NSAI

Approved Vehicle Body Builder Scheme (AVBB)

For

National Vehicle Approvals (NSSTA and IVA)

For

Completed Vehicles

Contents

Record of revision

Revision	Date	Description of change
1	09.07.2014	
2	15.01.2015	-correction of detail contained in spray suppression section
3	16.11.2015	-removal of requirement for the issuance of a WMI and need to generate a new VIN on completed vehicles as a result of EU legislation 1171/2014/EU (previous requirements have being struck out in relation to this throughout this revision to manual) -General update of AVBB manual -Additional annex for IVA exemptions and IVA exemption justification form
4	16.01.2017	-Additional requirements for IVA and NSSTA application (see item 9 above) -General update of AVBB manual -Last revision (03) struck out WMI/VIN. This revision has removed reference completely

1. Application Process:

The application process for the NSAI Approved Vehicle Body Builder Scheme (AVBB) consists of the following steps:

- Complete and submit the AVBB application form which can be found from the following link:
  http://www.nsai.ie/AVBB.aspx

- On receipt of a completed AVBB application form, NSAI will send out a "Quotation" to the applicant for signature.

- When the Quotation has been returned, fully signed by the applicant, NSAI will:

  - Assign the application to an NSAI auditor.
  - The NSAI auditor will contact the applicant to arrange an audit of the applicant's Quality System.
  - Before an audit can be organised the Body Builder must:
    - Have a Quality System in place, to the minimum requirements as outlined in Section 2 of this manual, before an audit can be organised.
    - Submit a copy of their procedures to the auditor prior to the audit.

  - Unsigned Quotation forms will be returned to the applicant for signature. The application process will stop and will not resume until a fully signed Quotation has been received by NSAI.

- On foot of a successful audit and close out of any non-conformities identified during the audit, the applicant will:
  - Be issued with their AVBB scheme licence.
  - Entered onto the list of NSAI Approved Vehicle Body Builders.

- The AVBB licence has a validity of one year and can be renewed annually.

- The validity of the AVBB licence is dependent on an annual audit of the Approved Vehicle Body Builder and their facilities, carried out by NSAI.

- NSSTA and/or IVAs cannot be granted for N2 and N3 vehicles if a Body Builder's licence is out of date.

2. Quality System:

At a minimum, the quality system shall consist of the following:

Contract Review:

- Identification of the build required e.g.:
    - Box body.
    - Tank.
    - Crane.
    - Swap body (de-mountable superstructures).
    - Etc.
    - Special Purpose Vehicle (see Section 8 for full listing):
        - Ambulance.
        - Hearse.
        - Wheelchair Accessible Vehicle.
        - Etc.
- Category of base vehicle for build (see Annex 1 for list of vehicle categories).
- Category of completed vehicle (see Annex 1 for list of vehicle categories).
- Identification of the approval required (covered by an existing NSSTA or new IVA/NSSTA).
- Vehicle Re-call.

Material specification:

- For all materials used in the build, a material specification will be required detailing the material specification and sizes.

Drawings:

- Controlled drawings of the build shall be required.
- These drawings shall include the material specification of the components.

Control Plan (see Annex II):

- Required for NSSTA only.
- Will need to identify the various points during the build process where checks are made to ensure the build is in compliance.
- Will need to specify what these checks are.
- Will need to reference the records that are used to record these checks.
- Will need to reference the procedure to follow where discrepancies arise.
- Will be different for different builds (eg. box body, tank, crane etc).

Procedures:

As a minimum, Body builders shall develop procedures for the following areas:

Training procedure:

- Trade qualifications at appropriate FETAC level (eg. mechanic, fitter, electrician, welder)
- Minimum level and years of experience (to be decided by the body builder).
- All welders involved with the build must hold current welding certification.
- Ongoing training:
    - Company practices.
    - Vehicle specific.
    - Product specific (eg. lift/hoist installation, approved floor installation etc.,)
- Training plan.

Calibration procedure:

- All measuring equipment used must be part of a planned routine calibration/inspection system.
- All measuring equipment must be uniquely identified.
- Measuring equipment that can be calibrated must be calibrated at least annually. Calibration stickers must be displayed on these measuring devices.
- Measuring equipment that does not require calibration (eg, measuring tapes, rules etc.,) must be checked for continued good use.

Document control procedure:

- All documentation associated with the build must be controlled. This includes, but is not limited to, the following:
    - Bill of Materials (BOM) for each different build.
    - Forms and records.
    - COC or IVA for the base vehicle(s).
    - For NSSTA:
        - COCs issued by the body builder for the completed vehicle (see Section 10 for further details).
        - Procedure must also cover the sending to NSAI of copies of each COC issued by the body builder, within 24 hours of issuance.
        - Defining vehicle type (see Section 9 for further details)
    - Access to base vehicle manufacturer information. (e.g. web based. see section 3 below also)
    - Documents for inclusion with the approved vehicle (e.g. COC, IVA certificate, instruction manuals, maintenance schedules etc.)

Vehicle Approval File procedure:

An approval file will be required for each approval granted.

- For NSSTA approval: this file will consist of the following:
  - Appropriate NSAI Evaluation Form for vehicle category (eg. N1, N2, N3 etc.) (Only one form required for each type – not necessary to reproduce for each vehicle in the type.)
  - Base vehicle detail (Type variant version of base vehicle)
  - Type variant version coding (2nd stage)
  - Base vehicle COC for each vehicle in the type. *(To demonstrate compliance of the base vehicle)*
  - Individual COCs issued for each vehicle in the type.
  - Appropriate checklists as per Section 6 and Annex II of this manual for each vehicle a completed COC issued for.
  - Mass distribution sheets
  - Copies of ATC test reports.
  - Control Plan for the type.
  - Final inspection records.
  - Copy of NSSTA certificate.
  - Conformity of Production (COP) records.

- For IVA: this file will consist of the following:
  - Appropriate NSAI Evaluation Form for vehicle category (eg. N1, N2, N3 etc.)
  - Base vehicle COC or IVA certificate. (To demonstrate compliance of the base vehicle)
  - Appropriate checklists as per Section 6 and Annex II of this manual.
  - Copies of ATC test reports.
  - Final inspection records.
  - Copy of IVA certificate.

Body Builder Plate procedure (see Section 5 for further details):

- In addition to the base vehicle manufacturers' plate, the following two plates shall be required for each completed vehicle:
    - A 2nd or subsequent stage manufacturer's plate (Body Builder plate) will be required for each vehicle. This plate shall be attached to the vehicle close to the base vehicle manufacturer's plate.
    - A plate with an identification number identifying the body, tank, crane etc., that is the subject of the build, shall be attached to the body/tank/crane etc.
- Body Builders Plate procedure shall take into account the plate requirements contained in Section 5.

Build Procedure:

- All Body Builders shall develop procedures describing the different stages of the build.
- These procedures shall also accommodate any Regulatory requirements, other than the National vehicle approval requirements, which may apply to the build. e.g. CE Marking, etc.
- These procedures shall also take into account the areas for test and inspection detailed in Section 6.
- These procedures shall include the Plate and VIN requirements as per Sections 4 and 5.

Final inspection procedure:

- All vehicles shall be subject to a final inspection.
- This final inspection shall include, but is not limited to, the following:
    - A check to insure all approval related requirements have been complied with.
    - A check to insure that if any approved systems have been modified/re-positioned during the course of the build, these systems have been returned to their original positions. If this is not possible then:
        - Follow up with NSAI to determine the extent of modification that can be accommodated by the approval.
        - Appropriate records of these modifications have been maintained and have been included in the Approval File.
        - The Control Plan must also accommodate these changes during the approval process as they may require inspection and test.
    - Any other checks required by the client not necessarily part of the approval process.

Vehicle Re-call procedure (see Section 7):

- All Body Builders shall develop a Vehicle Re-call procedure.
- The procedure shall provide for the notification to NSAI of any vehicle that has been issued with a National approval, which requires re-call.
- The notification to NSAI shall be as per the model contained in Section 7.
- The procedure shall identify the vehicle(s) requiring re-call and detail the defects and proposed remedies.
- The procedure shall provide for notification of re-call to the vehicle owners for the following situations:

- Completed vehicles sold directly by the Body Builder to their client(s).
  - For this situation the Body Builder shall notify their client(s) directly of the re-call.
  - The notification shall be as per the model contained in section 7.
- Vehicles completed on behalf of dealers/distributors and returned to the dealer/distributor for subsequent sale.
  - For this situation, the Body Builder shall notify the dealer/distributor directly.
  - The notification shall be as per the model contained in section 7.

Conformity of Production (COP) procedure (see Section 11):

- For National Small Series Type Approval.
- Procedure shall ensure that the Body Builder has control over the production of the completed vehicle.
- Tests or checks of vehicles are taken and recorded at appropriate intervals, to ensure conformity with the approved type.
- Results of tests or checks are analysed.
- Further sampling is taken if necessary.
- Where non-conformities arise all steps are taken to restore conformity of the vehicle(s).
- COCs issued to vehicles correspond to the approved type.
- All records of COP, checks, tests remain available for a period of 10 years.

Forms/Records:

- Bill of Materials (BOM) for each different build.
- All forms and records.
- COC for base vehicles.
- Mass distribution sheet(s).
- For NSSTA approval, COC templates for completed vehicle.
- Approval file.
- Maintenance records.
- Calibration records.
- Control plan(s).
- Documents for inclusion with the approved vehicle.
- Final inspection records.
- Notification of re-call.
- Special Purpose Vehicles.

Retention of Records:

- Approval file and associated records must be retained in a secure and safe location for a minimum period of 10 years.

3. Base Vehicle Approval:

Prior to commencement of the build, all base vehicles (eg. cab-chassis, etc.,) are required to have either:

1. An incomplete European Commission Whole Vehicle Type-Approval (ECWVTA) or
2. An incomplete IVA issued by NSAI.

If the base vehicle has an incomplete ECWVTA then there will be an incomplete ECWVTA COC available for the vehicle.

If the vehicle has an incomplete IVA then there will be an incomplete IVA certificate available for the vehicle.

Body builders must obtain the incomplete ECWVTA COC or incomplete IVA certificate for the vehicle. This is what demonstrates that the base vehicle is in compliance with their legislative requirements (eg. braking, exhaust emissions, EMC, steering etc.). Without this information, body builders will be taking on full responsibility for the entire vehicle, not just the work they carry out.

Body Builders Document Control procedure and Approval File procedure must ensure these documents are obtained and located in the correct vehicle file.

Access to vehicle manufacturer's body builder instructions

All bodybuilder must have access to the base vehicle manufacturer's body mounting instructions. This may be achieved by an agreement between both parties (letter of association) that ensures the supply and interchange of relevant documents and information to ensure the finished vehicle meets all of the relevant technical requirements (Annex XVII agreement of 2007/46/EC as amended)
As a minimum, the bodybuilder must have access to the base vehicle manufacturer's body builder portal.
Minimum information required to be accessed form base vehicle manufacturer portal include:

- All systems approvals which are granted to the base vehicle chassis for each variant and version (e.g. braking, masses and dimensions, rear under run, lateral protection etc.)
- Covered masses and dimensions including:
  - the maximum completed mass
  - the maximum allowed reference mass for the emission approval
  - rear overhang limitation
  - minimum front axle unladen mass
- The centre of gravity for the bodywork which is authorised regarding the difference vehicle axle loads
- Attachment of the bodywork or accessories on the chassis e.g.
  - forbidden welding points or
  - drilling points or
  - fixing point for the body
- Drawings

5. Plates (Manufacturers Plate/Body Builder Vehicle Plate/Body Identification Plate):

Base vehicle manufacturer plate:

Every base vehicle will have a manufacturers plate fitted detailing at least the following information:

- Name of the manufacturer.
- EC type-approval number.
- VIN.
- Maximum permitted laden mass of the vehicle.
- Maximum permitted laden mass of the combination if the vehicle is used for towing.
- Maximum permitted road mass for each axle, listed in order from front to rear.
- In the case of a semi-trailer, the maximum permitted mass on the fifth wheel king pin.

Body Builder Vehicle Plate:

Each Body Builder shall attach to each completed vehicle a 2nd or subsequent stage, manufacturers' plate.

This plate must be firmly attached, in a conspicuous and readily accessible position. It must be close to the base vehicle manufacturer's plate on a part not subject to replacement in use. It must show clearly and indelibly the following information in the order listed:

- Name of the manufacturer,
- IVA or NSSTA approval number,
- The stage of approval,
- Bodywork Identification Number.
- Maximum permissible laden mass of the vehicle (*),
- Maximum permissible laden mass of the combination (where the vehicle is permitted to tow a trailer) (*),
- Maximum permissible mass on each axle, listed in order from front to rear (*),
- In the case of a semi-trailer or centre axle trailer, the maximum permitted mass on the coupling device (*).

(*) Only where the value has changed during the current stage of approval.

The minimum height of the characters used on the Body Builders vehicle plate is 4mm.
Example of a Body Builders vehicle plate (this is given as a guide only):

MANUFACTURER'S NAME
e24*NKS*5515
Stage 2
Bodywork Identification Number: ABC???
2800 kg
3500 kg
1-1000 kg
2-1800 kg

Example of a Body Builders vehicle plate for vehicles configured for swap bodies (this is given as a guide only):

MANUFACTURER'S NAME	
e24*NKS*5515	
Stage 2	
Bodywork Identification Number	
Swap Body 1:	01ABC??
Swap Body 2:	02DEF??
Swap Body 3:	03GHJ??
Swap Body 4:	04KLM??
2800 kg	
3500 kg	
1-1000 kg	
2-1800 kg	

Each Body Builder shall develop a procedure describing the generation of vehicle plates. This procedure shall include at least the following:

- Describe the manufacture of these plates (either in-house or external manufacture).
- The responsibility for these plates.
- The layout of these plates.
- Process for the correction of incorrect plates attached to a vehicle.
- Type of plate eg. for swap body (de-mountable superstructure) vehicles.

Bodywork Identification Plate:

In addition to the Body Builder Vehicle Plate, each Body Builder shall attach to the body, tank, crane etc., subject to the build, a plate identifying the bodywork.

This plate must be firmly attached, in a conspicuous and readily accessible position on a part not subject to replacement in use.

This plate shall contain at least the following information:

- Name of manufacturer
- Bodywork Identification Number (should match the Body ID number on the body builder vehicle plate)
- NSAI AVBB Body Builder number.

The minimum height of the characters used on the Body Identification Plate is 4mm

Example of a Body Identification Plate (this is given as a guide only):

MANUFACTURER'S NAME
Bodywork Identification Number
NSAI AVBB Body Builder Number

Material Requirement for plates (body ID plate and body builder vehicle plate)

The plate(s) shall consist either of:
(a) a rectangular sheet of metal;
(b) a rectangular self-adhesive label.

Metallic plates shall be fastened with rivets.

If self-adhesive labels are used instead of metallic plate, the labels shall be tamper evident, fraud resistant and self-destructive in case there is an attempt to remove the label.

Bodywork Identification Number:

- Shall be generated by the Body Builder.
- Shall uniquely identify the bodywork.
- Shall appear on the Body Builder Vehicle Plate.

For swap bodies:

- The first two characters shall consist of the bodywork code (see Section 4)
- All Bodywork Identification Numbers for a type of completed vehicle shall appear on the Body Builder's Vehicle Plate.

As a minimum, each Body Builder shall:

- Develop a procedure for the generation and issuing of Bodywork Identification Numbers.
- For swap bodies this procedure shall:
    - Provide for the use of the Bodywork Codes for the first two characters of the Bodywork Identification Number.
    - Provide for the inclusion of all Bodywork Identification Numbers on the relevant Body Builder's Vehicle Plate.
- Develop a procedure describing the generation of Bodywork Identification Plates. This procedure can be part of the Vehicle Plate procedure and shall include at least the following:
    - Describe the manufacture of these plates (either in-house or external manufacture).
    - The responsibility for these plates.
    - The layout of these plates.
    - Process for the correction of incorrect plates attached to a body identified during production and in the field.

6. Technical Requirements:

It is expected that most builds will have the following technical requirements for National Approval:

a) Masses and Dimensions.
b) Couplings.
c) Rear View Mirrors Field-of-View.
d) Spray-Suppression.
e) Lateral Protection.
f) Rear Under-Run Protection.
g) Braking.
h) Lighting/Conspicuity Markings.
i) Attachment of body to vehicle.

This is not an exhaustive list. The complexity of the build will be a leading factor in determining the need for further tests/inspections.

Body Builders quality systems shall accommodate these tests/inspections and allow for additional tests/inspections if the need arises.

Annex II to this manual contains a sample control plan and an inspection checklist

NOTE 1:
These tests and inspections do not supersede any other Regulatory or National Standard or International Standard or any other requirement applicable to the completed vehicle or bodywork.

NOTE 2:
These tests and inspections cannot be used in place of any build procedures or processes. They are intended as a guide to aid Body Builders to complete vehicles in compliance with the National Vehicle Approval Schemes (NSSTA, IVA). They should be used in conjunction with existing procedures and engineering practices.

NOTE 3:
For vehicles configured as swap bodies the vehicle shall be tested and inspected with the bodywork configuration that represents worst case conditions. It is very likely that the vehicle will require testing configured with a number of (or all of) its swap bodies.

a) Masses and Dimensions:

Body Builders quality systems and control plans shall capture at least the following mass information:

Weight of vehicle as per weigh docket = ***(ensure there is no driver in cab as 75kg shall be added in to represent driver as per definition above)***	kg
Capacity of Fuel tank in litres =	L
Approximate fuel level when weighed =	%
Fuel type (Diesel, Petrol, LPG, Other)=	

Mass in running order *is defined as the mass of the vehicle,* ***with its fuel tank(s) filled to at least 90%*** *of its or their capacity,* ***including the mass of the driver (75 kg)****, oil and other liquids, fitted with the standard equipment in accordance with the manufacturer's specifications and, when they are fitted.*

Bodybuilders must also be able to demonstrate the distribution of this mass in running order amongst the vehicle axles

Example of mass in running order calculation:
Weigh docket = 2000 kg

Fuel tank size = 80 Litres

Approximate fuel level when weighed = 50%

Fuel type= Diesel (Density of Diesel is 0.832 kg/L)

Note: to calculate 90% of fuel tank we must first subtract the 50% that was in tank when weighed and then add on the 90%

Weight of 50% of fuel tank = 80 x .832 x .5 = 33.28 kg

Weight of 90% of fuel tank = 80 x .832 x .9 = 59.9 kg

Using definition of mass in running order above:

(2000– 33.28) + 75kg + 59.9 = 2101.62

Mass in running order = 2101.62

Please note: The mass of the vehicle in running order, plus the mass of the optional equipment, plus the mass of the passengers, plus the mass of the coupling if not included in the mass in running order plus the maximum permissible maximum mass at the coupling point shall not exceed the technically permissible maximum laden mass of the vehicle.

Criteria for the categorisation of vehicles in category N:

The number of seating positions excluding the driver's seating position shall not exceed:

(i) 6 in the case of N1 vehicles;
(ii) 8 in the case of N2 or N3 vehicles.

Vehicles shall show a goods-carrying capacity equal or higher than the person-carrying capacity expressed in kg.

Calculation procedure and notations:

'P' is the technically permissible maximum laden mass;

'M' is the mass in running order;

'N' is the number of seating positions excluding the driver's seating position;

In all cases the following equations shall be satisfied:

(a) When N = 0

$$P - M \geq 100\ kg$$

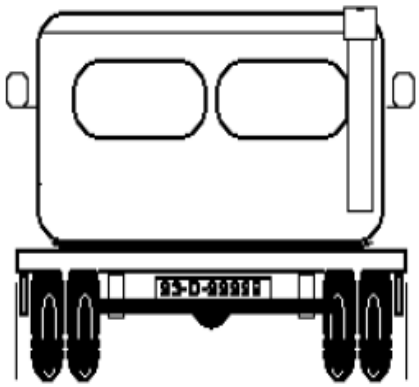
(b) When 0 < N ≤ 2

$$P - (M + N \times 68) \geq 150\ kg$$

(c) When N > 2

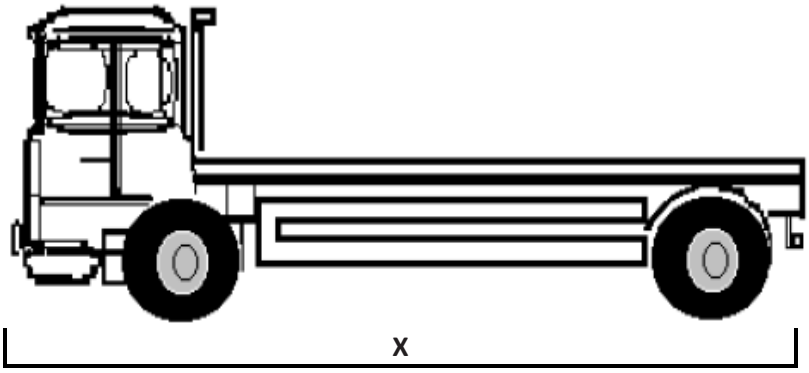
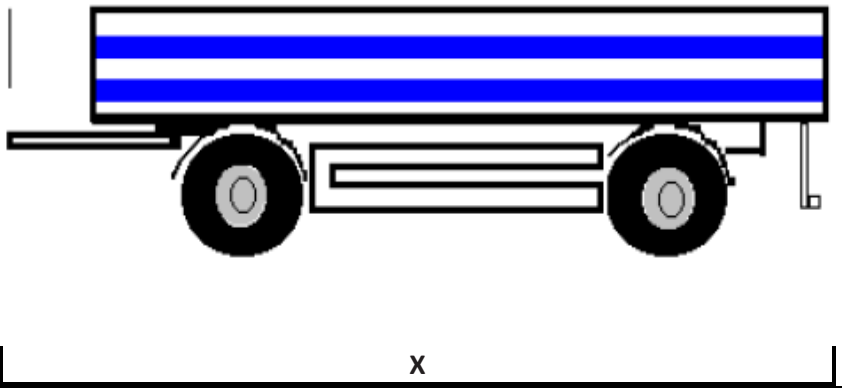
$$P - (M + N \times 68) \geq N \times 68$$

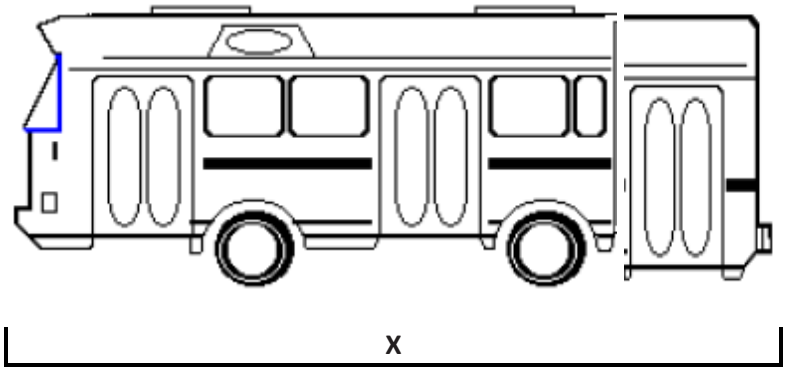
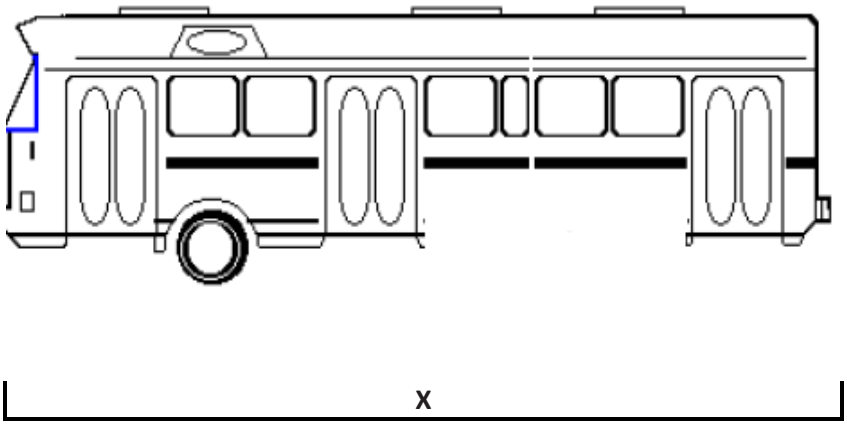
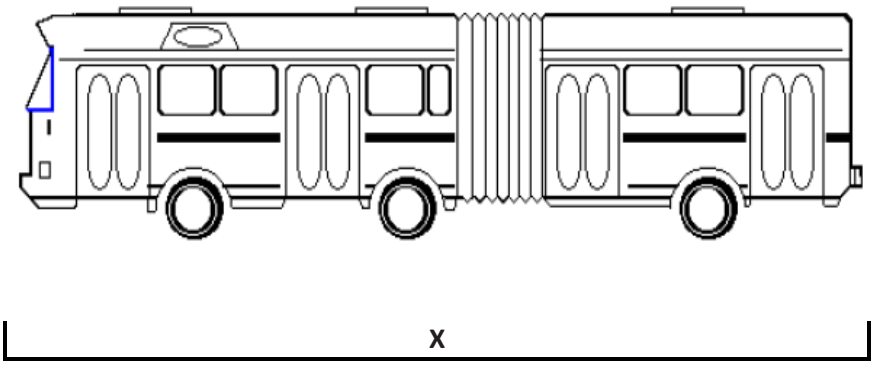
Maximum Width

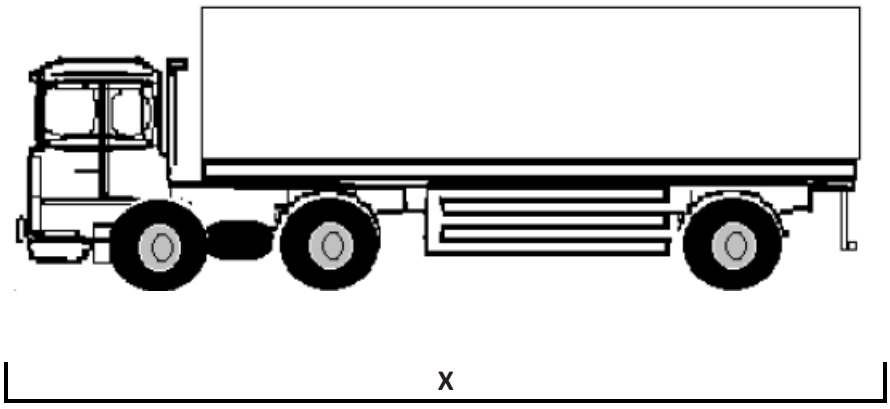
Description	Width (X)	Image
VEHICLE OR TRAILER: RIGID TRUCK, TRACTOR UNIT OF AN ARTICULATED VEHICLE, TRAILER OR A SEMI-TRAILER: PASSENGER VEHICLE WITH SEATING CAPACITY FOR MORE THAN EIGHT PASSENGERS: LARGE TRACTOR: REFRIDGERATED VEHICLE, TRAILER OR SEMI-TRAILER:	2.5m 2.55m *(Provided that the vehicle's DGVW exceeds 3.5 tonnes)* 2.55m 2.75m 2.55m *(For vehicles first registered or trailers first licensed on or before 31st Dec 1997 the limit was*	. 48and communicated to NS,  **X**

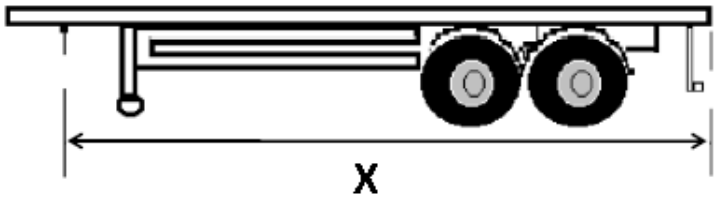
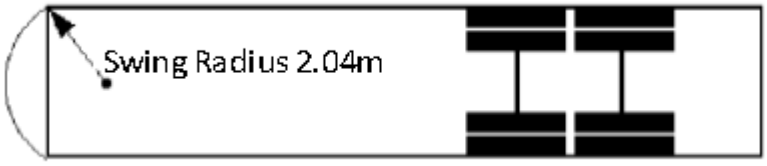
	2.6m but this expired on 31st Dec 2006)	
CONDITIONED VEHICLE:	2.6m	
VEHICLE TOGETHER WITH ITS LOAD: *(Apart from loose agricultural produce which is not in bales or crates)*	2.9m	

Maximum Length

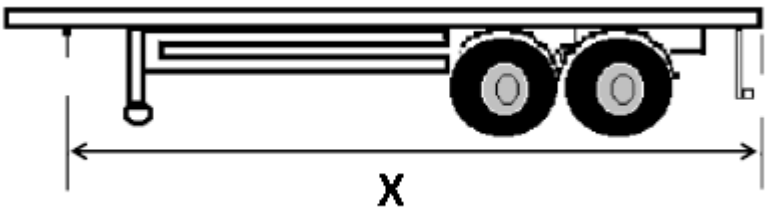
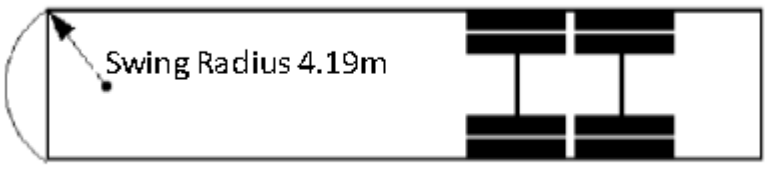
Description	Length (X)	Image
RIGID TRUCK	12m	
TRAILER	12m	

TWO AXLE BUS	13.50m	
BUS HAVING MORE THAN TWO AXLES	15.00	
ARTICULATED BUS	18.75m	

ARTICULATED VEHICLE	16.5m	

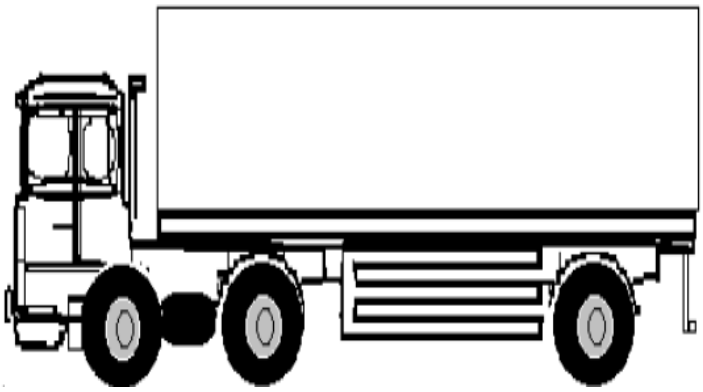
SEMI-TRAILER	12.0m *(Distance measured from the axis of the kingpin to the rear of the trailer)*	 

Swing Radius	2.04m *(Distance measured from the axis of the kingpin to any point on the front of the semi-trailer)*	

VEHICLE TRANSPORTER	12.5m *(Distance measured from the axis of the kingpin to the rear of the trailer)* 4.19m	 

Swing Radius	*(Distance measured from the axis of the kingpin to any point on the front of the semi-trailer)*	

Maximum Height

Description	Height		Image
All VEHICLES	4.65m (Includes the load being carried)	X	

b) Couplings:

Coupling Balls and Towing Brackets

The coupling ball must not be mounted so as to obscure the place or visibility of the rear license plate. If it is mounted in this area, then a coupling ball that can be dismantled without special tools must be used.

Coupling balls and towing brackets shall be attached to vehicles of category M1, M2 and N1 in a manner which conforms to the clearance and height dimensions given in Figure 1.

The installation height shall be between 350 mm – 420 mm from the ground to the centre of the coupling ball.

There must be sufficient clearance around it to enable safe operation and a minimum clearance of:

60° left or right of the centre point of the coupling ball, (β = 60°, Figure 1).

10° up or down from the centre point of the coupling ball (α = 10°, Figure 1).

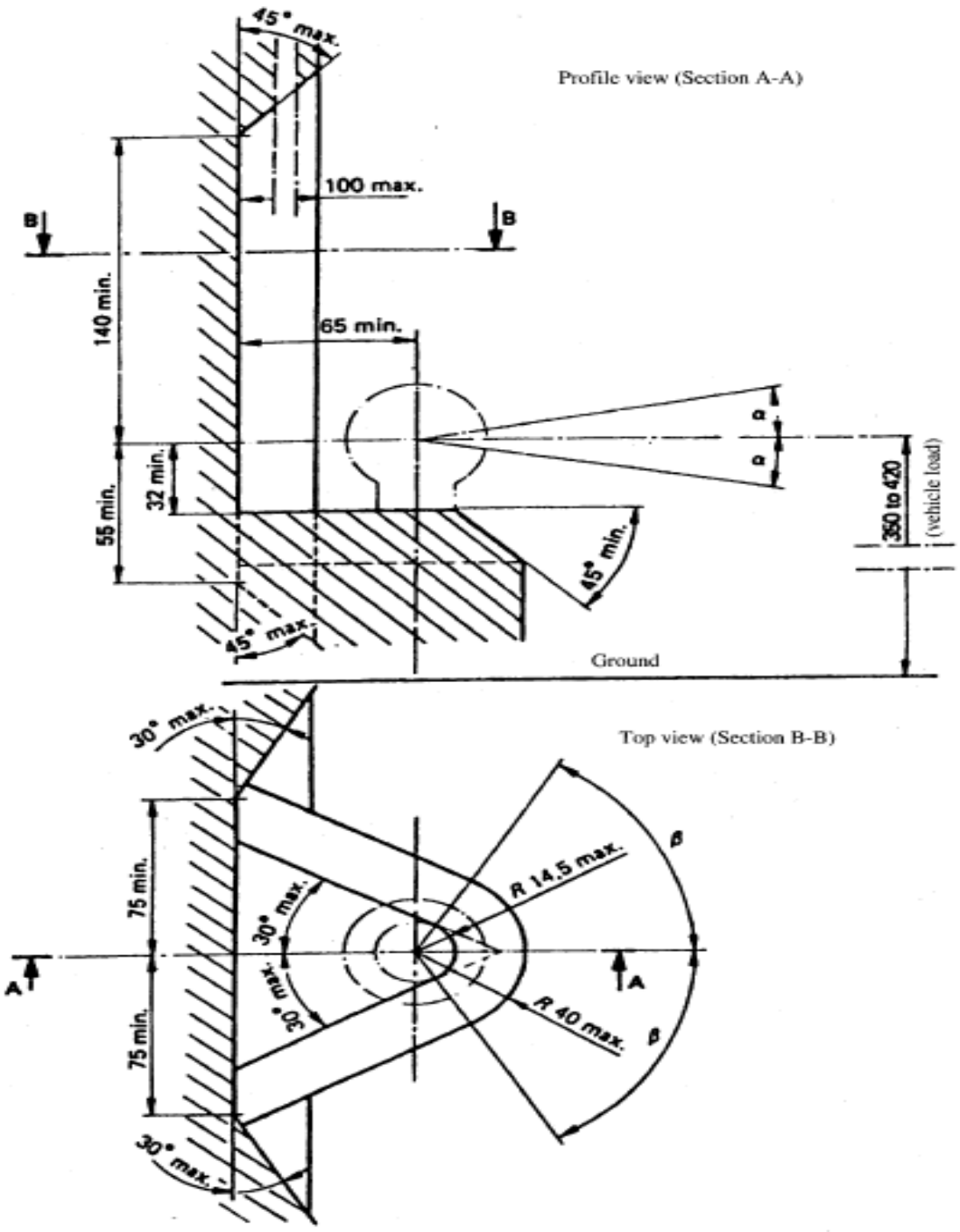
10° axial rotation to right or left.

