Before the
LIBRARY OF CONGRESS
UNITED STATES COPYRIGHT OFFICE

**In the Matter of Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies for Proposed Class 21**

Docket No. 2014-07

**Reply Comment of the Specialty Equipment Market Association (SEMA)**

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*Proposed Class Addressed*

**Proposed Class 21:** Vehicle Software—Diagnosis, Repair, or Modification

This proposed class would allow circumvention of TPMs protecting computer programs that control the functioning of a motorized land vehicle, including personal automobiles, commercial motor vehicles, and agricultural machinery, for the purposes of lawful diagnosis and repair, or aftermarket personalization, modification, or other improvement. Under the exemption as proposed, circumvention would be allowed when undertaken by or on behalf of the lawful owner of the vehicle.

## I. INTEREST IN PROPOSED CLASS

The Specialty Equipment Market Association (SEMA) was founded in 1963 to represent the specialty automotive industry. It is a nonprofit trade organization composed of over 6,800 companies, including manufacturers, distributors, installers, and retailers for the specialty equipment automotive industry.[1] This industry, which has existed for almost as long as the automobile itself, has grown into a $33 billion market and now employs more than 1 million Americans. Operating at the leading edge in automotive innovation and technology, the industry has created new jobs for engineers, designers, manufacturing workers, distribution, marketing and sales personnel, and skilled

[1] The annual SEMA Show is the world's largest gathering of small businesses, with over 2,000 exhibitors and more than 135,000 industry participants. Each year, there are over 2 million square feet of exhibits displaying the industry's hottest products and latest trends.

technicians. An estimated 92% of the companies that participate in the specialty automotive aftermarket are small independent businesses.

SEMA's members offer custom auto accessories that enhance a vehicle's appearance, safety, performance, comfort and convenience. These aftermarket products include such accessories as custom wheels and tires, turbochargers, lighting equipment, performance exhausts, suspensions, grille guards, and sunroofs, and enable hobbyists to customize their vehicles according to their own tastes and preferences. The specialty automotive aftermarket supports these hobbyists and represents a longstanding history of innovation and entrepreneurship, developing cutting-edge products that increasingly become mainstream in the auto industry.

## II. "TINKERER" INNOVATIONS

The comments submitted in opposition to the proposed class assert that hobbyists, referred to as "tinkerers," who gain access to the Electronic Control Units (ECUs) in the vehicles they own for the purposes of repair and modification, may impair safety and emissions. Those assertions, which are lacking in supportive data, ignore the actual history of automotive innovation.

Critically important, and now taken for granted, many safety advances originated in the hobbyist community *independent of the automakers*. As early as 1945, a prolific and blind engineer named Ralph Teetor invented the now ubiquitous cruise control to improve jerky car rides he experienced from the passenger seat.[2] The idea for the retractable seat belt, which has dramatically improved safety in the automotive industry, first came from a neurologist named Dr. C. Hunter Shelden, who observed in the 1950s that many patients coming into the emergency room had suffered head injuries from car accidents. In addition to the modern seat belt, Dr. Shelden proposed recessed steering wheels, reinforced roofs, roll bars, door locks, and passive restraints such as the air bag.[3] The first intermittent windshield wiper mechanism was designed and developed in 1963 by American inventor and "tinkerer" Robert William Kearns, using off-the-shelf electronic components.[4] Furthermore, until the late 1960s, the only available back-up mirrors that came standard with personal vehicles were rear-view mirrors between the front and passenger seats. Fortunately, in the 1950s and early 1960s a number of innovative businessmen began offering aftermarket wing- and door-mounted mirrors as add-ons.[5] Other safety features like Bluetooth hands-free technology to address distracted driving and lane departure warning systems also originated in the aftermarket and have dramatically improved the safety of today's vehicles.[6] Allen

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[2] *See* Mary Bellis, *Ralph Teetor Invented Cruise Control*, ABOUT.COM, http://inventors.about.com/library/inventors/blcruisecontrol.htm; *see also The Perfect Circle Co.*, SPOTLIGHT ON WAYNE COUNTY, http://www.waynet.org/waynet/spotlight/2003/030521-perfectcircle.htm.

[3] *See* C. Hunter Shelden, M.D., *Prevention, the Only Cure for Head Injuries Resulting from Automobile Accidents*, 159 JAMA 981-86 (November 5, 1955).

[4] *See* Curt Wohleber, *The Windshield Wiper: Nonstop Ones Made Drivers Crazy. Inventing A Solution Did the Same to Robert Kearns*, 23 AM. HERITAGE INVENTION & TECH., issue no.1 (Summer 2007).

[5] *See External Rear-View Mirrors - 1950s/1960s*, OLD CLASSIC CAR: DRIVEN BY CLASSICS, http://www.oldclassiccar.co.uk/mirrors.htm (showing examples of aftermarket door and wing mirrors manufactured by Desmo, Raydyot, Arden, and Wingard that were popular with motorists in the 50s and 60s).

