



Wheelchair Accessible Vehicle Converters Association

# **PAS 2012:2015**

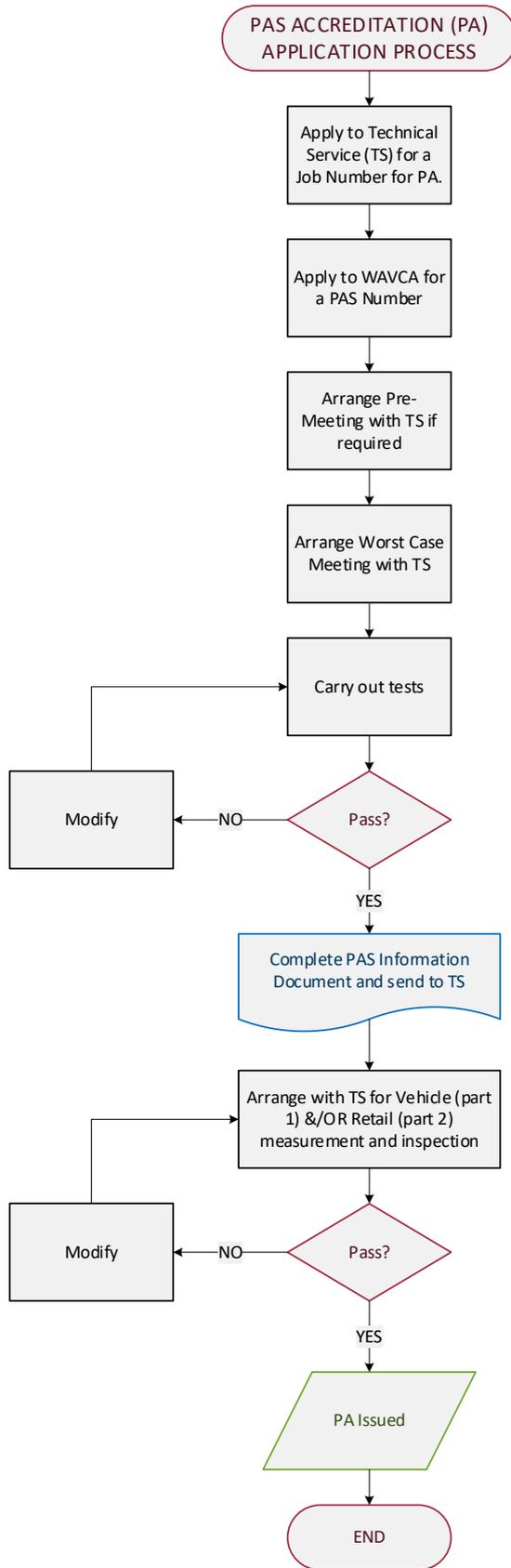
## IMPLEMENTATION GUIDE

## **INTRODUCTION**

PAS2012-1:2015 contains information on technical requirements for wheelchair accessible vehicles. This document is intended to supplement the PAS, and give an indication into how assessment to the standard is to be made. It also aims to help the manufacturer through the accreditation process, giving an indication of what additional information is required. Charts give an outline to the process from start to finish, with each key area being described in detail.

# PAS ACCREDITATION (PA) APPLICATION PROCESS

PA Application Process 03a.vsd



## 1. PRE-MEETING

Although not compulsory, the importance of the pre-meeting with the WAVCA Technical Service (TS) cannot be over emphasised, particularly for companies new to the scheme. The earlier in the life cycle of the vehicle that this occurs the more likely costly mistakes can be avoided. A number of items will often be discussed at these meetings, all based around the proposed design of the vehicle and its intended use. The more information that is presented at the time of the meeting the more productive the meeting will be. Areas covered will typically include

- ❑ Look at early prototypes / CAD drawings to advise on potential testing pitfalls and areas that could increase the cost of PAS Accreditation (PA)
- ❑ Discuss product options and how they will affect testing
- ❑ Run through of the approval process and advise on a suitable order for testing
- ❑ Discussion on the level and standard of paperwork required
- ❑ Advise on suitable test locations
- ❑ Overview of the requirements for preliminary accreditation

Following on from this meeting, the vehicle specification can be finalised. This meeting will last in the order of two hours, and if it is conducted at one of the TS premises then a charge will not be made for this service.

