RIGHT TO REPAIR AND WHAT IT MEANS FOR ENTREPRENEURS

HEARING

BEFORE THE

SUBCOMMITTEE ON UNDERSERVED, AGRICULTURAL, AND RURAL BUSINESS DEVELOPMENT

OF THE

COMMITTEE ON SMALL BUSINESS
UNITED STATES
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RIGHT TO REPAIR AND WHAT IT MEANS FOR ENTREPRENEURS

WEDNESDAY, SEPTEMBER 14, 2022

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SMALL BUSINESS,
SUBCOMMITTEE ON UNDERSERVED, AGRICULTURAL,
AND RURAL BUSINESS DEVELOPMENT,
Washington, DC.

The Subcommittee met, pursuant to call, at 10:00 a.m., in Room 2360, Rayburn House Office Building, Hon. Jared Golden [chairman of the Subcommittee] presiding.

Present: Representatives Golden, Carter, Peters, Williams, Stauber, Tenney, and Flood.

Chairman GOLDEN. Okay. Good morning. I call this hearing to order.

Without objection, the Chair is authorized to declare a recess at any time.

I would like to begin by noting a few requirements. Standing House and Committee rules continue to apply during hybrid proceedings. All Members are reminded that they are expected to adhere to these rules including the rules of decorum.

House regulations require Members to be visible through a video connection throughout the proceeding, so please keep your cameras on. Also, please remember to remain muted until you are recognized in order to minimize background noise.

In the event that a Member encounters technical issues that prevent them from being recognized for their questioning, I will move to the next available Member of the same party and I will recognize that Member at the next appropriate time slot provided they have returned to the proceeding.

With that, I will begin with an opening statement.

Advances in technology have created countless benefits for small businesses and consumers. Today, entrepreneurs can sell their offerings globally and customers have more access to the products and services they want than ever.

At the same time, increased technological adoption has created unintended consequences that can harm entrepreneurs, particularly in rural communities like those that we represent.

Since the 1990s, consumer electronics, automobiles, and a variety of other products have become more complicated to fix and maintain. Large manufacturers and corporations have increasingly moved to limit the ability of consumers and independent, small businesses to make repairs on a range of essential products. These

repair restrictions can impact small firms across various industries, often increasing costs and sometimes upending business models.

In a 2021 report to Congress, the Federal Trade Commission outlined numerous ways that manufacturers inhibit the ability to make repairs on everyday products like mobile phones, automobiles, agricultural machinery, and medical equipment.

These methods range from making products physically harder to open, to requiring access to proprietary diagnostic software to initiate even minor repairs. These practices frustrate consumers by forcing them to go to manufacturers for repair or to replace their products entirely. Repair restrictions also negatively impact small firms by raising costs and limiting repair options for small businesses that depend on machinery.

Take, for example, small independent farmers. For generations, small farmers have been able to make their own repairs on the spot and continue working when a tractor or other piece of important equipment breaks down. Yet, today, a modern tractor can come equipped with hundreds of censors. A malfunction in just one can cause an entire machine to stop working and force a farmer to stop their harvest to haul equipment to a dealership that is hours away or wait for a field technician. I have heard firsthand from Maine farmers that these delays can cost small farms days in wasted productivity and thousands of dollars in revenue.

But these restrictions do not just impact entrepreneurs that use machinery; they also make it difficult for the many independent businesses that work to repair these products.

Independent repair shops frequently offer lower prices than larger manufacturers. For instance, in the medical equipment sector, independent servicers often work on equipment for about $150 to $250 an hour, while large manufacturers charge up to $500 to $600 per hour with a 4-hour minimum.

Decades of evidence have made it clear that repair restrictions do cause costs to go up. They hurt small businesses, and they encourage waste while increasing the profits of corporations.

Given these adverse effects, the proliferation of restrictions should be addressed. That is why we should explore common-sense and bipartisan Right to Repair laws that protect consumers and small businesses. Several of my colleagues have already introduced proposals to restrict the ability of large companies to monopolize repair and aftermarket products.

Today, we will take a closer look at actions that Congress can take to ensure the right to repair for small businesses, independent shops, and for individual consumers.

I would now like to yield to the Ranking Member, Ms. Tenney, for her opening statement.

Ms. TENNEY. Thank you, Mr. Chairman. And thank you to the witnesses. Thank you for your remarks as well.

I am also a small business owner and my cousins and my brothers' in-laws are also farmers. So I am also a lawyer, so I have a unique perspective I think on this issue which I think is a very important one. And thank you.

The right to repair is alluring in its simplicity. In theory, it seems obvious that if you buy something, you own it, and you should have the freedom to do what you want with it. America is,

after all, a nation of thinkers and innovators. That freedom to innovate is part of what makes our country great.

From a more practical standpoint—I always have to have the legal side of it—the right to repair has its benefits. No more wasting valuable time and resources waiting for only the authorized professionals to repair a product at a fixed price. The right to repair, if properly designed, can create a world of consumer choice, competitor pricing, and potential cost savings.

However, when this issue is examined in full depth, it becomes substantially less black and white. There is, in fact, a significant amount of gray when it comes to the right to repair. Years ago, machines were simpler. They consisted of nuts, bolts, and other mechanical parts. Today, many machines are essentially sophisticated super computers. They perform seemingly miraculous feed thanks to delicate and complex electronic components integrated with highly specialized proprietary software.

Even with all the possible tools and resources at one's disposal, attempting to self-fix or modify products with electronic components could lead to disastrous results, such as product failure, or even worse, serious injury to the consumer. In addition, these alterations can put the privacy and security of the user at risk requiring product manuals and their software to be 100 percent open source risk bad actors tampering with hacking and damaging the product, as well as stealing consumers' private data. We cannot open our producers to this type of liability.

Looking at the bigger picture, I harbor serious concerns over the potential theft of American manufacturers' intellectual property if forced to divulge such information under Right to Repair laws. We could be inviting foreign and potentially hostile entities to steal American innovation right out from under us. American manufacturers could be stuck with a bill for the upfront research, development, and production costs. Then they would have to turn around and compete against foreign companies making similar products based off of stolen American intellectual property. This is famously true with China each year as they steal our intellectual property.

This would handicap American manufacturers on the world stage sending negative ripple effects throughout our economy while at the same time providing a windfall to our global competitors.

The last thing I will mention here is that we should be mindful of the downstream impacts of the right to repair and consumers and small businesses, not just manufacturers. The right to repair might create new markets where small and independent repair shops could flourish. We have seen this successfully happen within the auto industry.

However, the right to repair may also harm small businesses, like small dealerships and authorized repair shops. Also, small businesses and sometimes corporations that provide products, replacement parts, and professional repair services to the customers.

In short, the right to repair makes perfect logical sense when designed in a thoughtful manner that considers the realities of the industry. A cautious, measured, and well-informed approach is required when considering these next steps.

It is my hope today that we can engage our esteemed witnesses in such a great discussion. Thanks again to our witnesses for their contributions.

I just want to, for the record, introduce two letters that we received if I may, Chairman. The Alliance for Automotive Innovation. This record, if this letter could be introduced.

Also a letter addressed to both the Chairman and Ranking Member form the National Association of Manufacturers.

So I just want to say thank you to the witnesses. I really look forward to a great discussion with the Chairman and with our Members. Thanks again, and I yield back.

Chairman GOLDEN. Thank you, Ms. Tenney. All good points. I look forward to talking more about the issue.

I will quickly take a moment to explain how the hearing will proceed.

Each witnesses is going to have 5 minutes to provide an opening statement and each Committee Member will have 5 minutes for questions following that.

Please ensure that your microphone is on when you begin speaking and that you return to mute when finished.

With that, I will introduce our witnesses.

Our first witness is Ms. Gay Gordon-Byrne, the founding Member of the Digital Right to Repair Coalition. And she serves as its executive director. Ms. Gordon-Byrne has had a full career starting in the 1970s in the technology sector, trained first as a systems software engineer and then expanding into sales and marketing for many corporations. Her broad experience gave her specific into manufacturers' design and maintenance, resulting in her 2014 book, Buying, Supporting, and Maintaining Software and Equipment: An IT Manager's Guide to Controlling the Product's Lifecycle. She is a frequent guest and panelist at conferences such as the National Association of States Attorneys General. A month ago, her TED Talk in the summer of 2021 or her research and testimony the FTC Workshop, nixing the fix, which resulted in the 2021 report to Congress by the same name. Thank you for joining us today, and we look forward to hearing your testimony.

Second, we will hear from Mr. Brian Clark, the co-owner and CTO of iGuys Tech Shop in North Conway, New Hampshire. Mr. Clark started his business out of necessity in 2012 being the only independent phone repair shop in town. He manages day-to-day operations and takes a lead on repairs and support work. He has testified on behalf of state right to repair bills twice in New Hampshire and approaches this issue from the perspective of a small business owner in a rural area. Thank you, Mr. Clark.

Third is Mr. Jim Gerritsen, who along with his wife Megan and son Caleb, have run the Wood Prairie Family Farm in Northern Maine. That is in my congressional district. They have been running that for over 45 years now. The Gerritsens specialize in growing organic, early generation, Maine certified seed potatoes, seed crops, and grain. In addition to farming, Jim has been active in the organic community for over 4 decades. He helped found the Organic Seed Growers and Trade Association. He has served on its board of directors since its inception and has been its long-time president. On Earth Day in 2014, Jim spoke to the United Nations

General Assembly about the advantages of organic farming. Thank you, Mr. Gerritsen for being here today. I look forward to your testimony.

And I will yield to the Ranking Member to introduce our final witness.

Ms. TENNEY. Thank you. It is my pleasure to introduce Mr. Ken Taylor, Chairman of the Associated Equipment Distributors for AED, whom he is representing today. AED is an international trade association representing companies involved in the distribution, rental, and support of equipment used in construction, mining, forestry, power generation, agriculture, and industrial applications. Its membership consists of independent distributors, including small businesses that sell, rental, and provide after-market equipment support, manufacturers, and suppliers of business services. In addition to his leadership at AED, Mr. Taylor is the president and Chairman of the board of Ohio Machinery Company, an authorized dealer for construction, vehicle, and agricultural equipment. He is a third generation owner having assumed the role of president after his father and he is joined in the company by his daughter Jillian. Mr. Taylor is an active contributor to the industry and his community having served and currently serving in leadership roles in various organizations such as the Foundation for Appalachian Ohio; Ohio Equipment Distributors Association; Cooperation Association of Tractor Dealers, Inc.; Ohio Contractors Association; the Fisher Institute for Professional Selling at the University of Akron; and I Build America-Ohio. Mr. Taylor, I just want to say thank you for your valuable contributions to the community, for joining us today, and for your extensive involvement in organizations throughout the State of Ohio where I went to law school. I look forward to hearing your testimony and I yield back, Mr. Chairman.