Any coupling ball fitted must be of 50 mm diameter.

If a coupling device is fitted then the vehicle must be provided with a Gross Train Weight (GTW).

Please note: Towing brackets and coupling balls may be approved separately or as an assembly. Both the coupling ball and the towing bracket must be approved components.

Figure 1.



β = 60° to right or left
α = 10° up or down

Drawbar Couplings and Mounting Blocks

Easy and safe coupling operation:

Drawbar couplings must be mounted on the vehicle type in such a manner that they are easy and safe to operate.

In addition to the functions of opening (and closing, if applicable) this also includes checking the position of the indicator for the closed and secured position of the coupling pin (by sight and touch).

In the area in which the person operating the coupling has to stand, there shall not be any points of possible danger such as sharp edges, corners, etc. inherent in the design unless there are protected so that injury is unlikely.

Any underrun protection device shall not prevent the person adopting a suitable position to operate the coupling.

Accessibility:

The distance between the centre of the coupling pin and the edge of the bodywork of the vehicle shall not exceed 550 mm. Where the distance exceeds 420 mm, the coupling shall be fitted with an actuation mechanism which will allow safe operation at a maximum distance of 420 mm from the outer board of the bodywork.

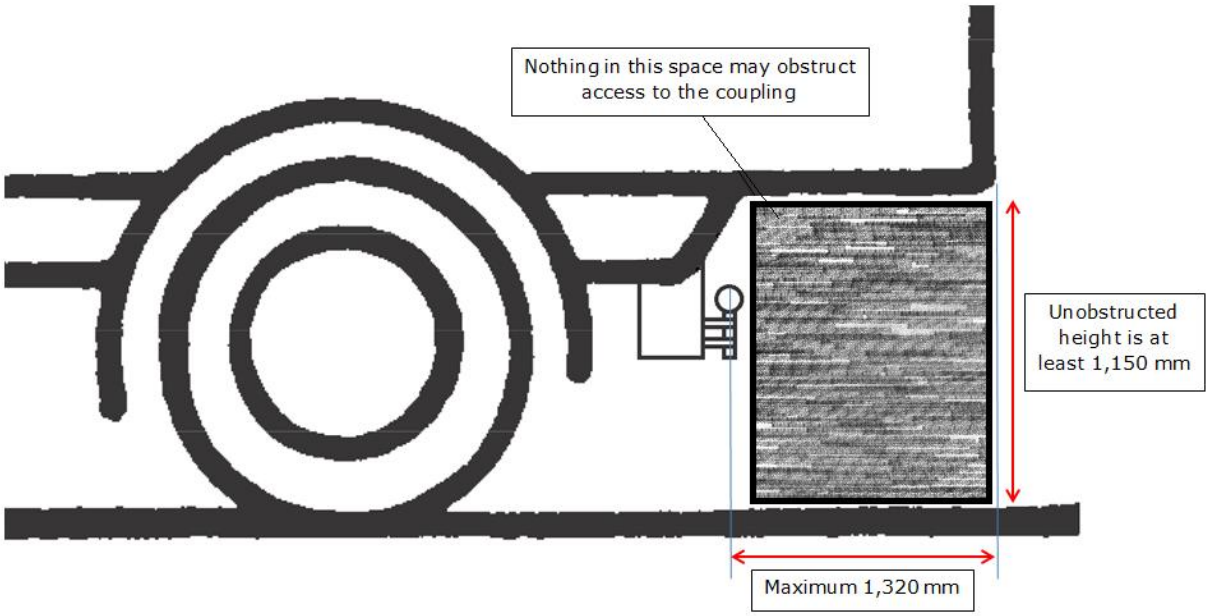
The distance of 550 mm may be exceeded as follows, provided that technical necessity can be demonstrated and that easy and safe actuation of the drawbar coupling is not adversely affected:

(i) distance up to 650 mm for vehicles with tipping bodies or rear-mounted equipment;

(ii) distance of up to 1,320 mm if the unobstructed height (Figure 2) is at least 1,150 mm;

(iii) in the case of car transporters with at least two loading levels when the trailer vehicle is not separated from the towing vehicle in normal transport operation.

Figure 2



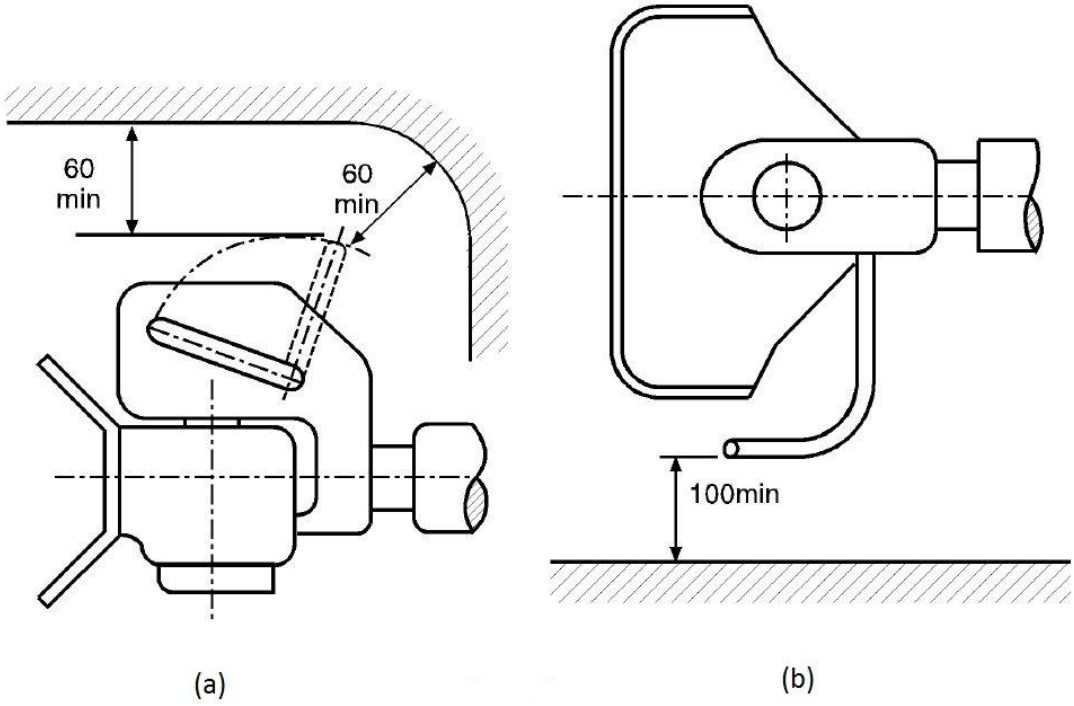
Clearance for hand lever:

There must be adequate free space around the hand lever in order to permit safe operation of the drawbar coupling (Figure 3a). A clearance of 60 mm is sufficient.

If different types of standard drawbar coupling are intended to be fitted to the vehicle, the clearance shall be such that the conditions are also satisfied for the largest size of coupling of the appropriate class given in Annex V, Section 3 of 94/20/EC.

The dimensions are also applicable as appropriate for drawbar couplings having hand levers pointing downwards or of different designs (Figure 3b). There must be a minimum of 100 mm clearance for hand lever.

Figure 3



If one or more of the requirements above (Accessibility, ease and safe coupling operation, clearance for hand lever) cannot be met, a coupling with a remote control device as described in Annex V, paragraph 10.3 of 94/20/EC shall be used.

Clearance for free movement of drawbar couplings:

The drawbar coupling attached to the vehicle must have a minimum clear gap of 10 mm from every other part of the vehicle taking into account all geometrical positions.

If different types of standard drawbar couplings are intended to be fitted to the vehicle type, the clearance must be such that the conditions are also satisfied for the largest possible coupling of the appropriate class stated in Annex V, Section 3 of 94/20/EC.

Attachment of Fifth Wheel Couplings, Mounting Plates and Coupling Pins

Fifth wheel couplings shall not be mounted directly on the vehicle frame unless permitted by the vehicle manufacturer. They must be fixed to the frame by means of a mounting plate. The installation of the fifth wheel coupling and mounting plate must be fixed in accordance with the manufacturer's instructions.

Semi-trailers must be equipped with a landing gear or any other equipment which allows uncoupling and parking of the semi-trailer. If the bodybuilder has installed any other equipment that is not a landing gear, they must provide a brief description of the equipment installed.

If semi-trailers are equipped so that the connection of the coupling devices, the electrical systems and braking systems can be effected automatically, the trailer shall have landing gear which retracts from the ground automatically after the semi-trailer has coupled up.

The fixing of the fifth wheel coupling pin in the mounting plate on the semi-trailer must be as instructed by the vehicle manufacturer or manufacturer of the fifth wheel coupling.

If the semi-trailer is equipped with a steering wedge the following dimensions must be recorded:

-Dimensions of steering wedge:	Thickness: mm Length: mm Width at both ends: mm mm

The following requirements must also be followed:

- The steering wedge must all safe and secure coupling up.
- The steering wedge must be spring mounted.
- The strength of the spring must be selected so that it is possible to couple up an unloaded semi-trailer and so that, with the semi-trailer fully loaded, the steering wedge is firmly in contact with the flanks of the coupling during travel.
- Uncoupling of the fifth wheel must be possible with the semi-trailer both loaded and unloaded.

c) Rear view mirrors Field-of-View:

All mirrors and camera systems fitted on vehicles must be approved.

Field-Of-View Requirements:

In all cases where the width of the body exceeds the width of the cab, a Field-Of- View test carried out by an ATC, will be required*. For most builds it is expected this will only apply to the exterior (Class II or Class III) rear view mirrors on both the drivers and passengers side of the completed vehicle.

*** Except if the maximum permissible width stated on the COC (Certificate of Conformity) is greater than the maximum width of the completed vehicle and the incomplete vehicle has been tested for such.**

Never-the-less, any change to any of the rear view mirrors will prompt the need for a rear view mirror field-of-view test.

Body Builders quality systems and control plans shall identify early in the build if there will be changes to any of the rear view mirrors. These changes must be identified and recorded in the appropriate documents attached to the build and filed in the Vehicle Approval File.

Below are the minimum field-of-view requirements for each class of rear view mirror.

Class I - Interior rear-view mirror:

The field of vision must be such that the driver can see at least a 20 m wide, flat, horizontal portion of the road centred on the vertical longitudinal median plane of the vehicle and extending from 60 m behind the driver's ocular points (Figure 1) to the horizon.

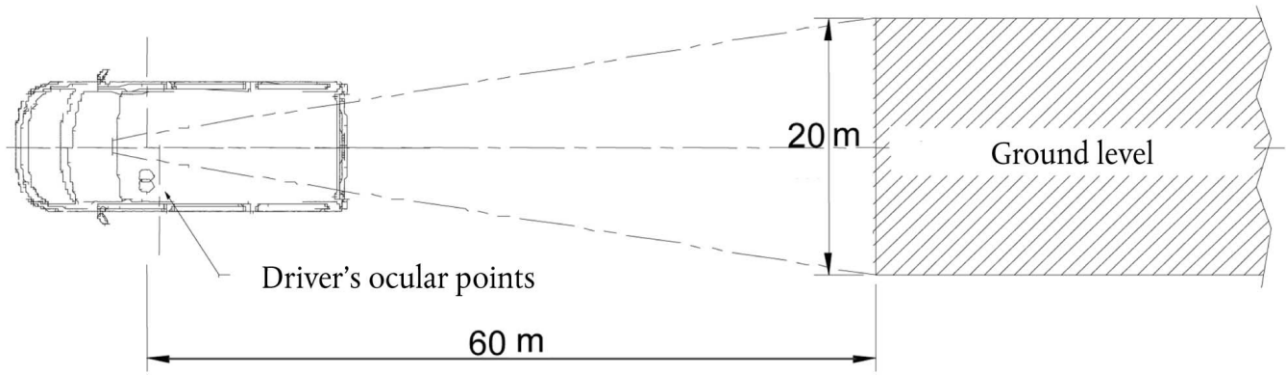


Figure 1 (Field of view for Class I mirror)

Class II - Main exterior rear-view mirrors:

Exterior rear-view mirror on the driver's side:

The field of vision must be such that the driver can see at least a 5 m wide, flat, horizontal portion of the road, which is bounded by a plane which is parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle on the driver's side of the vehicle and extends from 30 m behind the driver's ocular points to the horizon.

In addition, the road must be visible to the driver over a width of 1 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 4 m behind the vertical plane passing through the driver's ocular points (see Figure 2).

Exterior rear-view mirror on the passenger's side:

The field of vision must be such that the driver can see at least a 5 m wide, flat, horizontal portion of the road, which is bounded on the passenger's side by a plane parallel to the median longitudinal vertical plane of the vehicle and passing through the outermost point of the vehicle on the passenger's side and which extends from 30m behind the driver's ocular points to the horizon.

In addition, the road must be visible to the driver over a width of 1 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 4 m behind the vertical plane passing through the driver's ocular points (see Figure 2).

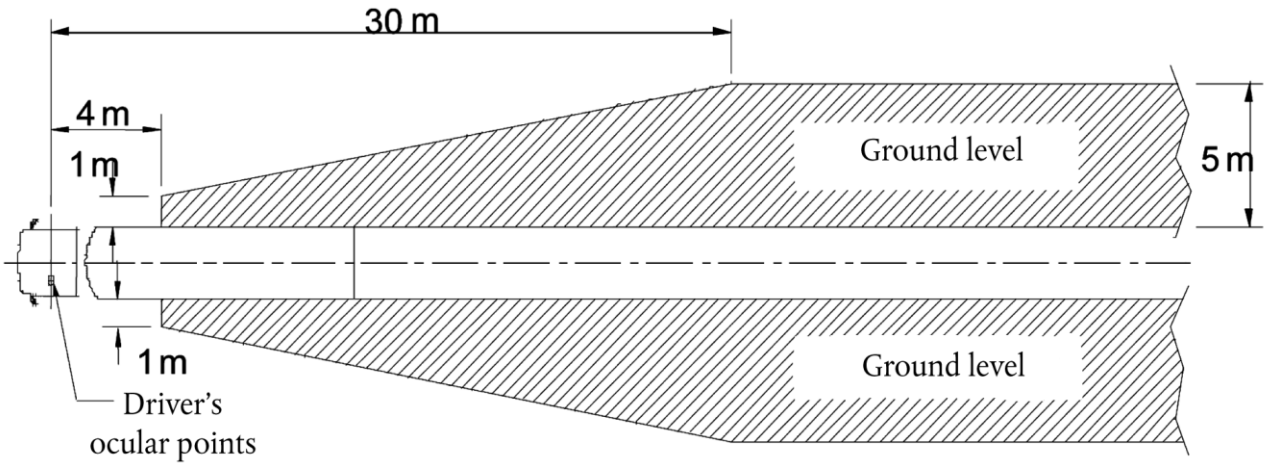


Figure 2 (Field of view for Class II mirrors)

Class III - Main exterior rear-view mirrors:

Exterior rear-view mirror on the driver's side:

The field of vision must be such that the driver can see at least a 4 m wide, flat, horizontal portion of the road, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle on the driver's side of the vehicle and extends from 20 m behind the driver's ocular points to the horizon (see Figure 3).

In addition, the road must be visible to the driver over a width of 1 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 4 m behind the vertical plane passing through the driver's ocular points.

Exterior rear-view mirror on the passenger's side:

The field of vision must be such that the driver can see at least a 4 m wide flat, horizontal portion of the road which is bounded by a plane parallel to the median longitudinal vertical plane passing through the outermost point of the vehicle on the passenger's side and which extends from 20 m behind the driver's ocular points to the horizon (see Figure 3).

In addition, the road must be visible to the driver over a width of 1 m which is bounded by a plane which is parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 4 m behind the vertical plane passing through the driver's ocular points.

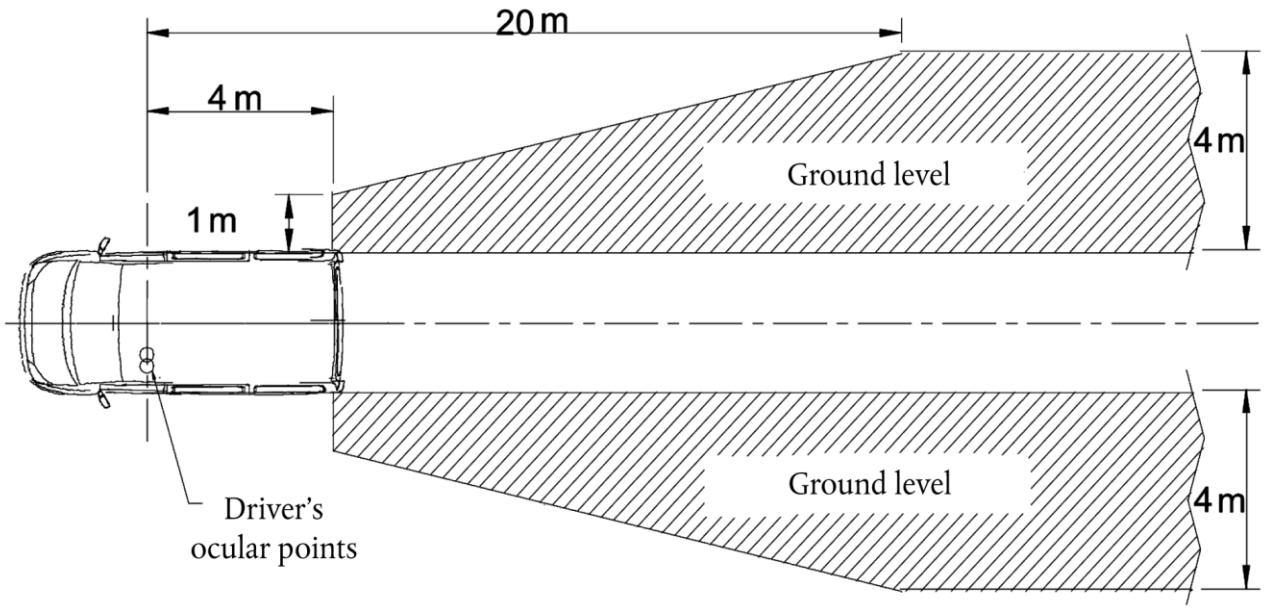


Figure 3 (Field of view for Class III mirrors)

Class IV - ‘Wide-angle’ exterior mirror:

‘Wide-angle’ exterior mirror on the driver's side:

The field of vision must be such that the driver can see at least a 15 m wide, flat, horizontal portion of the road, which is bounded by a plane parallel to the median longitudinal vertical plane of the vehicle and passing through the outermost point of the vehicle on the driver's side and which extends from at least 10 to 25 m behind the driver's ocular points.
In addition, the road must be visible to the driver over a width of 4.5 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 1.5 m behind the vertical plane passing through the driver's ocular points (see Figure 4).
‘Wide-angle’ exterior mirror on the passenger's side:

The field of vision must be such that the driver can see at least a 15 m wide, flat, horizontal portion of the road, which is bounded by a plane parallel to the median longitudinal vertical plane of the vehicle and passing through the outermost point of the vehicle on the passenger's side and which extends from at least 10 to 25 m behind the driver's ocular points.

In addition, the road must be visible to the driver over a width of 4.5 m, which is bounded by a plane parallel to the median longitudinal vertical plane and passing through the outermost point of the vehicle starting from a point 1.5 m behind the vertical plane passing through the driver's ocular points (see Figure 4).

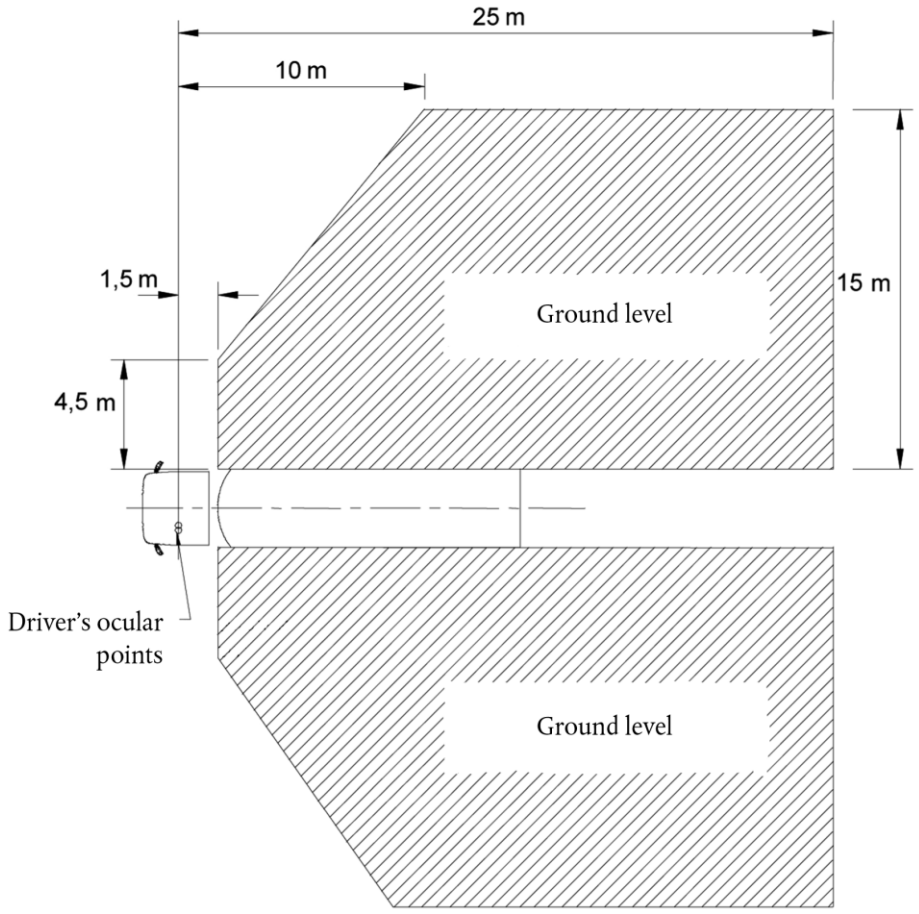


Figure 4 (Field of view for Class IV wide-angle mirrors)

Class V - 'Close-proximity' exterior mirror:

The field of vision must be such that the driver can see a flat horizontal portion of the road along the side of the vehicle, bounded by the following vertical planes (see Figures 5a and 5b).

1. The plane parallel to the median longitudinal vertical plane of the vehicle which passes through the outermost point of the vehicle cab on the passenger's side;

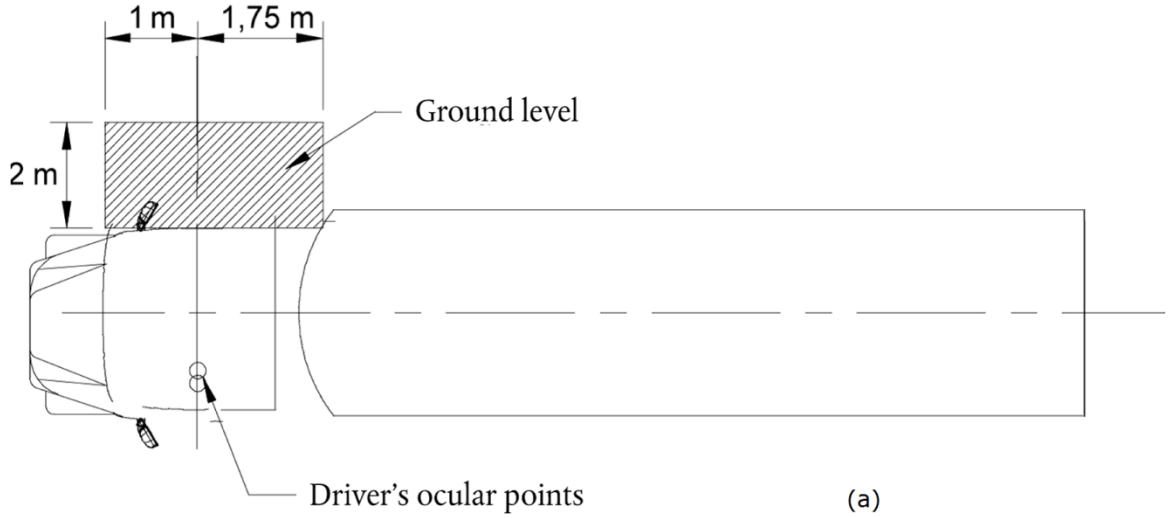
2. In the transverse direction, the parallel plane passing at a distance of 2 m in front of the plane mentioned in point 1. Above;

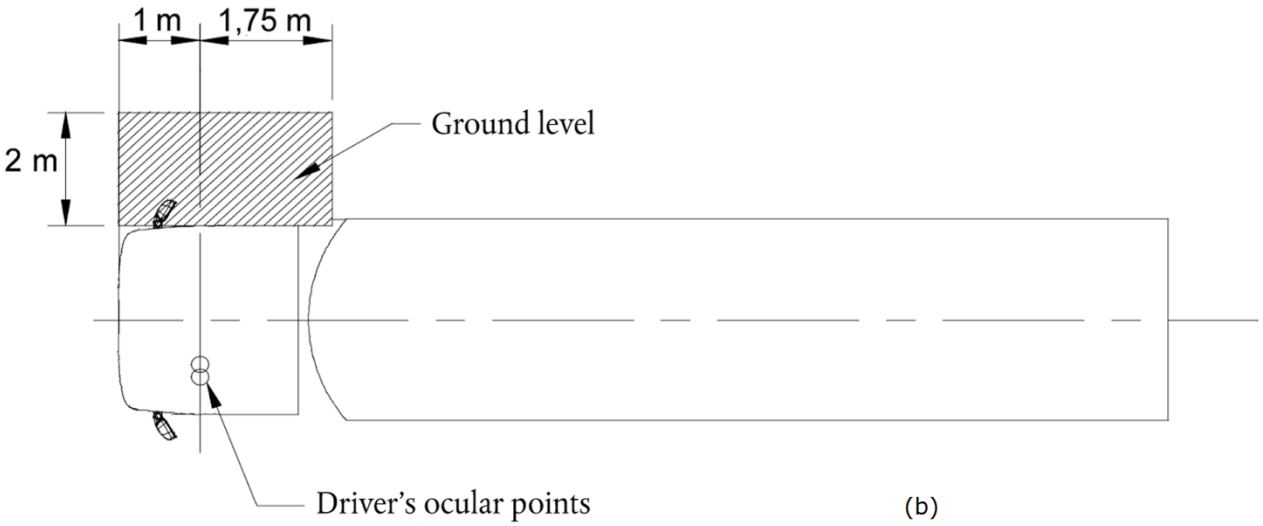
3. To the rear, the plane parallel to the vertical plane passing through the driver's ocular points and situated at a distance of 1.75 m behind that plane;

4. To the front, the plane parallel to the vertical plane passing through the driver's ocular points and situated at a distance of 1 m in front of that plane. If the vertical transverse plane passing through

the leading edge of the vehicle bumper is less than 1 m in front of the vertical plane passing through the driver's ocular points, the field of vision shall be limited to that plane.

5. In case the field of vision described in Figures 5a and 5b can be perceived through the combination of the field of vision from a Class IV wide-angle mirror and that of a Class VI front mirror, the installation of a Class V close proximity mirror is not compulsory.





Figures 5a and 5b (Field of view for Class V close-proximity mirror)

Class VI - Front mirror:

The field of vision must be such that the driver can see at least a flat horizontal portion of the road, which is bounded by:

1. One traverse vertical plane through the outermost point of the front of the vehicle- cab.

2. One traverse vertical plane 2 m in front of the vehicle.

3. One longitudinal vertical plane parallel to the longitudinal vertical median plane going through the outermost side of the vehicle at the driver's side.

4. One longitudinal vertical plane parallel to the longitudinal vertical median plane 2 m outside the outermost side of the vehicle opposite to the driver's side.

The front of this field of vision opposite to the driver's side may be rounded off with a radius of 2000 mm (or 2 m) (see Figure 6).

The provisions for front mirrors are compulsory for forward-controlled* vehicles of categories N2 > 7.5 t and N3.

If vehicles of these categories with other construction characteristics regarding the bodywork cannot fulfil the requirements by using a front mirror, a camera/monitor device shall be used. If either of these options does not provide the adequate field of vision, then any other device for indirect vision shall be used. This device must be able to detect an object of 50 cm height and with a diameter of 30 cm within the field defined in Figure 6.

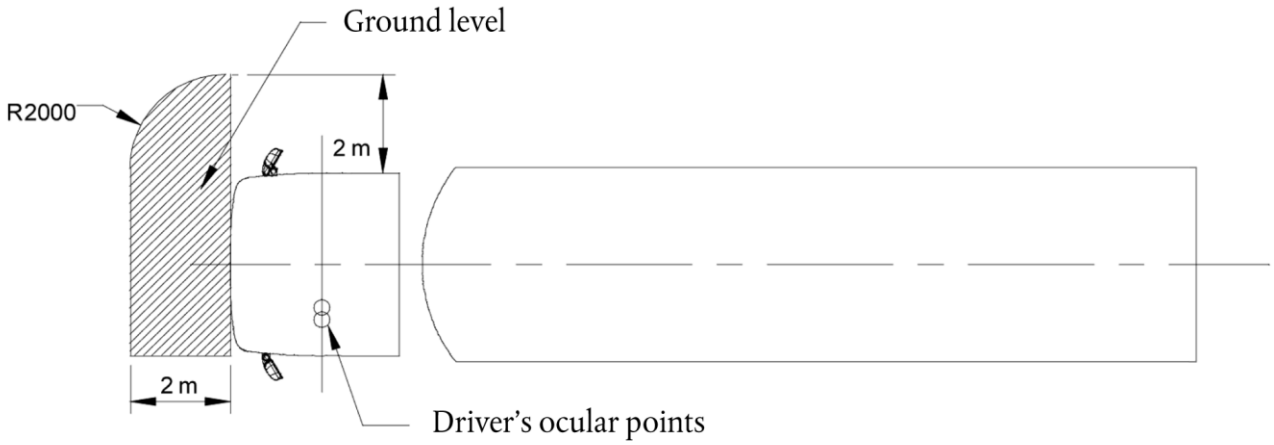


Figure 6 (Field of view for Class VI front mirror)

***** *Forward control. Means a configuration in which more than half of the engine length is rearward of the foremost point of the windshield base and the steering wheel hub in the forward quarter of the vehicle length.*

d) Spray suppression:

Completed vehicles will require either full spray-suppression or reduced spray-suppression depending on their use.

An ATC inspection will be required for the following possibilities:

Spray-suppression supplied with the base vehicle:

If these are interfered with during the build then a Spray-Suppression test carried out by an ATC will be required for granting of a National approval. The Spray-Suppression Requirements below must be followed to bring the completed vehicle back into compliance.

Fitting of spray-suppression system is part of the build:

A spray-suppression test carried out by an ATC will be required for grant of National approval. The Spray-Suppression Requirements below must be followed for the completed vehicle to be in compliance with the spray-suppression National approval requirements.

Body Builders quality systems and control plans shall identify what level of spray-suppression is required for the build taking account of the above and the definitions below:

Spray-suppression system:

This is a system intended to reduce the pulverization of water thrown upwards by the tyres of a vehicle in motion. The spray-suppression system is variously made up of a mudguard, rain flaps and valances equipped with a spray-suppression device.

Mudguard:

This is a rigid or semi-rigid component intended to trap the water thrown up by tyres in motion and to direct it towards the ground. Mudguards may entirely or partially form an integral part of the vehicle bodywork or other parts of the vehicle such as the lower part of the load platform, etc.

Rain flap:

This is a flexible component mounted vertically behind the wheel, on the lower part of the chassis or the loading surface, or on the mudguard.

The rain flap must also reduce the risk of small objects, in particular pebbles, being picked up from the ground by the tyres and thrown upwards or side wards towards other road users.

Spray-suppression device:

This is a part of the spray-suppression system and can be either of the following:

1. *Air/water separator:*
   This is a component forming part of the valance and/or of the rain flap through which air can pass whilst reducing pulverized water emissions.
2. *Energy absorber:*
   This is a component forming part of the mudguard and/or valance and/or rain flap which absorbs the energy of water spray, thus reducing pulverized water spray.