## 2. WORST CASE MEETING

Once the specifications, and all of the options, have been determined a worst-case meeting can be organised with the TS. The purpose of this meeting is to determine how much testing, and for which subject areas, needs to be conducted for the vehicle to gain PA. This meeting will encompass type approval, conformity of production and PA, where necessary. As in the pre-meeting, photographs, drawings or “looking around a vehicle” will make the process smoother and more concise. Once the level of testing has been determined, timescales and cost estimates can be drawn up. At this point, job numbers will need to be opened with the TS and WAVCA in order for all documentation to be stored securely. It would be prudent for dates to be booked for test engineer attendance at this stage so that unnecessary delays do not occur.

To summarise, the worst case meeting

- ❑ Outlines the final vehicle specification
- ❑ Determines the level of testing required
- ❑ Gives information to allow timescales to be determined
- ❑ Allows engineers and test houses to be booked
- ❑ Allows work to begin on necessary control plans
- ❑ Allows programme cost estimates to be made

### 3. PAPERWORK REQUIREMENTS

The most important part of PAS2012-1:2015 (and for that matter type approval) is the paperwork that supports the testing. The PAS works as a form of “type approval” itself in the sense that one vehicle of type is assessed, and the manufacturer makes an undertaking to guarantee that all vehicles produced are to the same specification. The only way that this can work is if the specification of the vehicle is tied down by a set of authenticated paperwork held by both the manufacturer and the TS. The content of this paperwork submission, to some extent, is vehicle specific due to the fact that every conversion is different. However, it is paramount that the paperwork supplied details all of the components and modifications made to the vehicle in sufficient detail to tie its specification down in its entirety. Along with good quality colour photographs, detailed drawings must be supplied that give all relevant dimensions and material specification for the added items. In addition to this, installation details are needed showing where components sit within the vehicle structure.

An Information Document for PAS2012-1:2015 accreditation is available from WAVCA and the TS. Once this paperwork is supplied to the TS it will be assessed by an engineer and any necessary amendments requested. No approvals of any kind will be issued until a satisfactory level of paperwork has been received. Please be aware that the paperwork details everything that is covered by the PA, and the omission of information on a particular part means that the approval is not valid for the vehicle with that part fitted.

## 4. WITNESS TESTS

Within the PAS, there a number of subject areas that require testing and evaluating. In order to demonstrate that testing has been conducted correctly, a number of these tests need to be witnessed by the TS engineers just like any type approval test. In many cases the tests that are witnessed are also required for type approval, meaning that if the vehicle is to be type approved there is no added burden, and if the vehicle is not to be type approved an upgrade in the future is possible without repeating expensive destructive tests. The subjects where an official witness is required is listed in 4.1 below. As mentioned in sections 1 and 2 the amount of testing required will be determined in meetings conducted before testing begins. Early booking for test facilities and the TS engineers would always be advised.

### 4.1. PAS2012-1:2015 TESTS REQUIRING WITNESSING

- Seat belt anchorages
- ISOFIX
- Fuel tanks
- Access to wheelchair space
- Wheelchair available space
- WTORS tests

## 5. SELF-CERTIFICATION TESTS

For the other subject areas of the PAS, self-certification may be accepted when supported by suitable paperwork and test evidence. In some cases, the tests will be conducted at an independent test house and not at the manufacturer's premises. In order for the self-certification to be accepted, the premises at which the testing is conducted needs to be suitably appraised and the test conducted by an appointed person. The appraisal will ensure that the location has suitable equipment that they are trained to use, along with copies of the requirements. The paperwork that is submitted to the TS to gain accreditation for these subjects will need to include calibration certificates for all equipment used along with the detailed test specification, photographs and results. At the manufacturer's choice, all tests can be independently witnessed by TS engineers.

However, in all cases the TS will need to agree which tests can be conducted as self certification at the worst case meeting stage. This will depend on the detail of the conversion and may change from model to model. The subjects where an official witness may not be required are listed below.

### 5.1. PAS2012-1:2015 TESTS NOT NECESSARILY REQUIRING WITNESSING (SELF CERTIFICATION)

- Ramp
- Ramp / spare wheel anchorage
- Back and head restraint
- Torsional rigidity

## 6. TEST REPORTS

As with type approval, for all witnessed tests the TS will issue an official test report. For tests that the manufacturer or test house carry out themselves, a test report will need to be supplied to the TS for checking. Checks will be made to ensure that all data has been collected, results are realistic and limits are not exceeded. The test report must be signed and dated by the appointed person who is “covered” by the facility appraisal mentioned in section 5.