Chairman GOLDEN. All right. Thank you all for joining us today.

We will begin with Ms. Gordon-Byrne. You are recognized for 5 minutes.

STATEMENTS OF GAY GORDON-BYRNE, EXECUTIVE DIRECTOR, DIGITAL RIGHT TO REPAIR COALITION; BRIAN CLARK, CO-OWNER, THE IGUYS' TECH SHOP, LLC; KEN TAYLOR, PRESIDENT, OHIO MACHINERY CO.; JIM GERRITSEN, MARKETING MANAGER, WOOD PRAIRIE FAMILY FARM

STATEMENT OF GAY GORDON-BYRNE

Ms. GORDON-BYRNE. Thank you very much, Mr. Chairman and ranker.

As you have already explained, right to repair is very near and dear to my heart, and it is particularly near and dear to me because I do live in an underserved rural area of Upstate New York. And having been a technology person for most of my career, I hope that I can speak well to this. If we cannot fix our stuff, and I mean it in a very general sense because anything that has a chip in it right now I call "stuff" so I do not have to mention any manufacturers. But if we cannot fix our stuff, we are in the position of we have got to throw it away, buy new, or do without.

Throwing away is why we have an e-waste problem. Most of our states and municipalities are not beginning to collect the full extent of what is now e-waste. And that winds up being a taxpayer expense.

If we are buying new, that is also a very limiting factor for people, particularly people that are already on public assistance of some kind which last I saw is about 50 percent of the population. So it is a big problem for people that are not wealthy.

And then going without is why we have a digital divide. So I think it is a very serious problem. It is not a trivial problem. It affects everything that we buy. And when I was preparing for testimony at the Federal Trade Commission, I looked at manufacturer policies and pretty much concluded, as did U.S. PIRG that about 90 percent of the products on the market today are already repair monopolized, meaning that the only option for repair, if there is one, is through the manufacturer.

So this eliminates all competition. These are now starting to be recognized in the courts as actual monopolies and there is some discussion among the state attorneys general, et cetera, of how they might approach these monopolies and try to untangle them.

Obviously, rural people, such as myself and a number of the Members here, are already underserved just because everything is far away. We do not have much access to medical care. Education is distant. High speed internet is still a problem. And even getting groceries. I mean, I am 15 miles from a grocery store. I have to plan ahead. If something breaks in my house, I really do have to fix it because the nearest technician could be 45 or 100 miles away. So I live in a community where repair is kind of in our DNA and we need to be able to do it. And that is not just consumers. That is also all the businesses in town. They face the same problems and they need the same options to be able to fix their stuff.

Now, urban areas, which I know has been a question, how is it that urban areas are underserved? Well, they are really underserved if they do not have money, which is not the same as distance, although they may also have, let's say public transit might not go to the mall where there is a local store. So it is even harder for people in underserved urban communities to get access to what I would call price competitive repair. And most of those people simply do without. So in order to turn this ship around, we really do have to make repairs more widely accessible. It is not even so much money as it is availability. Farmers, in particular, always tell us that they do not mind paying. They just have to have their stuff fixed.

So the key to keeping all this working is to have the option of competition for repair, which we have discovered works pretty well using the legislative template that the auto industry began with. They passed their first bill in Massachusetts in 2012. It rapidly led to an agreement that is now a national agreement. It is not perfect but it is working. And we copied it. I literally sat down and wrote the first bill by taking out the word "automobile" and stuffing in the word "digital electronic product." And the philosophy is the same. A state can say, Mr. Manufacturer, if you are going to do business in my state, you must provide fair and reasonable access to the same parts, tools, diagnostics, and service information that

you are currently only providing on an exclusive basis to your dealership.

Now, this means that the manufacturer—and I have been a manufacturer so I feel I can speak with some confidence—manufacturers never put secrets in their repair documentation because they would never be secret. They do not put crypto keys in their repair documentation because that would also get around the internet almost instantly. So what the dealerships and the authorized providers get is actually a very limited set of tools. The diagnostic tools may be "proprietary" but they are not mystical. They are reporting on whether or not a connection from part A to part B is functional. These things can be done without using the manufacturer. This is incredibly tedious. So as a practical business opportunity, people that cannot buy the manufacturer diagnostics cannot really be in business, which is a huge problem for people like Brian.

So the unlocking is basically the Massachusetts law turned into electronics and it has worked well. We have got 10 years of experience with that law. The sky did not fall. People are not driving around on terrible brake systems because the local mechanic fixed them instead of the dealership. They are not losing access to their bank accounts because of some crypto mythology. So I think we are pretty confident that that model works.

Now, we have actually got that bill going in 43 different states. And New York passed the first bill this year for consumer electronic—it is not strictly consumer electronics but——

Chairman GOLDEN. If we could just get close to——

Ms. GORDON-BYRNE.—general electronics.

Colorado passed a really quite different bill enabling repair of powered wheelchairs.

So we are on a roll. We know that Congress has some work to do. It would be very, very helpful if we could get some of the copyright restrictions that do apply to repair, if we could get those lifted. But other than that, I think we have got a good template and I think we can satisfy Ms. Tenney's concerns as well. Thank you.

Chairman GOLDEN. Thank you very much.

We will now recognize Mr. Clark.

STATEMENT OF BRIAN CLARK

Mr. CLARK. Good morning, Mr. Golden, Mr. Tenney. Thanks for hearing my testimony today.

As mentioned, my name is Brian Clark. I am the co-owner of a small, independent repair, consumer electronics repair shop located in the town of Conway, New Hampshire. We specialize in repair of all smartphones and tablets, as well as Apple branded computers. We also provide data recovery and micro soldering services. We founded the business in 2012. We recognized the Conway area desperately needed local options for repair of devices that were becoming increasingly important to everyday life.

Conway lies in a very rural part of the state in the heart of the White Mountains, a very popular tourist destination. The permanent population of the area that we serve is somewhere around 100,000 people based on 2020 census data. This is covering a very

large area at over 1,000 square miles. We serve around 1,200 to 1,500 paying customers every year on average.

As an independent shop, we have no affiliation with any manufacturer. Even as the industry has evolved over the last decade, we still find that it is best for our business and more importantly for our customers to remain independent. Any paths to becoming an authorized repair facility are far from ideal and are generally incredibly invasive to our business and restrictive in what we can do for our customers.

Of course, there are drawbacks to our choice, as most manufacturers continue to offer independent shops little to no official access to genuine parts, repair manuals, tools, or schematics. Manufacturers want control over how and whether your device gets repaired by forcing customers to authorized repair. For Apple devices, the nearest authorized repair facility, in this case an Apple Authorized Service Provider or AASP, is about 45 minutes from my shop. The nearest Apple Store is about 1 hour, 15 minutes away. For Samsung and Google devices, the closest facility is about 1 hour, 30 minutes away. If you have a device from another manufacturer such as Motorola or LG, mail-in repair is your only option.

Because New Hampshire becomes increasingly rural as you go north, all of these authorized repair options are located in the more densely populated southern parts of the state. This means that most of our customers would need to drive an additional 45 to 90 minutes, after already frequently driving over an hour or more just to reach us. This situation is far from unique to northern New Hampshire. I do want to be clear on that. There are countless locations around the country where similar, or worse, situations can be encountered.

Over the decade that we have been in business, we have seen countless scenarios repeat and replay themselves over and over again for our customers.

In my written testimony, I play out four examples of real world scenarios that are incredibly common for a rural repair shop like mine. With the limited time I have here today, I would like to highlight the common threads that come into play in these scenarios that we see so frequently.

First of all, the devices that we service have become tools. Tools that are integral to people's day-to-day lives at home, at work, and in businesses. Access to timely repair for folks that find themselves without these tools is crucial, and in rural areas that would be nearly impossible without independent repair. Time and time again we are able to get folks back up and running with far less interruption to their lives than if they were forced to use solely authorized repair options.

Misleading information. When contacting authorized repair, consumers are not always given completely truthful information. More specifically, they are told that certain things cannot be repaired when they really mean that the manufacturer does not offer an authorized repair option for the customer's problem. This practice is very unfriendly to the consumer and as part of an effort to replace replacement of devices, something that is not always easy to do in rural areas.

Keeping technology in use is important. Not everyone cares to have the latest and greatest tech. Not everyone can afford the latest and greatest tech as Ms. Gordon-Byrne alluded to. We found this especially true in rural areas like ours. Independent repair gives folks in these situations the option to keep their device going even if the manufacturer no longer wishes to provide official repair.

The last thing is data. The information we keep on these devices is often priceless. A business owner frequently has contacts and communication on their device that would be irreplaceable if lost. Almost all of us keep photographs and other personal data on our devices that would be devasting to lose. Authorized repair generally provides no options for a situation where data recovery is needed. Their point of view is that if you did not back it up, it is your fault.

In summary, the presence of reliable independent consumer electronics repair in rural areas is crucial for the quality of life of residents, as well as the economy of these areas. Despite this clear importance, manufacturers continue to ignore the need and frankly make it unnecessary challenging for businesses like mine to operate. Independent repair is ready, willing, and able to fill the void the major manufacturers have left particularly in these rural markets. All we ask is that manufacturers give us reasonable paid access to parts, tools, and documentation to continue to offer these services for years to come. Thank you for your time.

Chairman GOLDEN. Thank you.

And I believe that our third witness up in Maine has technical difficulties so we are going to go ahead and recognize you, sir.

STATEMENT OF KEN TAYLOR

Mr. TAYLOR. Chairman Golden, Ranking Member Tenney, and other distinguished Members of this Subcommittee, it is an honor to appear before you today both as Associated Equipment Distributors' (AED) 2022 Chairman and as president of Ohio Machinery Co. AED is the international trade association representing independent companies that sell, rent and service equipment used in many applications, including construction, agriculture, forestry, energy, mining, material handling and industrial production.

