's and/or passenger's feet

3.32

handlebar crossbar

rigid member attached to and connecting the left and right sides of the handlebar

3.33

ignition system

system in an spark-ignited internal combustion engine that ignites the mixture by producing a spark

3.34

instructions handbook

publication, supplied by the manufacturer as part of the ATV, which provides information and instruction regarding use, operation, care, and maintenance of the ATV

3.35

passenger handhold

device grasped by the passenger to provide support and help maintain the passenger's balance while riding

3.36

reverse control

control for selecting the reverse direction of movement of the ATV

4 List of significant hazards

This clause contains all the significant hazards, hazardous situations and events, as far as they are dealt with in this document, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk.

Table 1 — List of significant hazards

Clauses / Subclauses	Danger zone or source of hazard	Type of hazard	Relevant clause of this standard
4.1	Mechanical hazards		
4.1.1	Acceleration deceleration Quick acceleration or deceleration of the ATV may lead to loss of control by the rider and the rider being ejected from the machine	Being thrown	5.2.1, 5.2.2
4.1.2	Approach of a moving element to a fixed part		
	Hands or parts thereof may be trapped between steering handle and tank	Crushing	5.2.3
	Wheels or other parts of the transmission could trap hands or feet	Cutting/crushing/drawing in	5.2.4
	Feet being trapped under rotating wheels is one of the major hazards on ATVS	Entanglement/drawing in	5.2.4, 5.2.6
4.1.3	Mobility Unless ATVs are fitted with adequate steering, suspension, seating and transmission controls, the rider will not have full control over the vehicle	Being thrown	5.2.8, 5.2.9, 5.2.10, 5.2.11, 5.2.12, 5.2.13 5.2.14
4.1.4	Rotating elements		
	Feet being trapped under rotating wheels is one of the major hazards on ATVs	Cutting/crushing/drawing in	5.2.4
		Entanglement/drawing in	5.2.4, 5.2.6
4.1.5	Rough slippery surface	Slipping and falling	5.2.15, 5.2.16
4.1.6	Sharp edges		
	Sharp parts on the handlebar could cut the user when he operates the machine	Cutting or severing (handlebar)	5.2.5
		Cutting or severing (other parts)	
4.1.7	Stability Stability is compromised when tyres are underinflated (tyres separating from rims) or overinflated (may not adapt to the terrain)	Being thrown, crushing	5.2.18
4.2	Electrical hazards		
4.2.1	Arc Risk of direct/indirect electric contact	Electric shock	5.3.1, 5.3.3
4.2.2	Live parts Contact with high tension parts (ignition system) may lead to shocks	Shock	5.3.1

Table 1 (continued)

Clauses / Subclauses	Danger zone or source of hazard	Type of hazard	Relevant clause of this standard
4.2.3	Overload Circuit overload may lead to warming up of the wires, melting of the insulation and even to fire	Fire	5.3.1 5.3.2
4.2.4	Short circuit Contact between live parts and the ground (frame) will lead to short circuit	Fire/shock	5.3.1 5.3.2 5.3.4
4.3	Thermal hazard		
4.3.1	Flame Leaking fuel could catch fire when ignition sources are present	Burn	5.2.7.2
4.3.2	Objects or materials with a high or low temperature It is possible that hot parts lead to burns when the user accidentally touches them Users may come into contact during the use of the machine	Burn	5.4
	getting on and off the machine		
4.4	Noise		
	Exhausting system The machine may create excessive noise due to the loss or the damage of the intake system or of the exhaust system.	Discomfort, permanent hearing loss, risk of accidents due to non-perception of signals, physiological disorders.	5.5
4.5	Vibration hazards		
	Exhausting system The machine could create excessive vibration due to engine and transmission suspension etc., leading to damage to the machine and health risks for the user	Discomfort, Neurological disorder	5.6
4.6	Material/substance hazards		
4.6.1	Dust/fibre Health risks	Breathing/cancer	5.7
4.6.2	Explosive/Combustible Leaking fuel could catch fire when ignition sources are present	Explosion/fire	5.2.7.1, 5.2.7.2
4.6.3	Fumes Leaks in the exhaust system may lead to locally increased concentration of noxious substances	Suffocation/Intoxication	5.7