## 7. PAS APPLICATION & EXTENSION PROCEDURES.

### 7.1. NEW PAS ACCREDITATION APPLICATIONS

An application for a PAS accreditation remains valid for a period of 2 years. If the PAS accreditation has not been issued within this period, a new application shall be made. PAS applications already open at 29/01/15 remain valid until 29/01/17.

A vehicle shall be PAS-accredited and all tests shall be carried out according to the requirements of the version of PAS 2012 that was current at the time the application was made. If a revision of PAS 2012 is published after the application was made but before the end of the 2-year period of validity of the application, the applicant may test and accredit to any new requirements contained in the revised publication but this is not mandatory.

### 7.2. EXTENSIONS TO EXISTING PAS ACCREDITATIONS

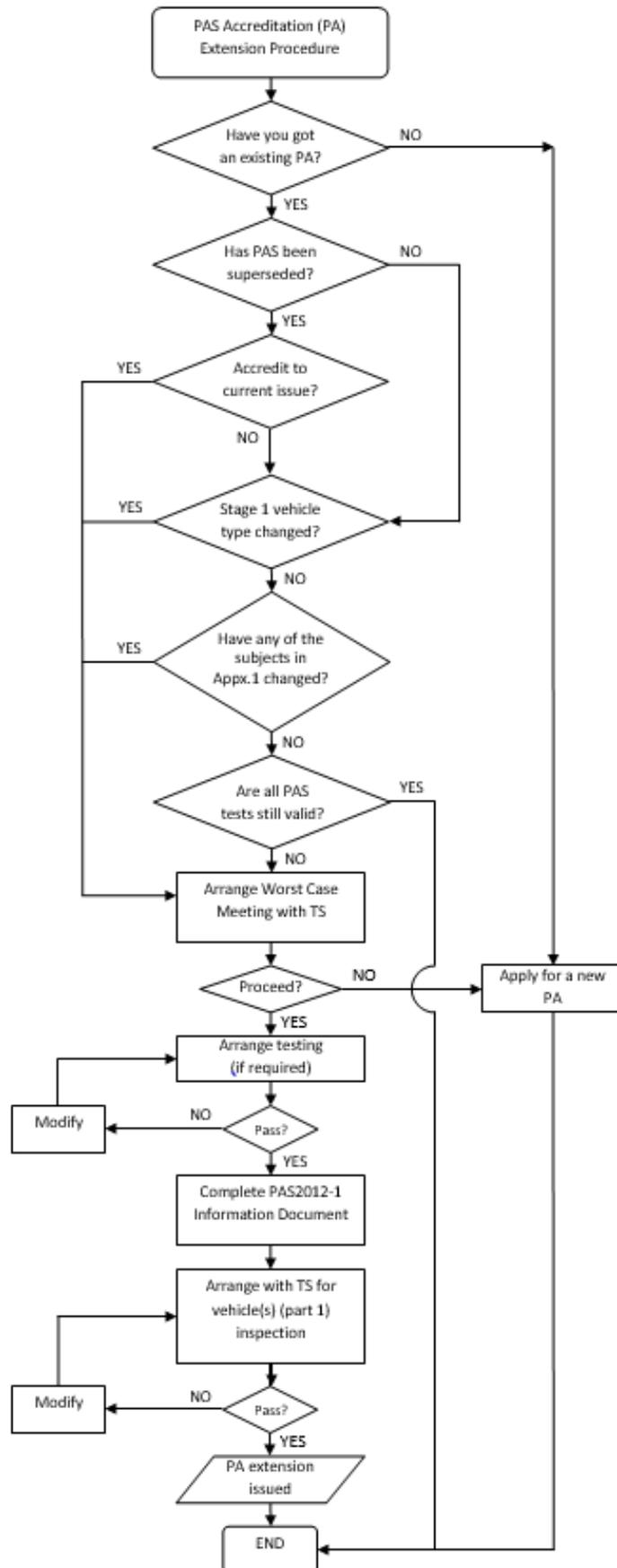
A PAS extension may be necessary if any changes have been made to one or more areas of the WAV included in the list in Appendix 1.

An early discussion with the TS is advised. Some changes may be possible to incorporate into an extension without physical testing. Others will require new tests to be carried out. The flowchart on the following page details the steps involved.

