Throttle Control

BACK WITH A VENGEANCE

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Right To Ride

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In his paper "Architectures of Control in Consumer Product Design" (2005)[1] Daniel Lockton considers the Intelligent Speed Adaption (ISA) device for motorcycles.

He writes "The case of external control which is arguably most likely to cause a widespread consumer reaction, outside of technical users, is the External Vehicle Speed Control (EVSC) system—with intended social benefits—proposed by Oliver Carsten at the University of Leeds' Institute for Transport Studies.

This is perhaps one of the most clear-cut examples of a disciplinary architecture of control".

According to Lockton, Carsten's own survey, involving both members of the public and representatives from the police, motoring and motorcycling organisations and environmental groups, concedes that:

"There are also many possible implications and concerns relevant to this type of system, into which there is insufficient scope to go here, ranging from attribution of accident liability, to the level of driver control (to what extent can he/she disable the system?), to implementing reliable fail-safes in the system (...)" (cited in Lockton 2005:30).

Lockton highlights that the EVSC system as proposed by the final (July 2000) Carsten report to the Department of the Environment, Transport & Regions suggests "mandatory usage" by 2019.

However, he concludes that as of 2005, "no policy decision has been made on whether or not to move ahead with the implementation of such a system for the vehicles on Britain's roads"[2], but whether or not that 'public support' is eventually forthcoming, the most vocal reaction so far has been entirely opposed to the system, with the 2001 International Motorcyclists' Public Policy Conference at Mulhouse declaring its opposition to the proposals and creating a petition[3] (...)". (2005:30-31)

The Mulhouse Declaration

- *We the undersigned utterly oppose the compulsory fitment to privately owned vehicles of any device designed to arbitrarily remove control from the driver to remote operation*
- *We note with extreme concern the tendency of governments to impose ever more intrusive and restrictive regulations upon the citizen*
- *We caution governments to remember that they are permitted to govern only by the consent of the people and that such consent when given through an election does not grant unlimited licence to interfere in the daily life of the citizen*
- *We further caution all governments that to impose unduly on popular freedom is to imperil the respect in which government and the rule of law is held.*

Lockton argues that "Regardless of the safety benefits of speed control (...), it is surely the external part which will cause the most consternation if the EVSC plans do proceed further. Architectures of control which fall into this category may be the hardest of all for consumers to accept; it is taking the concept of the 'nanny state' to a limit where the nursery is teetering on the brink of rebellion" (2005:31).

[1] Daniel Lockton : MPhil Technology Policy : June 2005 Judge Institute of Management : University of Cambridge
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=908493
[2] 'External vehicle speed control project-introduction,' Department for Transport website, acc. May 2005,
http://www.dft.gov.uk/stellent/groups/dft_roads/documents/page/dft_roads_506876.hcsp
[3] LIVERSIDGE, N.F. 'The Mulhouse Declaration,' Motorcycle Action Group, 2001,
http://www.network.mag-uk.org/EVSC/EVSC_Mulhouse.html

But what exactly is EVSC?

In the case of the ISA bike, the system fitted to the bike basically slows the bike down through speed limits by acting on the throttle.

Information for the bike to slow down through set speed limits, in this case at the test track it is supplied to the bike by GPS information digitally mapped to the various speed limits on the track. These speed limits range from 30 – 40 – 50 – 60mph.

When the bike enters a lower speed limited zone (e.g. .riding from a 40mph limit through to a 30mph limit without slowing down) then the ISA assisting system will warn the rider that the bike is travelling too fast, if the warnings are ignored then the throttle is gradually reduced until the speed of the bike is at or below the speed limit.

The system does not interfere with the brakes or the gears of the bike, only the throttle, which in turn reduces power to the engine.

The system introduces itself gradually by audible warning through ear phones plugged into the system, warning lights which flash, mounted under the screen, vibrating pads in the seat, these are placed under the seat cover at the riders inner thighs.