Exceptions to the fitting of spray-suppression devices:

- Except where fitted, the spray-suppression requirements do not apply to "off-road" vehicles as defined in EC Directive 2007/46/EC. However, if spray-suppression devices are fitted to these vehicles they must comply with these requirements.
- Spray-suppression requirements do not apply to vehicles where the use of spray-suppression devices is incompatible with their use (eg. steered axles on a low loader semi-trailer). However, if spray-suppression devices are fitted to these vehicles they must comply with these requirements.
- Spray-suppression devices are not mandatory for vehicle categories N, O_1 and O_2 with a permissible maximum laden mass not exceeding 7.5 tonnes. However, if spray-suppression devices are fitted to these vehicles they must comply with these requirements.

Please see Annex V for full list of exceptions to fitting spray-suppression devices.

Spray-Suppression Requirements:

Road wheels must have associated with them equipment or part of the body which, as far as is practicable, catches mud or water thrown up by the wheels as they rotate.

Check that the wing covers the whole width of the tyre especially where wide "Super Single" tyres are fitted to the front axle.

The spray-suppression material must be of an approved type.

Mud flaps
If a mud flap is an extension to a wing or similar fitting, where a mud flap is fitted in place of a wing, i.e. it serves the purpose of a wing (as on some semi-trailers) it must be treated as a wing and be securely fixed to prevent excessive movement.

Lifting axles

Where a vehicle is fitted with one or more lifting axles, the spray-suppression system must cover all the wheels when the axle is lowered and the remaining wheels which are in contact with the ground when the axle is raised.

Self-tracking axles

Where a vehicle is fitted with a self-tracking axle, the spray-suppression system must satisfy the conditions applicable to non-steered wheels if mounted on the pivoting part. If not mounted on that part, it must satisfy the conditions that are applicable to steered wheels.

Please note:

In the case of single or multiple axles where the distance between the adjacent tyres is at least 250 mm, the valance should cover the area extending from the underside of the body to at least a line formed by the tangent to the top of the tyres and between the outer edge of the wheel flap, with which it should form a seal and the vertical plane formed by the tangent at the front of the tyre. An outer valance must be fitted over each wheel. The whole inner face of the outer valance, the depth of which should not be less than 100mm, must be fitted with a suppression material.

Spray-Suppression Component Check

Evidence must be supplied to demonstrate compliance with the approval of Spray-Suppression Material.

State of vehicle for checking compliance with the requirements:

- vehicle must be unladen and with the wheels in the straight-ahead position;
- in the case of semi-trailers, the loading surfaces must be horizontal;
- the tyres must be inflated to their normal pressure.

Installation Check:

Spray-Suppression systems fitted with energy absorption spray-suppression devices for axles fitted with non-steered or self-steering or steered wheels.

Mud Guards

1. The mudguards must cover the zone immediately above; ahead and behind the tyre or tyres see Figure 1a and Figure 1b.

2. The front edge of the mudguard must be no more than 45 degrees above the horizontal line of the axle (θ in Figure 1a).

3. The rear edge of the mud guard must be no more than 100mm above the horizontal line of the axle (A in Figure 1a).

4. In the case of multiple axles, the angle θ relates only to the foremost axles and requirements relating to the height of the rearmost edge apply only to the rearmost axle.

5. The mudguard must possess a total width 'q' (Figure 1b) at least adequate to cover the width of the tyre 'b' or the entire width of two tyres 't' in the case of twin wheels. The dimensions 'b' and 't' shall be measured at hub height, excluding any markings, ribs, protective bands etc. on the tyre walls.

6. Spray-Suppression material must be fitted to the front face of the rear of the guard. The material must cover the inside of the mudguard to a height determined by a straight line running through the centre of the wheel and forming an angle of at least 30° with the horizontal (Figure 2).

7. Where the wheel guard consists of several components there must be no gaps between or within individual parts when assembled that will permit the exit of spray when the vehicle is in motion.

Outer Valance

8. The distance between the tyre wall and the vertical face of the valance must not exceed 100mm ('c' in Figure 1b).

9. The depth of the outer valance must extend to not less than 45mm at all points behind a vertical line passing through the centre of the wheel (Figure 1a).

Air Suspension:

10. The lower edge of the outer valance shall not exceed 1.5 x tyre radius on steered wheel and self-steering wheels from points A to C (Figure 1a).

11. The lower edge of the outer valance shall not exceed 1.25 x tyre radius on non-steered wheels from points A to C (Figure 1a).

Mechanical Suspension:

12. The lower edge of the outer valance shall not exceed 1.8 x tyre radius on steered and self-steering wheels from points A to C (Figure 1a).

13. The lower edge of the outer valance shall not exceed 1.5 x tyre radius on non-steered wheels, with a technically permissible laden mass more than 7.5 tonnes, from points A to C (Figure 1a).

14. In the case of multiple axles the requirements laid down in items 10-13 do not apply between the vertical transversal planes passing through the centre of the first and last axles where the outer valance may be straight in order to ensure the continuity of the spray-suppression system (Figure 3).

15. There must be no openings in the outer valances or between the outer valances and other parts of the mud guard enabling spray to emerge when the vehicle is moving.

Rain Flaps:

16. The rain flap must be at least the full width of the tyre(s) ('q' in Figure 1b).

17. The orientation of the flap must be basically vertical.

18. The maximum height of the bottom edge must be no more than 200 mm above the ground. The distance is increased to 300 mm in the case of the last axle where the radial distance of the lower edge of the outer valancing, Rv, does not exceed the dimensions of the radius of the tyres fitted to the wheels on that axle (Figure 2).

The maximum height of the bottom edge of the rain flap in relation to the ground may be raised to 300 mm if the manufacturer deems it technically appropriate with regard to the suspension characteristics (Figure 2).

19. The flap must be no more than 300 mm from the rearmost edge of the tyre (Figure 2).

20. There must be no openings between the rain flap and the lower edge of the wheel guard enabling spray to emerge.

21. The whole face of the rain flap must be covered in spray-suppression material.

22. In the case of multiple axles where distance (d) between the tyres on adjacent axles is less than 250 mm, only the rear set of wheels must be fitted with rain flaps (Figure 3, 4a).
23. There must be a rain flap behind each wheel when the distance (d) between the tyres on adjacent axles is at least 250 mm (Figure 3, 4b).

24. Where the spray-suppression device meets the specifications relating to rain flaps, (items 16-23) no additional rain flap is required.

Spray-Suppression systems fitted with air/water separator spray-suppression devices for axles fitted with steered, self-steering and non-steered wheels

Mud guard (items 1 - 7 must also be met) (Figures 5, 6):

25. In the case of multiple axles where the distance between the tyres on adjacent axles does not exceed 300 mm the mudguards must also conform to the model shown in Figure 6.

Outer Valance

26. The lower edges of the outer valances must be fitted with air/water separator spray-suppression devices.

27. The depth of the outer valance must extend to not less than 45mm, at all points behind a vertical line passing through the centre of the wheel (Figure 5, 6).

28. In the case of single or multiple axles where the distance between the tyres on adjacent axles exceeds 300 mm, the lower edge of the spray-suppression device fitted to the outer valance must have the following maximum dimensions and radii:

28. The lower edge of the outer valance shall not exceed 1.05 x tyre radius on steered and self-steering wheels (Figure 5). The front edge shall be at a maximum of 30° (OC in Figure 5) with the rear edge no more than 100 mm for steered and self-steering wheels.

29. The lower edge of the outer valance shall not exceed 1.00 x tyre radius on non-steered wheels (Figure 5). The front edge shall be at a maximum of 20° (OC in Figure 5) with the rear edge no more than 100 mm for non-steered wheels.

30. In the case of multiple axles where the distance between the tyres on adjacent axles does not exceed 300 mm, the outer valances located in the inter-axle spaces must follow the path specified in item 25, and must extend downwards in such a way as not to be more than 100 mm above a horizontal straight line passing through the wheel centres.

31. There must be no openings in the outer valances or between the outer valances and the mud guard enabling spray to emerge.

Rain Flaps (items 16, 17, 20, 22, 23 must also be met) (Figure 5):

28. A rain flap fitted with air/water separator must not be more than 200 mm from the rearmost edge of the tyre, measured horizontally.

29. The air/water separator spray-suppression device must be at least 100 mm deep when fitted to a rain flap.

30. The lower edge of the spray-suppression device must be no more than 200mm from the ground. The maximum height of the bottom edge of the rain flap in relation to the ground may be raised to 300 mm if the manufacturer deems it technically appropriate with regard to the suspension characteristics.

Spray-Suppression systems fitted with energy absorption spray-suppression devices for axles fitted with non-steered or self-steering wheels that are covered by the bodywork, floor or the lower part of the load area

Mud Guards (items 31 & 32 not required if items 1-7 & 25 are met):

31. Mud guards must cover the zone above the tyre or tyres from the front edge of the tyre to the rain flap located behind the wheel (Figure 4a, 4b).

32. All the inner rear part of the mud guard must be fitted with an approved spray-suppression device.

Outer Valance (items 33-36 not required if items 8-15 & 26-31 are met):

33. In the case of multiple axles an outer valance must be located above each wheel.

34. The entire inner surface of the outer valence must be fitted with an energy absorption spray-suppression device which must be a minimum of 100mm high.

35. There must be no openings between the outer valances and the inner part of the mud guard enabling spray to emerge.

36. Where rain flaps are not fitted behind each wheel (see items 22, 23), the outer valance must be unbroken between the outer edge of the rain flap to the vertical plane that is tangent to the point furthest to the front of the tyre (Figure 4a) of the first axle.

Rain Flaps:

37. These flaps must extend to the lower part of the mud guard and comply with items 16 to 22.

Where the bodywork floor forms part of the spray-suppression system:

For this situation if the spray-suppression system does not comply with the relevant items from 1 to 37, they must comply with the following items:

Mudguards:

38. Mudguards must cover the zone immediately above the tyre or tyres. Their front and rear extremities must extend at least to the horizontal plane that is tangent to the upper edge of the tyre or tyres (Figure 4a, 4b).

However, the rear extremity may be replaced by the rain flap, in which case this must extend to the upper part of the mudguard (or equivalent component).

39. All of the inner rear part of the mudguard must be fitted with a spray-suppression device that meets the requirements of EC Directive 91/226/EEC.

Outer valances:

40. In the case of single or multiple axles where the distance between the adjacent tyres is at least 250 mm, the outer valance must cover the surface extending from the lower to the upper part of the mudguard up to a straight line formed by the tangent to the upper edge of the tyre or tyres and lying between the vertical plane formed by the tangent to the front of the tyre and the mudguard or rain flap located behind the wheel or wheels (Figure 4b).

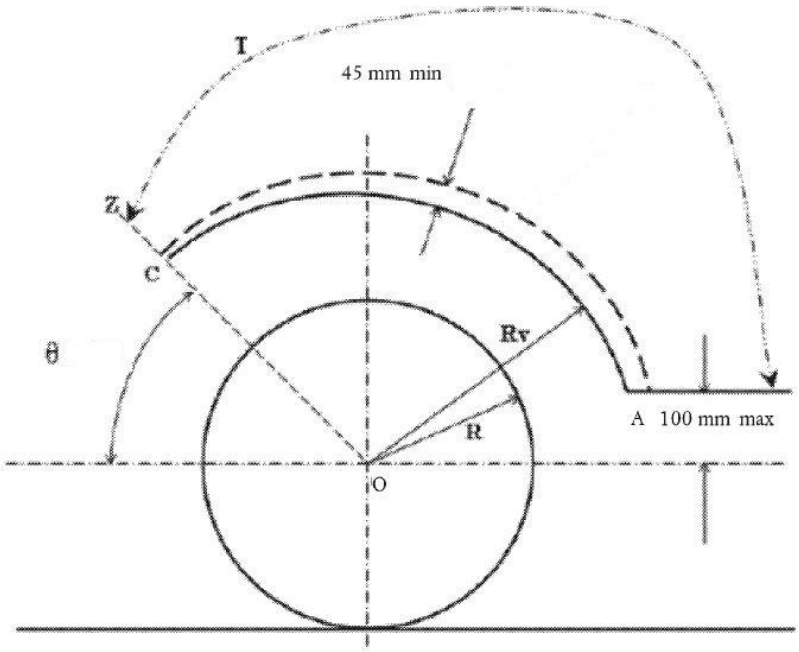
In the case of multiple axles an outer valance must be located by each wheel.

41. No openings enabling spray to emerge are allowed between the outer valance and the inner part of the mudguard.

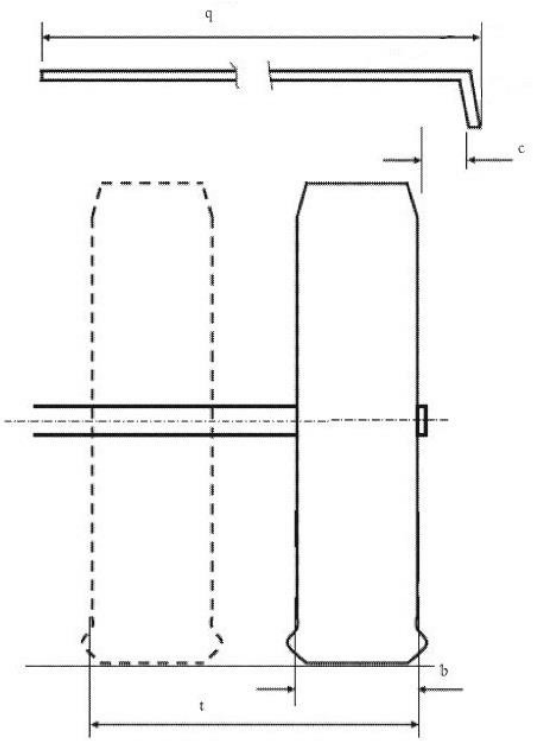
42. Where rain flaps are not fitted behind each wheel (see items 22, 23), the outer valance must be unbroken between the outer edge of the rain flap to the vertical plane that is tangent to the point furthest to the front of the tyre (Figure 4a) of the first axle.

43. The entire inner surface of the outer valance, the height of which must not be less than 100 mm, must be fitted with an energy-absorption spray-suppression device complying with the requirements of EC Directive 91/226/EEC.

Figures 1a and 1b – Dimensions of mudguard and outer valance



(a)



(b)

Figure 2 – Position of mudguard and rain flap

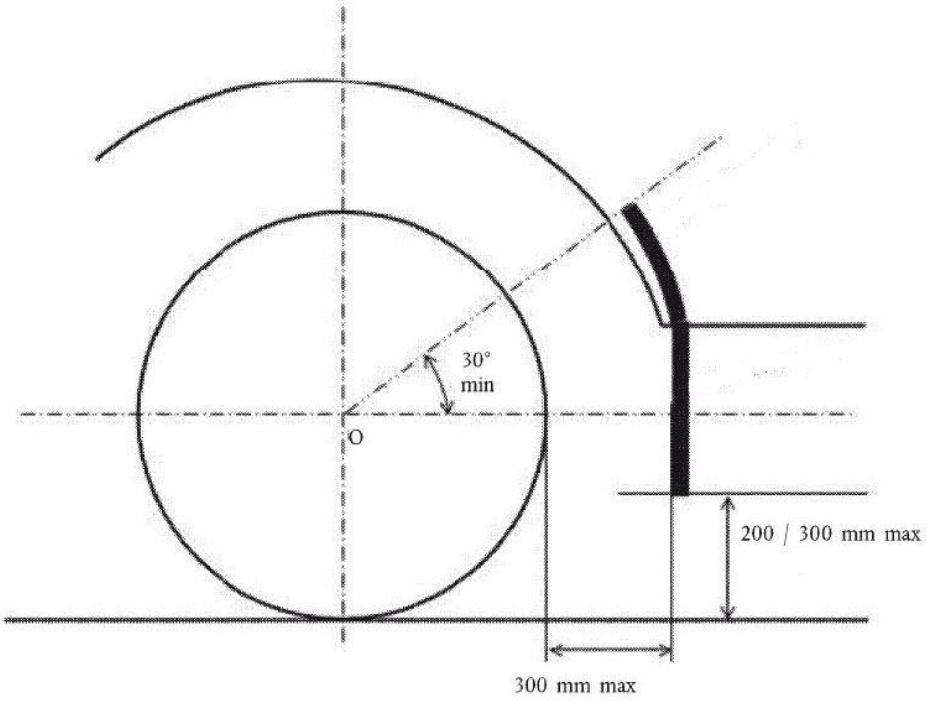
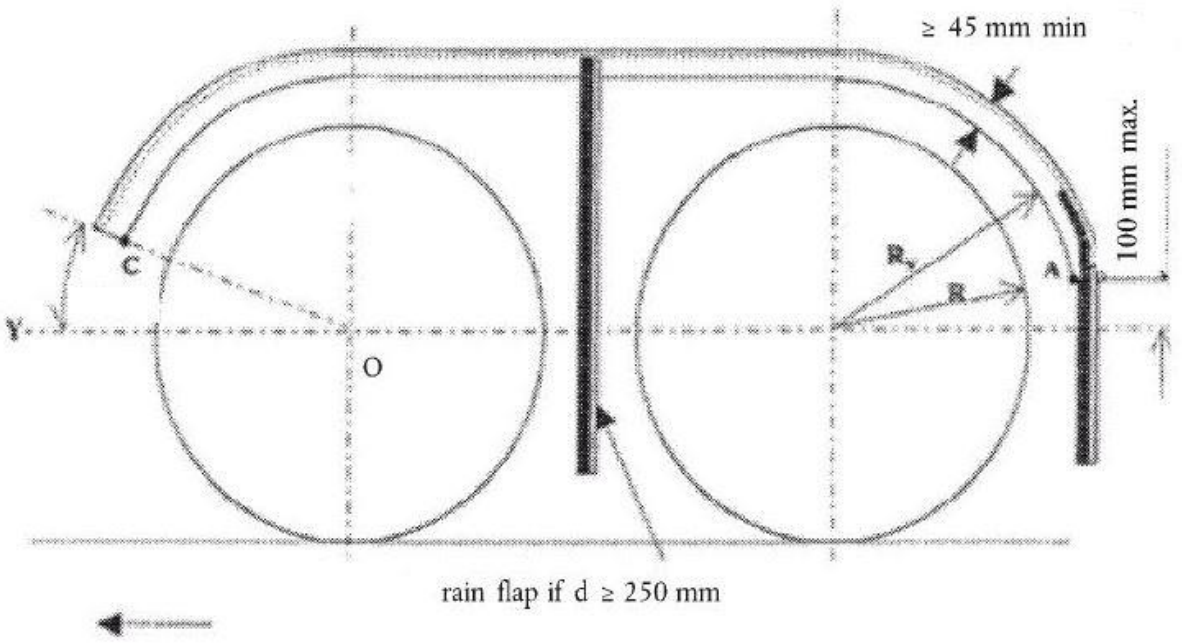
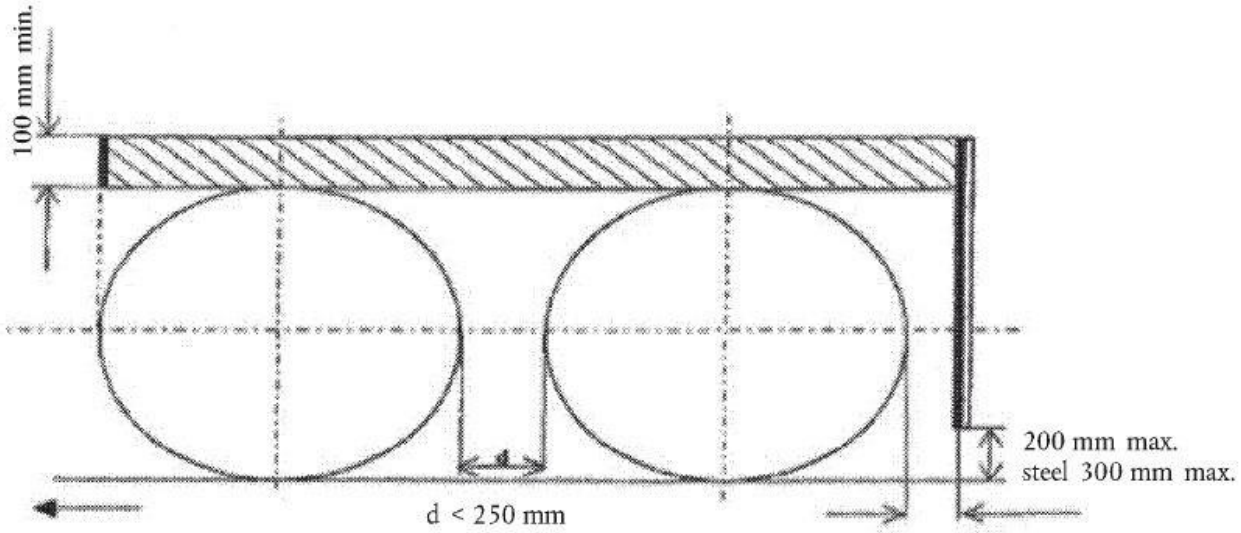


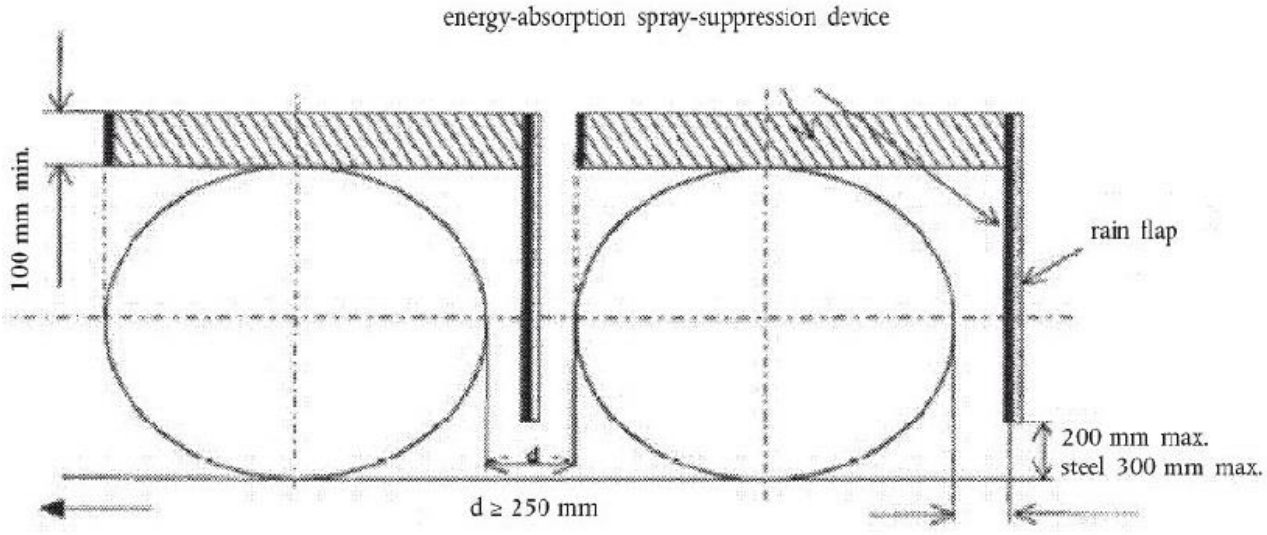
Figure 3 – Diagram showing assembly of spray-suppression system (mudguard, rain flap, outer valance) incorporating spray-suppression devices (energy absorbers) for multiple axles



Figures 4a and 4b – Diagrams showing assembly of a spray-suppression system incorporating spray-suppression devices (energy absorbers) for axles fitted with non-steered or self-steering wheels

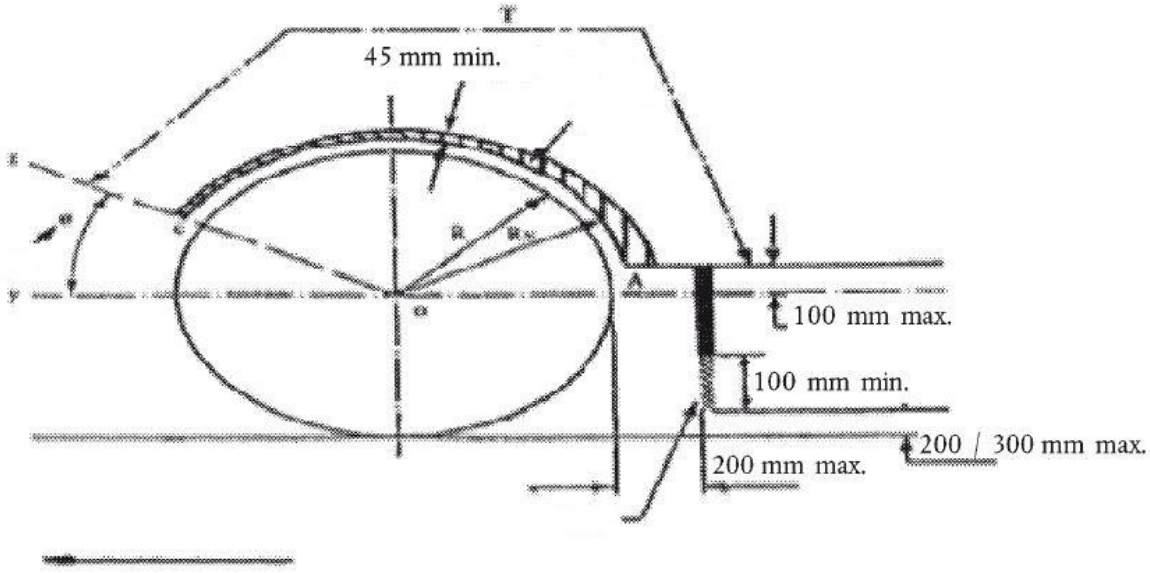


(a) Multiple axles where the distance between the tyres is less than 250 mm

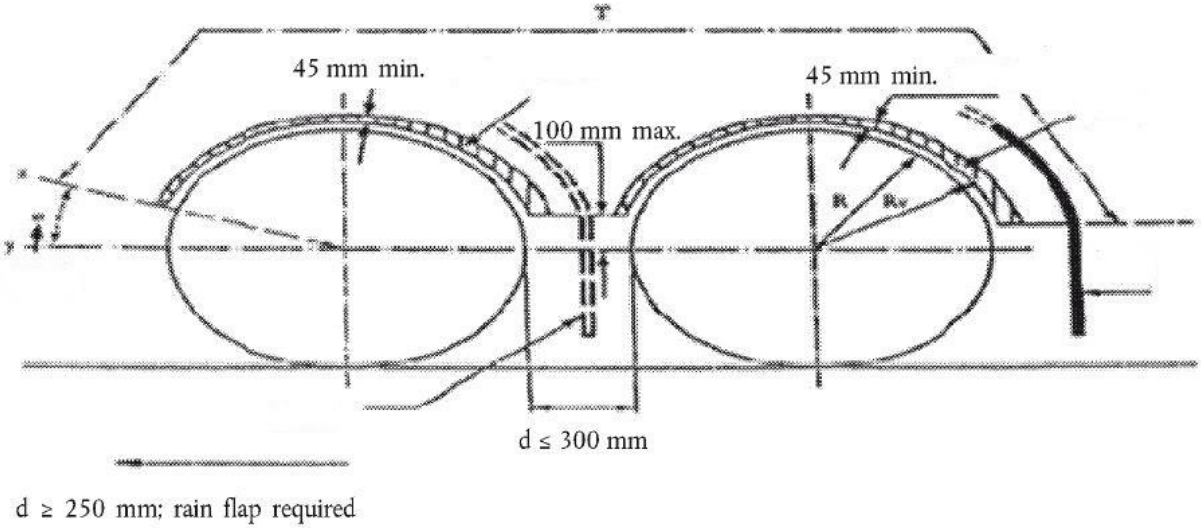


(b) Single axles or multiple axles where the distance between the tyres is greater than 250 mm

Figures 5 – Diagram showing assembly of a spray-suppression system incorporating spray-suppression devices fitted with air/water separators for axles fitted with steered, non-steered or self-steering wheels



Figures 6 – Diagram showing assembly of a spray-suppression system incorporating spray-suppression devices (mudguard, rain flap, outer valance) for multiple axles where the distance between the tyres does not exceed 300 mm



T: Extent of mudguard

e) Lateral Protection:

Every vehicle and trailer shall be so constructed and/or equipped as to offer, when a complete entity, effective protection to unprotected road users (pedestrians, cyclists, motorcyclists) against the risk of falling under the sides of the vehicle and being caught under the wheels.

The following vehicles are exempt from these requirements:

Vehicles of the following categories need not comply with the requirements for lateral protection
• Tractors for semi-trailers. • 'Slung' trailers and other similar trailers specially designed and constructed for the carriage of very long loads of indivisible length such as timber, logs steel bars or other very long items. • Vehicles designed and constructed for special purposes where it is not possible, for practical reasons, to fit such lateral protection. ***Please fill out the Exemption Justification Form (In Annex VI below) and send to NSAI before work commences to ensure that exemption will be granted.***

Body Builders quality systems and control plans shall identify what lateral protection is required for all builds and provide for it during the build.

Vehicles and trailers shall be deemed to satisfy the requirements set out in the opening paragraph if their side parts provide protection conforming to the provisions below. This can be achieved by:

- The design of the vehicle or trailer, or
- By the fitting of side-guards to the vehicle or trailer.

Lateral protection components must meet the dimensional requirements set out below but also, must meet the following strength requirements:
LPD shall be considered suitable if they are capable of withstanding a horizontal static force of 1kN applied perpendicularly to any part of their external surface by the centre of a ram the face of which is circular and flat, with a diameter of 220mm +/- 10 mm, and if the deflection of the device under load measured at the centre of the ram is then not more than:

- 30 mm over the rearmost 250 mm of the device; and
- 150 mm over the remainder of the device.

These strength requirements can be verified with the following methods:

- A type approval certificate to regulation 73 from the component manufacturer
- A test report from a physical test carried out on a representative design
- A test report from a virtual test carried out using some Finite Element Analysis software such as Ansys, SolidWorks etc.

Please see section J, Physical and Virtual Testing of Components for more information what is required from these reports.

Requirements for Lateral Protection

Side-guards, where fitted, shall be of adequate construction so as to provide effective protection to unprotected road users against the risk of falling under the sides of the vehicle and being caught under the wheels.

Note:
The following parts may be incorporated in the side-guard **as long as all of the dimensional requirements are met:**

- Battery box.
- Air tanks.
- Fuel tanks.
- Lamps.
- Reflectors.
- Spare wheels.
- Tool boxes.

Characteristics of the side guard

Side-guards shall comply with the required dimensional standards and have no protruding parts.

Note 1
If the sides of the vehicle/trailer are so designed and/or equipped that by their shape and characteristics **meet the dimensional and strength requirements** of this section, they may be regarded as replacing the side-guards.

Note 2
The upper edge of the guard shall not be more than 350mm below that part of the structure of the vehicle/trailer, cut or contacted by a vertical plane tangential to the outer surface of the tyres. See Figure 1 below.

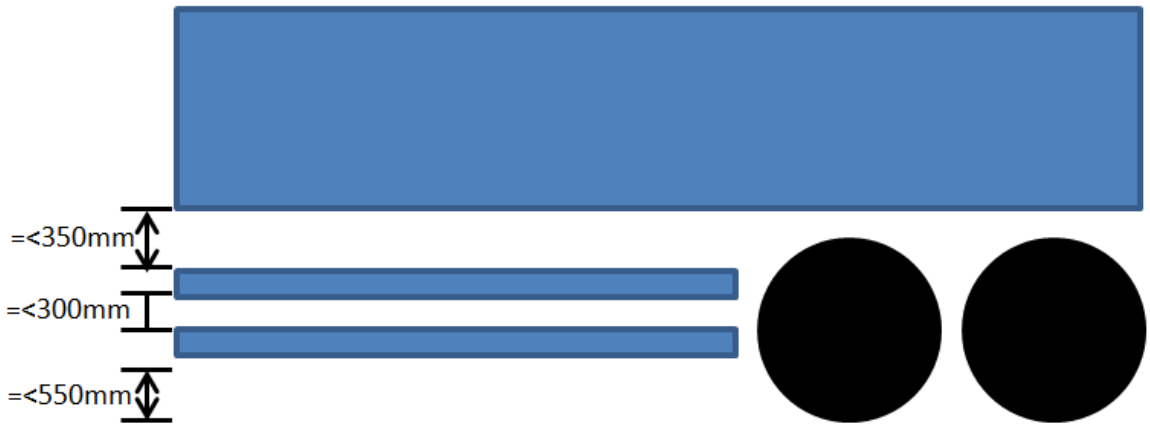


Figure 1

An exception is made in the following cases:

- Where the plane does not cut the structure of the vehicle (see Figure 2), the upper edge shall be level with the surface of the load carrying platform OR 950mm from the ground, whichever is the less.

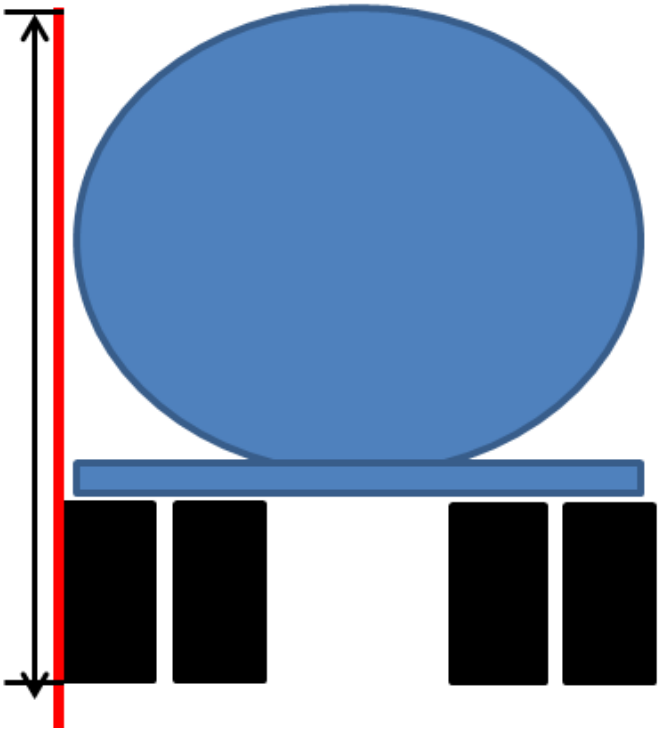


Figure 2

- Where the plane cuts the structure of the vehicle at a level more than 1.3m above the ground (see Figure 3 below), then the upper edge of the side guard shall not be less than 950mm above the ground.