Table 1 (concluded)

Clauses / Subclauses	Danger zone or source of hazard	Type of hazard	Relevant clause of this standard
4.7	Ergonomics hazards		
4.7.1	Design and location of indicators The machine could start reversing without the rider being aware of it The user could assume that gearbox is in neutral when a gear is still engaged. The machine will in such case start moving suddenly	Fatigue, other hazards caused by error	5.2.11 5.2.12
4.7.2	Design and location of indicators The user could be confused and could operate controls in a wrong way	Fatigue, other hazards caused by error	5.8

5 Safety requirements and/or protective measures

5.1 General

Machinery shall comply with the safety requirements and/or protective measures of this clause. In addition, the machine shall be designed according to the principles of EN ISO 12100 (all parts) for relevant but not significant hazards, which are not dealt with by this document.

5.2 Mechanical hazards

5.2.1 Throttle control

All ATVs shall be equipped with a means of controlling engine power in a progressive way through a throttle control. The throttle control shall be located on the right-hand side of the handlebar and shall be operable without removing the hand from the handlebar.

The throttle control shall be self-closing to an idle position once the rider's hand releases the control.

5.2.2 Braking devices

5.2.2.1 General requirements

All vehicles shall be equipped with two service braking devices, with independent controls and transmissions, one acting at least on the front wheels and the other at least on the rear wheels.

The two service braking devices may have a common braking action provided that a failure in one braking device shall not affect the performance of the other.

The rider controls for the two braking devices shall be operated either by hand on the handlebar or by the right foot.

All ATVs shall have a parking brake or parking mechanism capable of holding the ATV stationary under the conditions prescribed in 5.2.3 without sustained action, the working parts being held in the locked position by purely mechanical device.

The control shall be in a location accessible to the rider in his normal driving position.

5.2.2.2 Service brakes

5.2.2.2.1 Independently-operated front brakes

Independently-operated front brakes shall be applied by a hand-operated lever located on the right side of the handlebar, and be operable without removing the hand from the handlebar.

5.2.2.2.2 Independently-operated rear brakes

Independently-operated rear brakes shall be operated by either a pedal which is located near the right footrest and operable by using the right foot, or if no clutch lever, by a lever located on the left side of the handlebar and operable without removing the hand from the handlebar, or by both.

5.2.2.2.3 Simultaneously-operated front and rear brakes

Simultaneously-operated front and rear brakes shall be operated by either a pedal which is located near the right footrest and operable by using the right foot, or if no clutch lever, by a lever located on the left side of the handlebar and operable without removing the hand from the handlebar, or by both.

5.2.2.2.4 Performance requirements for ATVs with a maximum speed capacity below 30 km/h

When tested in accordance with Annex B (Service brake performance), all ATVs with a maximum speed capability of less than 30 km/h shall be capable of stopping in a distance that complies with the relationship:

$$S \leq \frac{1}{1,467} \times V \quad (1)$$

where

S is the brake stopping distance, expressed in metres (m);

V is the braking test speed, expressed in metres per second (m/s).

5.2.2.2.5 Performance requirements for ATVs with a maximum speed capacity greater than or equal to 30 km/h

When tested in accordance with Annex B (Service brake performance), all ATVs with a maximum speed capability greater than or equal to 30 km/h shall be capable of a braking deceleration greater than or equal to 5,88 m/s² (0,6 g).

Average braking deceleration shall be determined using the following formula:

$$a = \frac{V^2}{2S} \quad (2)$$

where

a is the average deceleration, expressed in metres per second squared (m/s²);

V is the braking test speed, expressed in metres per second (m/s);

S is the brake stopping distance, expressed in metres (m).

5.2.2.3 Parking brakes

When tested according to the procedure specified in Annex C (Parking brake/Mechanism performance) the parking brake or parking mechanism shall be capable of holding the ATV stationary on the test surface on a 30 % slope, for five minutes in both uphill and downhill directions.

