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Submission by me-bike australia

Review of the *Motor Vehicle Standards Act 1989*

OVERVIEW

We are submitting a response to the review of the ***Motor Vehicle Standards Act 1989,*** specifically paragraph 20 (1)(b) which refers to the importing of nonstandard vehicles. More specifically we are writing in relation to the Australian Design Rules (ADRS) Definitions and Vehicle Categories 2005 that sit behind the legislation, as it is our belief that the definition of nonstandard vehicles, in particular category AB under ADRS is:

- out-dated given contemporary technologies,
- inconsistent with other parts of the ADRS and
- inconsistent with global practise.

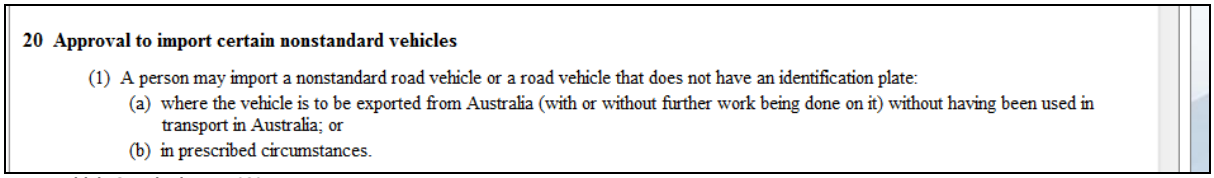
Me-bike australia imports power assisted pedal cycles (electric bikes or e-bikes) for distribution in the Australian market, which for the purposes of importation our imports are directly affected by this section of Motor Vehicle Standards Act 1989 and relevant ADRS.

As a small business we have faced into significant obstacles during most of 2014 in relation to how nonstandard vehicles of this type are measured which has led to our vested interest, research, subsequent current submission and recommendations.

BACKGROUND

Relevant Legislation and ADR's - Importation to Date

For the past 12 months (during 2013 and 2014) me-bike has imported power assisted pedal cycles which have been approved in the schedule below under paragraph 20(1)(b) of the Motor Vehicle Standards Act 1989 and regulation 11 of the Motor Vehicle Standards Regulations 1989.



20 Approval to import certain nonstandard vehicles

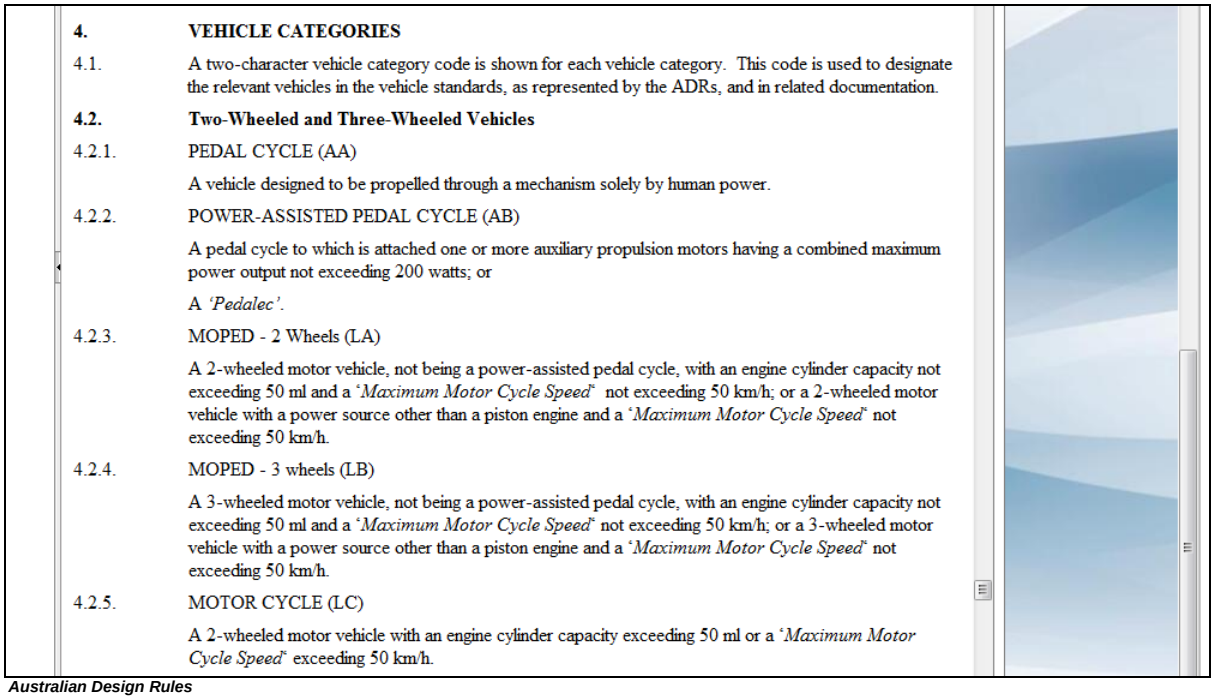
(1) A person may import a nonstandard road vehicle or a road vehicle that does not have an identification plate:

(a) where the vehicle is to be exported from Australia (with or without further work being done on it) without having been used in transport in Australia; or

(b) in prescribed circumstances.

Motor Vehicle Standards Act 1989

The current standards, the Third Edition ADRS, are administered by the Australian Government under the *Motor Vehicle Standards Act 1989.* The Act requires all road vehicles, whether they are newly manufactured in Australia or are imported as new or second hand vehicles, to comply with the relevant ADRs at the time of manufacture and supply to the Australian market.



4. VEHICLE CATEGORIES

4.1. A two-character vehicle category code is shown for each vehicle category. This code is used to designate the relevant vehicles in the vehicle standards, as represented by the ADRs, and in related documentation.

4.2. Two-Wheeled and Three-Wheeled Vehicles

4.2.1. PEDAL CYCLE (AA)

A vehicle designed to be propelled through a mechanism solely by human power.

4.2.2. POWER-ASSISTED PEDAL CYCLE (AB)

A pedal cycle to which is attached one or more auxiliary propulsion motors having a combined maximum power output not exceeding 200 watts; or

A *'Pedalec'*.

4.2.3. MOPED - 2 Wheels (LA)

A 2-wheeled motor vehicle, not being a power-assisted pedal cycle, with an engine cylinder capacity not exceeding 50 ml and a '*Maximum Motor Cycle Speed*' not exceeding 50 km/h; or a 2-wheeled motor vehicle with a power source other than a piston engine and a '*Maximum Motor Cycle Speed*' not exceeding 50 km/h.

4.2.4. MOPED - 3 wheels (LB)

A 3-wheeled motor vehicle, not being a power-assisted pedal cycle, with an engine cylinder capacity not exceeding 50 ml and a '*Maximum Motor Cycle Speed*' not exceeding 50 km/h; or a 3-wheeled motor vehicle with a power source other than a piston engine and a '*Maximum Motor Cycle Speed*' not exceeding 50 km/h.

4.2.5. MOTOR CYCLE (LC)

A 2-wheeled motor vehicle with an engine cylinder capacity exceeding 50 ml or a '*Maximum Motor Cycle Speed*' exceeding 50 km/h.

Australian Design Rules

Specifically me-bike has imported their bikes under section 4.2.2. as AB vehicles under the ADRS "***A pedal cycle to which is attached one or more auxiliary propulsion motors having a combined maximum power output not exceeding 200 watts***". As a pedal cycle a me-bike consists of two wheels held in a frame where the wheels sit one behind the other. They also have drive trains consisting of sprockets, chain, cranks and pedals as any other bicycle would have. These mechanics are the primary source of power for the me-bike, and propels the me-bike which is steered with handlebars which are attached to the front wheel.

A me-bike also uses **Power on Demand** through its "auxiliary propulsion motors having a combined maximum power output not exceeding 200 watts" and it is this auxiliary motor that has come into question over the past 12 months. In the absence of specific performance measures (ie. maximum performance speed as in the case of **Pedalec Bikes**) or universally agreed tests, interpretation of the ADRS seems inconsistent and difficult to regulate.

Why this category is important?

Power assisted pedal cycles or electric bikes as a category has had increasing popularity in Australia over the past decade. As their popularity grows, electric bikes have the potential to overcome some of the barriers that prevent Australians from riding a conventional pedal bike for transport. While electric bike sales are increasing, they remain relatively uncommon and little is known about electric bikes in Australia.

"Electric bikes are a potentially important component in the mix of transport mode options. Accessible to a greater proportion of the community than pedal bicycles, electric bikes could enable more Australians to shift from cars and public transport for personal mobility. Such a shift will have direct benefits in relieving traffic congestion, easing the burden on the public transport system and offering independent mobility options" ***Australasian Transport Research Forum 2013 Proceedings. Electric bikes – cycling in the New World City.***

Further, like a bicycle, an electric bike provides a travel option that has less environmental impact than a motor vehicle, while having greater capacity for the rider to travel further with less effort and carry heavier loads than a conventional bicycle (2012).