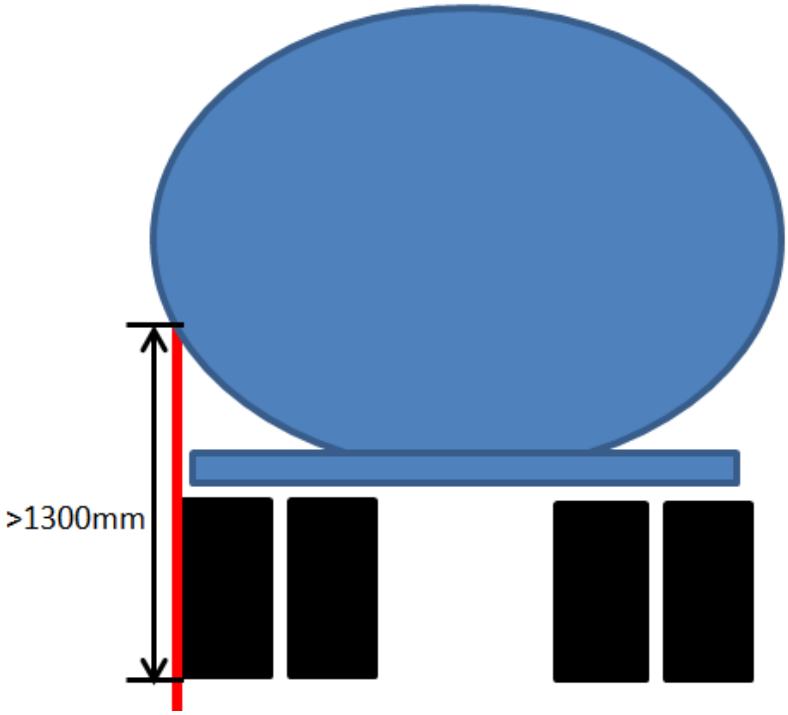


Figure 3

Note 3

Dome shaped bolt-heads and rivets of less than 10mm in height are acceptable.

Note 4

Combinations of surfaces and rails shall be considered as a continuous side-guard as long as the gaps between them are no greater than 25mm. See Figure 4 below.

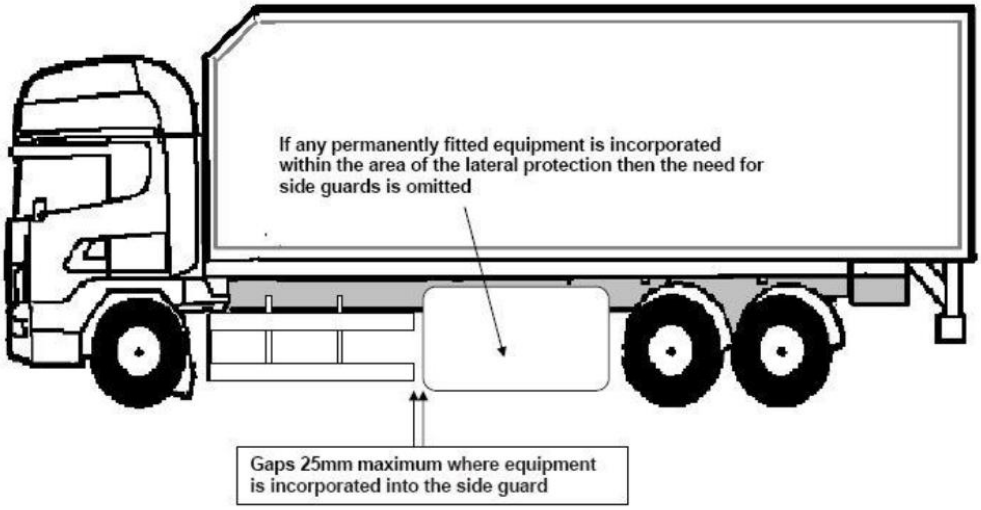


Figure 4

Note 5
If the vehicle cab is narrower than the body then the side guard must be angled to meet the cab.

If the guard complies with items **24, 25 or 26** then it is does not have to comply with items **27, 28 or 29.**

Equipment fitted to the vehicle

Any equipment that is incorporated into the side-guard area and which takes on the role of the guard shall comply with the dimensional requirements and have no protruding parts.

Requirements

1. There must be no modifications to the lateral protection system that could invalidate documentary evidence, unless the requirements can still be assured by an installation check.

2. The vehicle is accompanied by satisfactory evidence of compliance regarding the performance of the protective system.

3. A side-guard device must be fitted to the vehicle (unless exempt).

4. A side-guard device must be attached securely.

5. It must be attached as per manufacturer's instructions.

6. The side-guard must have a ground clearance of 550 mm or less.

7. The side-guard must be within 350 mm of the body line (see note 2).

8. The side-guard must be no more than 120mm inboard from the outermost plane of the vehicle.

9. The side-guard must consist of at least one horizontal rail.

10. If more than one horizontal rail is used, the rails must be not more than 300mm apart.

11. For N3 vehicles it must have a section height of at least 100 mm.

12. For N2 vehicles it must have a section height of at least 50 mm.

13. It must have a forward facing edge of at least 100 mm.

14. It must have a smooth or horizontally corrugated surface.

15. Any external edges and corners must be rounded with a radius of at least 2.5mm.

16. It must not increase the overall width of the vehicle.

17. The device must not be used for the attachment of air or hydraulic brake pipes.

18. There must be no projecting brackets or bolt-heads (see note 3).

19. It must be continuous in length (see note 4).

20. The device must have the rearward edge of the guard extend to within 300mm of the tyre on the first rear axle. See Figure 5 below.

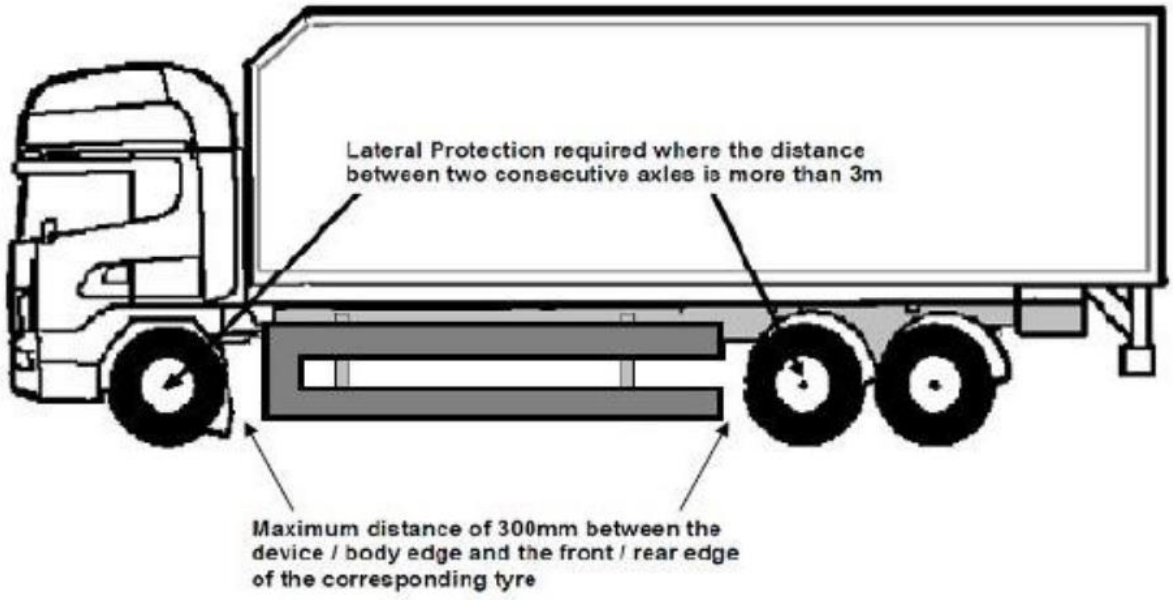


Figure 5

21. The device must not have the rearward end more than 30mm inboard from the outermost edge of the rear tyres over at least the last 250mm of the guard. See Figure 6 below.

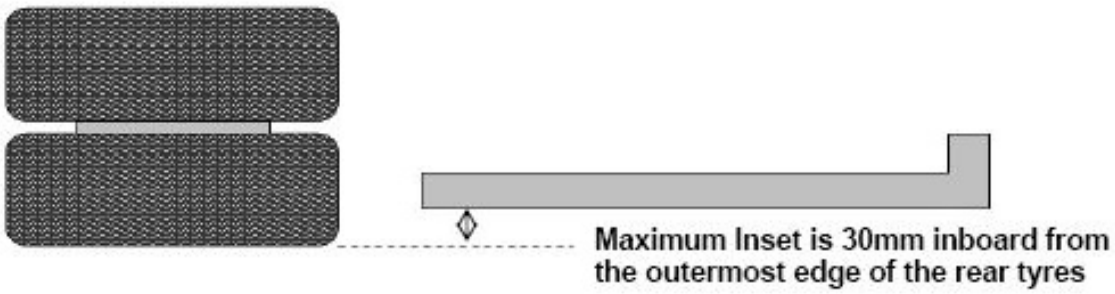


Figure 6

22. The device must have the front edge of the guard within 300 mm from the rear of the tyre on the front wheel (or second wheel if two front axles are fitted). See Figure 5 above.

Where the 300 mm dimension falls within the vehicles cab then:

23. The guard must be constructed as to meet the cab.

24. Where required, it must be turned inwards through an angle of not more than 45 degrees (see Note 5above).

25. It must have a gap of 100 mm maximum between the guard and the cab panel for tilting or suspended cabs.

Where the forward edge lies in otherwise open space then it must consist of:

26. A continuous vertical member extending over the whole height of the member.

27. The outer and forward faces must measure at least 50 mm rearward and be turned 100 mm inwards in the case of an N2 vehicle.

28. The outer and forward faces must measure at least 100 mm rearward and be turned 100 mm inwards in the case of an N3 vehicle.

Where equipment is incorporated into the side guard:

29. The device must have a smooth or horizontally corrugated outer surface.

30. It should be substantially flat or horizontally corrugated.

31. There must not be a gap of more than 25 mm between it and the guard.

32. There must be no projecting brackets or hinges.

33. It must not have protruding bolt heads.

34. Any external edges and corners must be rounded with a radius of at least 2.5mm.

Adjacent parts may however overlap provided that:

35. They have an overlapping edge that faces rearwards.

36. They have an overlapping edge that faces downwards.

f) Rear Under-Run Protection:

Every vehicle and trailer shall be so constructed and/or equipped as to offer, when a complete entity, effective protection against under-running by category M1 and N1 vehicles.

Vehicles and trailers shall be deemed to satisfy the requirements set out in the opening paragraph if they conform to the provisions below. This can be achieved by:

- Fitting a type approved rear under run to the vehicle and providing approval certificates as part of the vehicle approval file.
- Designing and fitting a rear under run and showing evidence of compliance with the dimensional and strength requirements as below.
- Showing that the rear construction of the fitted body complies with dimensional and strength requirements as below.

Strength requirements of non-approved devices can be shown by testing the components as per section J, Physical and Virtual Testing of Components.

Body Builders quality systems and control plans shall identify:

- What rear under-run protection is required for all builds and provide for it during the build.
- Attachment of rear under-run protection device to vehicle/trailer by:
    - Suitable bolting or
    - Combination of suitable bolting and welding.
- Suitable bracing/gusseting of rear under-run protection device.

When choosing a type approved rear under run, it should be ensured that it is suitable for the vehicle paying particular attention to the following points:

- Each rear under run will have a maximum permissible mass of vehicle that it can be fitted to. This information is on the Type Approval certificate.
- Each rear under run will come with manufacturers mounting instructions. These will have to be followed. If these mounting instructions cannot be followed due to the design of the vehicle then an alternative rear under run should be selected.
- The rear under run must be bolted back to the chassis using the manufacturer's brackets. Additional bodybuilder's brackets that have not been tested with the set up are not permitted.

For NSSTA approvals, the "Type" of rear under-run protection device means:

- Devices which do not differ essentially with respect to the following main characteristics:
    - Shape.
    - Dimensions.
    - Attachment.

- Materials.

This means that it is possible that one “Type” of rear under-run protection device can be suitable for different base vehicles.

Minimum Installation Requirements for Rear Under-run Protection devices

1. The device must be fitted as close to the rear of the vehicle as possible. When the vehicle is unladen the lower edge of the device must at no point be more than 550mm above the ground.

2. The width of the device must at no point exceed the width of the rear axle measured at the outermost points of the wheels, excluding the bulging of the tyres close to the ground, nor must it be more than 100mm shorter on either side. Where there is more than one rear axle, the width to be considered is that of the widest rear axle.

3. The section height of the cross-member must be not less than 100mm. The lateral extremities of the cross-member must not bend to the rear or have a sharp outer edge; this condition is fulfilled when the lateral extremities of the cross-member are rounded on the outside and have a radius of curvature of not less than 2,5 mm.

4. The device may be so designed that its position at the rear of the vehicle can be varied. In this event, there must be a guaranteed method of securing it in the service position so that any unintentional change of position is precluded. It must be possible for the operator to vary the position of the device by applying a force not exceeding 40 daN.

5. The device must offer adequate resistance to forces applied parallel to the longitudinal axis of the vehicle, and be connected, when in the service position, with the chassis side-members or whatever replaces them.

6. This requirement will be satisfied if it is shown that both during and after the application of the forces; the horizontal distance between the rear of the device and the rear extremity of the vehicle does not exceed 400mm at any of the points P1, P2 and P3. In measuring this distance, any part of the vehicle which is more than 3000mm above the ground when the vehicle is unladen must be excluded.

7. Points P1 are located 300mm from the longitudinal planes tangential to the outer edges of the wheels on the rear axle.

8. Points P2, which are located on the line joining points P1, are symmetrical to the median longitudinal plane of the vehicle at a distance from each other of 700mm to 1000mm inclusive, the exact position being specified by the manufacturer.

9. The height above the ground of points P1 and P2 must be defined by the vehicle manufacturer on the rearward face of the device. The height must not, however, exceed 600mm when the vehicle is unladen.

10. P3 is the centre-point of the straight line joining points P2.

Loads Required for Physical and Virtual Testing of Rear Underrun Protection Devices

11. A horizontal force corresponding to 25 % of the maximum technically permissible mass of the vehicle but not exceeding 50 kN must be applied successively to both points P1 and to point P3.

12. A horizontal force corresponding to 50 % of the maximum technically permissible mass of the vehicle but not exceeding 10 kN must be applied successively to both points P2.

13. The forces specified above must be applied separately. The order in which the forces are applied may be specified by the manufacturer.

14. Whenever a physical test is performed to verify compliance with the above mentioned requirements, the following conditions must be fulfilled:

    - The device must be connected to ta fixed structure representative of the chassis side-members of the vehicle so as to simulate its true position

    - The specified forces must be applied by rams which are suitably articulated (e.g. by means of universal joints) and must be parallel to the median longitudinal plane of the vehicle via a surface not more than 250mm in height (the exact height must be indicated by the manufacturer) and 200mm wide, with a radius of curvature of 5 ± 1 mm at the vertical edges.

    - The centre of the surface is placed successively at points P1, P2 and P3.

g) Braking:

All builds that require modification(s) of any kind to the brake system, will require a brake test and brake system inspection, carried out by an ATC.

As a minimum, Body Builders quality systems and control plans shall identify:

- What, if any, changes are made to the braking system during all stages of the build.
- Any additional components needed for the braking system shall be of the same:
    - Material
    - Specification
    - Fitting attributes

As provided by the base vehicle manufacturer (eg. brake lines, connectors, reservoirs etc).

- Fitting of an additional axle will require the following minimum requirements:
    - Appropriate UN-ECE R13 axle test report for additional axle.
    - Must be done in accordance with base vehicle manufacturer specifications.
        - If base vehicle manufacturer has not provided for fitting of an additional axle then Body Builder must consider at least the following:
            - Base vehicle braking approval will be invalidated by fitting of additional axle.
            - Base vehicle cannot be assumed to be designed to take the additional load the extra axle will allow.
            - Transmission may not be suitable for the additional load.
            - Additional full EC/UN brake testing will be required.
    - If not already provided for by the base vehicle manufacturer, fitting of additional air reservoir.
    - Fitting of appropriate ABS sensor and modulator (eg, going from a 2-axle vehicle to a 3-axle vehicle then the ABS system will need to go from a 2S/2M system to a 3S/3M system, etc).
    - "Teeing" of additional axle brake system into the air supply for any of the axles provided with the base vehicle is not allowed.
    - EBS.
    - Response time test as per UN-ECE R13 Annex 6.
    - There may be other items not covered above that will need to be discussed with NSAI.
- Trailers of category O1 and O2 shall be fitted with a breakaway cable (see Additional Requirements for Trailers, below).

Braking requirements for all vehicles

Definitions

Braking system:
Means the combination of parts 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 has already halted.

Control:
Means the part actuated directly by the driver (or in the case of some trailers, by an assistant) to supply to the transmission the energy required for braking or controlling it. This energy may be the muscular energy of the driver, or energy from another source controlled by the driver or in appropriate cases the kinetic energy of a trailer, or a combination of these various kinds of energy.

Continuous braking:
Means the braking of combinations of vehicles through an installation having the following characteristics:

- A single control which the driver actuates progressively, by a single movement, from his driving seat
- The energy used for braking the vehicles constituting the combination of vehicles is supplied from the same source (which may be the muscular energy of the driver)
- The braking installation ensures simultaneous or suitably phased braking of each of the constituent vehicles of the combination, whatever their relative positions.

Semi-continuous braking:
Means the braking of combinations of vehicles through an installation having the following characteristics:

- A single control which the driver can actuate progressively, by a single movement, from his driving seat
- The energy used for braking the vehicles constituting the combination of vehicles is supplied from two different sources (one of which may be the muscular energy of the driver)
- The braking installation ensures simultaneous or suitably phased braking of each of the constituent vehicles of the combination, whatever their relative positions.

Automatic braking:
Means braking of the trailer or trailers occurring automatically in the event of separation of components of the combination of coupled vehicles, including such separation through coupling breakage, without the effectiveness of the
remainder of the combination being affected.

Inertia or “overrun” braking:
Means braking by utilising the forces generated by the trailer’s moving up on the towing vehicle.

Service Braking

1. The vehicle must be fitted with a service braking system that is completely independent of the control of the parking brake, capable of functioning on all wheels by a single means of operation, which will gradually increase or reduce the braking force through action of the control.

2. The ‘service’ braking system must be capable of being operated from the driving seat, whilst keeping both hands on the steering wheel. This does not apply to the controls for use by a disabled driver, providing

the adaptation allows him/her to control the steering at all times while operating either braking system.

3. The 'service' braking system must be capable of being operated to slow down the vehicle when it is moving in a forward or reverse direction.

Secondary Braking

4. The vehicle must be fitted with a split (dual) circuit brake system with each part of the system operating on at least 50% of the wheels (on each side), capable of operating in the event of a failure of the service brake or its power assistance. Vehicles equipped to tow braked trailers must be fitted with a trailer brake valve.

Parking

5. The 'parking' braking system must be capable of being operated from the driving seat, whilst keeping one hand on the steering wheel.

6. The 'parking' braking system must be capable of being operated and released whether the vehicle is stationary or moving.

7. The 'parking' braking system must be capable of being operated on at least 50% of the wheels enabling the vehicle to be held on an up or down gradient even in the absence of the driver.

8. The 'parking' braking system must be capable of being operated using a control which is independent of the service brake, and once applied capable of being maintained in the 'on' position solely by mechanical means.

Service Brake Control – Mechanical Components

Note 1: A linkage that incorporates a device that allows adjustment of the front/rear braking ratio (longitudinal braking distribution) may require adjustment prior to the brake performance test.

Hydraulic systems (including servo assisted):
Fully apply the control twice, first slowly and then rapidly each time to a point where sustained pressure can be held. Check for creep and sponginess.
If a vacuum servo is fitted, with the engine off, totally deplete the stored vacuum. Fully apply the service brake. Note whether the control can be felt to travel further when the engine is started. If operation is not detected, the vehicle should be re-checked with the brake partially applied.

Full power hydraulic braking systems:
Check that a warning system is fitted and is audible or visible to the driver.

All systems: Check security of all mechanical components, and where possible (without dismantling) that each brake assembly incorporates an adjustment/compensation capability to compensate for friction wear.

Assess the ability of the brake friction surfaces to dissipate energy sufficiently to maintain the required braking performance under all normal conditions (including long descents) without the occurrence of brake fade.

1. The brake pedal must be capable of being operated easily from the driving position without obstruction or abnormal hand/foot position and that the pedal (where fitted) has an anti-slip provision.

2. A brake control, actuating linkage or associated component must be fully accessible for maintenance purposes.

3. A brake control, actuating linkage or associated component must be complete, so that it functions correctly.

4. A brake control, actuating linkage or associated component must be of adequate strength so as not to be likely to fail prematurely.

5. A brake control, actuating linkage or associated component must be made of a material sufficiently durable so as not to be likely to fail prematurely.

6. A brake control, actuating linkage or associated component must not be obstructed in its travel nor foul parts of the vehicle.

7. A brake control, actuating linkage or associated component mounting/bracket must be of adequate strength so as not to be likely to fail prematurely.

8. A brake control, actuating linkage or associated component mounting/bracket must be secure to the vehicle structure.

9. A brake control, actuating linkage or associated component mounting/bracket securing method must be of adequate strength so as not to be likely to fail prematurely.

10. A brake control, actuating linkage or associated component pivot bearing/bush must be of adequate strength so as not to be likely to fail prematurely.

11. A brake control, actuating linkage or associated component pivot bearing/bush must be secure such that it is unlikely to become displaced.

12. Any brake control, actuating linkage or associated component pivot/linkage pins must be present and secure.

13. Any brake control, actuating linkage or associated component locking/retaining devices must be present and secure.

14. With the brake control fully applied there must be sufficient reserve travel.

15. The brake control must not creep down while it is held under pressure.

16. There must not be an indication of 'sponginess' when the brake control is operated, indicating air in the system.

17. The brake control must be applied with no air/hydraulic leak.

18. When the brake control is applied and the engine started a dip must be felt, indicating that vacuum assistance is working satisfactorily.

19. On a full power hydraulic braking system a warning device must be fitted, operative, and visible to the driver, including in darkness.

20. All brake mechanical components must be secure, with relevant securing bolts, locking devices, retaining device etc present and secure.

21. A brake assembly on a FRONT axle of a vehicle must incorporate a means of automatically compensating for friction material wear.

22. A brake assembly on a REAR axle of a vehicle must incorporate either a manual or automatic means of compensating for friction material wear.

23. The brake friction surfaces must have sufficient capacity to dissipate heat and prevent fade.

24. It must not be possible to manually adjust braking rates between axles.

Park Brake Control – Mechanical Components

With the brake in both the on and off positions, check the lever, actuating linkage, cables and associated components for suitability of design, construction methods/materials, location, and mounting/fixing to vehicle structure.

1. A parking brake lever, actuating linkage, cable or associated component must be complete so that it functions correctly.

2. A parking brake lever, actuating linkage, cable or associated component must be of adequate strength so as not to be likely to fail prematurely.

3. A parking brake lever, actuating linkage, cable or associated component must be made of a material sufficiently durable so as not to be likely to fail prematurely.

4. A parking brake lever, actuating linkage, cable or associated component must not be obstructed in its travel nor foul parts of the vehicle.

5. A parking brake lever, actuating linkage, cable or associated component mounting / bracket must be secure to the vehicle structure.

6. A parking brake lever, actuating linkage, cable or associated component mounting / bracket securing method must be of adequate strength so as not to be likely to fail prematurely.

7. A parking brake lever, actuating linkage, cable or associated component pivot bearing / bush must be of adequate strength so as not to be likely to fail prematurely.

8. A parking brake lever, actuating linkage, cable or associated component pivot bearing / bush must be secure such that it is unlikely to become displaced.

9. A parking brake lever, actuating linkage, cable or associated component pivot / linkage pins must be present and secure.

10. A parking brake lever, actuating linkage, cable or associated component locking / retaining devices must be present and secure.

11. The parking brake ratchet pawl must engage positively with the ratchet teeth.

12. A lever operated parking brake must not disengage when the lever is knocked on each side and on the top.

13. A lever operated brake must be able to be positively held at a position of further travel.

14. An electrically operated parking brake switch must be protected from inadvertent use. As an alternative, with the ignition off, the switch must be capable of applying the brake, but must not be capable of releasing the brake.

15. The parking brake mechanism must incorporate a means of compensation between all brake assemblies operated by the parking brake control, and a means of adjustment to compensate for wear.

Hydraulic and Vacuum Systems

Where practicable, check all hydraulic and vacuum components for suitability of design, construction methods and materials, location, and mountings/fixings to the vehicle structure or other components.

All components must be suitable to withstand the stresses, vibration, corrosion and ageing (allowing for routine maintenance) to which they may be subject.

Compression joints of the type using separate ferrules are not considered suitable for joints on hydraulic brake lines other than in the case of a hose designed for a high pressure application that incorporates an inner sleeve in the compression fitting.

Check for leaks in any part of the braking system, with or without the brake applied. For vehicles fitted with a vacuum servo or power braking system, the engine must be running during the inspection.

1. A hydraulic and vacuum component must be complete, so that it functions correctly.

2. A hydraulic and vacuum component must be of adequate strength so as not to be likely to fail prematurely.

3. A hydraulic and vacuum component must be made of a material sufficiently durable so that it is unlikely to fail prematurely.

4. A hydraulic and vacuum component mounting/bracket must be secure to the vehicle structure or other components.

5. A hydraulic and vacuum component mounting/bracket must be of adequate strength so as not to be likely to fail prematurely.

6. A hydraulic and vacuum component mounting/bracket securing method must be of adequate strength and unlikely to fail prematurely.

7. A brake pipe or hose must not be fouled by moving parts.

8. A brake pipe or hose must not be kinked, stretched, or twisted.

9. A brake pipe or hose must be adequately clipped or otherwise supported.

10. A brake pipe or hose must have suitable joint fittings.

11. A brake pipe or hose must not be exposed to excessive heat.

12. A hydraulic/vacuum component must not be subject to a corrosive environment
and likely to fail prematurely.

13. Components must not leak due to constructional defects.

14. A fluid reservoir filling port must be easily accessible.

15. A fluid reservoir cap must be present and secure.

16. It must be possible to check the fluid relative to the manufacturer's specified
minimum level on all brake fluid reservoirs by the actual fluid level being visible through a transparent section of the reservoir, with the minimum level marked permanently on or adjacent to this section. As an alternative, a red warning lamp must be capable of illuminating when the reservoir fluid falls to the

minimum level.

17. Where a warning lamp is provided as the only means of checking the fluid level

without opening the reservoir it must be secure, operational, visible during daylight and darkness from the driving position, and fitted with a “test facility” that enables its operation to be checked from the driving position without opening the reservoir.

18. The hydraulic system must be fitted with a red warning lamp, sensitive to line pressure and capable of signalling the failure of any part of the hydraulic system as soon as the brake is applied and remaining lit as long as the failure exists (with the ignition switched on). As an alternative, the warning lamp must be sensitive to the reservoir fluid level, providing the reservoir is directly connected to supply the pressure side of the master cylinder when the piston is in the “brakes off” position, so that a failure of either part of a split system would result in a continuous draining of the reservoir fluid when the control is released (see Note 2).

19. The hydraulic system failure warning lamp must be secure, operational, visible during daylight and darkness from the driving position, identifiable (i.e. labelled in a recognised form – see diagram 1 for an example) and fitted with a “test facility” that
enables its operation to be checked from the driving position without opening the reservoir.

20. If the vehicle is fitted with an anti-lock braking system, all components must be present, undamaged, secure, and connected so that the system is likely to function as intended.

21. If the vehicle is fitted with an anti-lock braking system an operational warning lamp must be fitted to monitor the system, visible from the driving position, which operates when the anti-lock is energised, and extinguishes at the latest when the vehicle speed reaches 18km/h.

Note 2: in the case of a conventional split system (with or without vacuum assistance) it will be assumed that a failure will result in the draining of the fluid.
Evidence will be required, for example, in the case of a full power hydraulic system.

Note 3: It may be necessary to confirm the fluid circuit through the master cylinder by documentary evidence.

Note 4: One reservoir fluid warning lamp may fulfil the function of checking the fluid level and monitoring the hydraulic system providing both criteria are met.

Additional Requirements for Trailers

1. Trailers of category O1 need not be fitted with a service braking system; however,
if trailers of this category are equipped with a service braking system, this shall comply with the same requirements as those of category O2.

2. Trailers of categories O1 and O2 with a maximum mass greater than 1500kg shall be fitted with a breakaway cable. The following requirements apply:

- The breakaway cable shall apply the trailer brakes in the event of detachment.
    - For unbraked O1 trailers it is enough for the unbraked O1 trailer to be fitted with a breakaway cable which, in the event of detachment, can stop the drawbar from touching the ground and provide some residual steering action of the trailer.

- The breakaway cable shall be fitted with an attachment device that enables the cable to be fitted to any suitable drawing vehicle.

- The breakaway cable shall be fitted with a guide to ensure that the brake is applied with the trailer at any towing angle in the event of detachment.

3. Every trailer of category O2 shall be fitted with a service braking system either of the continuous or semi-continuous type or of the inertia (overrun) type.

4. Every trailer of category O3 or O4 shall be fitted with a service braking system of the continuous or semi-continuous type.

5. The service braking system shall act on all the wheels of the trailer.

6. The action of the service braking system shall be suitably distributed among the axles.

7. The action of every braking system shall be distributed between the wheels of each axle symmetrically in relation to the longitudinal median plane of the vehicle.

8. The braking surfaces required to attain the prescribed degree of effectiveness shall be in constant contact with the wheels, either rigidly or through components not liable to failure.

9. Wear of the brakes shall be easily compensated by a system of manual or automatic adjustment. In addition, the control and the components of the transmission and of the brakes shall possess a reserve of travel and if necessary, suitable means of compensation such that, when the brakes become heated or when the brake linings have reached a certain degree of wear, effective braking shall be ensured without immediate adjustment being necessary.

10. Wear adjustment shall be automatic for the service brakes. However, the fitting of automatic adjustment devices is optional for vehicles of categories O1 and O2.

Automatic wear adjustment devices shall be such that after heating followed by
cooling of the brakes, effective braking is still ensured. In particular, the vehicle shall remain capable of normal running after the tests conducted in accordance with Annex II, point 1.3 (Type I test) and Annex II, point 1.6 (Type III test).

11. It shall be possible to easily check the wear on service brake linings from the outside or underside of the

vehicle, utilising only the tools or equipment normally supplied with the vehicle; for instance, by the provision of appropriate inspection holes or by some other means.

12. The braking systems shall be such that the trailer is stopped automatically if the coupling separates while the trailer is in motion. However, this requirement does not apply to trailers with a maximum mass not exceeding 1.5 metric tons provided that the trailers are fitted, in addition to the main coupling, with a secondary coupling (chain, cable, etc.), which, in the event of separation of the main coupling, can stop the drawbar from touching the ground and provide some residual steering action on the trailer.

13. On every trailer which is required to be fitted with a service braking system, parking braking shall be ensured even when the trailer is separated from the towing vehicle. It shall be possible for a person standing on the ground to actuate the parking braking system; however, in the case of a trailer used for the carriage of passengers, it shall be possible to actuate this braking system from inside the trailer. The expression 'actuate' also covers the action of releasing.

14. If the trailer is fitted with a device enabling compressed-air actuation of the braking system, other than the parking braking system, to be cut out, the device shall be so designed and constructed that is positively restored to the 'at rest' position not later than on the resumption of the supply of compressed air to the trailer.

15. Trailers of categories O3 and O4 fitted with a two-line air supply system. In the case of a fracture or leak in one of the air supply lines (or in such other type of connection as may be adopted), it shall nevertheless be possible for the driver to fully or partially actuate the trailer brakes, by means either of the service braking system control or of the secondary braking system control or of the parking braking system control, unless the fracture or leak automatically causes the trailer to be braked with the following braking performance:

- The automatic braking performance in the event of a total pressure loss in the air supply line, when testing the laden vehicle from 40 km/h, shall not be less than 13.5 % of the maximum stationary wheel load.

- Wheel-locking at performance levels above 13.5 % is permitted.

16. Trailers of categories O3 and O4 shall be equipped with anti-lock systems in accordance with the Anti-Lock Braking System requirements of EC Directive 71/320/EC and or UNECE R13.

17. If trailers not mentioned in point 15. Above are fitted with anti-lock systems, they shall comply with the Anti-Lock Braking System requirements of EC Directive 71/320/EC and or UNECE R13.

18. The auxiliary equipment shall be supplied with energy in such a way that during its operation, the service braking energy storage device(s) shall be maintained at a pressure of at least 80 % of the minimum towing vehicle supply pressure of at least 7 bar ([1]).

19. In the event of a break or leak from the auxiliary equipment or any associated pipes, the sum of the forces exerted at the periphery of the braked wheels shall be at least 80 % of the value prescribed for the trailers as outlined below:

- If the service braking system is of the continuous or semi-continuous type, the sum of the forces exerted at the periphery of the braked wheels shall be at least X % of the maximum stationary wheel load, X having the following values:

    - Full trailer, laden and unladen 50%
    - Semi-trailer, laden and unladen 45%
    - Centre-axle trailer, laden and unladen 50%

- Where the trailer is fitted with a compressed-air braking system, the pressure in the control line shall not exceed 6.5 bar ([1]) and the pressure in the supply line shall not exceed 7.0 bar ([1]) during the brake test.