[6] *See* Svenolof Karlsson & Anders Lugn, *The History of Bluetooth*, THE HISTORY OF ERICSSON, http://www.ericssonhistory.com/changing-the-world/Anecdotes/The-history-of-Bluetooth-/ (describing engineer Sven Mattisson's journey to develop Bluetooth technology); *see also About Iteris: Mission & History*,

Breed, engineer and founder of aftermarket the company Breed Corporation, even invented the first airbag to be triggered by an electromechanical sensor, which was "a forerunner of the electronic sensors popular today."[7]

In addition to safety innovations, so-called "tinkerers" have developed technologies to significantly improve motor vehicle emissions and fuel economy. For example, the first catalytic converter for gasoline engines was invented by mechanical engineer Eugene Houdry and his company Oxy-Catalyst in the mid-1950s to reduce automobile exhaust pollutants.[8] One of the most prominent companies in the automotive aftermarket, Robert Bosch GmbH, launched gasoline direct injection technology for gasoline engines in 1951, allowing engines to run on less fuel and produce fewer emissions.[9] Direct injection, which is incidentally controlled by ECUs, has become so important for reducing emissions that Natural Resources Canada encourages buyers to opt for vehicles with this technology to help the country meet its greenhouse gas emission standards for light-duty vehicles.[10]

While owners and enthusiasts have worked freely to improve their cars' performance for decades, there is no evidence that such efforts have resulted in measurable adverse effects on either accidents or the environment. Since 1981, ECUs have been used in automobiles to meet state and federal emissions requirements, and they have evolved to now control everything from automatic transmissions to door locks. In the more than thirty years since their mainstream introduction, ECUs have been modified by vehicle owners for the purposes of repair and customization. Again, this has occurred without any data to support the argument that such repairs and customization negatively impacts safety or emissions.[11]

In each case, it has been necessary for the "tinkerer" to understand how the vehicle operated in order to achieve the desired results. Although in decades past hobbyists could install these new features mechanically, the advent of government-mandated electronic-based vehicle systems—including onboard diagnostics, tire pressure monitoring systems, and electronic stability control—has given rise to a need to more fully understand vehicle software to ensure new innovations will be compatible with existing systems. Today, in light of exceedingly complicated software in vehicle

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ITERIS, http://www.iteris.com/about/mission-and-history (explaining the aftermarket company's engineering of the first lane departure warning system in the early 1990s).

[7] *See* Nick Ravo, *Allen K. Breed, 72, a Developer Of Air Bag Technology for Cars*, N.Y. TIMES, Jan. 14, 2000, *available at* http://www.nytimes.com/2000/01/14/business/allen-k-breed-72-a-developer-of-air-bag-technology-for-cars.html.

[8] *See His Smoke Eating Cats Now Attack Traffic Smog*, POPULAR SCIENCE, at 83-85 (June 1955).

[9] *See Gasoline Direct Injection*, ROBERT MOBILITY SOLUTIONS, http://products.bosch-mobility-solutions.com/en/de/powertrain/powertrain_systems_for_passenger_cars_1/direct_gasoline_injection/direct_gasoline_injection_23.html.

[10] *See Learn the Facts: Direct Fuel Injection and Its Impact on Fuel Consumption*, NATURAL RESOURCES CANADA, http://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/oee/pdf/transportation/fuel-efficient-technologies/autosmart_factsheet_5_e.pdf.

[11] In fact, safety data suggests the opposite. *See Cars Move America: Safety Advances Increase Peace of Mind*, AUTO ALLIANCE, http://www.autoalliance.org/cars-move-america/safety-advances-increase-peace-of-mind (revealing various statistics demonstrating that vehicle safety has steadily improved over the last several decades, including that vehicle occupant fatality rate has declined by one third since 2004). In addition, the data shows that "even as licensed drivers and vehicle miles traveled have both doubled in the past three decades, traffic-related crashes declined by 18,000 from 1980-2012." *Id.*

ECUs, and ever more sophisticated measures put in place to block access to that software, the need for access free of any cloud created by the DMCA is more vital than ever.

## III. BRIEF OVERVIEW

SEMA strongly supports the traditional right of hobbyists and enthusiasts to research, modify and enhance their vehicles—a process referred to by proponent Electronic Frontier Foundation as "tinkering," and which the Copyright Office referred to as "lawful… aftermarket personalization, modification, or other improvement" in its formulation of the Proposed Class. For the purposes of this reply comment, we use the term "modification" and "modifier" interchangeably with "tinkering" and "tinkerer." To the extent that modification requires vehicle owners and those who support them to access, study, and modify copyrighted computer programs contained in ECUs, this conduct constitutes fair use within the meaning of 17 U.S.C. § 107.[12] Circumvention of technological control measures (TCMs) to access, study, and modify these programs should not even arguably constitute a violation of the DMCA. Accordingly, SEMA urges the Copyright Office to grant the requested exemption.