When this is "ignored" the throttle reacts by resisting the rider trying to accelerate and gradually decreases the speed. When the correct speed is reached the throttle returns to full control of the rider.

The audible warning also sounds when riding into and out of the set speed limits. There is also a display unit mounted on the centre of the handle bars which advises the rider of the speed limit. The display can also show the rider what junctions are approaching[4].

Back in 2001 Riders' Rights organisations in the UK commenced a campaign against the introduction of throttle control which included the Mulhouse Declaration[5].

The issue then (and remains the same today) was not about telematics or Intelligent Transport Systems (ITS) which can provide night vision devices and audible warnings for car drivers who wander over the white line or clever signs on motorways that advice of speed limits to improve the flow of traffic.

It concerned devices that remove control from the rider or driver to remote operation. The central and fundamental purpose of EVSC/ISA is control – control over individuals, control over vehicles, control over movements, control over lives.

Riders argued in 2001 and again in 2007 that this project may never see the light of day, it may never be commercially viable, it may never be possible to introduce the system on new bikes without retrospectively fitting it to older bikes - but we must be aware of future developments and state our opposition clearly.

Now in June 2010, throttle control is back with a vengeance.

An EU Commission funded project is moving system control technology forward, in this project, Advanced Rider Assistance Systems (ARAS) are being developed for motorcycles and will include the use of Human Machine Interface (HMI) technology in order to warn the rider of a potential crash or collision in a number of scenarios.

[4] http://www.network.mag-uk.org/EVSC/campaign/evsc5.html
[5] http://www.network.mag-uk.org/sept06frontpage.html

From the article "New HMI Concept for Motorcycles – the Saferider Approach[6] the project aims to re-introduce the speed control system:

Force feedback in throttle: a throttle with programmable return force is being developed. *"In the project the motorcycle will be equipped with a force controlled throttle able to tune the return force through a servo controlled electric motor in order to communicate a speed reduction warning[7]".*

Apart from the safety issues in relation to the warning systems and the time element (a crash scenario normally occurs within 2 seconds) there is another problem with the Saferider system which is the development of a permanent control system that cannot be turned off.

In a paper which explains the Saferider throttle control system (and other warning devices)[8] the authors argue that

"The design of an HMI always represents a trade-off between high user acceptance and little false alarms on the one hand and intrusiveness, effectiveness and annoyance on the other hand. In the end a compromise is the result of a process that contains an appreciation of the single values for the specific intention of the development project.

If a project aims at increasing safety, it might be necessary to cut back the expectations on user acceptance" (2008:60).

Later in the document the authors highlight that "the on/off-mode provides the possibility to switch off the safety warnings of a certain system or of all the systems, *whereas the imminent warnings cannot be turned off by the rider. This is due to the fact that imminent warnings only occur in cases that lead to great danger for the riders' safety.* For riders' comfort they do not play an important role, but in contrast to that increase safety considerably". (2008:61).

However, it is not clear which of these systems will be imminent warning systems and which can be switched off, more importantly, they do not explain exactly how this will increase safety.

In the Saferider focus group that was held with experienced trainers from around Europe at the beginning of the project, the trainers were adamant that ALL systems must have an on/off switch.

One of these trainers (Ian Lee) comments *"Having been involved with some research consultation on the Saferider Project and being a very experienced rider, user of navigation systems and motorcycle riding instruction I have come to the conclusion that the best way to avoid potential or actual accident situations is to improve the cognitive skills of the rider.*

The problem with the research and proposals in the Saferider project is it appears as though the initial consultees opinions and concerns have been either ignored or dismissed. I increasingly get the feeling that there is too much self interest or influence from the safety technology industry now driving the HMI systems proposals to introduce speed warning / restricting devices. Technology does have a place in safety but not at the expense of replacing riding skills which is what most of the proposals will do".[9]