([1]) The pressures specified here are relative pressures measured in bars.

h) Lighting/Conspicuity Markings:

All vehicles and trailers are required to have minimum lighting and conspicuity markings attached to them.

As a minimum, Body Builders quality systems and control plans shall identify:

- What additional lighting is required for the build.
- What conspicuity markings are required for the build.
- Location and positional requirements for the build.

The minimum requirements for lighting and conspicuity markings are those contained in UN-ECE R48.03 and S.I. No. 422 of 2011.
Please see UNE CE R48 on link address below for full detail on requirements:
https://www.unece.org/fileadmin/DAM/trans/main/wp29/wp29regs/2015/R048r10e.pdf
The following table is a summary of the minimum lighting and conspicuity marking requirements and is meant for use as guidance only.
In all instances UN-ECE R48.03 and S.I. No. 422 of 2011 shall be consulted for additional information, clarifications etc.

	Colour	Presence	Number	Arrangement	Position	Geometric Visibility	Orientation	Electrical Connections	Tell-Tale
Main Beam Headlight	White	Mandatory	2 or 4	No individual specification	Width / Height no specification		Towards to front, see R-48	May be switched on together or in pairs	Circuit closed tell-tale
Dipped Beam Headlight	White	Mandatory	2	No individual specification	W: ≤ 400mm from outer edge of vehicle. H: 500-200mm		Towards to front, see R-48	Control must switch off main + dipped together	Optional, see R-48
Front Fog Light	White or Yellow	Optional on prohibited trailers	2	No individual specification	W: ≤ 400mm H: 250-800mm		Towards to front, see R-48	Switch on + off independent of main lamps	Circuit closed tell-tale mandatory
Reversing Lamp	White	Mandatory, optional on O1 trailers	1 mandatory 2nd optional	No individual specification	W - no requirement H - 250 - 1200 mm		Rearwards, see R-48	Only light when in reverse	Optional
Direction Indicators	Amber	Mandatory	6	2 front, 2 rear, 2 side	W: ≤ 400mm H: 350-1500mm	See R-48	See R-48	See R-48 can use amber side lamps M1	Visible or auditory or both

Hazard Warning	Amber	Mandatory	6	2 front, 2 rear, 2 side	W: ≤ 400mm H: 350-1500mm	See R-48	See R-48	See R-48	Circuit closed tell-tale see R-48
Stop Lamp	Red	Mandatory	2 S1 or S2 plus 1 S3 or S4	no special arrangements	See R-48	See R-48	Towards rear of vehicle	Must light up when brake applied	Optional, see R-48

Rear Registration Plate Lamp	White	Mandatory	Such that device illuminates the plate	see R-48	See R-48	See R-48	See R-48	See R-48	Optional
Front Position Lamp	White	Mandatory for M1	2	no special arrangements	W: ≤ 400mm H: 350-1500mm	See R-48	Forwards	See R-48	Circuit closed tell-tale
Rear Position Lamp	Red	Mandatory	2, see R-48	no special arrangements	W: ≤ 400mm H: 350-1500mm	See R-48	Rearwards	See R-48	Circuit closed tell-tale see R-48
Rear Fog Lamp	Red	Mandatory	1 or 2	no special arrangements	See R-48		Rearwards	See R-48	Circuit closed tell-tale
Parking Lamp	White Front, Red Rear	M1 optional, see R-48	2 front, 2 rear or 1 lamp on each side	front & rear or each side	W: ≤ 400mm H: 350-1200mm	See R-48	See R-48	See R-48	Optional, see R-48
End-Outline Marker Lamp	White Front, Red Rear		2 front, 2 rear	no special arrangements	W: ≤ 400mm H: see R-48	See R-48	See R-48	See R-48	Optional, see R-48
Rear Retro-Reflector Non Triangular	Red	Mandatory	2	no special arrangements	W: M1 no requirement H: 250-900mm	See R-48	Rearwards. May have parts in common with the illuminating surface of the other rear lamsp	n/a	n/a

Rear Retro-Reflector Triangular	Red	Trailers ONLY, see R-48+	2	Apex of ▲ directed upwards	See R-48	See R-48	Rearwards	n/a	n/a
Front Retro-Reflector Non-Triangular	White	Mandatory for M1 if forward lamps are concealable	2	No special arrangements	W ≤ 400mm H: 250-900mm	See R-48	Frontwards	n/a	n/a
Side Retro-Reflector Non-Triangular	Amber	M1 < 6m long, optional	See R-48	No special arrangements	W £ 400mm H: 250-900mm	See R-48	Towards the side	n/a	n/a
Side-Marker Lamps	Amber	M1 < 6m long, optional	See R-48	No special arrangements	See R-48	See R-48	Towards the side	See R-48	Optional
Daytime Running Lamp	White	Optional	2	No special arrangements	See R-48	See R-48	Towards the front	See R-48	Optional
Cornering Lamp	White	Optional	2	No special arrangements	See R-48	See R-48	See R-48	See R-48	None
Conspicuity Markings	white/yellow side, red/yellow rear	Prohibited on M1	See R-48						
Adaptive Front Lighting System (AFS)	White	Optional prohibited on trailers	1	No special arrangements	See R-48	See R-48	See R-48	See R-48	See R-48
Emergency Stop Signal	Amber or Red	Optional	See R-48	see R-48	See R-48	See R-48	See R-48	See R-48	See R-48

Geometric Visibility

When building on an incomplete chassis, the base vehicle will generally be supplied with the lights required. Some of these will however have to be repositioned to suit the fitted bodywork. The requirements for positioning in the table above should be followed.
Also, it should be ensured that the geometric visibility angle of each lamp is not obstructed. Please see examples in the figures below.

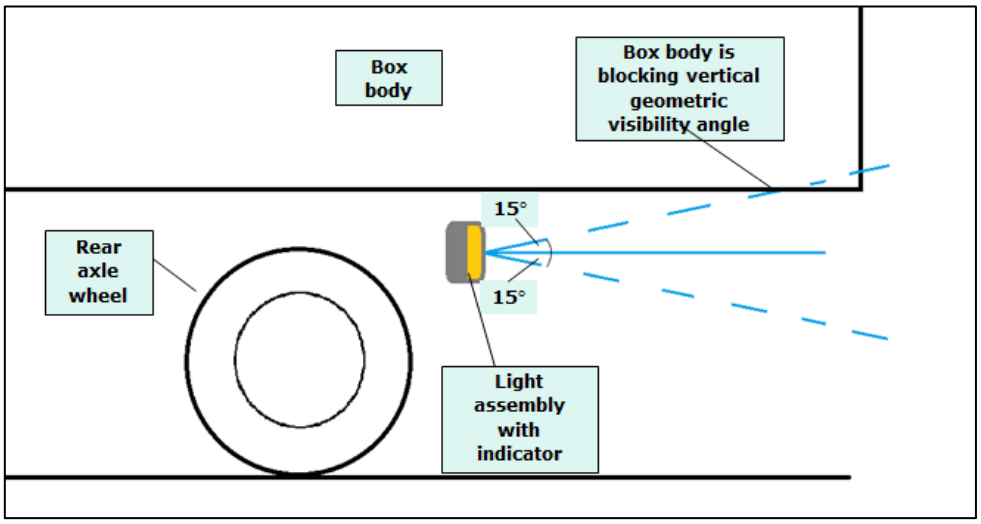


Figure 7

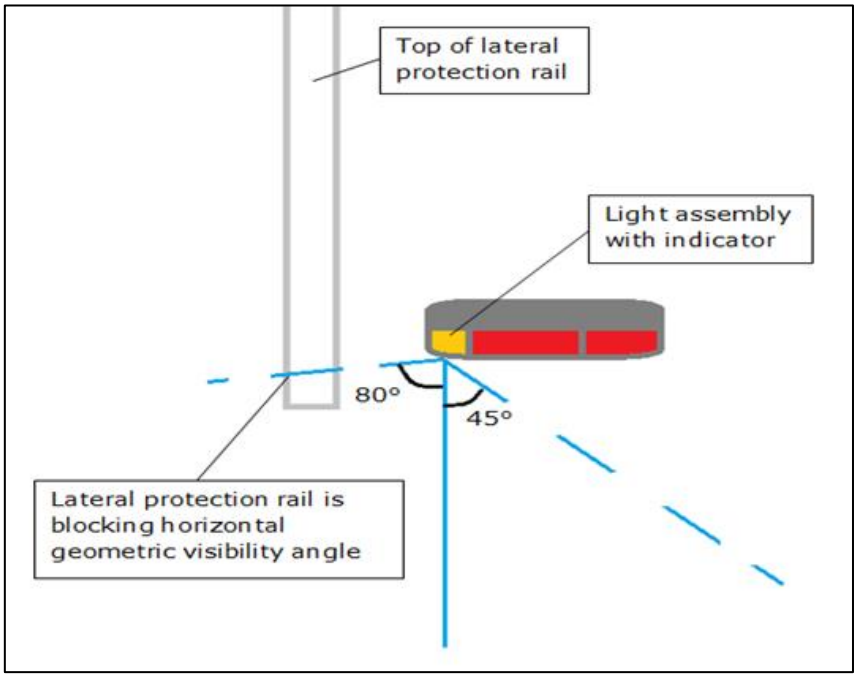


Figure 8

i) Attachment of Body/Tank etc to Vehicle/Trailer:

The attachment of the bodywork to the vehicle shall be done in accordance with the base vehicle manufacturer's instructions and good engineering practices.

As a minimum, Body Builders quality systems and control plans shall identify:

- The relevant base vehicle manufacturer's instructions.
- The completed bodywork has accommodated these instructions at the relevant stages of the build.
- The necessary equipment for positioning and attaching the bodywork to the base vehicle.

If swapping an existing body from an old vehicle to a new chassis cab, the body builder must ensure that the existing body is of sufficient quality and that the finished vehicle meets all relevant requirements i.e. plates, lamps, contour tape etc.

j) Physical and virtual testing of components:

For components such as lateral protection, rear under run and couplings which require load testing to be approved, the most straightforward thing for bodybuilders to do is to buy in components that are already e-marked.

However, we understand that in some cases there may be need for bodybuilders to design their own components. We can accept this approach if the bodybuilder can provide evidence of a physical or virtual test on the design showing that it meets the requirements of the respective regulation.

If a bodybuilder is carrying out testing with any of the methods below, they should discuss the testing requirements with NSAI beforehand to ensure that the test is done correctly, organise witness testing if required and to avoid having to re-test.

Virtual Testing

Virtual testing can be carried out using Finite Element Analysis software. Programs such as SolidWorks, Ansys, Autodesk and more can provide this facility. A virtual test report should include the following:

- Images of the model under test
- Detailed dimensioned drawings
- Loading and fixture conditions applied in line with the regulation
- Plots of stress and displacement distribution.
- Final relevant results

Physical testing

Physically testing can be carried out in house or by an independent tester and should be witnessed by a representative of NSAI. The equipment required to carry out the test will vary depending on the component to be tested but it must be fit to provide the required testing conditions. A report should be generated from the test and should include the following.

- Lots of images of the testing set up before during and after test
- Detailed drawings of the device under test
    - Should show method of mounting to the vehicle
    - Bill of materials should be included here also
- A step by step test procedure
- Images showing the final results readings (max deflection, any deformation that occurs)

Worst Case

When having a virtual or physical test carried out, it may be a good idea to think about other designs which may come about and try to include these in the same testing. If it can be shown the tested design is worst case i.e. that the alternative design will perform the same or better that that tested then we may be able to accept these for approval without further testing.

7. Vehicle Re-call:

As a minimum, Body Builders Quality Systems shall provide for vehicle re-call for the following situations:

- Completed vehicles owned by the Body Builder and sold directly to their client(s).
- Vehicles completed on behalf of dealers/distributors and returned to the dealer/distributor for subsequent sale.

1. Where it is necessary to re-call vehicles already sold, registered or put into service because one or more of the systems, components or separate technical units fitted to the vehicle as part of the Body Builders work, or any approved system, component or separate technical unit part of the base vehicle interfered with and/or modified etc, during the course of the Body Builders work; presents a serious risk to road safety, public health or environmental protection, the Body Builder shall immediately inform NSAI.

2. The Body Builder shall propose to NSAI a set of appropriate remedies to neutralise the risk referred to in paragraph 1. NSAI shall communicate the proposed measures to the Road Safety Authority (RSA) and National Consumer Agency (NCA) without delay.

3. If the measures are considered to be insufficient by the RSA and / or the NCA or have not been implemented quickly enough, they shall inform NSAI.

4. NSAI shall then inform the Body Builder. If NSAI is itself not satisfied with the measures of the Body Builder, it shall take all protective measures required, including the withdrawal of the vehicle approval where the Body Builder does not propose and implement effective corrective measures. In case of withdrawal of the vehicle approval, NSAI shall notify the Body Builder, the RSA and the NCA within 20 working days.

The following template shall be used for the notification of vehicle re-call:

Notification of Vehicle Re-Call

Base vehicle details: VIN: EC Type Approval Number: Manufacturer: Make: Trade name: Category: (M1, M2, M3, N1, N2, N3, O1, O2, O3, O4) Commercial Name(s):

Completed vehicle details:

VIN:
IVA Number:
NSSTA number:
Body Builder:
Body Builder Make description:
Body Builder Trade name:
Category:
(M1, M2, M3, N1, N2, N3, O1, O2, O3, O4)
Commercial Name(s): ???

The Safety Defect
???

List of vehicles affected (VINS)
???

Location and number of vehicles

Dealer(s)/Distributor(s)	Client(s) (if sold directly to clients)	Quantity	VIN(s)

The Proposed remedies/Corrective actions
???

8. Special Purpose vehicles:

Prior to the build, the Body Builder must first verify with NSAI that the completed vehicle will fall under the definition of Special Purpose Vehicle.

Consequently, due to the nature of the Special Purpose, the vehicle will not be able to comply with one, or more, of the National vehicle approval requirements. This must be identified by the Body Builders Quality System at the start of the build.

The particular requirements that the completed vehicle cannot comply with as a result of the special purpose nature of the vehicle, will need to be taken into account for the ATC inspections. For some special purpose vehicles, eg. Ambulances there is As a result, these shall be identified at the start, or as early into the build as possible.

Special Purpose Vehicles (SPV) are defined as follows:

"A vehicle of category M, N or O having specific technical features in order to perform a function which requires special arrangements and/or equipment".

For incomplete vehicles that are intended to fall into the SPV subcategory, the letter 'S' shall be added as suffix to the letter and numeral identifying the vehicle category.

Off road special purpose vehicle (ORV-SPV):

Means a vehicle that belongs either to category M or N having the specific technical features referred to for SPV above.

For those categories of vehicles, the letter 'G' shall be added as suffix to the letter and numeral identifying the vehicle category. Moreover, for incomplete vehicles that are intended to fall into the SPV subcategory, the letter 'S' shall be added as second suffix.

The various types of special purpose vehicles are defined and listed in the following table:

Name	Code	Definition
Motor caravan	SA	A vehicle of category M with living accommodation space which contains the following equipment as a minimum: (a) seats and table; (b) sleeping accommodation which may be converted from the seats;

		(c) cooking facilities; (d) storage facilities. This equipment shall be rigidly fixed to the living compartment. However, the table may be designed to be easily removable.
Armoured vehicle	SB	A vehicle intended for the protection of conveyed persons or goods with anti-bullet armour plating.
Ambulance	SC	A vehicle of category M intended for the transport of sick or injured persons and having special equipment for such purpose. The patient compartment shall comply with the technical requirements of Standard EN 1789:2007 on 'Medical vehicles and their equipment – Road ambulances' with the exception of Section 6.5 'List of equipment'.
Hearse	SD	A vehicle of category M intended for the transport of deceased persons and having special equipment for such purpose.
Wheelchair accessible vehicle	SH	A vehicle of category M 1 constructed or converted specifically so that they accommodate one or more persons seated in their wheelchairs when travelling on the road.
Trailer caravan	SE	A vehicle of category O as defined in term 3.2.1.3 of Standard ISO 3833:1977.
Mobile crane	SF	A vehicle of category N 3 , not fitted for the carriage of goods, provided with a crane whose lifting moment is equal to or higher than 400 kNm.
Special group	SG	A special purpose vehicle which does not enter in any of the definitions mentioned in this section.
Converter dolly	SJ	A vehicle of category O equipped with a fifth-wheel coupling to support a semi-trailer with a view to converting the latter into a trailer.
Exceptional load transport trailer	SK	A vehicle of category O 4 intended for the transport of indivisible loads that is subject to speed and traffic restrictions because of its dimensions. Under this term are also included hydraulic modular trailers irrespective of the number of modules.

9. Route to type approval once registered as an AVBB (IVA/NSSTA)

Once registered as an AVBB, access shall be given (username and password) to upload approval documents to the NSAI file sharing server "sharefile". Applications for type approval shall only be received through this server. Application documents can be uploaded by the AVBB applicant to NSAI sharefile and once approval is granted, NSAI shall upload the approval certificate also to same account for the AVBB to retrieve.

There are two routes available to approve a vehicle, Individual Vehicle Approval (IVA) or NSSTA (National Small Series Type Approval).

NSSTA applications may require an additional audit to be carried out before an application can be submitted. **As of 6th February 2017 all NSSTA applications shall be subject to NSAI NSSTA internal committee review. It shall be decided at this weekly committee whether an NSSTA can be issued without an on-site visit. Always contact NSAI before submitting an NSSTA application as NSSTA processing time can be longer than IVA**

Applying for Individual Vehicle Approval (IVA)

For standard IVA applications, the steps outlined below can be used. If in any doubt, contact NSAI beforehand to discuss

-**Download** and complete the most recent **NSAI IVA evaluation form** (available on NSAI website: http://www.nsai.ie/AVBB.aspx)
-Submit evaluation form plus requested attachments to NSAI for preliminary review (see flow chart) 2 weeks prior to ATC inspection. It must be stated on evaluation form which ATC is intended to use.
Documents to be included for preliminary review include (but not limited to, additional items may be requested):

- **NSAI evaluation form (most recent revision must always be submitted)**
- **Incomplete COC plus a statement of compliance[1] which indicates what approvals the incomplete base vehicle has. This must include the VIN of the vehicle**
- **Component certificates/test reports for additionally added equipment (RUP, lateral rail etc.)**
- **Drawings and any other technically relevant documents**
- **Photos of incomplete vehicle and any in build photos at time of submission**

NSAI shall review the documentation submitted and if all is in order, transfer required documents to ATC for inspection
-The AVBB **must themselves contact** an appropriate Approved Test Centre (ATC) to arrange for vehicle inspection (allowing for 2 weeks from the time of submission of preliminary documents to NSAI for preliminary review). NSAI may revert back if the intended ATC cannot be considered impartial or if their scope is insufficient for the required inspection
-The applicant must bring a weigh docket for the finished vehicle and completed mass calculation sheet (MCS) to the ATC at time of inspection
-Once ATC inspection is complete, the ATC should submit a copy of the ATC report to NSAI and also issue a copy of the ATC inspection report to the AVBB for their own records. The ATC may hold back on issuing the

[1] A statement by the base vehicle manufacturer/distributor to accompany an incomplete COC. It shall list all approvals for the incomplete vehicle. It shall assist NSAI in scheduling the ATC inspection, reducing requests for certs for OEM equipment e.g. rear under run, lateral rail fitted by base vehicle manufacturer,

ATC report if they find something is not in compliance with the vehicle. In such instances the vehicle should be taken away for whatever rework is required and brought back to the same ATC to check for compliance **Once the entire file is submitted to NSAI (technical documents, compliant ATC report, weigh docket + MCS) and reviewed in house by NSAI, if all is in compliance, an IVA certificate shall be issued for vehicle and uploaded by NSAI onto the AVBB sharefile account folder. NSAI endeavours to have IVA issue within 2 weeks of receipt of ATC report and all is in compliance.**

IMPORTANT: Incomplete files will not be opened and this will delay the time it will take to issue approval and registering the vehicle for end user

Applying for an NSSTA

NSSTA applications may require an additional audit to be carried out before an application can be submitted. As of 6th February all NSSTA applications shall be subject to NSAI NSSTA internal committee review. It shall be decided at this weekly committee whether an NSSTA application submitted can be issued without an on-site visit. Always contact NSAI before submitting an NSSTA application if an expedited approval is required

Check next section of AVBB manual below "elements of scheme for NSSTA" also. This shall assist in preparing file for NSSTA application and for determining type variant and version

For standard NSSTA applications (after discussion with NSAI), the steps outlined below can be used.
For NSSTA applications, a folder layout ZIP file is available. NSAI can forward this to the applicant prior to NSSTA submission

- **Download** and complete the most recent **NSAI NSSTA evaluation form** (available on NSAI website: http://www.nsai.ie/AVBB.aspx)
- **Submission to NSAI technical documentation and Quality control plans**
- **Second/third stage technical documentation to include:**
  - Detailed drawings (including material spec.) of the body styles (variants) to be covered. This must include overall dimensions (a range is acceptable for variations once within allowable limits)
  - Detailed type variant version matrix (see section 10 below for sample)
  - All components certificates and reports to cover representative vehicle and also variants for future builds. These variations must be accounted for in the type variant version matrix with appropriate coding
  - Mass calculation data for all variants
- **The body builder must have sufficient information on the base vehicle variant/versions that are to be included in the NSSTA (see section 3 above page 12 of 171 , base vehicle approval). Data as regards the incomplete variant/version must be included with application**
- **If variants within the NSSTA application involve a third party, for example a crane mounted by another AVBB, this third party AVBB must be listed as an assembly plant on the NSSTA application and a signed agreement between both must be included (sample of agreement Annex VI below). Plating arrangements for multi-party arrangements must also be developed**
- **NSAI shall review the technical file and advise on required test(s)**

- **AVBB Contact** an appropriate Approved Test Centre (ATC) to arrange for vehicle inspection. **Each variant to be covered in the NSSTA shall be required to have an ATC inspection**. This must be determined with NSAI prior to NSSTA submission hence always contact NSAI before submission of an NSSTA application
- Once ATC inspection is complete, the ATC should submit a copy of the ATC report to NSAI and also issue a copy of the ATC inspection report to the AVBB for their records. The ATC may hold back on issuing the ATC report if they find something is not in compliance with the vehicle. In such instances the vehicle should be taken away for whatever rework is required and brought back to the same ATC to check for compliance
- The entire file shall be reviewed in house by NSAI. If all is in compliance, an NSSTA certificate shall be issued for vehicle, uploaded by NSAI onto sharefile.
- Once an NSSTA is issued, the responsibilities of the NSSTA approval holder must be ensured. NSSTA requirements throughout this manual must be adhered to

Applying for an extension to an NSSTA

NSSTA's are issued based on the vehicle and its variants as finished at time of submission of application. If new variants need to be added or changes to the vehicle arise, this can be dealt with by an "extension" to the NSSTA

Examples why an NSSTA may need to be extended:

- addition of new variants or versions
- update of base vehicles approval
- change to the design/materials or new components added

A cover letter outlining reason for extension along with all relevant documentation i.e. Updated NSAI evaluation form, ATC report for new variants, technical details of change etc. should be uploaded to "sharefile". **If in doubt, contact NSAI for details**

Determining whether a new order is covered by an NSSTA issued

If as the holder of an NSSTA, you receive a new vehicle order, it must be checked at contract review stage whether the specification of the requested order is covered by an NSSTA held.

To assist with this, the following Items must be checked:

- The incomplete base vehicles type variant version is covered by the NSSTA (listed on page 3 of NSSTA cert) and have stayed within the type definition (See section 10 below)?
- The base vehicles EC approval number and its extension number covered by the NSSTA (listed on page 3 of NSSTA cert)?
- The body description is covered by the variants in the NSSTA (listed on page 3 of NSSTA cert)?
- The vehicles overall dimensions and masses are covered in the NSSTA application?
- All components to be fitted to the vehicle are covered by the NSSTA (lights, rear under run or tail lift, type of lateral rail system, type of spray suppression system, coupling etc.)

10 Elements of scheme for NSSTA only

Defining Vehicle Type:

NSSTA requires the defining of vehicles into types. Initially, the type description is based on the category of vehicle M, N or O (see Annex I for Definition of Vehicle Categories) and then particular features that each vehicle within the type must have in common.

There are a number of common features to all vehicle categories that will limit what vehicles can be classified in a type. For example:

- Power plant.
- Technically permissible maximum mass.
- Technically permissible mass of the vehicle in running order (applicable to variants/versions).
- Number of axles.
- Number and interconnection of powered axles.
- Number of steered axles.
- Stage of completion of the vehicle (eg. complete/incomplete/completed).
- Category.
- Exhaust emission level (eg. Euro V, Euro VI)

Type is further divided into “Variant” and “Version”. Each type must consist of at least one variant and one version. See Annex IV for further details.

The following tolerances apply to the mass of the vehicle in running order:

Vehicle Category	Maximum Mass (tonne)	Mass of the Vehicle in Running Order tolerance (%)
N1, N2, N3, M2, M3, O1, O2, O3, O4	N/A	3
N1, O1, O2, M2	≤ 3.5 t	5

Changes in the mass of the vehicle in running order above the allowable tolerances will require additional braking and exhaust emission testing of the vehicle(s).

Off-Road Vehicles:

Vehicles may be subcategorised as “off-road” depending on their complying with certain conditions. See Annex IV for the full list of these conditions for each category of vehicle.

Type, Variant and Version designations:

- The Body Builder shall allocate an alphanumeric code to each vehicle type, variant and version, made up of Roman letters and/or Arabic numerals. The use of brackets and hyphens is permitted provided they do not replace a letter or a numeral.

- The whole code shall be designated: Type-Variant-Version or ‘TVV’.

- The TVV shall clearly and unequivocally identify a unique combination of technical features in relation to the criteria defined in Part B of this Annex.

- The same manufacturer may use the same code in order to define a vehicle type when the latter falls in two or more categories.

- The same manufacturer shall not use the same code in order to define a vehicle type for more than one type-approval within the same vehicle category.

Number of characters for the TVV:

- The number of characters shall not exceed:

    (a) 15 for the code of the vehicle type;

    (b) 25 for the code of one variant;

    (c) 35 for the code of one version.

- The complete alphanumeric ‘TVV’ shall not contain more than 75 characters.

When the TVV is used as a whole, a space shall be left between the type, the variant and the version.

Example of such TVV: 159AF[..... *space*]0054[..... *space*]977K(BE).

Body Builders Quality Systems shall provide for the defining of the completed vehicle type, variant and version prior to the build. Procedure shall follow the prescriptions above and the definitions within Annex IV.

Example of a TVV matrix for a completed vehicle of category N

		1,2,3	1,2	3,4	5,6
	Type	Variant	Version		
		Body	Rear under run	Rear Door	Side door
	ABC				
Box Body		BOX			
Curtain Side		CUR			
Flat		FLA			
Zehra Lift			ZP		
Dhol Lift			DH		
VBB RUP			RP		
No Rear Door				ND	
Single Door				RD	
Double Door				2D	
No Side Door					ND
Side Door					SD

For the TVV matrix above, a box bodied variant of the type ABC with a Zehra tail fitted and a double rear door but with no side door would be described as:

Type: ABC
Variant: BOX
Version: ZPRDND

Please note, the above is only an example of a TVV matrix and each matrix should be specifically tailored to capture all of the varying elements of an NSSTA application.
The matrix could also capture other varying elements such as:
-differing spray suppression systems (air water separator or energy absorption)
-vehicle's coupling ability and types of coupling that could be mounted
-different lateral rail systems

Issuance of completed vehicle Certificates of Conformity (COC):

As a consequence of National Small Series Type Approval (NSSTA), Body Builders shall issue a Certificate of Conformity (COC) for each vehicle in the type approved.

Body Builders Quality Systems and control plans shall provide for:

- **The generation and issuance, on Body Builder company headed paper, of a COC for every vehicle in the type approved.**

- **It must ensure that no vehicle within the type leaves the premises without its COC.**

- **NSAI is sent a copy of each COC issued within 24hrs of issuance. This must be uploaded to an appropriately named folder on NSAI sharefile. This must consist of the completed COC generated attached with the incomplete COC of the base vehicle**

- **As of 12th September 2016, Revenue now requires that all COC's must be in XML format for registration purposes. More information on e-COC's can be found on Revenues website:** http://www.revenue.ie/en/tax/vrt/certificate-of-conformity.html

There are two main purposes for the COC as follows:

1. It is a statement of compliance of the completed vehicle with the relevant National vehicle approval requirements.
2. It serves the purpose of vehicle registration.

To serve these purposes, the certificate of conformity has to include:

(a) The Completed Vehicle VIN.

(b) The exact technical characteristics of the vehicle (i.e. it is not permitted to mention any range of values in the various entries).

- It is not necessary to repeat any values that have not changed from the base vehicle incomplete COC.

Without the COC, the completed vehicle will not be registered.

General Description

The certificate of conformity shall consist of two parts.

- SIDE 1, which identifies the particular vehicle and contains a statement of compliance of the particular vehicle, by the manufacturer.
- SIDE 2, which is a technical description of the main characteristics of the vehicle. The template of side 2 is adapted to each specific vehicle category.

The certificate of conformity shall be established in a maximum format A4 (210 × 297 mm) or a folder of maximum format A4. The certificate of conformity shall be designed to prevent forgery. To that end, the paper used shall be protected either by coloured graphics or by a watermark in the form of the manufacturer's identification mark

Example of COCs for completed M2 and M3 vehicles:

MODEL B — SIDE 1

COMPLETED VEHICLES

NATIONAL SMALL SERIES TYPE APPROVAL
CERTIFICATE OF CONFORMITY (Ireland)

Year	Seq. No

Side 1

The undersigned [……. (*Full name and position*)] hereby certifies that the vehicle:
0.1. Make (Trade name of the manufacturer):
0.2. Type:
Variant:
Version:
0.2.1. Commercial name:
0.2.2. Type-approval information of the base vehicle:
Type:
Variant:
Version:
Type-approval number, including extension number:

0.4. Vehicle category:

0.5. Company name and address of manufacturer:
0.5.1. Name and address of the manufacturer of the base vehicle:
0.6. Location and method of attachment of the statutory plates:
Location of the vehicle identification number:
0.9. Name and address of the manufacturer's representative (if any):
0.10. Vehicle identification number:
(a) has been completed and altered([1]) as follows: and
(b) conforms in all respects to the type described in approval (… *type-approval number including extension number*) issued on (…….. *date of issue*) and
(c) can be permanently registered in Member States having right/left hand traffic and using metric/imperial units for the speedometer .

(Place) (Date): … (Signature): .....

(1) Delete where not applicable
Attachments: Certificate of conformity delivered at each previous stage.

SIDE 2

VEHICLE CATEGORY M2

(complete and completed vehicles)

Side 2

General construction characteristics

1. Number of axles: ..... and wheels: .....

1.1. Number and position of axles with twin wheels: .....

3. Powered axles (number, position, interconnection): ....

Main dimensions

4. Wheelbase: ..... mm

4.1. Axle spacing: 1-2: ..... mm 2-3: ..... mm 3-4: ..... mm

5. Length: ..... mm

6. Width: ..... mm

7. Height: ..... mm

9. Distance between the front end of the vehicle and the centre of the coupling device: ..... mm

12. Rear overhang: ..... mm

Masses

13. Mass in running order: ..... kg

13.1. Distribution of this mass amongst the axles: 1..... kg 2. .... kg 3. ... kg etc.

13.2. Actual mass of the vehicle: ..... kg

16. Technically permissible maximum masses

16.1. Technically permissible maximum laden mass: ..... kg

16.2. Technically permissible mass on each axle: 1..... kg 2. .... kg 3... kg etc.

16.3. Technically permissible mass on each axle group: 1..... kg 2. .... kg 3... kg etc.

16.4. Technically permissible maximum mass of the combination: ..... kg

17. Intended registration/in service maximum permissible masses in national/ international traffic (1) (o)

17.1. Intended registration/in service maximum permissible laden mass: ..... kg

17.2. Intended registration/in service maximum permissible laden mass on each axle: 1. ..... kg 2. ..... kg 3. ..... kg

17.3. Intended registration/in service maximum permissible laden mass on each axle group: 1. ..... kg 2. ..... kg 3. ..... kg

17.4. Intended registration/in service maximum permissible mass of the combination: ..... kg

18. Technically permissible maximum towable mass in case of:

18.1. Drawbar trailer: ..... kg

18.2. Semi-trailer: ..... kg

18.3. Centre-axle trailer: ..... kg

18.4. Unbraked trailer: ..... kg

19. Technically permissible maximum static mass at the coupling point:.... kg

Power plant
20. Manufacturer of the engine: ....
21. Engine code as marked on the engine: .....
22. Working principle: ....
23. Pure electric: yes/no
23.1. Hybrid [electric] vehicle: yes/no
24. Number and arrangement of cylinders:.....
25. Engine capacity: cm3
26. Fuel: Diesel/petrol/LPG/NG — Biomethane/Ethanol/Biodiesel/Hydrogen)
26.1. Mono fuel/Bi fuel/Flex fuel)
27. Maximum net power: .... kW at ..... min-1 or maximum
continuous rated power (electric motor) ..... kW)
28. Gearbox (type): .....

Maximum speed
29. Maximum speed: ..... km/h
Axles and suspension
30. Axle(s) track: 1. ..... mm 2. ..... mm 3. ..... mm
33. drive axle(s) fitted with air suspension or equivalent: yes/no.
35. Tyre/wheel combination: .....