SEMA's analysis below is intended to bring forward three points. First, to the extent that opponents of the requested exemption posit that the exemption will threaten public health or safety, these concerns are unfounded, and they are adequately addressed by existing laws, including the federal Motor Vehicle Safety Act, 49 U.S.C. § 30101 *et seq*., the Clean Air Act, 42 U.S.C. § 7401 *et seq*., and the California Clean Air Act, Cal. Health & Safety Code § 39000 *et seq*. Second, the uses at issue are non-infringing uses. Third, and finally, vehicle owners and those who support them may be adversely affected if the proposed exemption is not granted.

## IV. MOTOR VEHICLE MODIFICATION IS ADEQUATELY GOVERNED BY EXISTING LAW

The exemption will not frustrate compliance with safety or environmental regulations. Quite simply, opponents overlook the fact that the Proposed Class only extends to "circumvention … for the purposes of *lawful* diagnosis and repair, or aftermarket personalization, modification, or other improvement."[13] If a modification results in a violation of any statute or regulation, whether directed at public safety or environmental preservation, the vehicle owner's circumvention would *not be exempt* from liability under the DMCA. And indeed, even the opponents accept that a number of statutes and regulations, including the Motor Vehicle Safety Act (MVSA) and the Clean Air Act (CAA), are already in effect to protect safety and ensure that vehicles are and continue to be in compliance with stringent emissions and safety standards.

Under authority of the MVSA, the National Highway Traffic Safety Administration (NHTSA) issues the Federal Motor Vehicle Safety Standards (FMVSS) to establish minimum safety

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[12] The conduct at issue is likely also authorized under Section 117 of the Copyright Act, 17 U.S.C. §117. Because this issue is adequately addressed in other submissions, including that of EFF, SEMA has not provided an additional discussion of it here.

[13] *See* Copyright Office Notice of Proposed Rulemaking, 79 Fed. Reg. 73,856, 73,869 (Dec. 12, 2014) (to be codified at 37 C.F.R. pt. 201).

performance requirements for new cars and parts.[14] Under the MVSA, equipment manufacturers, distributors, and commercial installers cannot market or install a product that would take a vehicle out-of-compliance with a federal safety standard.[15] For example, it would be illegal to commercially install colored bulbs on an automobile that, when installed, would not allow the required lamps to meet the color and performance requirements of the federal lighting standard.

The U.S. Environmental Protection Agency (EPA) regulates emissions-related aftermarket automotive parts and modifications on a federal level through the Clean Air Act (CAA).[16] Various state-level air quality agencies, including the California Air Resources Board (CARB), also enforce state laws and regulations imposing emissions requirements.[17] As several of the opponents themselves mentioned, modifications affecting vehicle emissions are subject to anti-tampering laws and require testing and certification to demonstrate that they do not unacceptably increase emissions. Under both EPA and CARB regulations, it is illegal to knowingly manufacture, sell, or install a part or component that would negatively affect emissions performance.[18]

These laws and a multitude of other laws, rules, and regulations, govern what is legally permissible for individual owners to do when engaged in improvements or modifications to their vehicles. As previously noted, the Proposed Class is specifically worded so that any use that ran afoul of these laws would not be exempted.[19]

In light of these safeguards, it is clear that the "sky is (or will be) falling" argument collectively put forward by the opponents is not supported. In supporting America's long-standing tradition of vehicle modification and customization, the hobbyist community has kept safety and environmental concerns in mind since its inception and, as set forth above, a history of innovations from auto enthusiasts and those who support them demonstrates that modifications improve and enhance rather than undermine safety and emissions.[20]

Finally, as set forth in more detail below, when confronted with similar arguments from Apple in a prior proceeding in the context of "jailbreaking" iPhones, the Copyright Office noted

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[14] Federal Motor Vehicle Safety Standards & Regulations (FMVSS), 49 C.F.R. pt. 571, *available at* http://www.nhtsa.gov/cars/rules/import/FMVSS/.

[15] *See* 49 U.S.C. § 30122(b).

[16] Clean Air Act, 42 U.S.C. § 7401 *et seq*.

[17] *See California Air Pollution Control Laws*, CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY: AIR RESOURCES BOARD (Feb. 7, 2012), http://www.arb.ca.gov/bluebook/bluebook.htm; *California Code of Regulations Titles 13 and 17 for CARB*, CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY: AIR RESOURCES BOARD (Jan. 14, 2014), http://www.arb.ca.gov/regs/regs.htm.

[18] *See* 42 U.S.C. § 7522(a)(3); Cal. Veh. Code § 27156(c).

[19] *See* Notice of Proposed Rulemaking, at 73,869 (defining the proposed class to allow "circumvention … for the purposes of *lawful* diagnosis and repair, or aftermarket personalization, modification, or other improvement.").