Ohio Machinery Co. was founded in 1945, and I am the third generation from my family to run the business, following both my father and my grandfather.

Right to repair is a simple slogan; however, the policy proposals surrounding the issue are complex with significant consequences. At the outset, I want to make it clear; AED Members support customers' right to repair their machinery, and distributors make available diagnostic tools, repair information, parts, and remote customer support.

Idle, non-functioning equipment equals lost time and money. Whether it is on a farm during harvest or on a road building project, there is absolutely zero incentive to not do everything we can as equipment dealers and manufacturers to keep a machine running. That can mean repairs completed by a dealership service technician, the customer, or a third-party provider.

The equipment industry is highly competitive, and if Ohio Machinery Co. is not providing proper and timely service, nothing is

stopping the customer from moving to one of my many competitors and their products.

However, we do not support unfettered access to critical on-board software and information pertaining to environmental and safety protections or key operational functions which is what proposals in various states and Congress would do.

The tractors we are selling today are not the same as those sold by my grandfather or even my father. While customers can complete most repairs to their machinery, government, environmental, and safety regulations, as well as technological developments that have made equipment more efficient and productive necessitate restrictions and access to source code and software that ensure key operational functions are not modified or disabled.

Right to repair legislation currently being considered in Congress will completely alter the equipment industry's distribution model. Manufacturers of equipment rely on a network of independent, mostly family-owned, small-to-medium-sized companies to sell, rent and service the equipment. These dealers make significant investments in their employees, including training service technicians to repair and maintain the latest high-technology machinery. Many AED Member facilities are located in rural and underserved areas, creating well-paying careers and economic opportunity.

Equipment dealers also invest extensive capital in parts inventories to ensure repairs and maintenance can occur as soon as possible. Out-of-service equipment is not merely an inconvenience; it can ruin a farmer's harvest or delay completion of a bridge or roadway.

However, right to repair proposals require original equipment manufacturers to sell parts and diagnostic tools directly to the public at cost, without profit, completely circumventing the equipment dealer. Aside from effectively dismantling the equipment distribution industry's aftermarket parts business and thereby putting many equipment dealers out of business, logistically, it is impractical and would only exacerbate inflationary pressures in the equipment market and create long delays in parts availability.

For many equipment dealers, parts revenue produces the majority of income for the business, though parts margins are far from inordinate. If parts are required to be provided at cost, many dealers would be put out of business. Anyone can walk into an AED Member facility, or go online, and buy OEM parts for their equipment. There is no restriction on who can purchase parts, whether it is an equipment owner, a third-party service provider, an equipment operator, or a Member of the general public. However, there will be no incentive for an equipment dealer to carry parts inventory if the manufacturer or the dealer is forced to sell without the ability to make a profit.

For the equipment industry, right to repair proposals are a solution in search of a problem. AED Members provide customers and third-party repair providers with parts, tools, and other resources to complete the overwhelming majority of equipment repairs. Enacting these proposals will stifle entrepreneurship and the result will be an unprecedented intrusion by government into the free enterprise system.

I reflect on my grandfather and the reasons he got into the equipment distribution industry. He was looking for a better life for his family, the opportunity to create well-paying jobs and careers for his employees, and the privilege of giving back to the community, including in underserved areas like Appalachia. Most equipment dealers have similar stories because the United States allows entrepreneurs to pursue their dreams. Unfortunately, I worry that should these right to repair policies become law, the viability of the equipment distribution industry will be severely hampered, resulting in lost economic activity, job creation, technological advancements, and a less competitive America.

Chairman Golden, Ranking Member Tenney, and Members of the Subcommittee, thank you for the honor of appearing before you today. I look forward to answering any questions you may have. Thank you.

Chairman GOLDEN. Thank you, sir.

Subject to the call of the Chair, we are going to take a brief recess to try and sort out some technological difficulties.

[Recess]

Chairman GOLDEN. We will bring this hearing back into order. And we will now recognize Mr. Gerritsen for 5 minutes for your opening statement. Thank you.

STATEMENT OF JIM GERRITSEN

Mr. GERRITSEN. Okay. Thank you for your patience. Sorry, but we had trouble with our rural internet.

Good morning, Congressman Golden and Congresswoman Tenney, and Members of the Subcommittee.

I am Jim Gerritsen from the State of Maine. I am a family farmer. I work closely with our son, who is the chief mechanic on the farm. We both strongly support the concept of preserving the right of farmers and independent shops to repair the equipment that farmers own. We urge Congress to codify traditional farmer and independent shop repair rights by passing legislation that serves the public good by leveling the economic playing field, restraining monopoly control, and thereby uplifting the economy and enhancing the freedom and liberty of working Americans.

For almost 50 years, along with my family, I have been growing organic crops on our farm. We are located in Aroostook County, the northernmost county in the State of Maine, referred to as the "Potato Empire." To this day, Aroostook County grows more acres of potatoes than any other county in the United States except one.

On our farm we raise organic Maine certified seed potatoes and other types of organic seed. Our crops have all been certified organic for 40 years, including the last 20 years under regulation by USDA National Organic Program.

For over 40 years we have retailed our crops directly to our retail customers and beginning 33 years ago we opened an organic seed business with a mail order catalog, later adding a web store.

My wife and I have now handed our farm down to our son, Caleb Gerritsen. He is a skilled mechanic. After high school, he increased his knowledge and ability by earning a degree in diesel hydraulic mechanics at the local community college. Caleb does an excellent job maintaining our tractors and equipment. In Aroostook County,

it is extremely common for farmers to do most of their own equipment repair work.

By design, in order to increase our own financial farm viability, we long ago consciously made the strategic decision to only own equipment that we ourselves are able to repair. Therefore, we have avoided purchasing modern, electronically sophisticated farm tractors and equipment which contain computer chips. For example, on our family farm we rely upon older equipment going back to the 1970s, equipment that we have repaired and rebuilt ourselves.

We would never choose to place ourselves into a vulnerable position of being at the mercy of malfunctioning electronic sensors, then being involuntarily forced into "limp mode," and becoming locked out of our own equipment, having to wait until a mechanic from the dealership came out on their time schedule to get us going again.

When a problem as common and as minor as water condensation in a diesel tank can cause a sudden "limp mode" activation, say during peak planting or peak harvest, not only does that place an individual farmer and our livelihood at risk, but it really places the nation's food security at risk.

Within the entire economy, there is growing concentration, growing monopoly control, and I think that this hurts all Americans. And within agriculture, I think the situation is extreme. Right here in Aroostook County, the local John Deere dealership last year, which had been owned for 63 years by a local family, they sold out to a company that has 63 John Deere dealerships. And that type of concentration I do not think is correct in a free market economy. And I think that when you have concentrated monopoly power that it works against the interests of citizens. And I think only under that kind of condition would you have the boldness for a tractor company to engage in putting this kind of proprietary limitation on farmers who with good intention bought the equipment and then are prevented from working on it themselves or having a local mechanic that they know and trust work on it.

In closing, let me encourage your Subcommittee to work together and create legislative remedies that will provide America's ailing family farms with greater resiliency, increase fair market competition, and provide Americans with a more stable food supply. Congress should enjoin the U.S. Department of Justice to vigorously enforce existing laws which restrain monopolies, including the Sherman Antitrust Act of 1890. We are living in a new era. Therefore, appropriate modernized legislation will be necessary to adjust to the times and force farm equipment manufacturers and software companies to play fair, prevent abuse and manipulation of markets, and be effectively restrained from the negative consequences of monopolistic behaviors. Thank you for this opportunity.

Chairman GOLDEN. Thank you. And thanks for overcoming the technological challenges there.

We will go ahead and move to Q and A at this point beginning by recognizing myself for 5 minutes. I will start with you, Ms. Gordon-Byrne.

You talked about a Massachusetts law, a Right to Repair law, which has been in existence it sounds like for about 10 years. Can

you tell us a little bit about how the law has worked to benefit independent repair shops that have been most hurt by restrictions?

Ms. GORDON-BYRNE. Certainly. The law required auto manufacturers doing business in the State of Massachusetts to provide access to the same diagnostic tools, software, software updates, and regular tools as were being made available only to the dealerships. And they did not have a parts requirement because the auto parts industry is pretty open. The only thing we really changed in the template bill was to add a parts requirement. But it worked very well. It has enabled independent mechanics to stay in business. And they very much expected to go out of business. We had some information from Snap-On Tools, pretty famous, that they were really, really financially stressed until the law was passed and then they were able to grow again, the only reason that I know that my local mechanic can even work on my car.

Chairman GOLDEN. Thank you. I appreciate that.

On the issue of software updates and diagnostic tools, with my Armed Services Committee hat on, it reminds me a little bit of some of the problem we have with the readiness of our naval fleet ships coming into port and sitting there for much longer than necessary is they wait for software updates because of the contracts and various other reasons the Navy is not even in possession of. It has become quite a problem.

Mr. Clark, there are, as you pointed out with Apple, several different levels of affiliation that can increase access to parts for independent repair shops. Can you explain these affiliations and why is it that you have remained independent? What is the benefit to you or to your customers?

Mr. CLARK. So I mentioned the Apple authorized service provider status in my testimony and that is the highest level that an independent shop like mine could gain. But the higher level you get, the more access you get to parts and information, but the more restrictive it is and the more Apple controls what you do. It is very, very difficult to become an AASP. It is very invasive to your business.

Now, I should also mention that it is also difficult to gain a true understanding of what you have to do because Apple makes everybody sign so many NDAs it is hard to get truthful information as to the process. But it has leaked out to a certain extent.

There is also Apple's relatively new IRP program, Independent Repair Provider program. Again, less access to parts and tools and software but a little less invasive, but still frightfully invasive to a person's business. You are open to audits at any time, both financial, and, also, they can just walk into your store and check on what you have in stock at any time that they want. And again, all of that, the knowledge we have on that is limited by those NDAs. People just cannot talk about it.

Apple did just introduce their self-service repair option but for that you have to put in the serial number of a device to even be able to order parts. So as an independent shop, I cannot even use that program to order parts to keep in stock. I have to put a customer's device in. I can order the part and then wait 5 to 7 days to receive it. It really just does not work for us. And our customers. Thank you.

Chairman GOLDEN. Thank you.