5.2.3 Steering system

5.2.3.1 General requirements

ATVs shall be equipped with a steering system ensuring safe driving at the nominal speed and braking capacity of the ATV.

The steering system shall be designed and constructed in such a way as to reduce the force of sudden movements of the steering system to the rider caused by shocks to the steered wheels.

NOTE The steering system includes the handlebar, the stem and the stops.

The following requirements apply to all steering systems within the scope of this European Standard.

- vehicle design shall prevent dangerous interferences to the steering system by any other component such as cables, wiring, etc.;
- the vehicle design shall allow the inspection of critical parts, such as steering-stops, welds, etc.;
- the steering system shall not lock under any circumstances while the vehicle is in motion.

5.2.3.2 Steering stops

The vehicles shall be equipped with two steering stops which prevent:

- the over-steering of the handlebar; and
- the trapping and/or crushing of fingers.

The steering stops shall fulfil the following requirements:

- the steering stops shall allow a rotation of the handlebar of at least 15° in each direction from the straight ahead position;
- the steering stops shall provide a clearance between the gripping area at the full lock of the handlebar and any part of the vehicle of at least 25 mm.

5.2.4 Moving parts

Fixed guards or parts fulfilling the function of a fixed guard that need to be removed for routine inspection, adjustment or maintenance as described in the instruction handbook shall be attached with fixings that are retained in the guard, or vehicle when the guard is removed.

Guards in accordance with EN 953 or structural parts of the machine shall prevent access to the following dangerous moving parts:

- all moving parts which, while the ATV is standing, are within hand reach of the rider when in his normal driving position or within the reach of bystanders;
- all moving parts which, while the ATV is travelling, are within hand reach of the rider when in his normal driving position and when using controls to be operated from that position or, where applicable, all parts within reach of the passenger.

The area to be verified shall be bound by the following planes:

- towards the front of the ATV: a vertical plane, perpendicular to the longitudinal median axis of the vehicle and passing through the centre of the front wheels;
- towards the rear of the ATV: a vertical plane, perpendicular to the longitudinal median axis of the vehicle and passing through the most rearward point of the seat;
- towards the left and right of the ATV: a vertical plane parallel to the longitudinal median axis of the vehicle and passing through the outermost point of the footrest.

Safety distances for reaching through guard openings shall be in accordance with EN ISO 13857:2008 as defined in Table 2 below.

Table 2 — Safety distances from EN ISO 13857:2008 to be applied to openings in guards

Exposed person	ATV Type I category Y		ATV Type I other categories		ATV Type II	
	Stationary	Travelling	Stationary	Travelling	Stationary	Travelling
Rider	YES, 4.2.4.2 ^b (+ 4.2.4.3 ^c)	YES, 4.2.4.2 ^b (+ 4.2.4.3 ^c) (from normal driving position)	YES, 4.2.4.1 ^a (+ 4.2.4.3 ^c)	YES, 4.2.4.1 ^a (+ 4.2.4.3 ^c) (from normal driving position)	YES, 4.2.4.1 ^a (+ 4.2.4.3 ^c)	YES, 4.2.4.1 ^a (+ 4.2.4.3 ^c) (from normal driving position)
Passenger	Not applicable	Not applicable	Not applicable	Not applicable	YES, 4.2.4.2 ^b (+ 4.2.4.3 ^c)	YES, 4.2.4.2 ^b (+ 4.2.4.3 ^c)
Bystanders	YES, 4.2.4.2 ^b (+ 4.2.4.3 ^c)	Not applicable	YES, 4.2.4.2 ^b (+ 4.2.4.3 ^c)	Not applicable	YES, 4.2.4.2 ^b (+ 4.2.4.3 ^c)	Not applicable
^a 4.2.4.1 of EN ISO 13857:2008: reaching through openings by persons older than 14 years. ^b 4.2.4.2 of EN ISO 13857:2008 : reaching through openings by persons older than 3 years. ^c 4.2.4.3 of EN ISO 13857:2008: additional rules only for the case of irregular openings.						