[20] While the opponents suggest that tinkerers may make changes that allow operation at higher speeds, they ignore the fact that they have always and continue now to aggressively market their own highest speed models. For example, Dodge offers a 707-horsepower model of its Challenger, which it markets as "the most extreme example of unrelenting muscle, making the Challenger SRT Hellcat the most powerful muscle car ever." *See, e.g.*, *Heart-Pounding Performers: Supercharged 6.2L HEMI SRT Hellcat V8 Engine*, DODGE, http://www.dodge.com/en/challenger/performance/. Chevrolet similarly promotes the "unbridled power" of its 580-horsepower Camaro ZL1, which it claims ran a 7:41:27 lap around one of the most grueling tracks in the world and can go from zero to sixty in 3.9 seconds. *See The 2015 Camaro ZL1: Legendary Performance*, CHEVROLET, http://www.chevrolet.com/camaro-zl1-muscle-car.html.

that it would be inappropriate to rely on copyright law to bear the burden of enforcing other laws or to refuse to extend the copyright three-year safe harbor to lawful uses on the basis that a small minority might circumvent in ways that are outside the scope of the safe harbor.

## V. NONINFRINGING "FAIR USE"

Section 107 of the Copyright Act provides a complete defense against copyright infringement for "fair uses," based on the weighing of four factors:

> (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
> (2) the nature of the copyrighted work;
> (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
> (4) the effect of the use upon the potential market for or value of the copyrighted work.[21]

Modifiers interested in enhancing vehicle functionality must use the vehicle software in one of two noninfringing ways when the component they want to modify is controlled by a vehicle ECU. First, they must access the software code to analyze its functionality in order to develop new software that makes the vehicle compatible with a third-party application, part or accessory. Second, individual vehicle owners looking to install a new application, part or accessory must access the vehicle software in the ECU to modify portions of the code so that the vehicle will properly communicate with new components. Neither of these uses infringes copyrights in the underlying software because both fall squarely within the boundaries of fair use.

Copying software code for the purpose of analyzing and reverse engineering the software to create a new compatible product has long been held to constitute a fair use of the software. In *Sega v. Accolade*, the Ninth Circuit held that disassembly of copyrighted software code is a fair use if (1) it is the only means of accessing noncopyrightable, functional elements of the code and (2) the copier has a legitimate reason for seeking such access, including interoperability.[22] Modifiers meet both of those criteria when they seek to develop new software applications through reverse engineering of highly functional code to modify and customize their vehicles and allow the vehicles to interoperate with new components.

Similarly, the Copyright Office has determined that under the laws of fair use, an individual who has paid for the right to use copyrighted software is also permitted to modify portions of the code in order to make it compatible with new software or a new device. The Copyright Office previously found fair use where individuals sought to circumvent TPMs in their smartphones to implement minor modifications to the phone's firmware in order to permit interoperability with independently developed applications.[23] The uses contemplated under Proposed Class 21, which involve the modification of existing software to ensure new components and features are interoperable with the vehicle's ECUs, present nearly identical circumstances. Consequently, the

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[21] 17 U.S.C. § 107.
[22] *Sega Enterprises Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1518, 1527-28 (9th Cir. 1992).
[23] Recommendation of the Register of Copyrights in RM 2008-8, Rulemaking on Exemptions from Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 91-92 (June 11, 2010) [hereinafter "2010 Recommendation"].

Copyright Office should recognize use of vehicle software for purposes of modification or enhancement as a noninfringing fair use in support of the proposed exemption for Class 21.

Factor #1: The purpose and character of the use

The first fair use factor asks whether the use of a copyrighted work "merely supersedes the objects of the original creation, or instead adds something new."[24] Cases following these principles, specifically in the context of computer software, make clear that a modifier's use of vehicle software to develop and implement new software to allow for the installation and interoperability of specialty parts and accessories is a "legitimate purpose" that weighs in favor of fair use.

*Analyzing and Reverse Engineering Code to Achieve Interoperability*

As EFF explained in their opening comment, courts have repeatedly held that analyzing copyrighted software to reverse engineer a product for the purpose of developing a new compatible product is a "legitimate purpose" under the first factor of the fair use analysis.[25] In *Sega v. Accolade*, the Ninth Circuit found fair use where Accolade, a video game competitor, reverse engineered object code in Sega's console in order to learn how to program its games so that they could run on the console.[26] Central to the court's finding was that Accolade needed to "discover the functional requirements for compatibility" in order to develop an interoperable device.[27] The court reached the same conclusions in *Sony v. Connetix* nearly a decade later.[28]

Here, enthusiasts are seeking the right to do precisely the same thing—access vehicle software to study the functional parameters of the code for the sole purpose of interoperability. Exempting modifiers who wish to analyze vehicle software would also promote the "public benefit" of enabling the design of compatible products, a fact the Ninth Circuit found persuasive under this factor.[29]