Mr. Taylor, some of the concerns you raised were concerns about environmental regulations as well as kind of safety. People given the option to bypass some of these things would go ahead and do so. Is it a concern about personal liability for your business or is it just a strong kind of like feeling that the environmental regulations are important? I mean, my take is that generally farmers, just as an example, will find a way around these things given the opportunity. Is it not really up to them once they own the equipment? What is the concern for you as a business owner as it relates to safety or environmental regulations?

Mr. TAYLOR. Some personal experience. Both trade-in situations. So had a farm tractor. Traded it in and it was "chipped." And the chipping allows it to put more horsepower to the ground and really a farmer needs to get work done in a short amount of time. So when we took that machine in on trade, as a dealer, we cannot let it leave our facility chipped. We have to put extra cost into the unit for it to be a valid product to sell.

Same with a truck. We had a CAT truck at the time where all of the gear was taken off of the engine. And again, if it enters our premises, then we are going to have to add all that equipment. And I think that with that truck the gear was probably $10,000 or $12,000 of material that someone had to pay for for that truck to be a viable trade in and then to be sold again. So, I think it is the regulations. It is the laws that are applicable here both with environmental and safety but it is also the practical cost issues associated with people messing with the technology makes our life difficult as a dealer.

Chairman GOLDEN. That is an interesting point. Thank you.

That is the 5 minutes that I have so we will now recognize the Ranking Member.

Ms. TENNEY. Thank you. The witnesses, that was great testimony. I am just going to bring a couple of angles.

Whenever government gets in the middle of it, it tends to overplay. I know all the witnesses talked about competition, and I heard an all or nothing approach.

I am from New York State, and even as a lawyer, most of the bills that I looked at of any significance coming through our Codes Committee, which was our Committee of jurisdiction, there was an angle for the trial lawyers to find liability on someone, particularly small business owners without taking that into regard. So that is my concern, the liability issue.

I am concerned about intellectual property. Ma'am, you mentioned competition. You also mentioned competition. We mentioned competition. It seems to me that there could be a reasonable middle ground here on some of these issues because I will give you a perfect example. When I was young in our printing business, I learned how to operate a press in the 1970s, beginning of the 1980s, and it was hard work. I mean, there were no computers and no chips. You had to know how to gauge the water, the ink, and how to deal with the press. Now we actually operate a press that are very expensive and you can operate them in a suit and never get any ink on you and be very clean. And the technology is very different. And, also, as the lawyer, former lawyer for our company,

I have gone in and seen these very expensive presses with duct tape on them. And that is because a lot of our employees are former farmers, especially dairy farmers. They are like MacGyver. They can fix anything and they can make anything run, even if it has a chip in it. So, but I do think there is a middle ground.

But I wanted to ask you, and just to respond maybe to some of the comments made by, you know, I love the vintage farmer and the idea of that. We still have people in our communities, very rural upstate New York, who use vintage equipment. We also have a lot of Amish farmers who are still using horses.

So could you just explain to me a little bit on maybe replying to that and how we could find a way to make sure we protect our supply chains the way they are now to make sure the small business owners and dealers are protected, but also, how do we kind of bring this all together? A little elaborate on what you just said to Mr. Golden possibly.

Mr. TAYLOR. I have to say at the outset I think that our industry has many differences with consumer electronics in other industries. We have, for instance, as a CAT dealer, we have a tool called Electronic Technician. And you can buy the customer version of Electronic Technician. And that facilitates more repairs than if you did not have the tool. Right on CAT's website today there are instructions for the "do it myself" owner of equipment or engines. We will engage with that customer and find a solution, whether that is in-person, on the phone, over a chat, whatever it might be. We will engage with that equipment owner to come up with a solution.

There is going to be inevitably, perhaps, some cost that is extraordinary because of the remoteness, perhaps, of that company, but I think we are always looking at the end result, which is uptime. And so our whole business functions on uptime. So we are going to figure that out. It just may not be as efficient a solution as would be in an urban area perhaps.

Ms. TENNEY. So quick question, potentially a solution to you, and I am going to ask this of Mr. Clark. Is there a way that we can negotiate and keep competition in play that manufacturers can actually work with and make it easier to create authorized repair facilities and get more people involved in that process so that people in rural areas can have greater access to people that are highly trained? I am going to ask you that quickly because I want to ask Mr. Clark about that because he includes in his testimony that it is incredibly invasive and tough to be an authorized repair facility. And I just want to get your quick answer and see what his response is.

Mr. TAYLOR. Well, my quick answer would be that setting up a dealership in an area is probably at minimum a $500 million investment in our type of business. So you are going to see us look for economies of scale and cover any——

Ms. TENNEY. But quickly, can you not contract with someone like Mr. Clark and train him so that he could be someone in that rural area? Is that something that could be done?

Mr. TAYLOR. Well, really, there would need to be an approval from a manufacturer. So we are the distributor in the middle and the manufacturer would have to allow that.

Ms. TENNEY. Okay. So, but I am saying there could be a contract.

So Mr. Clark, is that something that you would consider a potential solution? I am running out of time.

Mr. CLARK. If it were that easy, sure. I will answer your question with a little bit of a question. Why does Apple need to see my financials to order parts from them? Why do they need to visit my shop to see what accessories I am selling to buy parts from them? That is what is problematic for a business like mine. It just does not make any sense why they need to have so much control over my business just to get parts. Just to get tools.

Ms. TENNEY. I think they are basic financial statements; would they not be? I am just guessing.

Mr. CLARK. Again, it is hard to know because it is all hidden behind nondisclosure agreements.

Ms. TENNEY. My time has expired but I would love if we can revisit. Thank you so much. Thank you. I appreciate that.

Mr. TAYLOR. Could I just simply add as a dealer, we have very high standards of what they want to see the customer experience. And so those standards will not be sacrificed. And therefore, when we move outside the authorized dealer network, there is no ability to control standards and the companies meeting those standards. So it is just not even a discussion point.

Chairman GOLDEN. Thank you.

Next, we will recognize Representative Carter.

Mr. CARTER. Thank you, Mr. Chairman. And thank all of you.

Listen, we hear much from manufacturers who suggest that their restrictions are imposed because of intellectual property rights. Can you share your view on how much that bleeds over into and how it impacts you?

Chairman GOLDEN. Who are you addressing?

Mr. CARTER. Anyone. Anyone who would like to answer it.

Ms. GORDON-BYRNE. I will give a swing at that.

Intellectual property is not involved in repair. Many people assume that it is but it is not. Our copyright law, the DMCA of 1998, has specific provisions in it to allow people to back up and restore all of their licensed software at no copyright peril.

Patents are already public. So if Chinese people are ripping off patents, nothing about right to repair is going to add to that capability. That has already been done. That horse is out of the barn, so to speak. And there is really no actual period. The copyright law and I believe it was Senators Leahy and Grassley requested a study of the copyright office back in 2016 and 2017 about the specific rights under copyright law and under the 1201 exemption process. And they found that there is nothing wrong with copyright law.

Mr. CARTER. Excuse me. We continue to hear that manufacturers are still leaning on this as a barrier. Are you saying that that is not correct? Are they just doing it erroneously?

Ms. GORDON-BYRNE. They are pretty disingenuous.

Mr. TAYLOR. I would say today in the equipment business, the innovation that is occurring is extraordinary. Hard parts at one time were a part of a product's competitive advantage, and today as much as hard parts as the software and the code that provides

more power, more efficiency, longevity, all the features that one wants in a piece of equipment, a tool on a job, software supports much of that today which is just an entirely different picture. It is new ground for all of us to cope with, I think.

Mr. CARTER. So, I am sorry to interrupt. Real quickly before my time elapses.

So, (a) how can we help with that? Because if, in fact, there is a remedy in place yet, manufacturers are still using this, then obviously tell us how we can from this Committee standpoint help address that so it is no longer a barrier. And then lastly, you guys can answer this, whoever wants to, but lastly, I represent several rural areas in Louisiana. And obviously, people have issues with repair. In the city, there is access to more repair shops. How do you handle, how do you deal with those rural areas who do not have a plethora resources as relates to close proximity to have their trucks repaired or their vehicles repaired?

Ms. GORDON-BYRNE. I do not know if you are asking Ken or myself, but the solution for repair in general is having more. The more businesses that can form that can provide repair services locally, the more options there will be for our communities. So, it would be very helpful, I think, for your constituents to be able to use a local shop as opposed to having to drive to let's say New Orleans. So what you could do would be to help support some of the bills that are already in Congress. That will make things easier.

Mr. TAYLOR. I think one of the challenges is the amount of training that is required for an individual that might be local in a community far away from a dealer. The training and knowledge that is required to effectively make a repair are extensive. And so I guess, perhaps, if the repair shop were willing to pay a fee for the training to help them perhaps do more, maybe not everything they want to do but more, that could be arranged. But is that a cost that that business is willing to bear?

Mr. CARTER. And going back to the add-on about what can we do to assist in the area of the so-called intellectual property barrier, is there something that we can do from this Committee's standpoint to assist with ferreting out that falsehood and forcing them to do the right thing if they are, in fact, doing the wrong thing?

Ms. GORDON-BYRNE. Well, let me jump back in on that one. There is a bill that was filed by Rep. Mondaire Jones and I think Victoria Spartz in their Committee that was addressing a specific problem of copyright law that does need to be fixed by Congress. There is a longstanding prohibition on making tools to make it easier to copy VCR tapes. That is how old it is. And it needs to be updated because it is standing in the way of people building tools that would be necessary to fix modern equipment. I do not mean physical tools. I mean software tools. So that would be something that would be very helpful.

Mr. CARTER. If you would be so kind as to send some information to us I would greatly appreciate it.

Mr. Chairman, I yield back.

Chairman GOLDEN. Thank you.

Next up we will recognize Representative Williams.

Mr. WILLIAMS. Thank you, Chairman. And thank all of you for being here today, and Representative Tenney for helping us lead.

We are here today to discuss the notice of the Right to Repair. As a small business owner, and in full disclosure, 89 years in the car business, 51 years I have been in the business. Chrysler, Dodge, Jeep, Ram, Chevrolet, you name it, for 51 years, and I am also a rancher, calf-cow operation, Angus, Black Angus back in Texas. So I understand this complex topic firsthand. Maybe as much or more than anybody in this room. And it is not as cut and dry as it may seem.

