Position Paper – Possible Type Approval of EPACs

Executive Summary

CONEBI represents the Bicycle, Pedal-Assist E-Bike and Parts & Accessories Industries before the EU Institutions, which amount to more than 1.000 companies and 155.000 direct/indirect jobs.

Last year the European Commission announced its intention to conduct a study on market development and related road safety risks for L-category vehicles and new personal mobility devices with the possible aim to revise the current EU Type Approval Framework.

The threat exists that EPACs may in the future be included in the type approval framework and that they will no longer enjoy the status of being a bicycle. EPACs have primarily been included in the scope of the study as the European Commission was made aware that many tampered EPACs can be found on the market. However, the industry is already taking various technical and proactive measures to make sure that tampering is no longer possible. CONEBI is in regular contact with the European Commission and other key stakeholders to ensure that EPACs continue to be seen as bicycles.

Here below you will find an in-depth explanation on the ongoing study commissioned by the European Commission, the position and actions of the Bicycle Industry as well as the next steps.

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What are EPACs

An Electrically Pedal Assisted Cycle (EPAC) is a bicycle supported by a motor with a maximum continuous rated power of 250-watt which cuts off at 25 km/h and is *only activated if the rider is pedalling* to provide a mild boost. The average speed of an EPAC is between 1-3 km/h faster than that of a conventional bicycle[1].

On the EU level, EPACs are exempted from type approval and instead need to be self-certified according to EN15194(2017) that has been harmonized under the EU Machinery Directive 2006/42/EC since May 2019. This standard includes many important safety relevant tests with which the industry has had good experiences.

Position of the EU Bicycle Industry

The EU Bicycle Industry believes that EPACs should continue to be treated as bicycles in terms of technical and usage requirements based on the below reasons.

Benefits to wider society and environment

CONEBI strongly believes that EPACs are in fact bicycles with a tremendous potential to substitute motor vehicle use for short journeys. They have all the benefits of a conventional bicycle (health, emission and CO2 free, congestion busting) and manage to overcome many of the barriers to traditional bicycle use.

A recent study[2] calculates that the health benefits of cycling are over 191 billion Euros per year (page 10 of the study) deriving from longer and healthier lives, improved mental health, reduced fatalities, reduced serious injuries and reduced light injuries. Employers also profit from reduced absenteeism for employees who cycle. People who cycle to work reduce their risk of cancer and heart disease by almost half – affirms a research carried out for over five years by researchers from the University of Glasgow [3]. Despite the assistance from the bicycle, EPACs provide as much public health benefit as conventional bicycles[4], and have a substantial positive benefit particularly for the health of elderly people. In fact, a study of traditional cyclist and EPAC users has shown that EPAC users move more than cyclists with a traditional bicycle, this is mainly due to EPAC users travelling longer distances.[5] A further study has proven that the average trip distance is more than double for EPAC users (10.5km) than from conventional cyclists (4.8km).[6]

Moreover, there is substantial evidence that shows EPAC riders are switching from motor vehicles and not from conventional bicycles, walking or other sustainable modes of transport. In addition, EPACs increase the amount of cycling, both expressed as number of trips and as distance cycled[7].

Based on this, e-cycling can make an important contribution to reducing greenhouse gas emissions in the transport sector. A Swedish study showed that about 20% of the average total CO2 emissions per person from transportation could be reduced based on the changed travel behavior shown in their study where mainly car trips have been replaced by EPAC trips.[8]

[1] https://www.itf-oecd.org/safety-e-bikes-netherlands
[2] https://ecf.com/sites/ecf.com/files/FINAL%20THE%20EU%20CYCLING%20ECONOMY_low%20res.pdf
[3] http://news.sky.com/story/cycling-to-work-almost-halves-risk-of-cancer-and-heart-disease-10843398
[4] https://www.researchgate.net/publication/282752633_Cycling_for_transport_physical_activity_and_health_What_about_Pedelecs
[5] https://www.sciencedirect.com/science/article/pii/S259019821930017X
[6] https://www.tandfonline.com/doi/full/10.1080/15568318.2017.1302526
[7] https://www.sciencedirect.com/science/article/pii/S1361920916304837?via%3Dihub
[8] https://www.sciencedirect.com/science/article/pii/S0959652616314822