Electric bike trials have been used internationally to better understand

- In Europe there has been an increasing uptake of electric bike use, increased from sales of 300,000 in 2008 to almost 700,000 in 2010, however there is a greater emphasis on their use by older riders or people who have some physical illness or impairment (***Hendriksen, Engbers et al. 2008; 2012***)
- Cappelle and colleagues reported on an electric bike trial of 250 participants over 2 years in Belgium and saw a mode shift for commuting, shopping and leisure; the shift was primarily from car, bicycle and public transport. Participants also reported time gains per trip which were calculated to a reduction of 76 hours of traffic congestion for a single electric bike user (***Cappelle, Lataire et al. Undated***)
- China is currently the country with the most electric bikes in the world. The combination of low income, high population density, short trip length and extensive cycling infrastructure contributes to the bicycle being the mode for 50 percent of trips in many large cities (***Cherry 2007; Weinert, Ma et al. 2007***). In an intercept survey of 460 electric bike riders in Shijiazhuang, Weinert and colleagues reported that the main reason for riding an electric bike to commute was that it was faster than a pedal bicycle, they didn't have to wait for public transport, it was a comfortable option and that public transport was too crowded (***Weinert, Ma et al. 2007***).

Further to the environmentally responsible community issues such minimising traffic congestion and reducing carbon footprint with zero emissions, me-bike australia has also found that electric bikes (specifically use of power assisted pedal bikes **Power on Demand** as opposed to **Pedalec Bikes**) are popular for people with quite specific needs who:

- Do not want to take up a car space in traffic for short trips
- Do not want to have a shower due to perspiration when arriving at work or destination
- Want to be able to travel comfortably in hot or wet conditions
- Do not want to get their business or social clothes wet from standing or rain water on the road
- Do not have public transport adjacent to destination without transfers
- Do not like the congestion of public transport during peak periods
- Want to be able to transit with heavier equipment like laptops or files
- Want the safety of lights, indicators and horns at their fingertips

- Want the convenience of easier parking at home, work or play
- Low cost of personal transport
- Find a bicycle seat unbearably uncomfortable

With the many benefits apparent to not only the community however also the consumer, and in combination with Australia's generally flat topography in populated areas, excellent cycling infrastructure (lanes, paths and parking facilities) and good quality roads with good shoulders, power assisted pedal bikes requiring **Power on Demand** within Australia have the potential for growth, however this will be difficult given current the ***Motor Vehicle Standards Act 1989*** and current ADRS.

Relevant Legislation and ADR's – Current Barriers

1. **Motor Specifications**

   Firstly, the ADRS specify "auxiliary propulsion motors having a combined maximum power output not exceeding 200 watts".

   Me-bike australia has done significant research and due diligence with electric bike manufactures to evolve to the point where we have manufacturers to produce small quantities to Australian specifications, which includes ensuring we have compliant 200 watt motor. However in doing so, it is our experience with manufactures that 200 watts maximum output is not a standard size motor for electric bikes

   When examining the same category bikes using **Power on Demand** world wide (see examples below), you will note that Australia allows for the smallest sized motor that is not a standard product.

   - United States 750 watts
   - Canada 500 watts
   - New Zealand 300 watts
   - United Kingdom 250 watts
   - China no limit

   Working with suppliers to get customised 200watt motors has become overly expensive and difficult as Australian motors do not harmonise to any other global standard. The Australian requirement of 200watt "maximum output" is not an international standard, and the size of the motor is not equivalent to most comparable countries requiring similar standards as outlined below.

   This provides multiple barriers to the power assistant pedal cycle category as there is a reduced economy of scale for manufacturers to specifically research, development and test the 200watts maximum power motor to improve the product and also results in a reduction of available spare part supplies.

2. **Testing and Measuring**

   Maximum Power Output OR Maximum Continuous Power/Maximum Efficient Power

   Reports produced by our Chinese manufacturer were questioned, and based on the process we feel that measurement of motors seems subject to opinion as no agreed measurement or tool is provided for compliance with Australian standards. For example whilst **Pedalec** bikes must comply with European testing and standards, there is no apparent testing measure or performance measure to determine the validity of **Power on Demand** bikes. Alternatively when we have sought import permits we have been advised to ensure the

quality of our product via NATA approved testing facilities in Australia, however even these reports are subject to interpretation.