Brakes
36. Trailer brake connections mechanical/electric/pneumatic/hydraulic
37. Pressure in feed line for trailer braking system: ..... bar
Bodywork
38. Code for bodywork: .....
39. Class of vehicle: Class I/Class II/ Class III/ Class A/Class B.
41. Number and configuration of doors: .....
42. Number of seating positions (including the driver): .....
42.1. Seat(s) designated for use only when the vehicle is stationary: .....
42.3. Number of wheelchair user accessible position: .....
43. Number of standing places: .....
Coupling device
44. Approval number or approval mark of coupling device (if fitted): .....
45.1. Characteristics values: D: ..... / V: ...../ S: ...../ U: .....

Environmental performances
46. Sound level
Stationary: ..... dB(A) at engine speed: min-1
Drive-by: ..... dB(A)
47. Exhaust emission level: Euro .....
48. Exhaust emissions:
Number of the base regulatory act and latest amending regulatory act
applicable: .....

1.1. test procedure: Type I or ESC
CO: ..... HC: ..... NOx: ..... HC + NOx: ..... Particulates: .....
Smoke opacity (ELR): ..... (m-1)
1.2. test procedure: Type I (Euro 5 or 6)
CO: ..... THC: ..... NMHC: ..... NO:..... THC + NOx: .....
Particulates (mass): ..... Particles (number): .....
2. test procedure: ETC (if applicable)
CO: ..... NOx: ..... NMHC: ..... THC: ..... CH4: ....Particulates: .....
48.1. Smoke corrected absorption coefficient: ..... (m-1)

Miscellaneous
51. For special purpose vehicles: designation in accordance with Annex II Section 5:.....
52. Remarks :

SIDE 2

VEHICLE CATEGORY M3

(complete and completed vehicles)
Side 2
General construction characteristics
1. Number of axles: ..... and wheels: .....
1.1. Number and position of axles with twin wheels: .....
3. Powered axles (number, position, interconnection): ....
Main dimensions
4. Wheelbase: ..... mm
4.1. Axle spacing: 1-2: ..... mm 2-3: ..... mm 3-4: ..... mm
5. Length: ..... mm
6. Width: ..... mm
7. Height: ..... mm
9. Distance between the front end of the vehicle and the centre of the coupling device: ..... mm
12. Rear overhang: ..... mm

Masses
13. Mass in running order: ..... kg
13.1. Distribution of this mass amongst the axles: 1..... kg 2. .... kg 3. ... kg etc.
13.2. Actual mass of the vehicle: ..... kg
16. Technically permissible maximum masses
16.1. Technically permissible maximum laden mass: ..... kg
16.2. Technically permissible mass on each axle: 1..... kg 2. .... kg 3... kg etc.
16.3. Technically permissible mass on each axle group: 1..... kg 2. .... kg 3... kg etc.
16.4. Technically permissible maximum mass of the combination: ..... kg
17. Intended registration/in service maximum permissible masses in national/ international traffic (1) (o)
17.1. Intended registration/in service maximum permissible laden mass: ..... kg
17.2. Intended registration/in service maximum permissible laden mass on each axle: 1.

..... kg 2. ..... kg 3. ..... kg
17.3. Intended registration/in service maximum permissible laden mass on each axle group: 1. ..... kg 2. ..... kg 3. ..... kg
17.4. Intended registration/in service maximum permissible mass of the combination: ..... kg
18. Technically permissible maximum towable mass in case of:
18.1. Drawbar trailer: ..... kg
18.2. Semi-trailer: ..... kg
18.3. Centre-axle trailer: ..... kg
18.4. Unbraked trailer: ..... kg
19. Technically permissible maximum static mass at the coupling point:.... kg

Power plant
20. Manufacturer of the engine: ....
21. Engine code as marked on the engine: .....
22. Working principle: ....
23. Pure electric: yes/no
23.1. Hybrid [electric] vehicle: yes/no
24. Number and arrangement of cylinders:.....
25. Engine capacity: cm3
26. Fuel: Diesel/petrol/LPG/NG — Biomethane/Ethanol/Biodiesel/Hydrogen)
26.1. Mono fuel/Bi fuel/Flex fuel)
27. Maximum net power: .... kW at ..... min-1 or maximum
continuous rated power (electric motor) ..... kW)
28. Gearbox (type): .....

Maximum speed
29. Maximum speed: ..... km/h
Axles and suspension
30.1. Track of each steered axle: ..... mm
30.2. Track of all other axles: ..... mm
32. Position of loadable axle(s): .....
33. Drive axle(s) fitted with air suspension or equivalent:
35. Tyre/wheel combination: .....

Brakes
36. Trailer brake connections mechanical/electric/pneumatic/hydraulic
37. Pressure in feed line for trailer braking system: ..... bar
Bodywork
38. Code for bodywork: .....
39. Class of vehicle: Class I/Class II/ Class III/ Class A/Class B.
41. Number and configuration of doors: .....
42. Number of seating positions (including the driver): .....
42.1. Seat(s) designated for use only when the vehicle is stationary: .....
42.3. Number of wheelchair user accessible position: .....
43. Number of standing places: .....
Coupling device
44. Approval number or approval mark of coupling device (if fitted): .....

45.1. Characteristics values: D: ..... / V: ...../ S: ...../ U: .....

Environmental performances

46. Sound level

Stationary: ..... dB(A) at engine speed: min-1

Drive-by: ..... dB(A)

47. Exhaust emission level: Euro .....

48. Exhaust emissions:

Number of the base regulatory act and latest amending regulatory act applicable: .....

1.1. test procedure: Type I or ESC

CO: ..... HC: ..... NOx: ..... HC + NOx: ..... Particulates: .....

Smoke opacity (ELR): ..... (m-1)

1.2. test procedure: Type I (Euro 5 or 6)

CO: ..... THC: ..... NMHC: ..... NO:..... THC + NOx: .....

Particulates (mass): ..... Particles (number): .....

2. test procedure: ETC (if applicable)

CO: ..... NOx: ..... NMHC: ..... THC: ..... CH4: ....Particulates: .....

48.1. Smoke corrected absorption coefficient: ..... (m-1)

Miscellaneous

51. For special purpose vehicles: designation in accordance with Annex II Section 5:.....

52. Remarks:

Example of COCs for completed N1, N2 and N3 vehicles:

MODEL B — SIDE 1

COMPLETED VEHICLES

NATIONAL SMALL SERIES TYPE APPROVAL
CERTIFICATE OF CONFORMITY (Ireland)

Year	Seq. No

Side 1

The undersigned [……. (*Full name and position*)] hereby certifies that the vehicle:
0.1. Make (Trade name of the manufacturer):
0.2. Type:
Variant:
Version:
0.2.1. Commercial name:
0.2.2. Type-approval information of the base vehicle:
Type:
Variant:
Version:
Type-approval number, including extension number:

0.4. Vehicle category:

0.5. Company name and address of manufacturer:
0.5.1. Name and address of the manufacturer of the base vehicle:
0.6. Location and method of attachment of the statutory plates:
Location of the vehicle identification number:
0.9. Name and address of the manufacturer's representative (if any):
0.10. Vehicle identification number:
(a) has been completed and altered ([1]) as follows: and
(b) conforms in all respects to the type described in approval (… *type-approval number including extension number*) issued on (…….. *date of issue*) and
(c) can be permanently registered in Member States having right/left hand traffic and using metric/imperial units for the speedometer .

(Place) (Date): … (Signature): .....

(1) Delete where not applicable

Attachments: Certificate of conformity delivered at each previous stage.

SIDE 2

VEHICLE CATEGORY N1

(complete and completed vehicles)

Side 2

General construction characteristics

1. Number of axles: ..... and wheels: .....
1.1. Number and position of axles with twin wheels: .....
3. Powered axles (number, position, interconnection): ....

Main dimensions

4. Wheelbase: ..... mm
4.1. Axle spacing: 1-2: ..... mm 2-3: ..... mm 3-4: ..... mm
5. Length: ..... mm
6. Width: ..... mm
7. Height: ..... mm
8. Fifth wheel lead for semi-trailer towing vehicle (maximum and minimum): ..... mm
9. Distance between the front end of the vehicle and the centre of the coupling device: ..... mm
11. Length of the loading area: ..... mm

Masses

13. Mass in running order: ..... kg
13.1. Distribution of this mass amongst the axles: 1..... kg 2. .... kg 3. ... kg etc.
13.2. Actual mass of the vehicle: ..... kg
14. Mass of the base vehicle in running order: ..... kg
16. Technically permissible maximum masses
16.1. Technically permissible maximum laden mass: ..... kg
16.2. Technically permissible mass on each axle: 1..... kg 2. .... kg 3... kg etc.
16.4. Technically permissible maximum mass of the combination: ..... kg
18. Technically permissible maximum towable mass in case of:
18.1. Drawbar trailer: ..... kg
18.2. Semi-trailer: ..... kg
18.3. Centre-axle trailer: ..... kg
18.4. Unbraked trailer: ..... kg
19. Technically permissible maximum static mass at the coupling point:.... kg

Power plant

20. Manufacturer of the engine: ....
21. Engine code as marked on the engine: .....
22. Working principle: ....
23. Pure electric: yes/no
23.1. Hybrid [electric] vehicle: yes/no
24. Number and arrangement of cylinders:.....

25. Engine capacity: cm3
26. Fuel: Diesel/petrol/LPG/NG — Biomethane/Ethanol/Biodiesel/Hydrogen)
26.1. Mono fuel/Bi fuel/Flex fuel)
27. Maximum net power: .... kW at ..... min-1 or maximum
continuous rated power (electric motor) ..... kW)
28. Gearbox (type): .....

Maximum speed
29. Maximum speed: ..... km/h
Axles and suspension
30. Axle(s) track: 1. ..... mm 2. ..... mm 3. ..... mm
35. Tyre/wheel combination: .....

Brakes
36. Trailer brake connections mechanical/electric/pneumatic/hydraulic
37. Pressure in feed line for trailer braking system: ..... bar
Bodywork
38. Code for bodywork: .....
40. Colour of vehicle: .....
41. Number and configuration of doors: .....
42. Number of seating positions (including the driver): .....
Coupling device
44. Approval number or approval mark of coupling device (if fitted): .....
45.1. Characteristics values: D: ..... / V: ...../ S: ...../ U: .....

Environmental performances
46. Sound level
Stationary: ..... dB(A) at engine speed: min-1
Drive-by: ..... dB(A)
47. Exhaust emission level: Euro .....
48. Exhaust emissions:
Number of the base regulatory act and latest amending regulatory act
applicable: .....
1.1. test procedure: Type I or ESC
CO: ..... HC: ..... NOx: ..... HC + NOx: ..... Particulates: .....
Smoke opacity (ELR): ..... (m-1)
1.2. test procedure: Type I (Euro 5 or 6)
CO: ..... THC: ..... NMHC: ..... NO:..... THC + NOx: .....
Particulates (mass): ..... Particles (number): .....
2. test procedure: ETC (if applicable)
CO: ..... NOx: ..... NMHC: ..... THC: ..... CH4: ....Particulates: .....
48.1. Smoke corrected absorption coefficient: ..... (m-1)
49. CO2 emissions/
Urban conditions (g/km:
Extra-urban conditions(g/km):
Combined(g/km):

Weighted, combined(g/km):
fuel consumption/electric energy consumption
Urban conditions (l/100 km/m3/100km):
Extra-urban conditions(l/100 km/m3/100km)
Combined(l/100 km/m3/100km)
Weighted, combined(l/100 km/m3/100km)

Miscellaneous

50. Type-approved according to the design requirements for transporting dangerous goods: yes/class(es): ..... /no :
51. For special purpose vehicles: designation in accordance with Annex II Section 5:.....
52. Remarks:

SIDE 2

VEHICLE CATEGORY N2

(complete and completed vehicles)

Side 2

General construction characteristics

1. Number of axles: ..... and wheels: .....
1.1. Number and position of axles with twin wheels: .....
2. Steered axles (number, position):
3. Powered axles (number, position, interconnection): ....

Main dimensions

4. Wheelbase: ..... mm
4.1. Axle spacing: 1-2: ..... mm 2-3: ..... mm 3-4: ..... mm
5. Length: ..... mm
6. Width: ..... mm
7. Height: ..... mm
8. Fifth wheel lead for semi-trailer towing vehicle (maximum and minimum): ..... mm
9. Distance between the front end of the vehicle and the centre of the coupling device: ..... mm
11. Length of the loading area: ..... mm
12. Rear overhang: ..... mm

Masses

13. Mass in running order: ..... kg
13.1. Distribution of this mass amongst the axles: 1..... kg 2. .... kg 3. ... kg etc.
13.2. Actual mass of the vehicle: ..... kg
14. Mass of the base vehicle in running order: ..... kg
16. Technically permissible maximum masses
16.1. Technically permissible maximum laden mass: ..... kg
16.2. Technically permissible mass on each axle: 1..... kg 2. .... kg 3... kg etc.
16.3. Technically permissible mass on each axle group: 1...kg 2. . kg 3... kg etc.
16.4. Technically permissible maximum mass of the combination: ..... kg
17. Intended registration/in service maximum permissible masses in national/

international traffic
17.1. Intended registration/in service maximum permissible laden mass: .... kg
17.2. Intended registration/in service maximum permissible laden mass on each axle: 1. ..... kg 2. ..... kg 3. ..... kg
17.3. Intended registration/in service maximum permissible laden mass on each axle group: 1. ..... kg 2. ..... kg 3. ..... kg
17.4. Intended registration/in service maximum permissible mass of the combination: .... kg
18. Technically permissible maximum towable mass in case of:
18.1. Drawbar trailer: ..... kg
18.2. Semi-trailer: ..... kg
18.3. Centre-axle trailer: ..... kg
18.4. Unbraked trailer: ..... kg
19. Technically permissible maximum static mass at the coupling point:.... kg

Power plant
20. Manufacturer of the engine: ....
21. Engine code as marked on the engine: .....
22. Working principle: ....
23. Pure electric: yes/no
23.1. Hybrid [electric] vehicle: yes/no
24. Number and arrangement of cylinders:.....
25. Engine capacity: cm3
26. Fuel: Diesel/petrol/LPG/NG — Biomethane/Ethanol/Biodiesel/Hydrogen)
26.1. Mono fuel/Bi fuel/Flex fuel)
27. Maximum net power: .... kW at ..... min-1 or maximum continuous rated power (electric motor) ..... kW)
28. Gearbox (type): .....

Maximum speed
29. Maximum speed: ..... km/h
Axles and suspension
30. Axle(s) track: 1. ..... mm 2. ..... mm 3. ..... mm
31. Position of lift axle(s): ....
32. Position of loadable axle(s): .....
33. Drive axle(s) fitted with air suspension or equivalent:
35. Tyre/wheel combination: .....

Brakes
36. Trailer brake connections mechanical/electric/pneumatic/hydraulic
37. Pressure in feed line for trailer braking system: ..... bar
Bodywork
38. Code for bodywork: .....
40. Colour of vehicle: .....
41. Number and configuration of doors: .....
42. Number of seating positions (including the driver): .....

Coupling device
44. Approval number or approval mark of coupling device (if fitted): .....
45.1. Characteristics values: D: ..... / V: ...../ S: ...../ U: .....

Environmental performances
46. Sound level
Stationary: ..... dB(A) at engine speed: min-1
Drive-by: ..... dB(A)
47. Exhaust emission level: Euro .....
48. Exhaust emissions:
Number of the base regulatory act and latest amending regulatory act applicable: .....
1.1. test procedure: Type I or ESC
CO: ..... HC: ..... NOx: ..... HC + NOx: ..... Particulates: .....
Smoke opacity (ELR): ..... (m-1)
1.2. test procedure: Type I (Euro 5 or 6)
CO: ..... THC: ..... NMHC: ..... NO:..... THC + NOx: .....
Particulates (mass): ..... Particles (number): .....
2. test procedure: ETC (if applicable)
CO: ..... NOx: ..... NMHC: ..... THC: ..... CH4: ....Particulates: .....
48.1. Smoke corrected absorption coefficient: ..... (m-1)

Miscellaneous
50. Type-approved according to the design requirements for transporting dangerous goods: yes/class(es): ..... /no :
51. For special purpose vehicles: designation in accordance with Annex II Section 5: .....
52. Remarks :

SIDE 2

VEHICLE CATEGORY N3

(complete and completed vehicles)
Side 2
General construction characteristics
1. Number of axles: ..... and wheels: .....
1.1. Number and position of axles with twin wheels: .....
2. Steered axles (number, position):
3. Powered axles (number, position, interconnection): ....
Main dimensions
4. Wheelbase: ..... mm

4.1. Axle spacing: 1-2: ..... mm 2-3: ..... mm 3-4: ..... mm
5. Length: ..... mm
6. Width: ..... mm
7. Height: ..... mm
8. Fifth wheel lead for semi-trailer towing vehicle (maximum and minimum): ..... mm
9. Distance between the front end of the vehicle and the centre of the coupling device: ..... mm
11. Length of the loading area: ..... mm
12. Rear overhang: ..... mm

Masses
13. Mass in running order: ..... kg
13.1. Distribution of this mass amongst the axles: 1..... kg 2. .... kg 3. ... kg etc.
13.2. Actual mass of the vehicle: ..... kg
14. Mass of the base vehicle in running order: ..... kg
16. Technically permissible maximum masses
16.1. Technically permissible maximum laden mass: ..... kg
16.2. Technically permissible mass on each axle: 1..... kg 2. .... kg 3... kg etc.
16.3. Technically permissible mass on each axle group: 1...kg 2. . kg 3... kg etc.
16.4. Technically permissible maximum mass of the combination: ..... kg
17. Intended registration/in service maximum permissible masses in national/ international traffic
17.1. Intended registration/in service maximum permissible laden mass: .... kg
17.2. Intended registration/in service maximum permissible laden mass on each axle: 1. ..... kg 2. ..... kg 3. ..... kg
17.3. Intended registration/in service maximum permissible laden mass on each axle group: 1. ..... kg 2. ..... kg 3. ..... kg
17.4. Intended registration/in service maximum permissible mass of the combination: .... kg
18. Technically permissible maximum towable mass in case of:
18.1. Drawbar trailer: ..... kg
18.2. Semi-trailer: ..... kg
18.3. Centre-axle trailer: ..... kg
18.4. Unbraked trailer: ..... kg
19. Technically permissible maximum static mass at the coupling point:.... kg

Power plant
20. Manufacturer of the engine: ....
21. Engine code as marked on the engine: .....
22. Working principle: ....
23. Pure electric: yes/no
23.1. Hybrid [electric] vehicle: yes/no
24. Number and arrangement of cylinders:.....
25. Engine capacity: cm3
26. Fuel: Diesel/petrol/LPG/NG — Biomethane/Ethanol/Biodiesel/Hydrogen)

26.1. Mono fuel/Bi fuel/Flex fuel)
27. Maximum net power: .... kW at ..... min-1 or maximum
continuous rated power (electric motor) ..... kW)
28. Gearbox (type): .....

Maximum speed
29. Maximum speed: ..... km/h
Axles and suspension
30. Axle(s) track: 1. ..... mm 2. ..... mm 3. ..... mm
31. Position of lift axle(s): ....
32. Position of loadable axle(s): .....
33. Drive axle(s) fitted with air suspension or equivalent:
35. Tyre/wheel combination: .....

Brakes
36. Trailer brake connections mechanical/electric/pneumatic/hydraulic
37. Pressure in feed line for trailer braking system: ..... bar
Bodywork
38. Code for bodywork: .....
40. Colour of vehicle: .....
41. Number and configuration of doors: .....
42. Number of seating positions (including the driver): .....
Coupling device
44. Approval number or approval mark of coupling device (if fitted): .....
45.1. Characteristics values: D: ..... / V: ...../ S: ...../ U: .....

Environmental performances
46. Sound level
Stationary: ..... dB(A) at engine speed: min-1
Drive-by: ..... dB(A)
47. Exhaust emission level: Euro .....
48. Exhaust emissions:
Number of the base regulatory act and latest amending regulatory act
applicable: .....
1.1. test procedure: Type I or ESC
CO: ..... HC: ..... NOx: ..... HC + NOx: ..... Particulates: .....
Smoke opacity (ELR): ..... (m-1)
1.2. test procedure: Type I (Euro 5 or 6)
CO: ..... THC: ..... NMHC: ..... NO:..... THC + NOx: .....
Particulates (mass): ..... Particles (number): .....
2. test procedure: ETC (if applicable)
CO: ..... NOx: ..... NMHC: ..... THC: ..... CH4: ....Particulates: .....
48.1. Smoke corrected absorption coefficient: ..... (m-1)

Miscellaneous
50. Type-approved according to the design requirements for transporting

dangerous goods: yes/class(es): ..... /no :
51. For special purpose vehicles: designation in accordance with Annex II
Section 5: .....
52. Remarks :

Example of COCs for complete and completed O1 and O2 trailers:

SIDE 2

VEHICLE CATEGORY O1 AND O2

(complete and completed vehicles)

Side 2

General construction characteristics

1. Number of axles: ..... and wheels: .....

1.1. Number and position of axles with twin wheels: .....

Main dimensions

4. Wheelbase: ..... mm

4.1. Axle spacing: 1-2: ..... mm 2-3: ..... mm 3-4: ..... mm

5. Length: ..... mm

6. Width: ..... mm

7. Height: ..... mm

10. Distance between the centre of the coupling device and the rear end of the vehicle: ..... mm

11. Length of the loading area: ..... mm

12. Rear overhang: ..... mm

Masses

13. Mass in running order: ..... kg

13.1. Distribution of this mass amongst the axles: 1..... kg 2. .... kg 3. ... kg etc.

13.2. Actual mass of the vehicle: ..... kg

16. Technically permissible maximum masses

16.1. Technically permissible maximum laden mass: ..... kg

16.2. Technically permissible mass on each axle: 1..... kg 2. .... kg 3... kg etc.

16.3. Technically permissible mass on each axle group: 1..... kg 2. .... kg 3... kg etc.

19. Technically permissible maximum static mass at the coupling point:.... kg

Maximum speed

29. Maximum speed: ..... km/h

Axles and suspension

30.1. Track of each steered axle: ..... mm

30.2. Track of all other axles: ..... mm

31. Position of lift axle(s): ....

32. Position of loadable axle(s): ....

34. Axle(s) fitted with air suspension or equivalent: yes/no

35. Tyre/wheel combination: .....

Brakes

36. Trailer brake connections mechanical/electric/pneumatic/hydraulic

Bodywork

38. Code for bodywork: .....

Coupling device
44. Approval number or approval mark of coupling device (if fitted): .....
45.1. Characteristics values: D: ..... / V: ...../ S: ...../ U: .....

Miscellaneous
50. Type-approved according to the design requirements for transporting dangerous goods: yes/class(es): ..... /no (I):
51. For special purpose vehicles: designation in accordance with Annex II Section 5:.....
52. Remarks:

Example of COCs for completed O3 and O4 trailers:

SIDE 2

VEHICLE CATEGORY O3 AND O4

(complete and completed vehicles)

Side 2

General construction characteristics

1. Number of axles: ..... and wheels: .....
1.1. Number and position of axles with twin wheels: .....
2. Steered axles (number, position): .....

Main dimensions

4. Wheelbase: ..... mm
4.1. Axle spacing: 1-2: ..... mm 2-3: ..... mm 3-4: ..... mm
5. Length: ..... mm
6. Width: ..... mm
7. Height: ..... mm
10. Distance between the centre of the coupling device and the rear end of the vehicle: ..... mm
11. Length of the loading area: ..... mm
12. Rear overhang: ..... mm

Masses

13. Mass in running order: ..... kg
13.1. Distribution of this mass amongst the axles: 1..... kg 2. .... kg 3. ... kg etc.
16. Technically permissible maximum masses
16.1. Technically permissible maximum laden mass: ..... kg
16.2. Technically permissible mass on each axle: 1..... kg 2. .... kg 3... kg etc.
16.3. Technically permissible mass on each axle group: 1..... kg 2. .... kg 3... kg etc.
16.4. Technically permissible maximum mass of the combination: ..... kg

17. Intended registration/in service maximum permissible masses in national/ international traffic (1) (o)
17.1. Intended registration/in service maximum permissible laden mass: ..... kg
17.2. Intended registration/in service maximum permissible laden mass on each axle: 1. ..... kg 2. ..... kg 3. ..... kg
17.3. Intended registration/in service maximum permissible laden mass on each axle group: 1. ..... kg 2. ..... kg 3. ..... kg
19. Technically permissible maximum static mass at the coupling point:.... kg

Maximum speed
29. Maximum speed: ..... km/h
Axles and suspension
31. Position of lift axle(s): ....
32. Position of loadable axle(s): ....
34. Axle(s) fitted with air suspension or equivalent: yes/no
35. Tyre/wheel combination: .....

Brakes
36. Trailer brake connections mechanical/electric/pneumatic/hydraulic
Bodywork
38. Code for bodywork: .....
Coupling device
44. Approval number or approval mark of coupling device (if fitted): .....
45.1. Characteristics values: D: ..... / V: ...../ S: ...../ U: .....

Miscellaneous
50. Type-approved according to the design requirements for transporting dangerous goods: yes/class(es): ..... /no (l):
51. For special purpose vehicles: designation in accordance with Annex II Section 5:.....
52. Remarks:

11. Conformity of Production (COP):

As a minimum, Body Builders Quality Systems shall provide for Conformity of production (COP).

All Body Builders will be subject to at least one COP inspection from NSAI each year at which time vehicles will be selected for re-test at an ATC.

The Body Builders procedure shall, in particular:

a) Ensure the existence and application of procedures for effective control of the conformity of completed vehicles to the approved type.

b) Have access to the testing or other appropriate equipment necessary for checking the conformity to each approved type.

c) Ensure that test or check results data are recorded and that annexed documents remain available for a period of 10 years.

d) Analyse the results of each type of test or check, in order to verify and ensure the stability of the product characteristics, making allowance for variation of an industrial production.

e) Ensure that for each completed vehicle type approved; at least checks based on ATC inspection check (forms available on the website) are carried out.

f) The checks referred to in point (e) above shall also include the verification of the build specifications in relation to the approval and the information required for certificates of conformity (COC).

g) Ensure that any set of samples or test pieces, giving evidence of non-conformity in the type of test or check in question gives rise to a further sampling and test or check. All the necessary steps shall be taken to restore conformity of production.

ANNEXES

Annex I

Definition of Vehicle Categories

For EU and National vehicle type approval, vehicles are categorised as follows:

Category M:

Motor vehicles designed and constructed primarily for the carriage of persons and their luggage.

Category N:

Motor vehicles designed and constructed primarily for the carriage of goods.

Category O:

Trailers designed and constructed for the carriage of goods or of persons as well as for the accommodation of persons.

They are further categorised as per the table below:

Vehicle Category	Maximum number of passengers (not including the driver)	Maximum Mass (M)
M1	8	N/A
M2	>8	M ≤ 5 tonnes
M3	>8	M > 5 tonnes
N1	6	M ≤ 3.5 tonnes
N2	8	3.5 < M ≤ 12 tonnes
N3	8	M > 12 tonnes
O1	N/A	M ≤ 0.75 tonnes
O2	N/A	0.75 < M ≤ 3.5 tonnes
O3	N/A	3.5 < M ≤ 10 tonnes
O4	N/A	M > 10 tonnes

Annex II

Example of a Control Plan and inspection record for NSSTA and IVA

Control Plan for NSSTA			
Engineering Approval:	AVBB Licence Number:	Part Number Change Level:	Project Number:

General Base Vehicle Details			
Manufacturer:	Category: N1: ☐ N2: ☐, N3: ☐,	Base Vehicle Type:	
Approval Number:			
Number of wheels and axles:	Number of wheels:	Number of axles:	
Axle configuration:			

Completed Vehicle Details	
Brief description of body work: *(Box body, Tank, Crane etc)*	
Body Builders Unique Code identifying the build *(for swap bodies include the code for each swap body)*: *(See section 5 of AVBB document)*	
Approval Number (if available):	
Category:	N1: ☐ N2: ☐, N3: ☐,
Vehicle Body Code: *(See section 4 of AVBB document)*	BA: ☐, BB: ☐, BC: ☐, BD: ☐, BE: ☐, CA: ☐, CB: ☐, CC: ☐, CD: ☐, CE: ☐, CF: ☐, CG: ☐, CH: ☐, CI: ☐, CJ: ☐, DA: ☐, DB: ☐, DC: ☐ DE☐
Bodywork Code: *(See section 4 of AVBB document)*	01:☐, 02: ☐, 03: ☐, 04: ☐, 05: ☐, 06: ☐, 07: ☐, 08: ☐, 09: ☐, 10: ☐, 11: ☐, 12:☐, 13:☐, 14:☐, 15: ☐, 16:☐, 17: ☐, 18: ☐, 19:

Control Plan for NSSTA

Engineering Approval:	AVBB Licence Number:	Part Number Change Level:	Project Number:

General Base Vehicle Details

Manufacturer:	Category: N1: ☐ N2: ☐, N3: ☐,	Base Vehicle Type:	
	☐ 20: ☐, 21: ☐, 22: ☐, 23: ☐, 24: ☐, 25: ☐, 26: ☐, 27: ☐, 28: ☐, 29:☐, 30: ☐, 31: ☐		

Process Control

Process number	Process name	Machine/ Device Tool	Specification Tolerance	Measurement Technique	Sample		Control Method	Reaction Plan to Non-Conformance*	Record number
					Size	Freq			
1	Bom Check			Review	1				
2	Receiving inspection	N/A	N/A	Certificate	1	Per Del			
3	Frame assy	Jig # 1		Measure	1	Per build			
4	Chassis assy	Jig # 2		Measure	1	Per build			
5	Ancillary fit			Checklist	1	Per build			
6	Paint		Paint Thickness	Paint tool	1	Per build			
7									
8									
9									

Completed Vehicle Checks

Description	Record Number	Result (Pass/Fail)	Comments	Signed by:
Masses and Dimensions:				
Couplings:				
Rear view Mirrors (Field of View):				
Spray Suppression:				
Lateral Protection:				
Rear-under Run:				
Braking:				
Lighting/Conspicuity markings:				
Attachment of body to vehicle:				
Documentation to accompany completed vehicle:				
Other:				
Final inspection:				

*Details of any non-conformances identified during Process control and Completed Vehicle Checks:

*Relevant Procedure(s) to follow to correct non-conformance(s):

a) Masses and Dimensions:

Body Builders quality systems and control plans shall capture at least the following mass information (will be needed for Mass Distribution Sheet):

General mass inspection for all types of category N2 / N3 vehicles						
M (tonne) *(technically permissible max laden mass of vehicle)*	Mi (tonne) *(technically permissible max mass on each axle)*	µj (tonne) *(technically permissible max mass on group of axles – tandem axles or tri-axles)*	TM (tonne) *(technically permissible max towable mass)*	MC (tonne) *(maximum laden mass of the combination), if applicable*	Fifth wheel couplings, maximum imposed load (tonnes)	King-Pin, maximum load (tonne)
	Axle 1:	Tandem axle:				
	Axle 2:					
	Axle 3:	Tri-axle:				
	Axle 4:					

- The sum of the masses Mi must not be less than the mass M.
- For each group of axles designated 'j'. The sum of the masses Mi on its axles must not be less than the mass µj. In addition, each of the masses Mi must not be less than the part of µj applying on the axle 'i' as determined by the mass distribution laws for that group of axles.
- The sum of the masses µj must not be less than the mass M.
- The mass in running order, plus the mass corresponding to 75 kg multiplied by the number of passengers, plus the technically permissible maximum mass on the coupling point, must not exceed the mass M.
- When the vehicle is laden to its mass M the mass corresponding to the load on the axle 'i' must not:
  - exceed the mass Mi on that axle, and the mass corresponding to the load on the solo axle or group of axles 'j' must not exceed the mass *µ*j.
- Uniform distribution of mass means the vehicle in running order with a mass of 75 kg positioned on every
- passenger seat is laden to its mass M, the payload being uniformly distributed on the area designed for the transportation of goods.