*Modifying Code to Achieve Interoperability*

As explained above, where the purpose of the use or modification of the copyrighted software is to achieve interoperability with another application or device, the first factor weighs in favor of fair use.[30] As in the case of reverse engineering, permitting modification to vehicle code would align with Congress's unambiguous intent to promote software interoperability and be an incentive for the development of new copyrighted works, a point that the Copyright Office found persuasive when considering the exemption for jailbreaking a cell phone to permit modifications to

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[24] *Campbell v. Acuff-Rose Music, Inc.*, 510 U.S. 569, 579 (1994).
[25] *Sony Computer Entertainment, Inc. v. Connectix Corp.*, 203 F.3d 596, 607 (9th Cir. 2000).
[26] *Sega*, 977 F.2d at 1514.
[27] *Id.* at 1522.
[28] *Sony v. Connectix*, 203 F.3d at 607 (holding that an emulator software developer's intermediate copying of a video game system manufacturer's software in order to access unprotected functional elements of the software for the purpose of developing a software program that would allow the manufacturer's video game to be played on a computer, and not just on its own consoles, was a fair use, based in large part on an analysis under the first factor).
[29] *Sega*, 977 F.2d at 1523 (noting the public value of Accolade's activity, which "has led to an increase in the number of independently designed video game programs offered for use with the Genesis console"); 2010 Recommendation, at 94.
[30] *Sega*, 977 F.2d at 1522-23.

make the software interoperable with an application created for that device.[31] The Copyright Office also observed that the reverse engineering exception to the anti-circumvention statute at 17 U.S.C. § 1201(f) provides further proof that Congress intended to favor uses of copyrighted works that enable interoperability, even of the individual doesn't "fall within the four corners of the statutory exemption."[32]

To the extent the opponents argue that the first factor goes against fair use in this case because the modifications to vehicle software are not "transformative," two points must be made. First, where the modification to the vehicle's software results in new functionality that *would not have been possible* without modification, as is the case with many vehicle enhancements, it is clear that the software modification "adds something new, with a further purpose or different character."[33] The "further purpose" is the added compatibility with applications, specialty parts and accessories, and the enhanced functionality is by definition transformative, *i.e.* "something new." Retractable seat belts and side-view mirrors were something new when that functionality was added by modifiers in the days when a bit of computer code did not hinder access or innovation. As demonstrated by the advent of the airbag and sensor technology, which quickly deploys in response to inputs from electromechanical sensors,[34] there is no reason to conclude that modern modifiers will be any less creative in the transformations they achieve. Second, proponents have demonstrated that the nature and purpose of the use is legitimate and favored by the first factor, whether or not a particular application, after access, is or is not "transformative" will not alter the analysis.[35]

Factor #2: The nature of the copyrighted work

It is well established in copyright law that highly functional software code is entitled to only minimal protection, since it contains substantial non-copyrightable elements.[36] The nature of the copyrighted work weighs heavily in favor of fair use when the user is only interested in the functionality of the code, not its expression.

In 2010, the Copyright Office relied on authority in *Sega v. Accolade* to find that the second factor weighed in favor of fair use with regard to cell phone jailbreaking because the users modified firmware in the "bootloader" and operating system, two software components that are "highly functional works used to operate a device."[37] Although the Copyright Office recognized that the software may contain creative elements that are copyrightable, it was persuaded that in order to achieve interoperability, the functional elements had to be modified, and there was no evidence that

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[31] 2010 Recommendation, at 94.
[32] *Id.* at 93-94.
[33] *Campbell*, 510 U.S. at 579.
[34] *See* Nick Ravo, *Allen K. Breed, 72, a Developer Of Air Bag Technology for Cars*, N.Y. TIMES, Jan. 14, 2000, *available at* http://www.nytimes.com/2000/01/14/business/allen-k-breed-72-a-developer-of-air-bag-technology-for-cars.html.
[35] 2010 Recommendation, at 95.
[36] *Sega*, 977 F.2d at 1524-25 ("[C]omputer programs are, in essence, utilitarian articles—articles to accomplish tasks. . . . [They] are dictated by the function to be performed, by considerations of efficiency, or by external factors such as compatibility requirements and industry demands."); *id.* at 1526 ("Because Sega's video game programs contain unprotected aspects that cannot be examined without copying, we afford them a lower degree of protection than more traditional literary works.").
[37] 2010 Recommendation, at 96.

that the creative elements of the software were copied in the course of the reprogramming.[38] The same facts exist here with respect to the highly functional vehicle software inside ECUs.