EPACs and their similarity to conventional bicycles

EPACs should be regulated in a similar manner as conventional bicycles because both require pedaling and their average speed in traffic is very similar. The average speed of an EPAC is only between 1-3 km/h higher than a conventional bicycle.[9] The maximum continuous rated power output of EPACs is 250W, which is the equivalent power output of a fit cyclist. The assistance of an EPAC is especially used in uphill situations, where the increased speed increases the stability and as a consequence the safety of the rider. In downhill situations, there is no assistance of the motor, because the velocity is above 25 km/h or the rider brakes. Furthermore, a study showed no difference between bicycles and EPACs with regard to their overall involvement in traffic conflicts, as well as for the role of most contextual factors.[10][11]

Due to those similarities also national usage regulations across the EU equate EPACs to bicycles. As a result, a level playing field between bicycles and EPACs should also be reflected in technical legislations at the EU level.

Type approval will not solve the tampering problem

EPACs that are being placed on the market have to comply with EN15194(2017) which includes robust anti-tampering measures. However, existing regulations have to be enforced by national market authorities.

Already today, tampering of EPACs is illegal and a criminal act in some EU countries. A prohibition at EU level is needed to ensure that the tampering of an EPAC is a criminal act in all EU countries. The anti-tampering section 4.2.17 in EN 15194(2017) has been introduced proactively by the industry to prevent tampering. Currently the Bicycle Industry is even pushing for even more stringent anti-tampering measures within the standard. But the industry needs the support of the market surveillance and road enforcement authorities to tackle the real problem.

Anti-tampering requirements also exist for other types of vehicles including two- or three-wheelers that have to be type approved according to EU Regulation (EU) No 168/2013. For passenger cars these regulations exist for more than 10 years, and were the starting point for ruling out chip tuning of engines. Type approval only (existing for >50 year for passenger cars), did not help preventing tampering. Nonetheless, tampering can also be found in those vehicles, if there is no adequate enforcement of the rules by national market authorities.

In conclusion, regulations to avoid the tampering of EPACs already exist. Type approving EPACs will not change the effectiveness of the regulations but enforcement of the regulation will. If enforcement is the main problem, the market surveillance and road enforcement authorities shall be supported by improved EU-legislation with an explicit prohibition on tampering an EPAC. With such a prohibition at EU-level enforcement will become easier. Such a prohibition could be added in both the EU Regulation No 168/2013 and/or the future EU Regulation on Machinery.

[9] https://www.itf-oecd.org/safety-e-bikes-netherlands
[10] https://www.sciencedirect.com/science/article/abs/pii/S1369847816300924
[11] https://www.sciencedirect.com/science/article/pii/S0001457519304695

Possible threats for the industry with a mandatory type approval for EPACs

Putting a mandatory type approval on EPACs would drastically reduce a market that sold about 3.4 million units in 2019. Right now the average price for an EPAC sold in the EU is 2,000€, with a mandatory type approval this is likely to increase to about 3,500€.

Moreover, the time to the market will increase due to the time needed for conducting a type approval. From experience with the type approval of Speed EPACs this time is at least 1.5 years in comparison to about 9 months for EPACs. If large numbers of EPAC types would have to be type approved, the number of applications for type approval at technical services would increase by 1 to 2 orders of magnitude. This will lead either to much longer lead times for product introduction or to severely increased cost (additional personnel and facilities) at national type approval authorities and technical services to be able to deal with the large amount of type approval applications. If type approval services would not upgrade their facilities, the bike manufacturers would have to drastically decrease the amount of EPAC types, with negative consequences for the EPAC market and uptake.