	KG
Mass in running order:	**Total:**
Distribution of this mass on each axle:	**axle 1: axle2: axle3:**

Body Builders quality systems and control plans shall capture at least the following dimensional information:

Overall Completed Vehicle Dimensions		
Length (mm)	**Width (mm)**	**Height (mm)**
Axle Track (mm)		**Wheelbase (mm)**
Axle 1:	**Axle 2:**	
Axle 3:	**Axle 4:**	
Front Overhang (mm)	**Rear Overhang (mm)**	

b) Couplings:

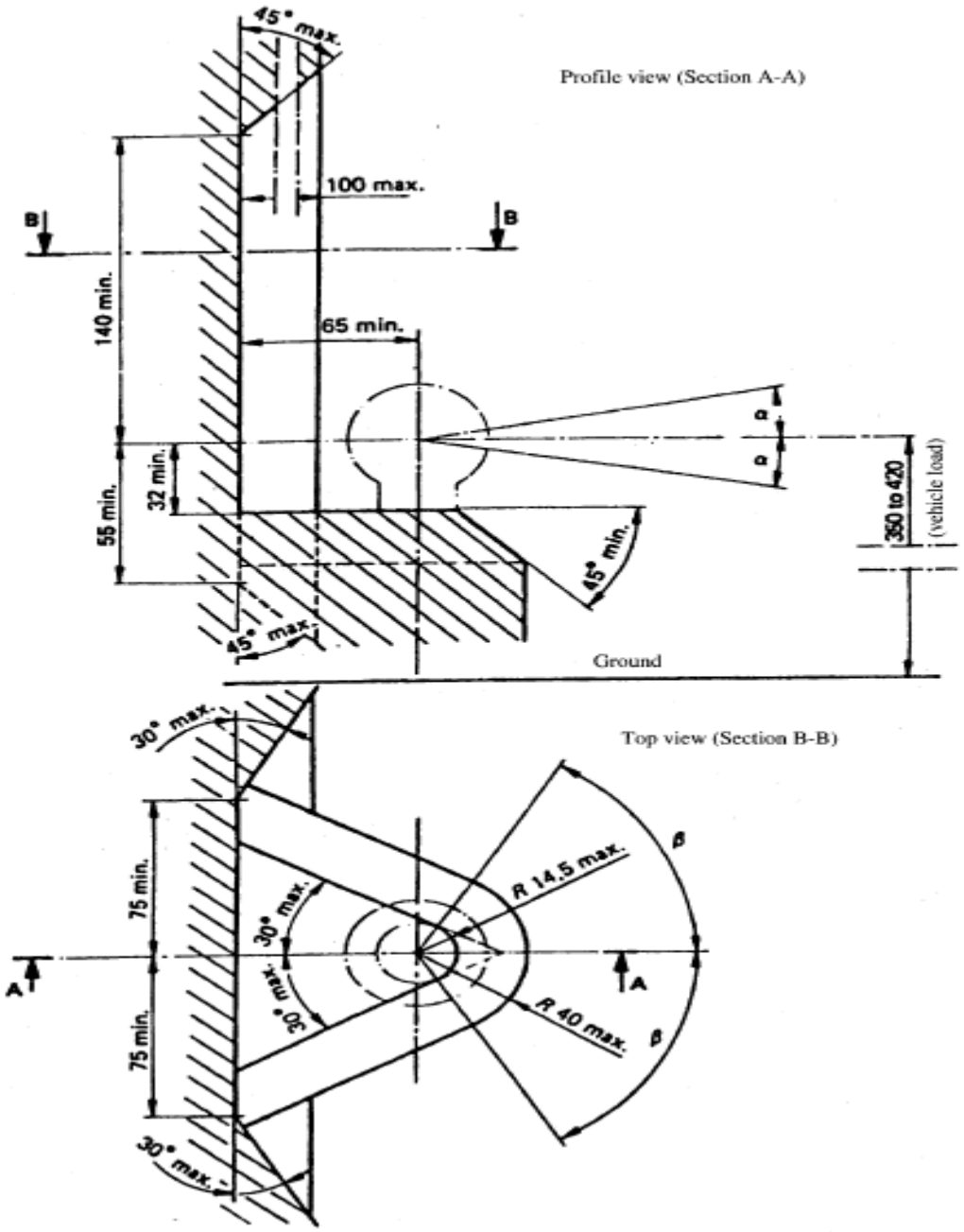
Where fitted, Body Builders quality systems and control plans shall capture at least the following coupling details and installation attributes:

"E" and/or "e" Approval Markings **D, S, V, U values**	
Requirement	**Observation and Result**
Correct 'e' or 'E' markings:	e mark: E mark:
Record load specifications: *(D, S, V, U values)*	D-value: kN S-value: kg V-value: kN U-value: tonnes

Coupling Balls and Towing Brackets	
Requirement	**Observation and Result**
Security of the coupling ball and towing bracket paying particular attention to: - The number, size and grade of securing bolts required:	No. of bolts: Size of bolts:

- Whether appropriate reinforcement or load spreader plates are fitted: - Installed in accordance with Manufacturers installation instructions:	Grade of bolts: Load spreader plates fitted: Yes☐ No ☐ Installed in accordance with Manufacturer's instructions: Yes☐ No ☐ If NO approval cannot be granted.
The coupling ball must not be mounted so as to obscure the place or visibility of the rear licence plate: If it is mounted in this area, then a coupling ball that can be dismantled without special tools must be used:	Licence plate visibility obscured:Yes☐ No ☐ If so, demountable ball fitted: Yes☐ No ☐
Installation height of the coupling: There is sufficient clearance around it to enable safe operation, a minimum of 60 deg. clearance either side of the centre point, 10 deg. up and down and 10 deg. axial rotation (see Fig.1):	Height from ground: mm *(350 – 420mm)* Clearance angles *(see Fig 1)*: β = 60° to right or left: Yes☐ No ☐ α = 10° up or down: Yes☐ No ☐ 10° axial rotation: Yes☐ No ☐
Any tow ball fitted must be 50mm diameter:	Tow ball diameter: mm
If a coupling device is fitted then the vehicle must be provided with a Gross Train Weight (GTW):	Vehicle supplied with GTW: Yes☐ No ☐ If yes, GTW is: Kg

Figure 1.



β = 60° to right or left
α = 10° up or down

Drawbar Couplings and Mounting Blocks	
Easy and safe coupling operation	**Observation and Result**
Drawbar couplings must be mounted on the vehicle type in such a manner that they are easy and safe to operate: In addition to the functions of opening (and closing, if applicable) this also includes checking the position of the indicator for the closed and secured position of the coupling pin (by sight and touch): In the area in which the person operating the coupling must stand, there must be no points of possible danger such as sharp edges, corners, etc., inherent in the design or they must be protected so that injury is unlikely: The way of escape from this area must not be restricted or barred on either side by any attached objects:	Yes☐ No ☐ Yes☐ No ☐ Yes☐ No ☐ Yes☐ No ☐

Accessibility	**Observation and Result**
The distance between the centre of the coupling pin and the rear edge of the vehicle bodywork must not exceed 420 mm: However, the distance of 420 mm may be exceeded if technical necessity can be demonstrated provided easy and safe actuation of the drawbar coupling is not adversely affected: 1. a distance of up to 650 mm for vehicles with tipping bodies or rear-mounted equipment: 2. a distance of up to 1 320 mm if the unobstructed height is at least 1 150 mm: 3. car transporters with at least two loading	Distance: mm Distance: mm Distance: mm

levels when the trailer vehicle is not separated from the towing vehicle in normal transport operation, provided easy and safe actuation of the drawbar coupling is not adversely affected:	Trailer is car transporter: Yes☐ No ☐
Clearance for the hand lever	**Observation and Result**
In order to permit safe operation of drawbar couplings there must be adequate free space around the hand lever: If different types of standard drawbar couplings are intended to be fitted to the vehicle type, the clearance must be such that the conditions are also satisfied for the largest size of coupling of the appropriate class given in Annex V, Section 3 of 94/20/EC: The dimensions are also applicable as appropriate for drawbar couplings having hand levers pointing downwards or of a different design:	Clearance: mm *(60mm minimum)* Clearance requirement for different types of standard drawbar couplings complied with: Yes☐ No ☐ Clearance: mm *(100mm minimum)*

Clearance for free movement of drawbar coupling	**Observation and Result**
The drawbar coupling attached to the vehicle must have a minimum clear gap of 10 mm from every other part of the vehicle taking into account all possible geometrical positions: If different types of standard drawbar couplings are intended to be fitted to the vehicle type, the clearance must be such that the conditions are also satisfied for the largest possible coupling of the appropriate class stated in Annex V, Section 3:	Minimum gap of 10mm: Yes☐ No ☐ Minimum gap of 10mm: Yes☐ No ☐

Attachment of Fifth Wheel Couplings, Mounting Plates and Coupling Pins on Vehicles	
Requirements	**Observation and Result**
Fifth wheel couplings must not be mounted directly on the vehicle frame unless permitted by the vehicle manufacturer: They must be fixed to the frame by means of the mounting plate: The installation instructions provided by the vehicle manufacturer or coupling manufacturer must be followed:	Vehicle designed for fifth wheel coupling: Yes☐ No ☐ Fixed using mounting plate: Yes☐ No ☐ Fixed in accordance with Installation instructions: Yes☐ No ☐
Semi-trailers must be equipped with landing gear or any other equipment which allows uncoupling and parking of the semi-trailer:	Semi-trailer fitted with landing gear: Yes☐ No ☐ If not, has Body Builder fitted with the semi-trailer with any other equipment which allows uncoupling and parking of the semi-trailer: Yes☐ No ☐ If yes, brief description of this equipment:
If semi-trailers are equipped so that the connection of the coupling devices, the electrical systems and braking systems can be effected automatically, the trailer must have landing gear which retracts from the ground automatically after the semi-trailer has been coupled up:	Landing gear retracts automatically after coupling: Yes☐ No ☐

Requirements	Observation and Result
The fixing of the fifth wheel coupling pin in the mounting plate on the semi-trailer must be as instructed by the vehicle manufacturer or manufacturer of the fifth wheel coupling:	Yes☐ No ☐
Is semi-trailer equipped with a steering wedge: -Dimensions of steering wedge: - The steering wedge must allow safe and secure coupling-up: - The steering wedge must be spring-mounted: - The strength of the spring must be selected so that it is possible to couple up an unloaded semi-trailer and so that, with the semi-trailer fully loaded, the steering wedge is firmly in contact with the flanks of the coupling during travel: - Uncoupling of the fifth wheel must be possible with the semi-trailer both loaded and unloaded:	Yes☐ No ☐ Thickness: mm Length: mm Width at both ends: mm mm Yes☐ No ☐ Yes☐ No ☐ Yes☐ No ☐ Yes☐ No ☐

c) Rear view mirrors Field-of-View:

All mirrors and camera systems fitted on vehicles must be approved.

Body Builders quality systems and control plans shall capture at least the following information:

<table>
<tr><th>Indirect Vision Devices
(Mirrors and Camera Systems)</th><th colspan="4">Observations</th></tr>
<tr><td>Number and location of indirect vision devices:</td><td colspan="4">Number of Mirrors:

Locations of mirrors:

Number of Cameras:

Location(s) of Camera(s):</td></tr>
<tr><td>List all Mirror Class(es) and location:
(Class: I, II, III, IV, V, VI)</td><td colspan="4"></td></tr>
<tr><td rowspan="9">List all mirror and camera approval markings.

e / E Markings:</td><td colspan="4"></td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="4"></td></tr>
<tr><td rowspan="2">Method of adjustment:</td><td colspan="2">Mechanical Adjustment</td><td colspan="2">Electrical Adjustment</td></tr>
<tr><td>Yes: ☐</td><td>No: ☐</td><td>Yes: ☐</td><td>No: ☐</td></tr>
<tr><td>Can be adjusted by the driver from the drivers sitting position:</td><td>Yes: ☐</td><td>No: ☐</td><td>Yes: ☐</td><td>No: ☐</td></tr>
</table>

d) Spray suppression:

Where fitted, Body Builders quality systems and control plans shall capture at least the following details and installation attributes:

Spray Suppression Systems	*Observation*	*Result*
Component Check		
1. Spray Suppression Material of an approved type i.e. e-marked?		
Installation Check		
Spray Suppression systems fitted with energy absorption spray suppression devices for axles fitted with non steered or self steering or steered wheels		
Mud Guards		
2. The mudguards must cover the zone immediately above, ahead and behind the tyres, see figure 1 and 2.		
3. The front edge of the mudguard must be no more than 45 degrees above the horizontal line of the axel (A on figure 1) (non steered axles).		
4. The front edge of the mudguard must be no more than 45 degrees above the horizontal line of the axel (A on figure 1) (steered axles).		
5. The rear edge of the mudguard must be no more than 100mm above the horizontal line of the axel (as in figure 1C).		
6. The mudguard must cover at least the full width of the tyre or tyres.		
7. Spray suppression material must be fitted to the front face of the rear of the guard.		
8. Where the wheel guard consists of several components there must be no gaps between or within individual parts when assembles that will permit the exit of spray when the vehicle is in motion.		
Outer Valance		
9. In the case of steered and self steered wheels, the distance between the tyre wall and the vertical face of the valance “C” must not exceed 100mm. See figure 2.		
10. In the case of non steered wheels, the distance between the tyre wall and the vertical face of the valance “C” must not exceed 75mm. See figure 2.		
11. The dept of the outer valance must extend to not less than 45mm, at all points behind a vertical line passing through the centre of the wheel. See figure 2.		
12. The lower edge of the outer valance shall not exceed 1.5 x tyre radius on steered wheel at points A, B and C		

as in figure 4.		
13. The lower edge of the outer valance shall not exceed 1.25 x tyre radius on non-steered wheel at points A, B and C as in figure 4.		
14. There must be no openings in the outer valances or between the outer valances and other parts of the mud guard enabling spray to emerge when the vehicle is moving.		

Rain Flaps	*Observation*	*Result*
15. The rain flap must be at least the full width of the tyre/s.		
16. The orientation of the flap must be basically vertical.		
17. The maximum height of the bottom edge must be no more than 200mm above the ground.		
18. The flap must be no more than 300mm from the rearmost edge of the tyre.		
19. There must be no openings between the rain flap and the lower edge of the wheel guard enabling spray to emerge.		
20. The whole face of the rain flap must be covered in spray suppression material.		
21. In the case of multiple axels where the distance between the tyres on adjacent axles is less than 250mm, only the rear set of wheels must be fitted with rain flaps.		
22. There must be a rain flap behind each wheel when distance between the tyres on adjacent axles is at least 250mm.		

Spray suppression systems fitted with air / water separator spray suppression devices for axels fitted with steered and non steered wheels		
Mud Guard (items 2-8 must also be met)	*Observation*	*Result*
23. In the case of multiple axles where the distance between the tyres on adjacent axles does not exceed 300mm the mudguards must also conform to the model shown in figure 7.		
Outer Valance		
24. The lower edges of the outer valences must be filled with air / water separator spray-suppression devices.		
25. The depth of the outer valence must extend to not less 45mm, at all points behind a vertical line passing through the centre of the wheel.		

26. The lower edge of the outer valance shall not exceed 1.05 x tyre radius on steered wheel, see figure 7.		
27. The lower edge of the outer valance shall not exceed 1.00 x tyre radius on non-steered wheel, see figure 7.		
28. There must be no openings in the outer valances or between the outer valences and the mud guard enabling spray to emerge.		
Rain Flap (14, 15, 18, 20 & 21must also be met)		
29. A rain flap fitted with air / water separator must not be more than 200mm from the rearmost edge of the tyre, measured horizontally.		
30. The air / water separator spray suppression device must be at least 100mm deep when fitted to a rain flap.		

e) Lateral Protection Requirements

Where fitted, Body Builders quality systems and control plans shall capture at least the following details and installation attributes:

Material, Fitting, Installation of Side-Guards	
• Side-guard drawing number:	
• Approval number or test report:	
• The side-guard device is constructed of what material(s):	Stainless Steel: ☐ Mild Steel: ☐ Aluminium: ☐ Other: ☐ *(Specify)*

• Method of attachment of side-guard to rail:
  ○ Welding:
  ○ Bolting:
  ▪ Number of bolts:
  ▪ Size of bolts:
  ▪ Grade of bolts:
  ▪ Number of brackets:
 	
▪ Method of attachment of rail to vehicle:
  ○ Welding direct to vehicle chassis:
  ○ Use of brackets:
  ▪ Number of brackets:
  ▪ Bracket spacing:
	
	Yes: ☐ No: ☐
	Yes: ☐ No: ☐
	
	Yes: ☐ No: ☐
	Yes: ☐ No: ☐
	
	mm

▪ Rail welded to bracket: ▪ Rail bolted to bracket: • Number of bolts: • Size of bolts: • Grade of bolts:	Yes: ☐ No: ☐ Yes: ☐ No: ☐
• Ground clearance of the side guard: *(Maximum 550mm)*	mm
• Distance between the side guard and the body line :	mm

• Length inboard of the side guard from the outermost plane of the vehicle:	mm
• Number of horizontal rails included in the side guard:	
• Maximum vertical distance apart of horizontal rails:	mm
• Section height of horizontal side rail:	mm
• Size of forward facing edge:	mm
• Surface is smooth / horizontally-corrugated (delete as applicable):	
• Smallest radius of curvature of external edges or corners:	mm
• The device is used for the attachment of air or hydraulic brake pipes (Y/N):	
• There are no projecting brackets or bolt heads (see note 3 of IVA Vehicle inspection procedure 42) (Y/N):	

• Maximum gap between 2 rails making up one horizontal continuous rail:	mm
• The side rail is continuous in length (see note 4 of IVA Vehicle inspection procedure 42) (Y/N):	
• Length of the rearward edge of the guard device from the tyre on the first rear axel:	mm
• The maximum distance inboard of the device from the outermost edge of the rear tyres over the last 250mm of the guard:	mm

• Length of the front edge of the guard from the rear of the tyre on the front wheel (or second wheel if two front axles are fitted).	mm
• Where the 300 mm dimension falls within or behind the vehicles cab then:	
The guard is constructed as to meet the cab (Y/N):	Yes: ☐ No: ☐
Where required, it is turned inwards through an angle of not more than 45 degrees (see Note 5 above) (Y/N):	Yes: ☐ No: ☐
There is a gap of 100 mm maximum between the guard and the cab panel for tilting or suspended cabs (Y/N):	Yes: ☐ No: ☐
• Where the forward edge lies in otherwise open space then it must consist of:	
A continuous vertical member extending over the whole height of the member (Y/N):	Yes: ☐ No: ☐
The outer and forward faces measure at least 50	

mm rearward and are turned 100 mm inwards in the case of an N2 vehicle (Y/N): The outer and forward faces measure at least 100 mm rearward and are turned 100 mm inwards in the case of an N3 vehicle (Y/N):	Yes: ☐ No: ☐ Yes: ☐ No: ☐
• Where equipment is incorporated into the side-guard: The device has a smooth or horizontally corrugated outer surface (Y/N): It is substantially flat or horizontally corrugated (Y/N): There is no gap of more than 25 mm between it and the guard (Y/N): There is no projecting brackets or hinges (Y/N): It does not have protruding bolt heads (Y/N): Any external edges and corners are rounded with a radius of at least 2.5mm (Y/N):	 Yes: ☐ No: ☐ Yes: ☐ No: ☐ Yes: ☐ No: ☐ Yes: ☐ No: ☐ Yes: ☐ No: ☐ Yes: ☐ No: ☐

• Adjacent parts may however overlap provided that: They have an overlapping edge that faces rearwards (Y/N): They have an overlapping edge that faces downwards (Y/N):	 Yes: ☐ No: ☐ Yes: ☐ No: ☐

f) Rear Under-Run Protection:

Body Builders quality systems and control plans shall capture at least the following details and installation attributes:

Rear Under-Run Protection Requirements	
Rear protective device connected directly/indirectly to the chassis side-members:	Yes ☐ No ☐
If No then approval cannot be granted	
Means of attachment to chassis side members: • Bolting only: • Combination of welding and bolting: • Bracing between chassis and rear protective device: o Gusset pieces (size and material): o Other (specify): o Bracing material: • Brackets: o Size of brackets: o Bracket material:	Yes ☐ No ☐ Yes ☐ No ☐ mm X mm X mm Stainless Steel:☐ Mild Steel:☐ Aluminium: ☐ mm X mm X mm Stainless Steel:☐ Mild Steel:☐ Aluminium: ☐

○ Number of bolts per bracket: ○ Size of bolts: • Other means: (specify):	

Length of cross-member:	mm
Cross Section of cross-member:	Circular: ☐ Rectangular: ☐ Square: ☐ Other: ☐ *(Specify)*
Section height of cross-member (must not be less than 100mm):	mm
Section wall thickness (minimum 4mm):	mm
Width of the widest rear axle:	mm
Width of rear protective device:	mm
*Difference:	mm
Ground clearance: *(must not exceed 550mm over its width)*	mm
Securely attached to the vehicle chassis side members:	
e / E Mark or test report:	

**The width of the rear protective device shall not be less than the width of the widest rear axle by more than 100mm on either side (total 200mm).*

Vehicles fitted with Platform/Tail lifts	
For vehicles fitted with a platform/tail lift the fitting of the rear protective device may be interrupted for the purposes of the mechanism. In such cases, the following must apply:	
• The lateral distance between the fitting elements of the rear protective device and the elements of the platform lift, which make the interruption necessary, may amount to no more than 25 mm. • The individual elements of the rear protective device must, in each case, have an effective surface area of at least 350 cm2.	**Lateral distance(s)** Distance (1): mm Distance (2): mm Distance (3): mm Distance (4): mm **Surface area of individual elements** Element 1: cm² Element 2: cm² Element 3: cm² Element 4: cm² Element 5: cm²

Vehicle Rear Construction Forms The Rear Protective Device	
When the construction of the rear of the vehicle forms the rear under run protection device, then the ground clearance of the rear part of the vehicle must not exceed 550mm over a width which is not shorter than that of the rear axle by more than 100mm on either side (excluding any tyre bulging close to the ground).	
Ground clearance:	**mm**
Width of rear of vehicle:	**mm**
Width of rear axle:	**mm**

h)Light installation:

Body Builders quality systems and control plans shall check that the finished vehicle has the correct e-marked lamps/reflectors and contour tape installed correctly and in accordance with UN-ECE R48-03. The table below is an example of a standard check and additional checks may be required, depending on finished build:

	Yes	No	Record
Vehicles longer than 6m in length, side retro reflectors fitted?: ***Requirement (class IA or IB marking should be present):***			**E number**
One fitted to middle third of vehicle, not less than 250mm from the ground nor more than 900mm (1500mm if shape of vehicle makes 900mm impossible)			
One fitted to rearmost section of vehicle, within 1m of rear, height requirements as above.			
One fitted to foremost section of vehicle, within 3m of from the front, height requirements as above.			
The distance between 2 adjacent lamps shall not exceed 3m			
Vehicles longer than 6m in length, side marker lamps fitted? ***Requirement (class SM1 or SM2 marking should be present):***			**E number**
One fitted to middle third of vehicle, not less than 250mm from the ground nor more than 900mm (1500mm if shape of vehicle makes 900mm impossible)			
One fitted to rearmost section of vehicle, within 1m of rear, height requirements as above.			
One fitted to foremost section of vehicle, within 3m of from the front, height requirements as above.			
The distance between 2 adjacent lamps shall not exceed 3m			
Vehicles wider than 2.1m in length, end outline markers fitted?: ***Requirement:*** ***Categories A or Am visible from the front:*** ***Category: R, R1, R2, RM1 or RM2 visible from the rear:***			**E number**
End outline markers shall be located within 400mm to the edge of the vehicle and at a maximum height compatible with the design of the body			
For vehicle wider than 2100mm, full contour reflective marking to rear of the body?			**E number**
For vehicle NOT wider than 2100mm, partial contour reflective markings to rear of the body?			**E number**
For vehicles exceeding 6000mm in length, partial contour reflective markings to the side?			**E number**

OEM lamp cluster installed correctly and all required lamps/reflectors evident			
For all fitted lamps as required above ,the operational illumination has being checked by the relevant control e.g. brake lamp activated by brake pedal, reverse light activated by reverse gear selection etc.			

Are the Geometric visibility angles of the lamps still evident with the body fitted?
Are the correct number and location of lamps as per Appendix II?
Show compliance or noncompliance in applicable section below.

	Colour	**Geometric Visibility** **ß=horizontal angle** **α= vertical angle**	**Com pliant**	**Not Com pliant**	**Check attached Appendix II for correct number and location of lamps**	**Com pliant**	**Not Com pliant**
Reversing Lamp	White	**α** =15° upwards and 5° downwards **ß**=45° to right and left if one device. 45° outwards and 30° inwards if two installed					
Direction Indicators	Amber	**α** = 15° upwards and downwards **ß**=80° outwards and 45° inwards					
Hazard Warning	Amber	See direction indicators above					
Stop Lamp	Red	**α** = 15° upwards and downwards **ß**=45° to right and left					
Rear Registration Plate Lamp	White	Such that the device illuminates the plate					
Rear Position Lamp	Red	**α** = 15° upwards and downwards **ß**=80° outwards and 45° inwards					
Rear Fog Lamp	Red	**α** = 5° upwards and downwards **ß**=25° right and left					
End-Outline Marker Lamp	White Front, Red Rear	**α** = 5° above and 20° below **ß**= 80 outwards					
Rear retro reflector, non-triangular	red	**α** = 10° above and 10° below **ß**= 30° inwards and outwards					
Side Retro-Reflector Non-Triangular	Amber	**α** = 10° above and below **ß**=45° front and to the rear					
Side-Marker Lamps	Amber	**α** = 10° above and below **ß**=45° front and to the rear					

i) Attachment of Body/Tank etc to Vehicle/Trailer:

The attachment of the bodywork to the vehicle shall be done in accordance with the base vehicle manufacturer's instructions and good engineering practices.

As a minimum, Body Builders quality systems and control plans shall identify:

- **The relevant base vehicle manufacturer's instructions.**
- **The completed bodywork has accommodated these instructions at the relevant stages of the build.**
- **The necessary equipment for positioning and attaching the bodywork to the base vehicle.**

Attachment of Bodywork to incomplete Vehicle/Trailer	
Bodywork Description:	
Body identification marking:	
Location of body identification marking:	
Mounting Plates: *(Number off, size off, etc)*	
Method of attachment of mounting plates to bodywork: Bolting only: Combination of welding and bolting: Other: *(specify)*	 Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐

Method of attachment of mounting plates to base vehicle: Bolting only: Combination of welding and bolting: Other: *(specify)*	 Yes ☐ No ☐ Yes ☐ No ☐ Yes ☐ No ☐
Bolts: *(Number off, size off, etc)*	Number: Size: Grade: Torque setting(s)(Nm):
Welding: *(Type of welding)*	MIG: ☐ TIG: ☐ ARC: ☐ Other: ☐ *(Specify)*

Annex III

Response Time Test (extract from UN-ECE R13.06)

E/ECE/324
E/ECE/TRANS/505 Rev.1/Add.12/Rev.6
Regulation No. 13
page 86
Annex 6

Annex 6
METHOD OF MEASURING THE RESPONSE TIME ON VEHICLES
EQUIPPED WITH COMPRESSED-AIR BRAKING SYSTEMS

1. GENERAL
1.1. The response times of the service braking system shall be determined on the stationary vehicle, the pressure being measured at the intake to the cylinder of the least favourably placed brake. In the case of vehicles fitted with combined compressed-air/hydraulic braking systems, the pressure may be measured at the opening of the least favourably placed pneumatic unit. For vehicles equipped with load sensing valves, these devices shall be set in the "laden" position.

1.2. During the test, the stroke of the brake cylinders of the various axles shall be that required for brakes adjusted as closely as possible.

1.3. The response times determined in accordance with the provisions of this annex shall be rounded to the nearest tenth of a second. If the figure representing the hundredth is five or more, the response time shall be rounded up to the next higher tenth.

2. POWER-DRIVEN VEHICLES
2.1. At the beginning of each test, the pressure in the energy storage device shall be equal to the pressure at which the governor restores the feed to the system. In systems not equipped with a governor (e.g., pressure-limited compressors) the pressure in the energy storage device at the beginning of each test shall be 90 per cent of the pressure specified by the manufacturer and defined in paragraph 1.2.2.1. of Part A of Annex 7 to this Regulation, used for the tests prescribed in this annex.

2.2. The response times as a function of the actuating time (tf) shall be obtained by a succession of full actuations, beginning with the shortest possible actuating time and increasing to a time of about 0.4 seconds. The measured values shall be plotted on a graph.

2.3. The response time to be taken into consideration for the purpose of the test is that corresponding to an actuating time of 0.2 seconds. This response time can be obtained from the graph by interpolation.

2.4. For an actuating time of 0.2 seconds, the time elapsing from the initiation of the braking system control actuation to the moment when the pressure in the brake cylinder reaches 75 per cent of its asymptotic value shall not exceed 0.6 seconds.

2.5. In the case of power-driven vehicles having a pneumatic control line for trailers, in addition to the requirements of paragraph 1.1. of this annex, the response time shall be measured at the extremity of a pipe 2.5 m long with an internal diameter of 13 mm which shall be joined to the coupling head of the control line of the service braking system. During this test, a volume of 385 + 5 cm3 (which is deemed to be equivalent to the volume of a pipe 2.5 m long with an internal diameter of 13 mm and under a pressure of 650 kPa) shall be connected to the coupling head of the supply line. Tractors for semi-trailers shall be equipped with flexible pipes for making the connection to semi-trailers. The coupling heads will, therefore, be at the extremity of those flexible pipes. The length and internal diameter of the pipes shall be entered at item 14.7.3. of the form conforming to the model in Annex 2 to this Regulation.

2.6. The time elapsing from the initiation of brake-pedal actuation to the moment when (a) the pressure measured at the coupling head of the pneumatic control line, (b) the digital demand value in the electric control line measured according to ISO 11992:2003 reaches x per cent of its asymptotic, respectively final, value shall not exceed the times shown in the table below:

X (per cent)	t(s)
10	0.2
75	0.4

2.7. In the case of power-driven vehicles authorized to tow trailers of category O3 or O4 fitted with compressed-air braking systems, in addition to the above-mentioned requirements, the prescriptions in paragraph 5.2.1.18.4.1. of this Regulation shall be verified by conducting the following test:

(a) by measuring the pressure at the extremity of a pipe 2.5 m long with an internal diameter of 13 mm which shall be joined to the coupling head of the supply line;

(b) by simulating a failure of the control line at the coupling head;

(c) by actuating the service braking control device in 0.2 seconds, as described in paragraph 2.3 above.

3. TRAILERS

3.1. The trailer's response times shall be measured without the power-driven vehicle. To replace the power-driven vehicle, it is necessary to provide a simulator to which the coupling heads of the supply line, the pneumatic control line and/or the connector of the electric control line are connected.

3.2. The pressure in the supply line shall be 650 kPa.

3.3. The simulator for pneumatic control lines shall have the following characteristics:

3.3.1. It shall have a reservoir with a capacity of 30 litres which shall be charged to a pressure of 650 kPa before each test and which shall not be recharged during each test. At the outlet of the braking control device, the simulator shall incorporate an orifice with a diameter of from 4.0 to 4.3 mm inclusive. The volume of the pipe measured from the orifice up to and including the coupling head shall be 385 + 5 cm3 (which is deemed to be equivalent to the volume of a pipe 2.5 m long with an internal
diameter of 13 mm and under a pressure of 650 kPa). The control line pressures referred to in paragraph 3.3.3. of this annex shall be measured immediately downstream of the orifice.

3.3.2. The braking system control shall be so designed that its performance in use is not affected by the tester.

3.3.3. The simulator shall be set, e.g. through the choice of orifice in accordance with paragraph 3.3.1. of this annex in such a way that, if a reservoir of 385 + 5 cm3 is joined to it, the time taken for the pressure to increase from 65 to 490 kPa (10 and 75 per cent respectively of the nominal pressure of 650 kPa) shall be 0.2 + 0.01 seconds. If a reservoir of 1155 + 15 cm3 is substituted for the above-mentioned reservoir, the time taken for the pressure to increase from 65 to 490 kPa without further adjustment shall be 0.38 + 0.02 seconds. Between these two pressure values, the pressure shall increase in an approximately linear way. These reservoirs shall be connected to the coupling head without using flexible pipes and the connection shall have an internal diameter of not less than 10 mm.

3.3.4. The diagrams in the appendix to this annex give an example of the correct configuration of the simulator for setting and use.

3.4. The simulator for checking the response to signals transmitted via the electric control line shall have the following characteristics:

3.4.1. The simulator shall produce a digital demand signal in the electric control line according to ISO 11992-2:2003 and shall provide the appropriate information to the trailer via pins 6 and 7 of the ISO 7638:1997 connector. For the purpose of response time measurement the simulator may at the manufacturer's request transmit to the trailer information that no pneumatic control line is present and that the electric control line demand signal is generated from two independent circuits (see paragraphs 6.4.2.2.24. and 6.4.2.2.25. of ISO 11992-2:2003).
3.4.2. The braking system control shall be so designed that its performance in use is not affected by the tester.

3.4.3. For the purpose of response time measurement the signal produced by the electric simulator shall be equivalent to a linear pneumatic pressure increase from 0.0 to 650 kPa in 0.2 + 0.01 seconds.

3.4.4. The diagrams in the appendix to this annex give an example of the correct
configuration of the simulator for setting and use.

3.5. Performance requirements
3.5.1. For trailers with a pneumatic control line the time elapsing between the moment when the pressure produced in the control line by the simulator reaches 65 kPa and the moment when the pressure in the brake actuator of the trailer reaches 75 per cent of its asymptotic value shall not exceed 0.4 seconds.

3.5.1.1. Trailers equipped with a pneumatic control line and having electric control transmission shall be checked with the electrical power supplied to the trailer via the ISO 7638:1997 connector (5 or 7 pin).

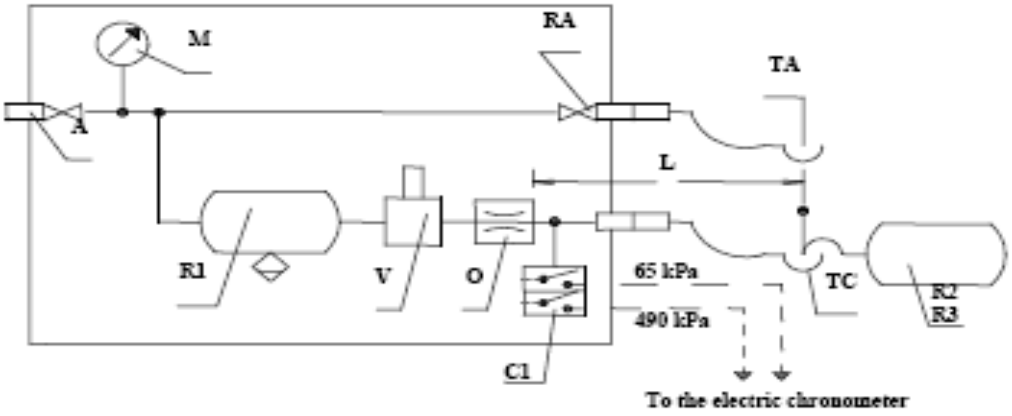
3.5.2. For trailers with an electric control line the time elapsing between the moment when the signal produced by the simulator exceeds the equivalent of 65 kPa and the moment when the pressure in the brake actuator of the trailer reaches 75 per cent of its asymptotic value shall not exceed 0.4 seconds.

3.5.3. In the case of trailers equipped with a pneumatic and an electric control line, the response time measurement for each control line shall be determined independently according to the relevant procedure defined above.