Several opponents cite the case *Oracle America, Inc. v. Google Inc.*;[39] that case is entirely inapposite. In that case, the Federal Circuit reversed the lower court's finding that the particular software comprising plaintiff's API packages was not entitled to any copyright protection because they constituted methods of operation. It then sent the case back to the District Court because the fair use defense had yet to be tried.[40] Further, although the Federal Circuit in *Oracle* did not opine on the fair use analysis, it did reiterate some of the basic principles under each fair use factor. With regard to the second factor, the court deferred to the Ninth Circuit's reasoning in *Sega v. Accolade*:

> Because computer programs have both functional and expressive components, however, where the functional components are themselves unprotected [by copyright]… those elements should be afforded a lower degree of protection than more traditional literary works. Thus, where the nature of the work is such that purely functional elements exist in the work and it is necessary to copy the expressive elements in order to perform those functions, consideration of this second factor arguably supports a finding that the use is fair.[41]

Thus, even under the authority cited by the opponents, where the copyrighted work at issue is a software program with substantial functional components, the second factor weighs strongly in favor of fair use.

Factor #3: The amount and substantiality of the portion used

The use of vehicle software that would be authorized under Proposed Class 21—the aftermarket personalization, modification, or other improvement of motor vehicles—supports a finding of fair use under the third factor, since the modifiers here would use no more than is necessary to research and ultimately implement the desired modification.

*Analyzing and Reverse Engineering Code to Achieve Interoperability*

The third fair use factor only weighs against fair use if the amount used is unreasonable in light of the purpose for which the copyrighted work is used.[42] Thus, even where the entire copyrighted work has been copied, such a finding will not defeat fair use if the copying was necessary to accomplish a legitimate purpose.[43] It is reasonable to assume that in many cases of modification to improve or tailor performance, once discrete elements are changed appropriately, the only reason original portions of the code unaffected by the change must remain intact is so that other functionality is not impaired.

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[38] *Id.* at 96.

[39] *See, e.g.*, Long Comment Regarding a Proposed Exemption Under 17 U.S.C. 1201 (Proposed Class #21) of Alliance of Automobile Manufacturers at 10 (arguing that under *Oracle*, the Copyright Office's interpretation of the second fair use factor is "ripe for reexamination").

[40] *Oracle Am., Inc. v. Google Inc.*, 750 F.3d 1339, 1348, 1367-68 (Fed. Cir. 2014).

[41] *Id.* at 1375.

[42] *Campbell*, 510 U.S. at 586-87.

[43] *See Authors Guild, Inc. v. HathiTrust*, 755 F.3d 87, 98 (2d Cir. 2014) (finding that "[f]or some purposes, it may be necessary to copy the entire copyrighted work, in which case Factor Three does not weigh against a finding of fair use").

As EFF has pointed out, Ninth Circuit authority in both *Sega v. Accolade* and *Sony v. Connectix* establishes that the copying of an entire software program may be fair use if the copying was necessary to understand the functional elements of the software.[44] It has also explained that in the case of reverse engineering vehicle software, analyzing the entire software program may be critical to understand the functionality of the vehicle and, in addition, to determine how much storage is available to support additional functionality.[45] Importantly, access to the entire work is necessary to ensure that modifications in one part of the code will not negatively impact other functionality.[46] This factor supports a finding of fair use.

*Modifying Code to Achieve Interoperability*

In 2010, the Copyright Office faced almost exactly the same analysis as contemplated here under Proposed Class 21, where the modification to the original software entails changing or adding a small amount of code but otherwise reusing the vast majority of the original firmware.[47] In that case, commenting parties submitted evidence that cell phone jailbreaking required the modification of fewer than 50 bytes out of more than 8 million bytes, approximated 1/160,000 of the copyrighted work as a whole.[48] The Copyright Office found that "where the alleged infringement consists of making an unauthorized derivative work, and the only modifications are as *de minimus* as they are here, the fact that iPhone users are using almost the entire iPhone firmware for the purpose for which it was provided to them by Apple undermines the significance of this factor."[49] The reprogramming of vehicle software to personalize or improve the vehicle and enable interoperability with new parts is no different.

Factor #4: The effect of the use upon the potential market for or the value of the copyrighted work

The vehicle software comes with and is intertwined with the vehicle. Therefore the only relevant market when considering the value of the copyrighted work is the primary sales market for personal vehicles. Because the modifications contemplated in Proposed Class 21 exist only after first retail sale, and are only authorized if the individual implementing the modification has lawfully purchased the vehicle, the promotion of these activities would not harm vehicle sales in the primary market. Therefore, this factor cannot weigh against a finding of fair use.[50] In fact, the ability of the secondary market to provide and enable post-sale modifications that increase a vehicle's

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[44] *Sega*, 977 F.2d at 1526-27; *Sony v. Connectix*, 203 F.3d at 606.

[45] Comment of Electronic Frontier Foundation at 10 (citing Karl Koscher, et al. *Experimental Security Analysis of a Modern Automobile*, CENTER FOR AUTOMOTIVE EMBEDDED SYSTEMS, 2010 IEEE SYMPOSIUM ON SECURITY AND PRIVACY 5 (May 16, 2010), http://www.autosec.org/pubs/cars-oakland2010.pdf; Tephra, Forum Post to *TephraModV7*, EVOLUTIONM.NET (Oct. 10, 2009), http://www.evolutionm.net/forums/ecuflash/451836-tephramod-v7.html (last updated Apr. 10, 2011)).