In addition, there are increased costs for the manufacturer and the variety of models will greatly decrease, if type approving every individual model in total costs about 40,000€, in comparison to 5,000€ for the tests associated with EPACs. Such an increased cost to the manufacturer and a limit of models would also mean that innovation within the EPAC sector would be limited.

Furthermore, once EPAC would be under the type approval framework, they would be regarded as motor vehicles and there are likely to be additional burdens for the user, such as a mandatory motor vehicle insurance, mandatory (motorcycle) helmet, etc. In addition, it would no longer be possible to use the bicycle infrastructure. For comparison, Speed EPACs (electric bikes that assist up to 45km/h) are in the Scope of Regulation (EU) No 168/2013. They belong to subcategory L1e-B and are overregulated with the burdens described above. As a consequence the market share of Speed EPACs is below 1%.

As of 2020, the Bicycle Industry provided more than 155,000 direct/indirect green jobs in 24 out of 28 Member States investing more than 1€ billion annually into R&D. Due to the increased production of EPACs in the EU (half of the value of bicycles sold consists of EPACs), the EU Bicycle Industry was able to continuously increase employment over the past years because four to five jobs are generated for the production of 1.000 EPACs per year. In comparison, only two to three skilled workers are needed to produce 1.000 traditional bicycles per year. Therefore, a mandatory type approval on EPACs and a resulting loss in sales would gravely hurt the EU Bicycle Industry as a whole.

Differences between EPACs and other PMDs

EPACs and other PMDs such as e-scooters are distinctly different products and should be treated as such in traffic. An e-scooter is a two-wheel stand-up vehicle which is powered by an electric motor. It has neither pedals nor a seat and the electrical traction power is activated simply by means of a throttle or an electrical on/off switch, regardless of the activity of the rider. Thus, for an e-scooter the electrical assistance is automatic and independent. In addition, most EPACs can also be used with an empty battery, while e-scooters are less attractive when the battery is empty due to the weight of the vehicle and the small wheels.

The lack of specific safety requirements for PMDs compared to EPACs leads to the safety of an EPAC being better than that of a PMD. Especially the braking distance of an EPAC is much shorter and air filled tyres run smoother over obstacles or bad roads, by which riding stability is improved. E-scooters, on the other hand,

given their small wheelbase, are unstable, and generally, relative to their speed, have an inadequate braking system. This could be the reason for more frequent accidents. Furthermore, there have been incidents of the throttle getting stuck, or the e-scooter slowing down, speeding, or even braking autonomously.[12] This is probably caused by product development processes that are not related to the Bicycle Industry.

Independent research has shown that the carbon footprint of e-scooters is the same as a car transporting three passengers.[13] Furthermore, a life-cycle impact study (which includes an assessment not only of carbon emitted while the device is in use, but also that released by manufacturing, transporting, and charging the vehicles and their batteries), conducted by scientists at North Carolina State University and published in the journal Environmental Research Letters found that although e-scooters had less than half the total emissions of cars (202 grams of carbon dioxide per mile traveled for the former vs. 414 grams for the latter), their output was still dramatically higher than that of bicycles or EPACs, whose life-cycle emissions only average 8 or 40 grams per mile respectively.[14]

[12] https://www.derstandard.at/story/2000106359200/wiener-polizei-nimmt-e-scooter-fahrer-ins-visier
https://www.versicherungsjournal.at/markt-und-politik/e-scooter-kfv-rechnet-mit-ueber-1-000-verunfallten-19626.php
https://www.lesoir.be/240115/article/2019-08-03/bruxelles-un-homme-hospitalise-suite-un-accident-de-trottinette-electrique
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https://www.standaard.be/cnt/dmf20190626_04480604
[13] https://www.sciencesetavenir.fr/nature-environnement/climat/la-trottinette-electrique-est-tres-polluante_139399
[14] https://iopscience.iop.org/article/10.1088/1748-9326/ab2da8