5.2.5 Sharp edges

5.2.5.1 Handlebar

The handlebar shall be of sufficient strength to resist the load applied during normal operation without excessive deflection or permanent deformation.

In the event of overload, the handlebar shall be designed so that it shows no brittle failure, leading to sharp edges and (or) injury.

The ends of handlebars forming the gripping surface shall be of appropriate length and diameter for the category of rider for which the ATV has been designed and shall be covered with soft rubber or plastic having a hardness of less than 65 Shore A at an ambient temperature of $(20 \pm 5) ^\circ\text{C}$. The ends of handlebars shall not be open-ended tubes.

Handgrips shall be fixed in a mechanically positive way or resist a removal force of 70 N when tested in accordance with Annex D (handlebar).

The handlebar and its mounting shall contain no rigid materials with an edge radius of less than 3,2 mm and with which a spherical probe, diameter 165 mm, may come into contact. The probe shall be positioned in the handlebar mounting area.

During the test described in Annex D (handlebar), it shall not be possible for any part of the probe to touch any part of an edge with a radius of less than 3,2 mm.

If fitted, the handlebar crossbar shall be padded.

5.2.5.2 Other parts

All other parts that are likely to be contacted by the rider and, in case of ATV type II, by the passenger, while driving shall have no sharp edges.

5.2.6 Rider foot environment

5.2.6.1 General

The design of a Type I machine shall be such that with shoes the rider's feet shall not make contact with the ground just in front of the rear tyre or the rear tyre itself.

On a Type II machine, the design shall be such that it shall not be possible for the rider nor for the passenger to touch the ground or the rear wheels with their feet when in the normal travelling position.

Verification is by means of the tests of 5.2.6.2.1 and 5.2.6.2.2.

5.2.6.2 Requirements

5.2.6.2.1 ATV Type I

All ATVs Type I shall have footrests or other design features which satisfy the following requirements applying to all the tyre configurations mentioned in the instructions handbook:

- during the test described in E.2.1 (inserting the probe vertically and downward from inside the test zone), the end of the probe shall remain within the limits of the test zone to the extent that it shall not penetrate the limits of the test zone sufficient to touch the ground when applied with a force of 445 N;
- during the test described in E.2.3 (inserting the probe horizontally and rearwards from inside the test zone), the end of the probe shall remain within the limits of the test zone to the extent that it shall not penetrate the test zone sufficient to touch the rear tyre when applied with a force of 90 N.

There shall be no permanent deformation of the protective structure. Permanent deformation is any permanent deformation or damage that reduces the ability of the protective structure to continue to prevent access to the hazard.

5.2.6.2.2 ATV Type II

All ATVs Type II shall have footrests or other design features for the rider and passenger which satisfy the following requirements applying to all the tyre configurations mentioned in the instructions manual:

- during the test described in E.3.1 (inserting the probe vertically and downward from within the zone), the end of the probe shall remain within the limits of the **AC1** test **AC1** zone to the extent that it shall not penetrate the **AC1** test **AC1** zone sufficiently to touch the ground when applied with a force of 445 N;
- during the test described in E.3.3 (inserting the probe horizontally and rearwards from within the zone), the end of the probe shall remain within the limits of the **AC1** test **AC1** zone to the extent that it shall not penetrate the **AC1** test **AC1** zone sufficiently to touch the rear tyre when applied with a force of 90 N;

- if footpegs are provided, the minimum longitudinal separation distance between the centre point of the rider's footpeg (P1) and the centre point of the passenger's footpeg (P2), on each side, shall be 200 mm.

There shall be no permanent deformation of the protective structure. Permanent deformation is any permanent deformation or damage that reduces the ability of the protective structure to continue to prevent access to the hazard.

5.2.7 Fuel and hydraulic systems

5.2.7.1 Pipes, fittings and hoses

Pipes, fittings and hoses shall be installed in such a manner that they are protected against mechanical and/or thermal damage.