So I made a few notes here, and there is no organization to them but it was commented earlier. Leveling the playing field. Well, what the heck does that mean? Leveling the playing field. And I know one of our witnesses is in the potato business. I am sure they would not sell their potatoes at cost. In many cases we are asked to do things at cost, and nobody knows what cost is anyway. That is a phony word. And I cannot buy equipment. If I cannot buy the equipment. If I cannot buy the equipment, I am out of business. Well, you do not have to pay cash for the equipment. You can finance the equipment. You can also wrote 100 percent off of it this year and take a tax deduction.

And someone said, too, that a lot of people, regardless of their income class or whatever, are not getting repairs done, I fix everybody. We do not ask them what their class is. So everybody is getting fixed.

Independents, quite frankly, are the best customers I have got in my car business. I have got six parts trucks. I am just going to put another one in when I get back because we have got so much business taken to independent mechanics. Independent people. They are the best customers I have got. So they are getting good service. And the truth of the matter is, if you cannot fix it, send it to the franchise dealer. This happens all the time. Independent people send it to us and we fix it. And the customer has no problem with that.

Independents have access to parts. It is me. I have got millions of dollars' worth of parts and we will deliver them to you. We will do everything. You have got access to parts.

And we talk about how complicated it is. Well, just go to the dealer and get it fixed. Because I know what happens. You bring it to me. I fix it. And you mark it up 10 percent. No problem. Everybody makes a little.

And all of us should remember this. The reason these repairs are so hard is because the government has demanded this. Not consumers, not me, not you. The government has demanded it. So, let's just understand that there is a pecking order here that works and the government does not need to be involved in it.

And many proposals that we talk about tend to simply the issue without addressing the serious consequences this type of government intrusion will impose in the free market. And we have talked about it. Government, when they get involved, write it off. It really gets messed up and the consumer is the one that gets hurt.

Manufacturers make significant investments in research and development of their products and services, and by forcing them to

share their models for third parties to excess it removes all incentives to innovate. And remember, you have access. Okay?

And on top of that there needs to be significant discussions on consumer privacy. We talked about that and data security. And some of the data, it could be assessed if anyone had an open handbook, it is sensitive and proprietary.

We must ensure that we are not opening the door for hackers. We all have a hacker story. And we could be just making their life easy to take advantage of unknowing consumers. So it is critical we look at this issue from all angles and proceed with caution before we try to get the government more involved. And quit talking about cost and quit talking about selling for nothing. Because if you are selling at cost and selling for nothing there is no service to anybody. I cannot buy parts. I cannot deliver the parts. So we need to quit talking about that. The other side talks about it a lot but profit is a really good word. That is why we are all in business.

So Mr. Taylor, how will your business ability compete to be affected if right to repair legislation passes and what legislative proposal do you believe would do the most harm to the equipment distributors' industry and why that you represent and are?

Mr. TAYLOR. I would have to pick the parts topic. In my agricultural business, we are an AGCO and a CLAAS dealer. We are not John Deere. We are not Case IH. We are not the dominant player but we have a good size business. And 75 percent of our profit for that division comes from the parts business. We make an okay amount selling a tractor, used or new. Service, we lose money just because we are trying to get the customer service challenge done and so far we have not solved that yet. So we rely extensively on the parts profit just to stay open for that division. So I would say that is probably the most frightening aspect of some of these proposals is that parts will be sold at cost and then that would push the burden back on the manufacturer, and suddenly the manufacturer would have to figure out how to distribute the parts and whether that is through UPS or through some other channel. And that is added cost to their business. And so there would be an inflationary impact on that.

Mr. WILLIAMS. Mr. Chairman, I yield my time back. The process works. Let's keep it that way.

Chairman GOLDEN. We are going to recognize Representative Peters.

Mr. PETERS. Thank you, Mr. Chairman. Really interesting discussion.

On one hand you have got these repair shops just want to do a good job for their customers and feel like sometimes the suppliers or the manufacturers are too rigid. And on the other hand you have got manufacturers or businesses that are worried that the small shops will not maintain quality or privacy or intellectual property. So it is a hard balance.

I was going to ask Mr. Taylor about the intellectual property and security concerns, especially as technology continues to improve. Tell me about the risks of the IP violations some of your Members are worried about. What are the risks to them?

Mr. TAYLOR. The IP issue is more related to the manufacturers than it is to us a dealer. I think the primary concern we would

have is the, well, environmental and safety both. Really to comply with regulation, there are designs in both the engine technology, exhaust technology that are high hurdles to reach. And the manufacturer spends a heck of a lot of R and D on that technology. We are in the field and we are going to have to support the manufacturers' expectations of that equipment in the field. Will we get mixed up in an argument and a lawsuit over a product that has been altered? Everyone sues everyone when there is a problem. I think a dealer could be pulled in pretty easily to an IP problem.

The safety part of this, heavy equipment is pretty dangerous and today some of the technology that is software based is sensors that sense the proximity of a person or a vehicle. If any of that was tampered with, I think we would all be pointing fingers at who altered that machine so that they could avoid any of those restrictions. So I think the risk is when there is a violation, we are going to be pulled into any of these kinds of problems. And the manufacturer is going to be concerned that its IP is out on the market.

Mr. PETERS. So Ms. Gordon-Byrne, so my understanding is now that the FTC is taking action to enforce against a warning law against bad actors that illegally restrict consumers' choice of how to fix their products, they are trying to enforce the law that we already have in the books, can you tell me if that is a satisfactory situation and how that enforcement can help small businesses, or what do we need to do beyond that?

Ms. GORDON-BYRNE. If you could elaborate a little bit about which particular enforcement action you are talking about because I am not aware of all of them. I know a lot of them but not all.

Mr. PETERS. I do not have particular actions in mind. It is just that there is existing law in the books about illegally restricting consumers' choice and why do you think the FTC has adequate authority to enforce those laws today?

Ms. GORDON-BYRNE. I am probably not qualified to say what the FTC has the authority to do but what they have been doing is something they could have been doing the past 20 years and it would have been enormously helpful to not have the proliferation of monopolized repair that we have today. So I am aware that they are going after some particularly obvious cases. I think Harley-Davidson, famous example. They were telling their customers that they were not allowed to repair their stuff with an independent mechanic, which is actually contrary to federal law. So I am excited about that.

Mr. PETERS. Okay. I mean, I also think that that is part of what we have to weigh, too, in terms of creating new rules. I guess Mr. Williams kind of hinted at that as well.

Mr. Clark, repair shops like yours, can only have a few, often a few employees to help consumers keep their products operating. How do consumers/customers react when you tell them about the warning message they might receive to their phones if their phone is repaired with aftermarket parts? And have you lost business because of that?

Mr. CLARK. So far the response has been such that we have not lost any customers from that so far. There are some people who have a lot of questions about it. They may not fully understand it but frankly, they just deal with it because they have to. They do

not feel like they have a choice. They can have me fix their device in an hour or they can drive and take an entire day and hope that Apple will fix it. So, yeah, lack of choice does not help the fact. That drives some of the reason why they do not seem to be bothered by that.

Mr. PETERS. Okay. Well, I appreciate it.

Mr. CLARK. Sure.

Mr. PETERS. Mr. Chairman, my time has expired and I yield back. Thank you.

Chairman GOLDEN. Thank you.

We will now recognize Representative Stauber.

Mr. STAUBER. Well, thank you, Chair Golden, Ranking Member Tenney for holding this really important hearing.

And I am grateful to be a part of it. On one hand the consumers are looking for freedom to repair products they own in a timely and cost-efficient manner. Why should rural Minnesotans have to wait for engineers from Silicon Valley to come fix a product they would happily fix themselves if given the chance? Minnesotans have always been a "fix it ourselves" kind of people.

On the other hand, we want manufacturers to continue to research, innovate, and invest in the safety and efficacy of their products. The modernization of products we have seen over the last few decades has been outstanding, but it has also created a very complicated regulatory landscape. We must be thoughtful and considerate as we consider this issue to ensure we do not have any unintended consequences.

So Mr. Gerritsen, in your testimony you mentioned that you made the conscious decision to only own farm equipment you can repair yourself. Do you feel your farm has missed opportunities to produce more should you have had more advanced equipment that you had an ability to repair yourself?

Chairman GOLDEN. Sir, if you could unmute yourself.

Mr. GERRITSEN. Thank you for the question.

I would say that a farmer's purpose is like any business and that is to make the most profit for their efforts. Our interest is not in increasing production. It could well come at a higher cost and we would be making less. So our strategy has been to increase our independence and our farm by ability by keeping as many things within our control as we can.

So many years ago we saw, especially the sophisticated electronics and chips, that that was simply a direction we were not interested in going in. So we do not, you know, increase in production is not of a high importance to us. Maintaining viability, increasing profitability, that is what is important to us, and I think that is probably what is most important to most farmers.

Mr. STAUBER. And the second question, Mr. Gerritsen, do you know other farmers who became as you suggest as vulnerable to this more advanced equipment? And if so, what did they do to ensure?

Mr. GERRITSEN. Well, about 15 or 20 years ago I received a phone call from an editor at one of the large farm magazines and he was incredulous that he had somewhere picked up the idea that we did not go for modern equipment that had chips in it. And I assured him that our reasoning, you know, we felt that it was sound

and that, in fact, I could have given him at that time, I told this to him, I could give him the names and phone numbers of half a dozen farmers I know across the country that have the same philosophy as we do. So it has been interesting to me that within the last 4 to 5 years, the major media has picked up the fact that a lot of farmers are finding that they can buy older American-made tractors, say from the 1970s, buy the tractor, rebuild it, and for $50,000 or less have a tractor that is the equivalent of a $200,000 to $300,000 tractor, one that they can repair.

So I think it is an increasing trend. I believe that some of the equipment in terms of relation to the Farmgate value of crops, I think some of the equipment has just become unaffordable for family farmers. And being innovative, family farmers are finding a good solution and that is using equipment, American-made equipment.

Mr. STAUBER. Thank you very much for your answer.

The newly elected Member from Minnesota's 1st District, Brad Finstad is a farmer and he says that he gets up in the morning knowing something is going to break and he is going to fix it himself, so.

Mr. Taylor, have you ever interacted with equipment where the safety features had been overridden or manipulated for machine performance?

Mr. TAYLOR. I keep forgetting to hit the button.