[46] Comment of Electronic Frontier Foundation at 10.

[47] 2010 Recommendation, at 97.

[48] *Id.*

[49] *Id.*

[50] *See Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 450 (1984) ("[A] use that has no demonstrable effect upon the potential market for, or the value of, the copyright work need not be prohibited in order to protect the author's incentive to create.")

interoperability with improved components only increases the attractiveness of that vehicle to buyers, thereby benefiting the market for the copyright work.[51]

To the extent that opponents are concerned that modifications will compete with and therefore cause harm to the market for their vehicles, this concern will not tip the scale of the fourth factor against fair use. If a copyright owner argues against the fourth fair use factor due to a fear of future harm to a market, it must show "by a preponderance of evidence that some meaningful likelihood of harm exists."[52] The opponents have not met this burden here. In *Lewis Galoob Toys v. Nintendo*, the Ninth Circuit considered whether fair use applied to a video game cartridge add-on device that allowed players to alter various features of a Nintendo game.[53] The court held that because Nintendo failed to show that it had plans to develop its own altered versions of these games, any harm to that potential market was too speculative to be considered under the fourth fair use factor.[54] Turning to the case of vehicle modifications, tinkerers seek to modify their vehicles precisely because certain features they want do not yet exist in their vehicle. Without a showing that the automakers themselves offer vehicles originally outfitted with the unique features that tinkers seek, "the existence of [the] potential market cannot be presumed."[55]

Some opponents of Class 21 argue that the fourth factor weighs against a finding of fair use because modifying the vehicle software could lead to safety, security, or environmental issues. As set forth in Part IV, there is no merit to these contentions. Even if there were, the Copyright Office unequivocally rejected similar arguments posed by Apple in 2010 when it considered, and ultimately granted, an exemption for cell phone jailbreaking for software interoperability:

> Ultimately, Apple's position with respect to harm to the market for and value of its firmware boils down to Apple's conclusion that "the value of the iPhone, and hence the software embedded in it, is substantially diminished when the integrity and functionality of that software is compromised by jailbreaking, when Apple is left to deal with the problems that ensue, and when the positive feedback loops enabled by the App Store and the iPhone Developer Program are compromised." The Register concludes that these concerns are not what the fourth fair use factor is intended to address.[56]

As the Copyright Office previously found, a copyright owner's concern about harm to its reputation, even if it were at all supported by evidence, is not sufficient to tip the fourth factor against a finding of fair use.[57] Rather, the fourth factor aims to prevent copiers from "usurp[ing] the demand" for the original work by offering infringing works as substitutes; the copyright laws "are not aimed at recompensing damages which may flow indirectly from copying."[58] In 2010, the Copyright Office

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[51] Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 77 Fed. Reg. 65,260, 65,264 (Oct. 26, 2012) (codified at 37 C.F.R. pt. 201) [hereinafter "2012 Final Rule"] ("[N]othing in the record suggested that the market for mobile phones had been negatively affected by the designation of such a class and, in fact, such a class might make smartphones more attractive to consumers.").

[52] *See Sony v. Universal*, 464 U.S. at 451.

[53] *Lewis Galoob Toys, Inc. v. Nintendo of Am., Inc.*, 964 F.2d 965, 967 (9th Cir. 1992).

[54] *Id.* at 971.

[55] *Id.* at 972.

[56] 2010 Recommendation, at 98 (quoting Apple's Response Comment at 18).

[57] *Id.* at 99.

[58] *Consumer Union of the United States, Inc. v. Gen. Signal Corp.*, 724 F.2d 1044 (2d Cir. 1983). *See also* P. Leval, *Toward a Fair Use Standard*, 103 HARV. L. REV. 1105, 1125 (1990) ("Not every type of market impairment

found that Apple could not make a viable argument that the practice of jailbreaking would displace sales of its firmware or its iPhones "since one cannot engage in that practice unless one has acquired an iPhone."[59]

In fact, upon revisiting the exemption for jailbreaking in 2012, the Copyright Office observed that, "exemption notwithstanding, the proliferation of smartphones has increased since the last rulemaking, suggesting that the fourth factor calculus favors a fair use finding even more than it did in 2010."[60] Analogous facts exist here, in the context of vehicle customization.

Finally, to the extent the automakers oppose the fair use of ECU software for the purpose of modification, and that were to result in manufacturer control of the market for upgrades and modification products, copyright law simply does not operate to grant such protections. In 2010, the Copyright Office noted that "Apple's objections to the installation of unapproved software had nothing to do with its interests as [a copyright owner]" and instead its "access controls served to promote a restrictive business model rather than meaningful copyright interests."[61] Such an attempt here should not bolster the opponent's arguments against fair use.