If any part of an existing PA changes, any tests required shall be carried out to the requirements in force at the time of the change to the vehicle. If only PART of the WAV is tested to the current requirements, its PA remains to the published level of PAS 2012 that was current at the time of the oldest accreditation (e.g. if the WAV was accredited to the 2012 version of PAS 2012, compliance with the 2015 version cannot be claimed until ALL the requirements of the 2015 version had been satisfied.)

When PAS 2012 is reviewed and any technical requirements change, the date(s) by which any existing PAS accredited vehicles need to comply with the new technical requirements (known as “Transitional Provisions”) will be agreed by the WAVCA Technical Working Group and the WAVCA Board, before being notified to the membership and to the TS.

## PAS ACCREDITATION (PA) EXTENSION PROCESS



## 8. VARIATIONS

A “Variation” is defined as ‘a customer-requested one-off change to the (accredited) design’. It is recognised that WAVs, by their nature, will often require a degree of bespoke customisation to meet the needs of an individual wheelchair user. Such modifications might include the fitting of different wheelchair tie-down end-fittings to those that were originally tested for PAS accreditation; the mirroring of an upper anchorage to suit a particular disability; increased (or reduced) ground clearance as a result of fitting different wheels; wider assistant seating, resulting in a smaller wheelchair space width than quoted in the PAS Technical Specification; etc. Rather than re-accrediting the WAV for such one-off changes, it has been agreed that a “Variation” can be made.

### 8.1. VARIATION PROCEDURE

The procedure for making a Variation is as follows:

- (i) As a result of a specific individual customer request, a vehicle may be built to a different specification than was PAS-accredited. This procedure shall not be used for changes to the WAV that have been instigated by the WAV manufacturer and form part of the advertised specification of the WAV. Such changes shall be handled under the PAS Extension procedure.
- (ii) Details of each Variation shall be kept in the WAV’s Variation Technical file for a period of not less than 7 years. The VCA shall reserve the right to check Variation files on surveillance visits.
- (iii) For each WAV that is subject to a Variation, the Variation Technical File shall record at least the following information:
  - (a) the reason for the change (e.g. “Customer’s wheelchair not suitable for WTORS end fittings currently accredited”), plus photos and / or drawings showing the need for the Variation;
  - (b) the technical justification for the variation (e.g. a statement that the WTORS being used have been tested to ISO 10542 in their own right, if not to that particular vehicle’s geometry, and that a reasonable level of safety can therefore be assumed). Other examples of technical justifications for changes might refer to in-house, unwitnessed testing that may have been carried out; computer modelling or calculations; comparison with a similar setup on a different PAS-accredited vehicle; a risk assessment showing that the risks involved in the variation are outweighed by the improvement to the customer’s quality of life; etc.
  - (c) A signature by a Director of the Company or technically competent person nominated by a director.
- (iv) The same technical justification may be used for more than one vehicle.

Note. A Variation may alter a type approved vehicle from its type approved specification. Users of this guide are reminded of the legal obligations when issuing a type approval Certificate of Conformity. It is therefore strongly recommended that any Certificate of PAS 2012 Compliance for a vehicle subject to a variation, be issued on a date AFTER the vehicle has been registered.

Examples of the Variation Technical File are shown in Appendix 2.

## 9. CERTIFICATES

### 9.1. WAVCA PAS CERTIFICATES

Upon successful completion of all testing and paperwork, a certificate in the format shown in Appendix 3 will be issued by WAVCA. One certificate will be issued for each model that is approved under the PAS2012 scheme. The certificate will be authenticated with a stamp, and copies held by WAVCA. A unique reference number will be allocated for the approved model. The certificate will also identify the number of pages that are contained in the approval paperwork package. Certificates will not be issued for vehicles only holding provisional approval – see section 13 for more details.

### 9.2. MANUFACTURERS CERTIFICATE OF PAS COMPLIANCE

For every PAS-accredited WAV produced by a WAV manufacturer, a “Certificate of PAS Compliance”, unique to that vehicle, (or a duplicate, clearly marked as such) shall be made available on demand. An example of a Certificate of PAS Compliance is attached in Appendix 4

The Certificate of PAS Compliance shall include, as a minimum:

- (a) the WAV make (WAV manufacturer’s trading name);
- (b) the WAV model (WAV manufacturer’s model name);
- (c) the PAS accreditation number;
- (d) the VIN;
- (e) a reference to any Variation Technical File(s) relevant to that WAV; (NOTE: the contents of the Variation Technical File itself need NOT be recorded on the Certificate of PAS Compliance. These can be recorded separately and held by the company, so that only a reference to that technical justification needs to be made on the Certificate of PAS Compliance itself).
- (f) the signature of a director or technically competent person nominated by a director;
- (g) the date on which the certificate was issued;
- (h) a unique Certificate of PAS Compliance reference number.