One of the most common safety items is a backup alarm. And yes, I think during my career with some customers they operated a machine without a backup alarm. And that is just a fundamental safety factor there. So if I were to pick one that would be the one that is most obvious that either it was disabled or it failed and they continued to operate the machine even though the backup alarm was——

Mr. STAUBER. Thank you very much.

Mr. Chair, I am out of time. Thank you. I yield back.

Chairman GOLDEN. Thank you.

Next, we recognize Representative Flood.

Mr. FLOOD. Thank you, Mr. Chair.

From Nebraska, right to repair, a complex issue. I am from the state where I was in the legislature. One of the first states to really confront this with a state regulation. And I understand the frustration of people, particularly farmers, that want to fix their own equipment when it breaks down.

But before the federal government leaps into action pursuing a federal right to repair mandate, we should carefully examine, and I think something that we have not touched on enough, are some of the self-repair functions that are already accessible. The Executive Director of the Digital Right to Repair Coalition, Ms. Gordon-Byrne, shared that if we were to pursue right to repair as a national policy, we would have more local repair options. And I think we are forgetting the value of self-repair. Some manufacturers are increasingly offering customers remote support that can help them troubleshoot through some of the most difficult equipment problems.

So Mr. Taylor, can you comment on self-repair, those options available in the Caterpillar equipment that you sell?

Mr. TAYLOR. Yes, I can. And I will mention that a major trust in Caterpillar's strategy today is what is called services growth. And services growth is all about providing more services to the customer ultimately to drive more parts sales for Caterpillar, the manufacturer. And so the amount of focus we have today on determining new services and new strategies to ultimately sell more parts for Caterpillar, which is just a major goal of ours as a distributor, the focus has risen enormously in the last couple of years in the field. Like I say, right on CAT's site, and I have not myself visited the site to review some of these repair procedures, but it is Self-Service and it is a much more extensive list of possibilities than ever was available before. We rarely wanted to give tools to the customer in our past back in my grandfather's generation, maybe in my dad's, too. But today, to maximize parts sales for the equipment in the field, it means that we have to try every strategy to do that. And this self-service strategy is one of those strategies to put a genuine part in the hands of a customer versus a will-fit aftermarket-type part.

So it used to be maybe the features were durability and productivity and resale value. Today it is fuel consumer. It is hours between oil changes. And if we can help that "do it myself" customer buy the cab part to do the work themselves, we are one part ahead every time we do that.

Mr. FLOOD. Thank you, Mr. Taylor. I want to touch on intellectual property for a moment. If proprietary information is easily made available to third parties, do you anticipate that manufacturers will continue to invest in future research and development? And I am looking for just a brief answer here.

Mr. TAYLOR. I will confess to being very confused about this topic, that this information is available to the public first of all.

Mr. FLOOD. Right.

Mr. TAYLOR. And, no, if all of that was free off the shelf, you would see much less investment.

Mr. FLOOD. And see, that is what is so interesting to me because property rights in Nebraska are at the top of Ag owner landowners' lists. We are talking about real property rights. When you talk about intellectual rights, I would think there would be a similar desire to protect those and to maintain the IP rights value.

I think it is important to note that in January of this year, a Chinese national in Missouri plead guilty to conspiracy to commit economic espionage. The man attempted to steal the algorithm behind a farming software platform, proprietary technology was used to boost the farmer's productivity. The Department of Justice found he was part of a program focused on advancing the Chinese effort sin industry and technology and his plan was to bring the software he stole back to China.

I would strongly caution that we caution against any federal action that could inadvertently let our guard down against China. And I think that is a real pressing threat. And would say that the bigger priority for me, getting more broadband into rural American so that we can first and foremost explore self-repair. Because I think that is really the direction we should be going. So I yield back. Thank you.

Chairman GOLDEN. Thank you.

I am going to do another round of questions and anyone remaining is welcome to have more opportunities to ask questions as well.

I was telling the Ranking Member, just listening to people talk about the issue of intellectual property, theft, particularly as it relates to China, there is a good report out there available to the public as well as to Members of Congress written by the AI Commission which talks extensively about the current problem of intellectual property theft. And it is massive, the scale of it. I think it is astounding when you look at the numbers ranking in the billions of dollars of lost revenue per year. So something I think Congress should be looking at no matter what.

Even with no matter what we may or may not do as it relates to right to repair, this is a bit problem that is taking place right now.

Mr. Gerritsen, my family has a business where they are still operating some pretty old equipment, some of it is actually older than I am, honestly, so 1970s and early 1980s equipment as well. I think one of the first challenges you start to see is the availability of parts, and then even you reach a point where the parts are not even available and then you have got to have people who start learning how to machine their own parts if you want to continue to repair and operate it. I am guessing that your family has coped in similar ways.

Do you have concerns about the sustainability of the approach that you have chosen to take as it relates to older equipment and the ability to continue to repair it down the road? Or do you foresee a future out there for a farm family such as yourselves, where you would just have no choice but to make that move over to electronic equipment?

Mr. GERRITSEN. Yeah. Congressman Golden, as you know, farmers in Maine are survivors. We will survive. I think it is going to be harder because of the proliferation of computer chips. But to be truthful, what I am hoping is that because so many family farmers are shifting to older equipment that this is going to trigger a market response and that there will be manufacturers that find that they can make a good living by manufacturing some of the parts that, you know, may now be 50 years old, that there is a demand for it. So I do think that American farmers are very innovative and if the demand is shifting towards older equipment, I am hoping that that is going to help make that repair parts available. But, you know, by the time we have to get into chipped tractors, I will not be around so I am here today trying to convey that we have got a problem for family farmers ahead and part of the important solution is to give freedom of access to repairing. And if a farmer buys a piece of equipment, it should be understood that they are buying the totality of it. It is not that they are buying simply the metal and not the brains behind it. And this is a traditional right that we have always had. And I think that it is best to improve that level playing field by decentralizing it and allowing as much interaction across the economy as you can with as many players as you can.

Chairman GOLDEN. You mentioned that your son took it upon himself to go and get extra training so that he knew how to do these repairs in-house. And while I think I understand correctly

that it is your opinion that you, as the owner of the equipment, ought to have access to information that would help you understand even what needs to be repaired, et cetera, the right to have access to that information.

But I just want to clarify. You do not expect when it comes to like new parts, you expect that you would pay not at cost but rather that anyone selling you that part has the right to make some form of profit; is that accurate?

Mr. GERRITSEN. Of course. We are all business people and we all have to make a profit on what we are doing to maintain it. So, of course.

But, on the other hand, you know, 20 years ago I bought a distributor cap at Ag Co and back then it was $75. And it was probably, you know, had a couple of dollars' worth of parts I int. So, you know, reasonable profit is a good idea. And sometimes I think under monopoly conditions I think reasonableness is kind of thrown out the window.

Mr. TAYLOR. I might take issue with that statement that there is an unreasonable profit on a part like that. The population of that particular machine that is 50 years old is so low that for a manufacturer to design and begin again manufacturing such parts, probably the cost is not even represented by the cost of that part that you paid. It is such a small population to address with that part. If it is not economical, no one is going to do it.

Chairman GOLDEN. Thank you.

More questions from you?

Ms. TENNEY. Yes, thank you.

Chairman GOLDEN. Of course.

Ms. TENNEY. I will just ask a couple. I want to kind of finish up on where I was, and I believe I did not get a chance to follow up I think with Ms. Gordon-Byrne.

You made kind of an extraordinary statement. You said that regarding copyright law and processes that they are already available and accessible and that the exemption under the 1201 and that the manufacturers were pretty disingenuous. So you did not say they were completely disingenuous but there are some concerns there.

I just wanted to kind of clarify, and maybe you could clarify for me an explanation that intellectual property is a lot more than just copyrights. I just wrote this down on a sheet of paper and under copyright law I am copyrighted on this now automatically and I choose to put it in the Library of Congress and, you know, that is pretty simple. But when you get into patents, trademarks, trade secrets, and other more detailed work that somebody does, it is sort of a founding principle of innovation in our country that you create something, you get it protected. That is why we have an elaborate patent law process.

So, I am just curious as to if you would be willing as I asked in my previous round of questions, on some kind of compromise where the manufacturer could actually contract say with Mr. Clark and say that we would like to train you and have you in a position where you can actually have the credibility. You know, whether it is financially based on your reputation, based on your willingness to sign maybe a nondisclosure agreement and other protections for that intellectual property. Is that something that would be consid-

ered and is considered under the current laws that are in play outside of the automotive industry?

Ms. GORDON-BYRNE. Well, it is actually not my compromise to make; it is a choice of the legislatures.

Ms. TENNEY. I understand that. But would you propose that? Would that be something that would be acceptable to you? Because it protects intellectual property. The exposure to liability for manufacturers, which has been described by Mr. Taylor, and then, yeah, protect the ability of someone's right to repair. I think there is maybe a middle ground here because I do not like to look at this as a zero sum game; it is either all or nothing.

And as Mr. Taylor pointed out in the situation with the vintage farm equipment, it is similar when you have people that are repairing vintage cars. That is expensive stuff to get, you know, if you want to repair an old car.

So is there a compromise that can be made where we can negotiate and make an agreement with people like Mr. Clark to be able to handle some of the repairs without compromising the intellectual property or the rights or the innovation of manufacturers? Or the sort of paradigm supply chain that we have in place now?

Ms. GORDON-BYRNE. Absolutely. There is a lot of room for discussion. And I think we have to start on a little bit more of a factual basis which is that repairing things is not what a lot of people assume it is. It is literally the process of figuring out that something is broken, buying the spare part, and stuffing the spare part in. There is very little beyond that that is repair. All of these concerns about modifying emissions and chipping tractors, that is just not repair.

So what we are really asking for is the right to do something extremely simple that has become overcomplicated by these questions. And absolutely, we want to protect IP rights.

I wrote a book. I have the copyright on that book. Many of our Members are also manufacturers and they have rights. They have patent rights. And we are not trying to interfere with any of those rights.

So, yeah. We can talk through all of these issues. I think most of them are nonissues to tell you the truth because when you get down to the nuts and bolts about what fixing something really is, it is not what a lot of people think it is.

Ms. TENNEY. Right. But if I may reclaim my time on that.

Ms. GORDON-BYRNE. Of course.