For example a power assisted pedal cycle requirement is that "A pedal cycle to which is attached one or more auxiliary propulsion motors having a combined maximum power output not exceeding 200 watts". It has been determined by Australian Department of Transport and Regional Development during our recent interactions that any test report that demonstrates a "spike" in output above 200watts is not compliant with ADRS.

Yet technically speaking, creating any circuit will result in a flow of current, however, if the load is an inductive load like a transformer motor, etc, then a high current will flow initially as the magnetic field around the windings must be created before any useful work can make use of said magnetic effect.

In more basic terms, any initial spike or surge experienced for an instant is similar to other electrical devices and translates no definably usable power. The "switching" of the throttle creates a sudden, brief demand for power, which upsets the steady voltage flow in the electrical system which accounts for the initial spike. This however produces no increase in performance from the motor.

Accordingly the "maximum efficient power" NOT "maximum power output" as stated in the ADRS is in fact the actual "maximum power" for **Power on Demand** bikes generated by the motor. This terminology has been rectified in the ADRS as it relates to **Pedalec** bikes where it states the "maximum continuous power output of the motor must be limited to 250 watts" which was amended in May 2012 when the Department of Infrastructure and Transport allowed for pedalecs as a form of electric bicycle and subsequently must comply with European standards. **However the actual definition of a power assisted pedal cycle "A pedal cycle to which is attached one or more auxiliary propulsion motors having a combined maximum power output not exceeding 200 watts" (per 4.2.2) has not changed since it was first introduced in 1984, which, given the time it takes to formulate ADRs, suggests it was formed even earlier, in the late '70s.**

The current out-dated terminology which is currently used as the measurement standard for bikes within this category is not current. It is global practice to measure electric motors in terms such as "Maximum Continuous Power" or "Maximum Efficient Power" as evidence by updated federal ADRS that relate to **Pedalec**, and any supported by research, engineers, professionals world wide working with electric motors.

3. Performance Based Speed

In the absence of international performance standards we also recommend the exploration of maximum speed as an easier method to regulate measure the maximum performance of motors.

Whilst we have worked closely with our suppliers in the production of compliant 200watt maximum output motors , we would also propose that there would be a significant reduction in government and business compliance cost if a "maximum speed under normal conditions" (flat road, wind averaged) was the regulating control measure.

Why make any changes?

1. On a global front, market analysis and forecasts for electric two-wheel vehicles concludes that "The worldwide electric two-wheel vehicle market is expected to grow at a compound annual rate of 9% through 2016". Forecasted worldwide sales of e-bikes, e-motorcycles, and e-scooters will reach more than 466 million between 2010 to 2016, and China will continue to dominate the world market, with more than 95% of sales during this period. E-bikes sales are expected to have the largest share with 56% of the market (***PikeResearch, for-profit market research firm, 2010).***

   In recognition of global forecasting, rapidly developing technologies and our evolving relationship with China as main suppliers of electric bikes, relevant Australian legislation and policy/rules have evolved for **Pedalec** bikes, however not for other electric bikes and they appear basic which will hamper adaption to these growing trends.

2. Furthermore, in accord with

- the governments deregulation agenda to ensure that the government has good safe legislation that minimises undue regulatory burden without adverse outcomes,
- in the spirit of the policy outcomes of ensuring community safety, and
- managing vehicle emissions,

   reviewing and changing current legislation and policy in relation to category AB power assisted pedal cycles, specifically **Power on Demand** will ensure this category of vehicle adheres to government direction and equally supports the needs of the Australian community.

3. The actual definition of a power assisted pedal cycle as it relates to **Power on Demand** has not been reviewed since 1984. Reviewing this category and addressing some of the barriers will serve to modernise this category, provide clarity to the category thereby providing more continuity in product, and harmonise Australian standards with International standards. This will allow for more stable and reliable products for consumers.

RECOMMENDATIONS

1. At a minimum the category for power assisted pedal cycle as it relates to **Power on Demand** meeds to be reviewed , contemporised and harmonised with global practice.

   Specifically as outlined above we have recommendations as to what should be amended, namely:

2. Changing the Australian motor specifications for this category to allow for 250watt motors (increasing it from 200watt), permitting greater ease and cost reduction in sourcing motors of an international standard;

3. Irrespective of motor specifications, a MUST for the legislation and ADRS is to reword the ADRS to reflect “maximum efficient power” for Power on Demand bikes; and

4. Consider introducing a performance based standard (ie. maximum speed 30kph) for this category to assist in governance and compliance, and regulating this category.

Yours Sincerely
Leann Jones
Founder me-bike australia