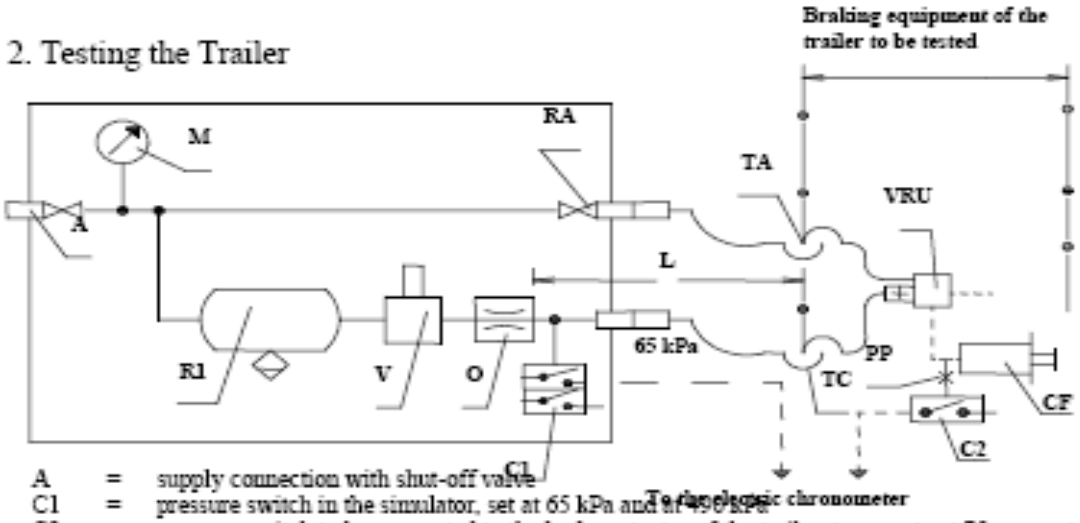
Annex 6 – Appendix

EXAMPLES OF SIMULATOR (see Annex 6, paragraph 3.)

1. Setting the Simulator

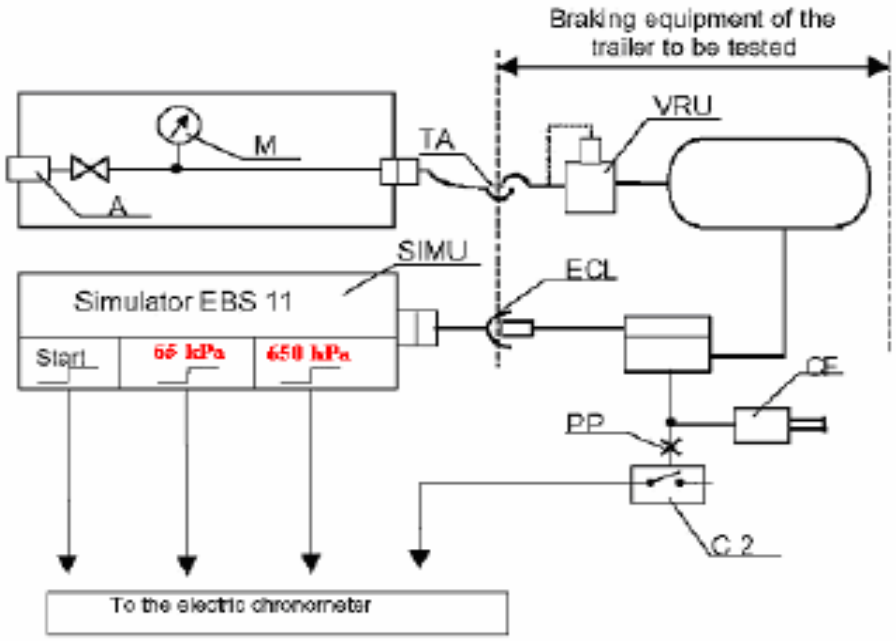


2. Testing the Trailer



A = supply connection with shut-off valve
C1 = pressure switch in the simulator, set at 65 kPa and at 490 kPa
C2 = pressure switch to be connected to the brake actuator of the trailer, to operate at 75 per cent of the asymptotic pressure in the brake actuator CF
CF = brake cylinder
L = line from orifice O up to and including its coupling head TC, having an inner volume of 385 ± 5 cm³ under a pressure of 650 kPa
M = pressure gauge
O = orifice with a diameter of not less than 4 mm and not more than 4.3 mm
PP = pressure test connection
R1 = 30 litre air reservoir with drain valve
R2 = calibrating reservoir, including its coupling head TC, to be 385 ± 5 cm³
R3 = calibrating reservoir, including its coupling head TC, to be 1155 ± 15 cm³
RA = shut-off valve
TA = coupling head, supply line
V = braking system control device
TC = coupling head, control line
VRU = emergency relay valve

3. Example of a simulator for electric control lines



ECL	=	electric control line corresponding to ISO 7638
SIMU	=	simulator of Byte 3,4 of EBS 11 according to ISO 11992 with output signals at start, 65 kPa and 650 kPa.
A	=	supply connection with shut-off valve
C2	=	pressure switch to be connected to the brake actuator of the trailer, to operate at 75 per cent of the asymptotic pressure in the brake actuator CF
CF	=	brake cylinder
M	=	pressure gauge
PP	=	pressure test connection
TA	=	coupling head, supply line
VRU	=	emergency relay valve

Annex IV

Definition of Type, Variant and Version

(Extract and numbering from EC Directive 2007/46/EC)

2. Categories M2 and M3

2.1. Vehicle type:

2.1.1. A 'vehicle type' shall consist of vehicles which have all of the following features in common:

(a) the manufacturer's company name. A change in the legal form of ownership of the company does not require that a new approval has to be granted;

(b) the category;

(c) the following aspects of construction and design:

(i) the design and construction of the essential constituent elements forming the chassis;

(ii) the design and construction of the essential constituent elements forming the body structure in the case of a self-supporting body;

(d) the number of decks (single or double);

(e) the number of sections (rigid/articulated);

(f) the number of axles;

(g) the mode of energy supply (on-board or off-board);

(h) in the case of multi-stage built vehicles, the manufacturer and the type of the previous stage vehicle.

2.1.2. A type shall consist of at least one variant and one version.

2.2. Variant:

2.2.1. A 'variant' within a vehicle type shall group the vehicles which have all of the following construction features in common:

(a) the type of bodywork as defined in Section 2 of Part C;

(b) the class or combination of classes of vehicles as defined in point 2.1.1 of Annex I to Directive 2001/85/EC (only in the case of complete and completed vehicles);

(c) the stage of completion (e.g. complete/incomplete/completed);

(d) the power plant with regard to the following construction features:

(i) the type of energy supply (internal combustion engine, electric motor or other);

(ii) the working principle (positive ignition, compression ignition or other);

(iii) the number and arrangement of cylinders in the case of internal combustion engine (L6, V8 or other).

2.3. Version:

2.3.1. A 'version' within a variant shall group the vehicles which have all the following features in common:
(a) the technically permissible maximum laden mass;

(b) the ability of the vehicle to tow a trailer or not;

(c) the engine capacity in the case of internal combustion engine;

(d) the maximum engine power output or the maximum continuous rated power (electric motor);

(e) the nature of the fuel (petrol, gas oil, LPG, bi-fuel or other);
(f) drive-by sound level;

(g) exhaust emission level (for example Euro IV, Euro V or other).

3. Category N1

3.1. Vehicle type:

3.1.1. A 'vehicle type' shall consist of vehicles which have all of the following features in common:
(a) the manufacturer's company name. A change in the legal form of ownership of the company does not require that a new approval has to be granted;

(b) the design and assembly of the essential parts of the body structure in the case of a self-supporting body;

(c) the design and the construction of the essential constituent elements forming the chassis in the case of a non self-supporting body;

(d) in the case of multi-stage built vehicles, the manufacturer and the type of the previous stage vehicle.

3.1.2. By way of derogation from the requirements of point 3.1.1(b), when the manufacturer uses the floor portion of the body structure as well the essential constituent elements forming the front part of the body structure located directly in front of the windscreen bay, in the construction of different kinds of bodywork (for example a van and a chassis-cab, different wheelbases and different roof heights), those vehicles may be considered as belonging to the same type. Evidence thereof shall be provided by the manufacturer.

3.1.3. A type shall consist of at least one variant and one version.

3.2. Variant:

3.2.1. A 'variant' within a vehicle type shall group the vehicles which have all of the following construction features in common:
(a) the number of lateral doors or the type of bodywork as defined in Section 3 of Part C (for complete and completed vehicles) when the manufacturer uses the criterion of point 3.1.2;

(b) the stage of completion (e.g. complete/incomplete/completed);

(c) the power plant with regard to the following construction features:

(i) the type of energy supply (internal combustion engine, electric motor or other);

(ii) the working principle (positive ignition, compression ignition or other);

(iii) the number and arrangement of cylinders in the case of internal combustion engine (L6, V8 or other);

(d) the number of axles;

(e) the number and interconnection of powered axles;

(f) the number of steered axles.

3.3. Version:

3.3.1. A ‘version’ within a variant shall group the vehicles which have all the following features in common:
(a) the technically permissible maximum laden mass;

(b) the engine capacity in the case of internal combustion engine;

(c) the maximum engine power output or maximum continuous rated power (electric motor);

(d) the nature of the fuel (petrol, gas oil, LPG, bi-fuel or other);

(e) the maximum number of seating positions;

(f) drive-by sound level;

(g) exhaust emission level (for example Euro 5, Euro 6 or other);

(h) combined or weighted, combined CO 2 emissions;

(i) electric energy consumption (weighted, combined);

(j) combined or weighted, combined fuel consumption.

4. Categories N2 and N3

4.1. Vehicle type:

4.1.1. A 'vehicle type' shall consist of vehicles which have all of the following essential features in common:

(a) the manufacturer's company name. A change in the legal form of ownership of the company does not require that a new approval has to be granted;

(b) the category;

(c) the design and construction of the chassis that are common to a single line of product;

(d) the number of axles;

(e) in the case of multi-stage built vehicles, the manufacturer and the type of the previous stage vehicle.

4.1.2. A type shall consist of at least one variant and one version.

4.2. Variant:

4.2.1. A 'variant' within a vehicle type shall group the vehicles which have all of the following construction features in common:

(a) the vehicle body code and bodywork code (see Section 4 VIN);

(b) the stage of completion (e.g. complete/incomplete/completed);

(c) the power plant with regard to the following construction features:
(i) the type of energy supply (internal combustion engine, electric motor or other);

(ii) the working principle (positive ignition, compression ignition or other);

(iii) the number and arrangement of cylinders in the case of internal combustion engine (L6, V8 or other);

(d) the number and interconnection of powered axles; (e) the number of steered axles.

4.3. Version:

4.3.1. A 'version' within a variant shall group the vehicles which have all the following features in common:
(a) the technically permissible maximum laden mass;

(b) the ability or not to tow a trailer as follows:

(i) an unbraked trailer;

(ii) a trailer with an inertia (or overrun) braking system as defined in point 2.12 of UNECE Regulation No 13;

(iii) a trailer with a continuous or semi-continuous braking system as defined in points 2.9 and 2.10 of UNECE Regulation No 13;

(iv) a trailer of category O4 that results in a maximum mass of the combination not exceeding 44 tonnes;

(v) a trailer of category O4 that results in a maximum mass of the combination exceeding 44 tonnes;

(c) the engine capacity;

(d) the maximum engine power output;

(e) the nature of the fuel (petrol, gas oil, LPG, bi-fuel or other);

(f) drive-by sound level;

(g) exhaust emission level (for example Euro IV, Euro V or other).

5. Categories O1 and O2

5.1. Vehicle type:

5.1.1. A 'vehicle type' shall consist of vehicles which have all of the following features in common:
(a) the manufacturer's company name. A change in the legal form of ownership of the company does not require that a new approval has to be granted;

(b) the category;

(c) vehicle body code (see Section 4 VIN)

(d) the following aspects of construction and design:
(i) the design and construction of the essential constituent elements forming the chassis;

(ii) the design and construction of the essential constituent elements forming the body structure in the case of a self-supporting body;

(e) the number of axles;

(f) in the case of multi-stage built vehicles, the manufacturer and the type of the previous stage vehicle.

5.1.2. A type shall consist of at least one variant and one version.

5.2. Variant:

5.2.1. A 'variant' within a vehicle type shall group the vehicles which have all of the following construction features in common:
(a) the kind of bodywork code (see Section 4 VIN);

(b) the stage of completion (e.g. complete/incomplete/completed);

(c) the type of braking system (e.g. unbraked/inertia/power).

5.3. Version:

5.3.1. A 'version' within a variant shall group the vehicles which have all the following features in common:
(a) the technically permissible maximum laden mass;

(b) the concept of the suspension (air, steel or rubber suspension, torsion bar or other);

(c) the concept of the drawbar (triangle, tube or other).

6. Categories O3 and O4

6.1. Vehicle type:

6.1.1. A 'vehicle type' shall consist of vehicles which have all of the following features in common:

(a) the manufacturer's company name. A change in the legal form of ownership of the company does not require that a new approval has to be granted;

(b) the category;

(c) vehicle body code (see Section 4 VIN)

(d) the following aspects of construction and design:
(i) the design and construction of the essential constituent elements forming the chassis;

(ii) the design and construction of the essential constituent elements forming the body structure in the case of trailers with a self-supporting body;

(e) the number of axles;

(f) in the case of multi-stage built vehicles, the manufacturer and the type of the previous stage vehicle.

6.1.2. A type shall consist of at least one variant and one version.

6.2. Variants:

6.2.1. A 'variant' within a vehicle type shall group the vehicles which have all of the following construction and design features in common:

(a) the kind of bodywork code (see Section 4 VIN);

(b) the stage of completion (e.g. complete/incomplete/completed);

(c) the concept of the suspensions (steel, air or hydraulic suspension);

(d) the following technical features:

(i) the capability or not for the chassis to be extendible;

(ii) the deck height (normal, low loader, semi-low loader etc.).

6.3. Versions:

6.3.1. A 'version' within a variant shall group the vehicles which have all the following features in common:

(a) the technically permissible maximum laden mass;

(b) the subdivisions or combination of subdivisions referred to in points 3.2 and 3.3 of Annex I to Directive 96/53/EC into which the axle spacing between two consecutive axles forming a group belongs;

(c) the definition of the axles in the following respects;

(i) lift axles (number and position);

(ii) loadable axles (number and position);

(iii) steered axle (number and position).

4. Criteria for the subcategorisation of vehicles as off-road vehicles

4.1. M1 or N1 vehicles shall be subcategorised as off-road vehicles if they satisfy at the same time the following conditions:

(a) at least one front and at least one rear axle designed to be driven simultaneously irrespective of whether one powered axle can be disengaged;

(b) at least one differential locking mechanism or a mechanism having similar effect is fitted;

(c) they are able to climb at least a 25 % gradient as solo vehicle;

(d) they satisfy five out of the following six requirements:

(i) the approach angle shall be at least 25 degrees;

(ii) the departure angle shall be at least 20 degrees;

(iii) the ramp angle shall be at least 20 degrees;

(iv) the ground clearance under the front axle shall be at least 180 mm;

(v) the ground clearance under the rear axle shall be at least 180 mm;

(vi) the ground clearance between the axles shall be at least 200 mm.

4.2. M2, N2 or M3 vehicles whose maximum mass does not exceed 12 tonnes shall be subcategorised as off-road vehicles if they satisfy the condition set out in point (a) or both conditions set out in points (b) and (c):

(a) all their axles are driven simultaneously, irrespective of whether one or more powered axles can be disengaged;

(b) (i) at least one front and at least one rear axle are designed to be driven simultaneously irrespective of whether one powered axle can be disengaged;

(ii) at least one differential locking mechanism or a mechanism having the same effect is fitted;

(iii) they are able to climb a 25 % gradient as a solo vehicle;

(c) they satisfy at least five out of the following six requirements if their maximum mass does not exceed 7,5 tonnes and at least four if their maximum mass exceeds 7,5 tonnes:

(i) the approach angle shall be at least 25 degrees;

(ii) the departure angle shall be at least 25 degrees;

(iii) the ramp angle shall be at least 25 degrees;

(iv) the ground clearance under the front axle shall be at least 250 mm;

(v) the ground clearance between axles shall be at least 300 mm;

(vi) the ground clearance under the rear axle shall be at least 250 mm.

4.3. M3 or N3 vehicles whose maximum mass exceeds 12 tonnes shall be subcategorised as off-road vehicles if they satisfy the condition set out in point (a) or both conditions set out in points (b) and (c):

(a) all their axles are driven simultaneously, irrespective of whether one or more powered axles can be disengaged;

(b) (i) at least half of the axles (or two axles out of the three in the case of a three axle vehicle and *mutatis mutandis* in the case of a five axle vehicle) is designed to be driven simultaneously, irrespective of whether one powered axle can be disengaged;

(ii) there is at least one differential locking mechanism or a mechanism having similar effect;

(iii) they are able to climb a 25 % gradient as solo vehicle;

(c) they satisfy at least four out of the following six requirements:

(i) the approach angle shall be at least 25 degrees;

(ii) the departure angle shall be at least 25 degrees;

(iii) the ramp angle shall be at least 25 degrees;

(iv) the ground clearance under the front axle shall be at least 250 mm;

(v) the ground clearance between axles shall be at least 300 mm;

(vi) the ground clearance under the rear axle shall be at least 250 mm.

4.4. The procedure for checking compliance with the geometrical provisions referred to in this section shall be set out in Appendix 1.

Appendix 1

Procedure for checking whether a vehicle can be categorised as off-road vehicle

0. General

0.1. For the purposes of classification of a vehicle as off-road vehicle, the procedure described in this Appendix shall apply.

1. Test conditions for geometric measurements
1.1. Vehicles belonging to category M1 or N1 shall be in unloaded conditions with a manikin of the 50th percentile male installed on the driver's seat and fitted with coolant fluid, lubricants, fuel, tools, spare-wheel (if fitted as OEM equipment).

The manikin may be replaced by a similar device having the same mass.

1.2. Vehicles other than those referred to in point 1.1 shall be loaded to their technically permissible maximum laden mass. The distribution of the mass on the axles shall be the one that represents the worst case with respect to compliance with the respective criteria.

1.3. A vehicle representative of the type shall be submitted to the ATC in the conditions specified in point 1.1 or 1.2. The vehicle shall be in a stationary position with its wheels set straight ahead. The ground on which measurements are made shall be as flat and horizontal (maximum of inclination 0,5 %) as possible.

2. Measurement of approach, departure and ramp angles

2.1. The approach angle shall be measured in accordance with Item 6.10 of Standard ISO 612:1978.

2.2. The departure angle shall be measured in accordance with Item 6.11 of Standard ISO 612:1978.

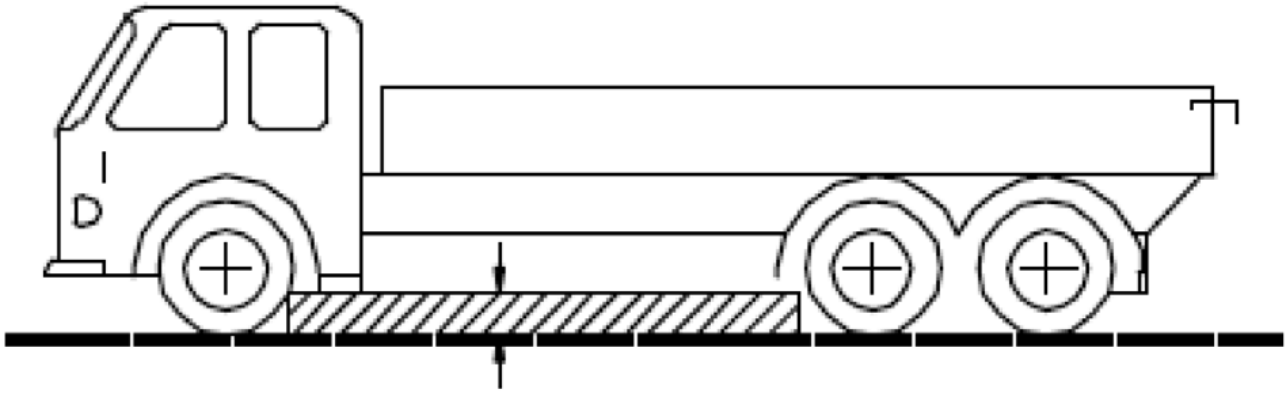
2.3. The ramp angle shall be measured in accordance with Item 6.9 of Standard ISO 612:1978.

2.4. When measuring the departure angle rear underrun protection devices which are adjustable in height may be set in the upper position.

2.5. The prescription in point 2.4 shall not be construed as an obligation for the base vehicle to be fitted with a rear underrun protection as original equipment. However, the base vehicle manufacturer shall inform the next stage manufacturer that the vehicle has to comply with the requirements on departure angle when fitted with a rear underrun protection.

3. Measurement of ground clearance
3.1. Ground clearance between the axles 3.1.1. '*Ground clearance between the axles*' means the shortest distance between the ground plane and the lowest fixed point of the vehicle.

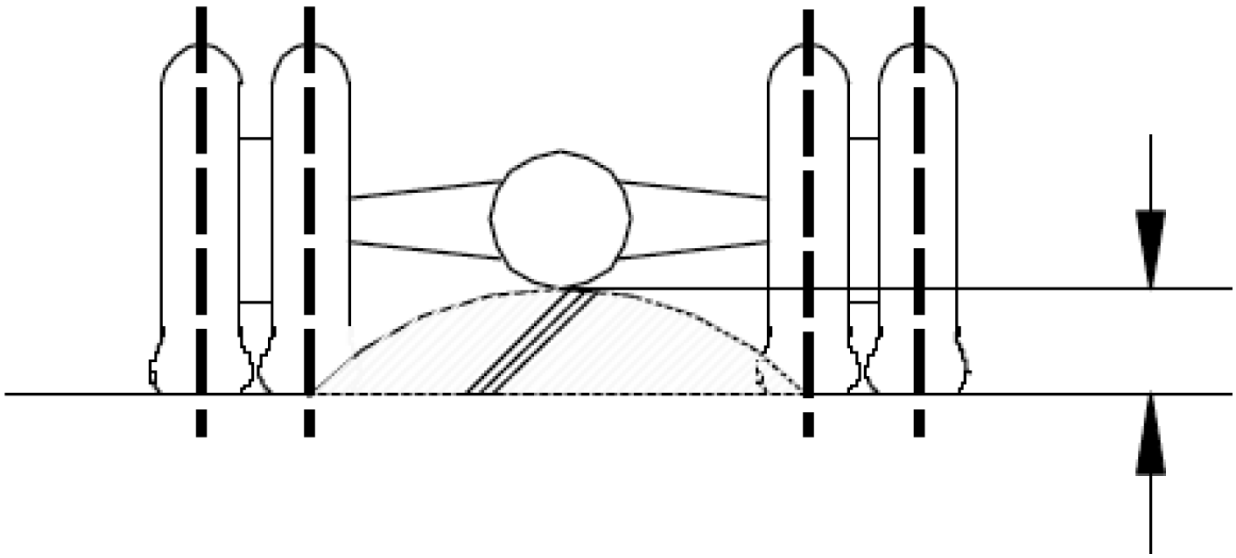
For the application of the definition, the distance between the last axle of a front group of axle and the first axle of a rear group of axle shall be considered.



3.1.2. No rigid part of the vehicle may project into the shaded area shown on the figure.

3.2. Ground clearance beneath one axle

3.2.1. '*Ground clearance beneath one axle*' means the distance beneath the highest point of the arc of a circle passing through the centre of the tyre footprint of the wheels on one axle (the inner wheels in the case of twin tyres) and touching the lowest fixed point of the vehicle between the wheels.



3.2.2. Where appropriate, the measurement of ground clearance shall be conducted on each of the several axles of a group of axles.

4. Gradeability

4.1. '*Gradeability*' means the ability of a vehicle to negotiate a gradient.

4.2. To the effect of checking the gradeability of an incomplete and a complete vehicle of category M2, M3, N2 and N3, a test shall be performed.

4.3. The test shall be conducted by an ATC on a vehicle representative of the type to be tested.

5. Test conditions and pass-fail criterion

5.1. Until 31 October 2014, the conditions set out in section 7.5 of Annex I to Directive 97/27/EC shall apply. As from 1 November 2014, test conditions adopted under Regulation (EC) No 661/2009 of the European Parliament and of the Council in accordance with Article 14 of that Regulation shall apply.

5.2. The vehicle shall climb the gradient at a steady speed without any wheel slipping, longitudinally or laterally.

Annex V

IVA scheme Exemptions for N2, N3 vehicles

- **Rear under run protection**
- **Lateral protection**
- **Spray suppression**
- **Front under run protection**

The following exemptions have been agreed with the Road Safety Authority to be incorporated into the **IVA** scheme for N2, N3 vehicles.

Justification for the application of these exemptions must be submitted to NSAI before approval can be granted. (Please complete Exemption Justification Form attached)

These exemptions are subject to change. Any changes will be posted to the NSAI website.

Rear Protective Devices (Rear under-run).

Vehicles of category N2 and N3

Vehicle Type	**Exemption Provided**
Tractors for articulated vehicles	Exempt
Gritter (vehicle fitted at the rear with apparatus for spreading material on a road)	Exempt
Car transporters (designed to carry vehicles loaded onto it from the rear)	Exempt if the platform upper edge is lower than 550mm
Concrete mixers & pumping vehicles	In cases where it is impractical to comply with the full requirements, the protection device will be mounted as close to the rear as possible. Exempt if the operation of equipment is compromised by the fitment of an under-run
Skip loaders, including hook lifts	Exempt if the operation of equipment is compromised by the fitment of an under-run OR the upper edge of the loading platform is lower than 550mm

Off road vehicles	Exempt if the operation of equipment is compromised by the fitment of a rear under-run protective device
Rear loading refuse collection vehicles	Where the equipment and bodywork prevent the fitting of a rear underrun device.
Crash cushion vehicles	Exempt where the ground clearance is less than 550mm with cushion in the retracted position
Breakdown vehicle (rear loading slide and tilt bed)	Exempt where fitted with a spectacle lift
Access Lift Vehicles	Exempt only where the platform is situated behind the vehicle making the fitment of the rear under-run device impractical
Vehicles designed to interchange equipment for road gritting (Evidence shall be required)	In cases where it is impractical to comply with the full requirements, the protection device will be mounted as close to the rear as possible. Exempt if the operation of equipment is compromised by the fitment of a rear under-run protective device
Tipper bodies designed **exclusively** for the purpose of unloading tar into a tar spreading machine	In cases where it is impractical to comply with the full requirements, the protection device will be mounted as close to the rear as possible Exempt if the operation of equipment is compromised by the fitment of a rear under-run protective device Evidence shall be required that the body is equipped to deliver tar i.e. it is insulated/has tar chutes in the tail gate

Note: Vehicles are exempt if the operation of equipment is compromised by the fitment of a rear under-run protective device

Vehicles for which rear under-run protection is incompatible with their use are exempt. (Evidence shall be required).

Lateral Protection (Side Guards)

Vehicles of category N2 and N3

Vehicle Type	Exemption Provided
Tractors for articulated vehicles	Exempt
Car transporters (Double deck vehicles, designed to carry other vehicles loaded on from the rear)	Exempt where the chassis rails are on the extremities of the vehicle and are no more than 550mm from the ground
Gulley emptiers	Exempt where fitting of a lateral protection device **prevents** the use of the suction tube (not merely hinders)
Road sweepers (A vehicle fitted with specialised equipment for sweeping streets)	Exempt
Vehicles specifically designed and constructed for a purpose where the fitment of a lateral protection device would prevent the use of that equipment fitted (not merely hinders)	Exempt
A tank-vehicle that is a vehicle designed solely for the carriage of fluid substance in a closed tank permanently fitted to the vehicle and provided with hose or pipe connections for loading or unloading	Shall be fitted with side guards which comply so far as is practicable with all the requirements of this section; strict compliance may be waived only where operational requirements make this necessary
Vehicles designed and constructed for special purposes where it is not possible, for practical reasons, to fit lateral protection devices	Exempt but justification will be required
Motor vehicles with tipper bodies – side tipping	Exempt

A vehicle of category N2 or N3 is not required to be fitted with a separate lateral protection device, providing the sides of the vehicle are so designed and/or equipped that by their shape and characteristics their component parts together meet the requirements as described in the IVA Inspection Manual.

Spray Suppression

Vehicles of category N2 and N3

Vehicle Type	Exemption Provided
All vehicles up to 7500kg	Exemption from spray suppression, but will require mud guards.
• Multi wheel drive motor vehicles (capable of driving the first axle (axle number 1)and at least one of the rear axles • High ground clearance motor vehicles (>400mm) • Off Road Vehicles	Exemption from spray suppression, but will require mudguards.
Motor vehicles with tipper bodies – side tipping or rear tipping	Tippers with open-backed bodies are exempt from spray suppression, but will require mud guards.
Refuse vehicles, including refuse collection vehicles, road sweepers and gulley emptiers	Exemption from spray suppression, but will require mud guards.
Vehicles designed, and not merely adapted, for the carriage and mixing of liquid concrete,	Exemption from spray suppression, but will require mud guards.
Motor vehicles designed for the collection of un-processed milk from farms for transport to a processing facility,	Exemption from spray suppression, but will require mud guards.
Motor vehicles designed for the transportation of livestock.	Exemption from spray suppression, but will require mud guards.
Motor vehicles designed for the carriage of concrete building blocks or bricks,	Exemption from spray suppression, but will require mud guards.

Mudguards

- Must fully cover the zone immediately above, ahead and behind and part of the tyres.
- Must have a lower front edge no more than 45 degrees above the horizontal line of the axle
- Must have the lower-rear edge no more than 100mm above the horizontal line of the axle

Front Under Run

Vehicles of category N2 and N3

Vehicle Type	**Exemption Provided**
Off-Road Vehicles	Exempt
All other vehicles	Where fitment would not be compatible for their use
Vehicles of Categories N2 with a maximum mass not exceeding 7,5 tonnes	as an alternative to satisfactory documentary evidence, can meet the requirements for front under run protection if: • The ground clearance at the front of the vehicle does not exceed 400mm between two points set at not more than 200mm inwards from the outer edge of the tyre on each side; and • Outside these points the height may increase towards the outside of the vehicle at an angle of not more than 15 degrees from the horizontal.

NSAI Exemption Justification Form

Applicants Name:
VIN:
Trade name of vehicle:
Category of vehicle:
ATC to carry out Inspection:

Please complete this form (along with support documents i.e. COC base vehicle/drawings /photos/video's etc.) if you require any exemptions to type approval requirements. Each application will be evaluated on a case by case basis. If exemption is justified, NSAI shall inform requested ATC of exemption granted prior to inspection being carried out.

1	Please state the regulation(s) that the vehicle requires exemption for: (e.g. lateral protection, rear under run etc…)
2	Please state why you believe that this vehicle cannot comply with the regulation(s) stating the particular requirement(s) of the regulation(s) that cannot be met:
3	What evidence have you supplied to show this? Feel free to add text here to supplement evidence. (Examples of evidence: photos/videos of equipment in operation, photos/drawings/sketches of build showing the inability to comply…)

4	Please detail what, if any, design options you have explored to comply with the requirements and why they are not suitable:
5	Any other relevant information:

Annex VI

Sample of Contractual agreement for multi stage approval

1.

1.1 Company A confirms that it is applying for an NSSTA application to NSAI and shall use company B for some element of the finished vehicles construction

1.2 Company B confirms that it is an assembly plant for an NSSTA as applied for by company A and shall work in conjunction with company A to ensure that the finished vehicle complies with all relevant requirements

2.

This contract is valid for the base vehicle manufacturer:

EWVTA No.:_____
Type: _____

and the completed/incomplete vehicle made from it

Type: _____

3.

The companies A and B are to exchange information with one another from which it can be observed that the technical requirements of all applicable separate directives have been met. The documents named comprised details on the approvals granted for systems, component parts and separate technical units as well as on vehicle parts that are part of the incomplete vehicle for which no approval has yet been granted.

4. The companies A and B are to keep one another informed of all changes that they carry out on systems, component parts, separate technical units and vehicle parts.

5. The companies A and B are to keep one another informed of the addenda and supplements to EC or ECE approvals that are applied to systems, component parts, separate technical units as well as the expiry of EC or ECE approvals.

6. The companies A and B are to inform the Type Approval Authority immediately about the alteration or termination of this contract.

7. The companies A and B have a declaration of agreement concerning COP as per sample declaration below

Company A:

Signature: _____ Date: _____

Position: _____

Company Stamp

Company B:

Signature: _____ Date: _____

Position: _____

Company Stamp

Declaration of Agreement concerning COP

(This declaration is to be printed on applicant company headed paper)

(…….Name of Applicant) and (…….Name of Assembly Company).

agree that:

1. (…….Name of Applicant) can, and will, stop production of non-conforming product (type name……) from (…….Name of Assembly Company).
2. At regular intervals, the tests prescribed in applicable legislation are carried out.
3. Any set of samples or test pieces showing evidence of non-conformity gives rise to further sampling and testing and all steps shall be taken to restore conformity of production.
4. Test results data are recorded and remain available for inspection by NSAI, for a period of 10 years.
5. Analysis of the results of tests is carried out and recorded, in order to verify and ensure the stability of the product characteristics.
6. Test records and production records shall be made available to NSAI.
7. The type shall continue to be manufactured and tested in accordance with the specifications and drawings contained in the test report and information document which was submitted with the application for EC/UN ECE type approval.
8. Changes to the type, materials, methods, processes, or otherwise shall be approved by NSAI prior to implementation.
9. Changes in Applicants name and address or Assembly Company name and address or Manufacturer name and address shall be notified to NSAI immediately.
10. The duties imposed by issuing of this type approval are not transferable.
11. NSAI retains the right to carry out conformity of production audits at (…….Name of Manufacturer), (…….Name of Applicant) and (…….Name of Assembly Company).