A review of the four fair use factors leads to the conclusion that accessing vehicle software for the purpose of studying the functionality of the code through reverse engineering or modifying the software to enable interoperability with a specialty application, part or accessory is a fair use. The Copyright Office has consistently recognized that the use and modification of copyrighted software for the purpose of achieving interoperability with a new device or software deserves protection against infringement liability, most recently in the case of cell phone jailbreaking. It should do so again here.[62]

## VI. CAR OWNERS AND THIRD PARTIES WHO SUPPORT THEM COULD BE SUBJECT TO AN ADVERSE IMPACT IF THE REQUESTED EXEMPTION IS NOT GRANTED

As set forth in substantial detail in the submissions by EFF, a traditionally innovative group of enthusiasts and modifiers may be adversely impacted in the absence of an explicit exemption. Like the owners of smart phones addressed previously by the Copyright Office, most car owners

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opposes fair use . . . . The fourth factor disfavors a finding of fair use only when the market is impaired because the quoted material services the consumer as a substitute….").

[59] 2010 Recommendation, at 99.

[60] Recommendation of the Register of Copyrights in No. 2011-7, Section 1201 Rulemaking: Fifth Triennial Proceedings to Determine Exemptions to the Prohibition on Circumvention, at 74 (Oct. 12, 2012); 2012 Final Rule, at 65,264.

[61] 2010 Recommendation, at 82, 93.

[62] Fair use aside, to the extent that any copying of vehicle software by modifiers is limited to copying a "lock-out" code designed to restrict access to the underlying software content, no infringement exists because that code is uncopyrightable in the first place. Although computer programs are considered "literary works" entitled to some degree of protection, the Sixth Circuit held in *Lexmark v. Static Control Components* that lock-out code amounts to a functional idea, not copyrightable expression. *Lexmark Intern., Inc. v. Static Control Components, Inc.*, 387 F.3d 522, 536 (6th Cir. 2004). Citing the doctrines of merger and scenes a faire, the court held that although the lock out code could have been expressed in another way, the code as written presented the most logical and efficient alternative and therefore merged with the functionality of the program. *Id.* at 536-37 (citing *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1524 (9th Cir. 1992); *Atari Games Corp. v. Nintendo of Am., Inc.*, Nos. 88-4805 & 89-0027, 1993 WL 207548, at *1 (N.D. Cal. May 18, 1993)). The code therefore was not protectable as original expression.

will not begin to understand the workings of the DMCA, and, in many cases, they lack the wherewithal to deal with any challenge or cloud hanging over lawful repairs or modifications they might undertake.

Central to the DMCA and vivid in the debate and discussion that led to its adoption is the proposition that the anti-circumvention protections afforded by the act were *not* intended to prevent secondary market competitors from using technological means to analyze the workings of a device or prevent use of knowledge gained from that access in order to use interoperable products. If any manufacturer could block access to vehicle software and enforce their copyrights against individuals working to reverse engineer the software's functionality, then the result could be an effective monopolization of the market for compatible enhancement products.

The Copyright Office has addressed the issue of lockouts for the purpose of market control. Specifically, in the 2010 and 2012 proceedings, the Copyright Office approved of the exemption for jailbreaking cell phones to permit interoperability with third-party applications where the technological measures were not intended to protect the copyrighted firmware, but rather to promote anticompetitive business practices. The Copyright Office stated in its final decision:

> [I]t is customary for operating systems—functional works—to enable third party programs to interoperate with them. It does not and should not infringe any of the exclusive rights of the copyright owner to run an application program on a computer over the objections of the owner of the copyright in the computer's operating system. Thus, if Apple sought to restrict the computer programs that could be run on its computers, there would be no basis for copyright law to assist Apple in protecting its restrictive business model.[63]

The Copyright Office should similarly prevent any automaker who might attempt to do so from overextending their rights under copyright law as a means to impair healthy competition in the aftermarket.[64]

## VII. CONCLUSION

For the foregoing reasons, SEMA urges the Copyright Office to grant the Class 21 Exemption for vehicle software for the purpose of repair, diagnosis, and modification.

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[63] Exemption to Prohibition on Circumvention of Copyright Protection Systems for Access Control Technologies, 75 Fed. Reg. 43,825, 43,829 (July 27, 2010) (codified at 37 C.F.R. pt. 201).

[64] The "Right to Repair" Agreement and Memorandum of Understanding that the opponents mention in their comments, while important, does not obviate the need for the exemption. The right to take advantage of the Agreement is not free. Also, it will not take effect until 2018, when the next triennial rulemaking is already underway. Lastly, because these agreements only enable access to diagnostic and repair information, they are not broad enough to be useful to vehicle owners interested in modifying and customizing their vehicles for reasons other than repair. Hobbyists and enthusiasts comprise a large proportion of the people stand to benefit from the Class 21 Exemption, yet they currently have no right to access the information they need.