## 10. REGISTER OF APPROVED VEHICLES

As mentioned in section 9, a unique reference number is allocated by WAVCA to each vehicle approved under the PAS2012-1. This number ties the specification of the vehicle to the paperwork issued. WAVCA will hold copies of the certificate along with very basic information on the vehicle; all technical “commercial” data will be retained by TS and only issued to the customer. WAVCA will list approved vehicles to the scheme on their website.

## 11. BUSINESS REVIEW / CUSTOMER SERVICE

Before any approvals to PAS2012 can be granted the Manufacturer has be assessed with regard to their premises, level of customer service and data storage in line with Part 2 of the PAS. In addition to the aforementioned paperwork, addition information is required in relation to the customer service offered. This can be split into two areas; that of the business and that which is vehicle specific.

### 11.1. BUSINESS

Details of the criteria against which the business is assessed is detailed in Section 10 of PAS2012-2. Paperwork outlining at least the following will be required.

- (i) An example of a demonstration report sheet
- (ii) Customer record sheet example
- (iii) Business hours, website and e-mail addresses
- (iv) Re-call procedure
- (v) Complaints procedure
- (vi) Coded welders list

Please note these items may be covered by a Conformity of Production assessment and need not be duplicated.

### 11.2. VEHICLE SPECIFIC

Details of the criteria against which the vehicle is assessed is detailed in Section 8 of PAS2012-1:2015. Paperwork outlining at least the following will be required. (Where these differ from 11.1 above)

- (vii) After sales parts availability declaration
- (viii) Items included in demonstration
- (ix) Sales literature example showing key dimensions
- (x) Warranty offered and items covered

## 12. PERIODIC ASSESSMENTS

In order to check that all processes are being followed and the vehicle still complies with the specification laid out in the paperwork, a periodic assessment will be made. This assessment will be on three main areas

- Conformity of production (if applicable)
- Business / management system
- Test facility (if applicable)

These inspections may be carried out at any time by the TS, with or without warning. The elapsed time period between inspections varies, but is typically less than three years.

### 13. PRELIMINARY APPROVALS

At the discretion of the TS a preliminary approval to PAS2012-1:2015 may be granted. This approval is only temporary in nature, and is only valid for 20 vehicles over a period of six months. However, if less than 20 vehicles covered by the advance approval have been sold in six months this time period may be extended. Before a preliminary assessment is issued, a number of things need to be in place

- 1) A technical meeting must have been held with the TS detailing the specification of the vehicle and outlining what testing is to be done.
- 2) A TS job number must be opened
- 3) The manufacturer must have full conformity of production clearance
- 4) All non-destructive testing contained within the PAS must be completed (including torsional rigidity tests)
- 5) A detailed photographic record of the completed vehicle and all its components along with drawings of all parts must be supplied
- 6) A IVA test must be successfully passed for the converted Vehicle

Each vehicle covered by the advance approval will need an advance approval certificate. This needs to be completed by the manufacturer. It must be sent in un-secured pdf format, and will not be valid until it has been authenticated by WAVCA. This certificate is a declaration that the manufacturer has made the vehicle to the specification agreed and covered by the paperwork above. A provisional number will be given along with a number and date to ensure that the limits detailed above are not exceeded.

The advance approval is granted on the understanding that full testing to the PAS will be conducted. Any failures observed during testing will lead to all vehicles already sold being re-called to have design changes implemented.

## **Appendix 1.**

### **Subjects for consideration when deciding to work on a new PAS or a PAS extension.**

- Stage 1 vehicle's type designation
- Seat belt anchorages
- ISOFIX
- Fuel tanks
- Access to wheelchair space
- Wheelchair available space
- WTORS tests
- Ramp SWL
- Lift SWL
- Ramp / spare wheel anchorage
- Back and head restraint
- Torsional rigidity
- Ground Clearance
- Ramp angle
- Ramp surface
- Ramp side guards
- Change of lift
- Maximum seating capacity:
  - designated w/c positions
  - maximum no. other seats including driver
  - up-front w/c positions
  - maximum no. of ISOFIX positions
  - any limitations on seating capacity when carrying a wheelchair

### **In addition, a PAS extension will be required if there are any changes to the following.**

- WAV Technical Specification (Section 7.3 of PAS 2012)
- PAS 2012-1 Information Document

## Appendix 2.

Example of a Variation Technical File (a copy of this file is available on the WAVCA website).