Ms. TENNEY. You are talking about sort of saying that there really are not any concerns about this. And I think of my son is in the Marines. Mr. Golden was in the Marines. We were talking about some of the equipment there. When we leave behind billions of dollars' worth of equipment in a country or somewhere and we worry about reverse engineering and our hard work and innovation and money that went into creating these products, whether it was by the Department of Defense and the taxpayers or by a company that is investing in R and D, to say that that is just, you know, look, we do not have respect for what you have put into that, you kind of said, well, these concerns are not really there.

My concern is that we do have, you know, just because somebody creates a little device and it looks just like a block, there is a lot

of engineering that could have gone into that because it is critical whether it is an airline part or something that would save lives. We talked about off the record here about just the environmental issues. So I am just saying I think that there is a middle ground. It is not just all or nothing. Like, let's just open it up but let's give people in a competitive way the option to be able to negotiate what they feel that they can comfortably reveal and allow the right to repair. Because I do not think a manufacturer does not want the ability to repair out there. I think they want to be able to find a way to protect themselves and exposure to liability, and also make sure the consumers are happy. So I think there is a middle ground. I was just thinking in the legislation.

Ms. GORDON-BYRNE. No, I completely agree.

Ms. TENNEY. It is up to you about the time. You are the Chair.

Ms. GORDON-BYRNE. Oh, I am sorry. I completely agree about there being middle ground. But when it comes to repair, it is like we have to talk through some of these issues and not just go over them because there are a lot of assumptions that are incorrect. And when the Federal Trade Commission did their study and I was at the study, they spent 2 years investigating all these claims. And they found literally only a single instance of a single phone that may have hurt somebody to talk about the safety problems. And the auto industry was there and the agriculture industry was there. It is not like they were ignored. So we have to make sure we are dealing with reality. We need some evidence of the problems.

One of the things that was clear today is that parts pricing is a problem. And we learned about that about a year ago and we immediately said, let's fix it. So there are a variety of state legislatures that have already looked at language that allows for, obviously, people need to make a profit.

So what was kind of essentially a drafting mistake is now not a problem. But we just have to get that information out there. There is nothing in the legislation that we are proposing that is asking for any form of software.

I came from the computer industry. My dad designed computers. I know that you can have a computer with software on it and not violate anybody's IP.

Ms. TENNEY. If I could ask you one last question.

Ms. GORDON-BYRNE. Sure.

Ms. TENNEY. Of all the legislation that has been enacted in the states, and you cited that there were 43—I am not sure I got that one right.

Ms. GORDON-BYRNE. Forty-three attempts.

Ms. TENNEY. Which state, and who is out there, has the best model legislation that you would propose?

Ms. GORDON-BYRNE. Well, I have to go with the bill that we got passed this year in New York.

Ms. TENNEY. Okay.

Ms. GORDON-BYRNE. But that is still not comprehensive. Agriculture and heavy equipment are not in the bill. Home appliances are not in the bill. Wheelchairs are not in the bill. No medical equipment is in the bill.

Ms. TENNEY. Okay. But you would say New York?

Ms. GORDON-BYRNE. Well, New York is the furthest along. Obviously, they passed it. It is a pretty good template.

Ms. TENNEY. Thank you.

Mr. TAYLOR. If I could add a comment. I really do not agree that the repair process is simple and not complex and that we are really not talking about, I guess, it is not simple. In our case, the tooling that could be required, the testing, diagnostic equipment that could be required to complete a repair is hugely expensive and may be required for a particular repair, whether that is in the shop or in the field. And so that is just one aspect of how our industry is very different from some of the other industries and under discussion here.

And if I could just add one other related comment. I find it kind of ironic that we are here talking about repair in general. Repair things. Our country over the last 40 years stopped producing technicians, people that like to repair things. There are a few farmers that are still producing some great people who we love to hire but a very small quantity today. In all the trades and for us service technicians, people are not on the street. They are not coming out of the schools. We have—means to go create people, to attract them into the business, train them, time on the job. Huge incentives such as signing bonuses, all kinds of things.

So I would just make a point that our whole country needs a better repair program, and that includes everybody. And today there is a dire shortage of people available to repair all of the things that us white collar people love to use in our work and in our pleasure.

Chairman GOLDEN. Thank you. That was a good exchange.

That is going to wrap it up for us here today. Very quickly I will just say, of course, thank you, all four of you, for taking the time to join us today. And for answering our questions. Clearly, there is a lot that we want to look at here in this Committee and in Congress as it relates to repair restrictions which can create significant headaches for consumers. As we have heard from individuals like Mr. Clark or for small business owners, as we heard from people like Mr. Gerritsen, by ensuring a right to repair we can help increase competition across a variety of industries. I think we learned today you have got to look at the differences between various industries, of course, and products, but hopefully, today's hearing serves as a jumping-off point for ongoing conversations about policies that can help protect the rights of consumers and small businesses in order to be able to repair the products that they now own and prevent manufacturers from having undue monopolies on repair.

So we look forward to working as a Committee to explore bipartisan actions to accomplish this goal.

And without objection, Members will have 5 legislative days to submit statements and supporting materials for the record.

If there is no further business before the Committee, without objection, we will adjourn. Thank you.

[Whereupon, at 11:41 a.m., the subcommittee was adjourned.]

APPENDIX

repair.org

Sept. 12, 2022

Chairwoman Nydia M. Velázquez
Committee on Small Business
2302 Rayburn HOB

Ranking Member Blaine Luetkemeyer
Committee on Small Business
2230 Rayburn HOB

Chairman Jared Golden
Subcommittee on Underserved, Agricultural, and Rural Business Development
222 Longworth HOB

Ranking Member Claudia Tenney
Subcommittee on Underserved, Agricultural, and Rural Business Development
1410 Longworth HOB

Dear Chairs, Rankers and Members of the Subcommittee on Underserved, Agricultural and Rural Business Development:

Thank you for your invitation to ask me to speak to the Subcommittee about issues facing repair businesses in our communities. In addition to my verbal testimony, I have elaborated on the topic for your use in the following document.

Why Repair?

Repair is at the center of everything we need to do to keep our stuff in use, be able to resell it to the next user, and the user after that, or we are forced to throw away our stuff, buy new, or do without. Keeping technology affordable and up and running takes much more from Congress than budgeting money for broadband – households also need functional computers, tablets and communications devices in order to participate in modern life. As we learned during the pandemic – its not enough for an Manufacturer to donate thousands of gadgets to schools – the school still has to keep the gadgets working at a reasonable cost– which is impossible without enabling broad access to repair competition in law.

We have always had the Big R "Right" to fix our stuff, but we lack laws making repairs practical. Antitrust laws are being dusted off after years of neglect. The FTC has recently taken actions to remind manufacturers that they cannot tie the business of repair exclusively to themselves. But those actions still do not make a requirement to sell repair materials. Unfair and Deceptive Acts and Practices ("UDAP") laws have not yet protected consumers from being forced to accept contracts that remove existing rights to repair. Consumers are not able to protect themselves by making smarter purchases – in many industries, such as agriculture, the handful

of major vendors have nearly identical policies[1] and operate as a cartel when it comes to opposition to the right to repair.

Repair monopolies are now pervasive and are unrelated to the size, shape, weight, cost or even purpose of the equipment. Monopolies are corrosive and illegal. We shouldn't accept any excuses for how repair monopolies are beneficial because they are not. All consumers (and business) deserve to know before they head to a store or online, that they will have full and complete control of their property because they are owners. We cannot rely on manufacturers to behave well consistently – we need a legal standard so that all consumers are protected and not just those few that can afford to litigate.

Why "Right to Repair"?

Repair is, and has always been, legal. Most every town used to have a variety of repair shops fixing our appliances, TVs, computers, cameras and cars. The difference between then and now is repair businesses are not able to purchase the basic service materials that are needed to fix modern things.

There is nothing about fixing a computerized gadget that is any different than it was twenty years ago other than policy. The only thing that changed is manufacturers stopped doing what they had always done. Manufacturers used to ship repair manuals and schematics standard with the product. They sold spare parts and if new parts were out of stock, we could buy a spare part from any number of vendors, stuff it in, and it would work. If there was a mis-match of version levels of firmware – we could download a patch or a driver for free from the manufacturer website. We could fix our own stuff or hire a local tech or use the manufacturer. We had choices and agency over our possessions.

Repair is also the gateway policy that supports a functional used market. If we can fix our stuff it can retain value over multiple users. If we can't fix our stuff its value drops to that of the raw materials that can be easily recovered. A common cell phone contains less than $ 2 in gold [2] and is far more valuable as a working phone than as scrap. Recyclers estimate the value of mixed "Shed" at $.025 per pound compared with $ 4.00 per pound as parts.[3]

Many of the terms and conditions now found in common contracts actually interfere directly with the used market. Many contracts contain restrictions that block the owner from reselling or reusing their purchases without engaging in some sort of process controlled by the

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[1] https://www.aem.org/news/aem-eda-announce-statement-of-principles-on-right-to-repair

[2] https://theconversation.com/im-a-bit-of-a-modern-day-alchemist-recovering-gold-from-old-mobile-phones-137959

[3] Estimates from Techdump, now https://getrepowered.org/

manufacturer. Even if this idea appears benign – it's always an impediment to resale. Some contracts even include a positive requirement to get permission to resell.

This has wide-ranging consequences for banks as well as buyers. Lenders don't like limitations on resale of their collateral – known in the industry as "impaired collateral". This makes for more difficulty getting financing on major purchases and grants the captive finance arm (such as John Deere Finance) a major competitive advantage. Owning things is not supposed to include any side deals or restrictions - so the contracts themselves are very badly formed.

A full decade after Automotive Right to Repair legislation was passed in Massachusetts, the problems of tech repair are continuing to converge and get worse across a wide variety of industries. Regardless of product - we're stuck with whatever options are offered, including distorted pricing, poor service availability and lack of any service options for all but the newest models. It has become common for manufacturers to tightly limit the types of repairs they offer and mark products with the label: "There are no user-serviceable parts" inside. Since nearly everything that has been made in a factory can be repaired, (some with great difficulty) that statement is not a genuine warning but an attempt to thwart repairs.

New models are crammed with spyware that capture our data and then monetize our own data back to us without our permission. We don't even have the option to turn these features off or direct the data back to ourselves or someone we trust to help us use it.