[6] Diederichs J.P. et al (2009): New HMI Concept for Motorcycles – the Saferider Approach, in D. Harris (Ed.): Engin. Psychol. and Cog. Ergonomics, HCII 2009, LNAI 5639, pp. 358–366, 2009. Springer-Verlag Berlin Heidelberg 2009

[7] From the Saferider article: *"The throttle is a critical interface for the rider stability and control of the vehicle and every action and force that is applied on it has to be carefully chosen. For this reason the programmed behaviour of the throttle is designed for a non invasive and highly intuitive feedback. The control principle is based on gradually increasing the stiffness of the return spring adding a simulated stiffness when a speed warning has to be transmitted. The system consists of an electric motor that is connected through a pulley on the return cable of the throttle. A dedicated electronic unit controls the motor to behave as a virtual spring in parallel to the return spring. The wanted stiffness and the stiffness variation slope are programmed. A set of tests on a riding simulator is foreseen in order to tune the system parameters and study the stability and safety of the system before integrating it into an on-road motorcycle." (idem 2009)*

[8] Frederik Diederichs, Benjamin Fischle (FHG-IAO) (2008) HMI CONCEPTS & STRATEGIES; http://www.saferider-eu.org/documents/SAFERIDER_D5_1_HMI_Concepts_and_Strategies.pdf

[9] Ian Lee and Duncan MacKillop's comments on Shake Rattle and Roll or Warning Systems for Motorcycles www.motorcycleminds.org/?p=26

Another of the trainers taking part in the focus group (Duncan Mackillop) comments:

"At my riding school, the very first thing we do is to get the students to understand what the throttle actually does and not what they think it does. The primary function of the throttle is to turn our bikes from something that is statically unstable to something that is statically and dynamically stable. Few of us can keep our feet on the pegs and balance a stationary bike simply by using shifts in bodyweight, but this all changes once we open the throttle when the task of balancing on the bike becomes immensely easier. This change in stability state comes from the forward motion of the bike and nowhere else. Unless we ride in a land that is on a permanent downhill slope, then the throttle is the only thing that can give us the stability we need.

The secondary function of the throttle is to control our suspension. Most riders know that the forks extend when we open the throttle, but around 90% of my students think that the rear suspension compresses at the same time. Few riders appreciate that the rear suspension also extends when we open the throttle. This extension of the suspension when we open the throttle gives us lots more ground clearance which is essential in any corner as well as putting the suspension in its sweet spot.

Finally, the throttle does the relatively simple job of changing the speed of the bike.

With an open throttle, a bike is more stable, has better ground clearance and has improved suspension function. With a closed throttle a bike is less stable, has less ground clearance and reduced suspension function. Of these two states, which is the safest?

Most government agencies like to believe that the throttle only makes bikes go faster and therefore safety can be improved simply by closing the throttle and slowing things down.

Helping these agencies to understand the somewhat counterintuitive relationship between throttle, stability and ground clearance will go a very long way to improving motorcycle safety rather than the somewhat dubious functions envisaged in Saferider".

The Intelligent Speed Adaption (ISA) trials held in the West Midlands (GB) which used force feedback in the throttle for motorcycle speed limiters were a failure. Each motorcyclist that tested the trial bikes came to the same conclusion: that the device was dangerous, because of the propensity to make the motorcycle unstable and because of the real possibility of distracting the rider and thus causing the vehicle to crash.

Consider that the EU Commission is already proposing anti-tampering legislation for motorcycles within the Framework Regulations – which the motorcycle industry wants and is promoting.

If the project consortium gets acceptance for the throttle control system by riders, by default – because there is nobody to protest and nobody to challenge them, then what will stop the EU Commission from proposing compulsory throttle control in the not too distant future?

Experience has taught us that when you work with the authorities and decision makers, it is always a good thing to define a red line that you will not cross - the principles which you will not compromise under any circumstance. The red line for Right To Ride is clear:

We say - **"No to throttle control".**

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