Wheelchair Accessible Vehicle Converters Association

## Variation Technical File

Document Name: EasyWAV Ltd_Variation Technical File_EZ.0001	
PAS Approval Number: PAS 0999	Converter Name: EasyWAV Ltd.
Vehicle Make: EasyWAV	Version: BAA BCA
Vehicle Model: SuperWAV GTI LWB	Build Reference: N32586

### Requirement for variation

In order to secure the wheelchair in the designated travelling position, the customer has asked for Mini Tongue and Buckle end fittings on the rear tie-downs. The vehicle was tested and PAS-accredited with J-hook end fittings but these are unsuitable for this particular wheelchair's tie-down attachment points.

### Documented changes

The WTORS in this model have been tested to ISO 10542:2012 with J-hook end fittings.

The WTORS manufacturer does, however, offer the alternative mini tongue and buckle end fitting, also tested to ISO 10542 with the same weight of wheelchair. Both WTORS come with a label attached confirming ISO 10542 compliance.

Based on the performance on these end fittings in previous tests, it has been deemed acceptable to accommodate the customer's request and provide Mini Tongue and Buckle attachments in this case.

### Attachments

List all attached including photographs, drawings and additional pages. Number all additional pages and record below. Please ensure all photographs are high resolution. No less than 3000x2000 Pixels (6 megapixel) is preferable.

Filename	Description
N/A	N/A

This document forms part of the build records for the vehicle and as such should be kept for a period of at least 7 years in accordance with PAS 2012-1:2012 Section 8.6

Authorised  
Signature

Position / Title

Homologation Engineer

Print Full Name:

J. Bloggs

Date:

01/10/16

**Appendix 3.**

Example of a WAVCA Certificate of PAS Accreditation (a copy of this file is available on the WAVCA website).

   	
<h1>PAS 2012-1:2012</h1>	
<p>PAS 2012-1:2012 specifies the design and manufacturing requirements for an M1 wheelchair accessible vehicle</p>	
<h2>CERTIFICATE OF ACCREDITATION</h2>	
NUMBER:	1000
WAV MANUFACTURER:	Noname WAVs Ltd
BASE VEHICLE MANUFACTURER:	A. Citroen B. Peugeot
BASE MODEL:	A. Berlingo B. Partner
WAV MODEL:	Noname Berlingo/ Partner
TYPE OF WAV:	Assisted
VERSIONS:	4
SEATING:	V1 - 5 seats and no wheelchairs; V2 - 4 seats + 1 wheelchair; V3 - 3 seats + 1 wheelchair; V4 - 2 seats + 1 wheelchair
NUMBER OF WHEELCHAIR POSITIONS:	V1 - no wheelchairs; Vs2-4 1 wheelchair
OEM TYPE APPROVAL NO:	A. e2*2007/46*1234 B. e2*2007/46*5678
WAV TYPE APPROVAL NO:	N/A
<p>Date of accreditation 3<sup>rd</sup> October 2016</p>	
<p>Chairman WAVCA</p> 	<p>PAS Manager WAVCA</p> 

## Appendix 4.

**Example of a Certificate of PAS 2012-1 Compliance** (a copy of this file is available on the WAVCA website).

Your logo here

### Certificate of PAS compliance

The below vehicle meets all requirements of PAS2012:2015

Manufacturer Reference / VIN:	<input style="width: 100%; height: 20px;" type="text"/>
PAS Approval Number:	<input style="width: 100%; height: 20px;" type="text"/>
COPC Reference Number:	<input style="width: 100%; height: 20px;" type="text"/>

**Remarks**  
*Describe the requirement for variation and how the original PAS approval is affected*

This document forms part of the build records for the vehicle and as such should be kept for a period of at least 7 years in accordance with PAS 2012-1:2012 Section 8.6

Authorised Signature:	Digital signature	Place:	
Print Full Name:		Date:	
		Position / Title:	



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