EXAMPLE This may be achieved by selecting appropriate materials, by protecting against abrasion and by providing suitable fixings.

Visual inspection of fittings and hoses shall be possible, except for those located inside frames.

5.2.7.2 Fuel system

Fuel tanks shall withstand an internal pressure of 30 kPa (0,3 bar) without permanent deformation or leakage.

ATVs shall be equipped with a manual fuel shutoff control in order to avoid the fuel continuing to flow once the engine has been switched off, unless the design of the fuel system is fulfilling the same objective.

5.2.8 Rider's seat and handlebar

ATVs shall be fitted with a padded seat to be straddled and a handlebar allowing the rider to steer the ATV safely in all intended conditions of use.

A steering handlebar shall not be wider than the overall width of the machine measured at the front axle.

The function of the controls shall not be influenced by the position of the handlebar.

In case of a removable or movable seat, the design shall ensure that it is correctly fitted and correctly latched without intentional action at the latest when the rider is sitting in the operating position.

5.2.9 Passenger handholds

Type II ATVs shall be provided with one padded passenger seat and with two handholds located on each side of the seat in a symmetrical manner.

The design of the seat together with the handholds shall enable the passenger to maintain a stable position during travelling.

The handholds shall be designed in such a way that each is able to withstand, without failure or permanent deformation, a vertically upward and downward traction force of 1 000 N applied statically to the centre of the handhold and equally distributed over a length of 100 mm.

The handholds shall be designed for not impeding the passenger dismounting from the ATV.

5.2.10 Mechanical suspension

ATVs shall be fitted with a mechanical suspension system suitable for the machine to perform its intended function of driving in all terrain and providing appropriate rider and passenger protection against shock.

The minimum wheel travel shall be 50 mm for all wheels.

Springing and damping properties shall be provided by components other than the tyres.

5.2.11 Drive train controls

5.2.11.1 Manual transmission gearshift control

5.2.11.1.1 Requirement

All ATVs equipped with a manual transmission gearshift shall have the control located so as to be operable by using the rider's left foot or left hand.

If three or more gears are provided, it shall not be possible to shift from the highest gear directly to the lowest gear, or vice versa.

5.2.11.1.2 Operation of a foot gearshift control

If the ATV is equipped with a foot-operated gearshift control, an upward motion of the rider's toe shall shift the transmission towards higher (lower numerical gear ratio) gears and a downward motion towards lower gears.

If the ATV is equipped with a heel-toe (rocker) gearshift control, an upward motion of the toe or a downward motion of the heel shall shift the transmission towards higher gears and a downward motion of the toe towards lower gears.

5.2.11.1.3 Operation of a hand gearshift control

If the ATV is equipped with a hand-operated gearshift control, moving a control upward or depressing the upper portion of the control shall shift the transmission towards higher (lower numerical gear ratio) gears, and moving the control downward or depressing the lower portion of the control shall shift the transmission towards lower gears.

5.2.11.2 Other controls

Controls for selecting forward, neutral, or reverse or for selecting overall transmission ranges, or for selecting the differential drive(s), may be located and operated differently.

A diagram showing the different positions of the control device(s) shall be permanently marked in the field of vision of the rider and close to the control.

5.2.12 Neutral indicator

All ATVs with a neutral position, except those equipped with a manual clutch, shall be fitted with either a neutral indicator readily visible to the rider when seated on the ATV or a means of preventing the ATV from being started unless the transmission is in the neutral or park position. The indicator, if fitted, shall be activated whenever the ignition system is on and the transmission is in neutral.

5.2.13 Indication of reverse drive selection

All ATVs with a reverse drive shall be fitted with a telltale or indicator showing that the reverse gear is selected, readily visible to the rider when the rider is seated on the ATV. The indicator shall be activated whenever the engine is running and the transmission is in reverse.

5.2.14 Electric starter interlock

An interlock shall be provided to prevent the ATV engine from being started by electric cranking unless the clutch is disengaged, the transmission is in neutral or park or the brake is applied.