Used markets that used to be viable options for farming equipment, motor vehicles, appliances and consumer electronics no longer exist. Tractors that pre-date modern models are in high demand because they can be fixed. [4] Refrigerators that used to last 20 years on average are now lasting an average of 12 years. [5] Consumers are told TVs are so cheap they aren't worth repairing, [6]but without competition for TV repair, it's impossible to know how costly repairs might be.

Consequently, the small businesses that used to provide repair services in every town in the US were driven out of business by manufacturers that have refused to sell or provide ordinary service materials to anyone but their authorized subcontractors. According to IBIS world, [7]consumer electronics repair businesses have been dwindling at a rate of 2% per year for at least the past decade, down from 175,000 locations in 2014 to 140,000 locations in 2020 with

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[4] https://www.bloomberg.com/news/articles/2021-11-13/deere-strike-ignites-bidding-wars-for-used-tractors

[5] https://www.homeserve.com/en-us/blog/home-improvement/old-appliances-vs-new-appliances/

[6] https://www.wsj.com/articles/we-need-the-right-to-repair-our-gadgets-1441737868

[7] IBIS World
https://www.ibisworld.com/united-states/market-research-reports/electronic-computer-repair-services-industry/

no end in sight. For context consider that the same entity reports 500,000 independent auto repair locations.

We cannot shop our way out of this problem. Manufacturers have all learned how much more money they can make when blocking repair than aiding it. In most industry categories there are no brands to buy that do not already monopolize repair. Any product labeled "Smart" is almost certainly repair monopolized not because consumers want "Smart" products, but because manufacturers know they can make more money selling things that cannot be repaired.

Manufacturers entirely control design and specifications. They have an incentive to compete on price at retail so choices that reduce manufacturing cost are desirable. Tech products are combinations of hundreds of small parts each with its own failure rate. The overall durability of the finished product is therefore limited by the durability of the lease durable component part. [8] So downrating specifications to lower manufacturing cost directly reduces the expected lifetime of the product - giving rise to the rational perception of "Planned obsolescence". [9] Our only defense against products that are designed to fail is to make sure we have equally robust options for repair.

Our research provided to the FTC for their Nixing the Fix study confirms a very wide gap between what manufacturers offer and what consumers want. Many of the limitations are flatly illegal. US PIRG studied all 50 members of the trade association AHAM (Association of Home Appliance Manufacturers) for their compliance with the Magnuson-Moss Warranty Act of 1975. 45 out of 50 manufacturers confirmed they would void a warranty if a customer did not use their services and parts. This is illegal under MMWA. [10]

We also dug into the contracts offered for review and negotiation by consumers pre-purchase. In five major categories of equipment: mobile devices, enterprise computing, personal computing, TVs, and agriculture. Our research showed that 90% of products [11] available today are repair-monopolized. The only category of equipment where contracts were more consistently available to preview are also the few brands for "commodity" laptops and desktops where repairs are not currently monopolized. Many consumers confuse their long-time experience of fixing their family desktop running a Windows OS with a healthy market for repair.

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[8] Gay Gordon-Byrne "Buying, Supporting and Maintaining Software and Equipment, an IT Managers Guide to Controlling the Product Lifecycle" . Chapter 11, pg 206. CRC Press 2014. https://www.amazon.com/Gay-Gordon-Byrne/e/B00LGYY96U?ref=dbs_a_mng_rwt_scns_share

[9] Early example of planned obsolescence in the light bulb industry. https://www.newyorker.com/business/currency/the-l-e-d-quandary-why-theres-no-such-thing-as-built-to-last

[10] Warranties in the Void – part 1 https://pirg.org/resources/warranties-in-the-void/ and part 2 https://pirg.org/resources/warranties-in-the-void-ii/

[11] Nixing the Fix empirical research submitted by Repair.org https://www.ftc.gov/news-events/events/2019/07/nixing-fix-workshop-repair-restrictions and https://www.regulations.gov/document/FTC-2019-0013-0030

Factually - that market is one of very few where consumer perceptions are reasonably well aligned with reality. No other category has the same policies.

Alignment with Antitrust and UDAP laws

The chain of contracts from the moment of purchase to documentation of limitations on repair show pervasive abuse of consumers under both antitrust and UDAP statutes. It is already illegal under antitrust provisions in the Sherman and Clayton Acts for manufacturers to tie the purchase of a second product or service to the original unless that service or part is provided for free. Conditioning the use of a product to buying service materials only from the manufacturer is already the subject of multiple class action lawsuits alleging John Deere illegal tying[12] of repair materials (17 so far) in Federal Court.

Even when a manufacturer uses wiggle words in their documentation such as "may" or "might" use the repair provider of their choice – unless it is practical to acquire the necessary repair materials, this is a clear instance of illegal tying and can be investigated not only by the US DOJ and FTC, but also by States Attorneys General.

Other aspects of antitrust law cover "refusal to deal" and "exclusionary dealing" which are also rampant in the repair industry. Courts have ruled variably on these matters and some of the actions underway recently will probably drag out for a decade or longer before being resolved. In the meantime - consumers need relief today.

Rather than argue the legal merits of right to repair in court one manufacturer at a time, we've come to accept that It is far simpler to work through states and their statutory control of general business law to blunt the pervasive use of unfair and deceptive contracts and policies such as found in all End User License Agreements ("EULA"). EULA make sense only for shrink-wrap media purchases where copyright law is not otherwise obvious to the consumer. Outside of that format, there are no good reasons to insist on additional agreements beyond the purchase agreement other than to surreptitiously hide anti-consumer and anti-competitive terms from the buyer.

a) EULA are not negotiable pre-purchase
b) EULA are not generally negotiable at all between consumers and corporations
c) EULA are written to be unintelligible to a consumer
d) EULA alter the fundamental terms and conditions of purchase post-purchase

In crude parlance – EULA are a form of Bait and Switch. Everything that a buyer needs to know about their rights is already set forth in the purchase agreement. If there are copyrighted licenses attached – those licenses need to be separate and just as negotiable and the purchase agreement.

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[12] https://news.bloomberglaw.com/antitrust/john-deere-facing-antitrust-lawsuit-over-tractor-repair-market

The computer industry has operated since the 1950s with a combination of hardware purchases and separate licenses. Buying a laptop and licensing a Windows or Linux operating system is a very clear instance of straightforward contracting. When a manufacturer ties licenses to hardware either in a EULA or other contract – the license turns that hardware into raw materials. Buyers need to know what they buy and what they don't in the first sale. Anything else is fundamentally unfair and deceptive.

State Legislation

Both New York and Colorado passed variations of Digital Fair Repair legislation in 2022. Another half dozen states have moved similar legislation through either a house or senate body and expect to finish the job in 2023. A total of 43 states have begun their legislative process without any discernible preference by political party.

States are ideal for moving practical legislation using their powers to control existing general business law to require manufacturers doing business in their state to sell all necessary repair materials directly to consumers and to independent repair businesses. This is the path taken by the auto industry in 2012 which unlocked auto repair nationally despite having been passed in only one state.

It was the potential for other states to pass similar laws that drove the auto industry to the bargaining table to hammer out a national Memorandum of Understanding in 2014 [13] This type of agreement may work in some industries with a small number of manufacturers, but is not likely to work for all.[14]

With a decade of experience – we can look to the success of the auto repair industry and conclude that despite projections of terrible consumer harm – the sky did not fall. Consumers did not suddenly die due to bad brake repairs, or lose control of their bank accounts, nor get stalked by home invaders. Unfortunately, the experience of the auto industry also tells us that being able to fix one's modern car in 2012 is not the same as cars today.

The most common automotive diagnostic portal in 2012 was the OBD-II port and the MOU memorialized this particular interface as the standard. Other interfaces were not included in the law and the subsequent MOU which has turned into another legislative battle. Consumers and mechanics are being cut off from wireless diagnostics and data restoring repair monopolies on more recent vehicles. As a result, the auto repair market is now headed down the same disastrous path as the market for repair of cell phones, TVS and tractors.

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[13] https://wanada.org/wp-content/uploads/2021/01/R2R-MOU-and-Agreement-SIGNED.pdf

[14] For example – the Consumer Technology Assn boasts more than 1,300 members https://www.cta.tech/. The auto industry had only 22 signatories to their MOU which to this date does not include Tesla. It is likely impossible for CTA to get 1300+ lawyers to agree to anything.

Legislation must therefore fill the void left by incomplete voluntary actions. Legislation must also cover two entirely different areas of law. States can require manufacturers to sell parts and tools, but only Congress can make sure that Copyright laws or Patent laws are not used as a method of blocking repair. Our Coalition supports both sets of activities and we work carefully to maintain the bright line between state and federal responsibilities.

Our legislative intent is to allow competition for the business of repair as a basic requirement supporting the rights of equipment owners to control their property. Competition for repair requires only fair and reasonable access to existing repair materials. Our template legislation does not specify how long parts must be available, only that if available they must be sold in non-exclusionary ways to consumers and independent repair businesses. There are no design requirements, nor any requirements not already legal under copyright or patent law. Trade secrets are not useful for repair and are disclaimed. Cyber security secrets are never disclosed in repair materials. There are no requirements for access to source code. Whatever federal laws exist, states cannot change them.

Ultimately, we expect that once a few more laws have been passed in state legislatures, that Congress can finish the job and harmonize the various laws so that manufacturers are less likely to be confused or non-compliant.

Manufacturers now dictate useful life rather than the market.

Equipment used to fade from the market as products ceased being desirable in the market. Classic cars started out as new cars and were kept in use at the choice of the owner, not the manufacturer. There are many computer products built over 25 years that are still in use powering such systems as nuclear power plants and chemical factories. Obsolete is not a choice made by the manufacturer but by the user.

In our digital world – manufacturers are determining useful life entirely on their terms. Once the manufacturer declares a particular product is "obsolete", that's the end of life even when the product has decades of expected useful life ahead of it. We know that even very old computers can be kept in use by harvesting used parts and using schematic diagrams to repair circuit boards for indefinite periods. When manufacturers refuse to provide a schematic, or most importantly the firmware to allow parts to be attached, that ends the potential for long life.

Many manufacturers subcontract to our members for specialized board repair services to be able to keep spare parts in stock for their own needs. The opportunity for repair techs to make these tiny repairs is also being killed by refusal on the part of manufacturers to provide a schematic diagram. These diagrams are not secrets, but they are subject to copyright. The only legal source of a schematic is therefore the OEM despite the diagram having no creative content.

Short useful life is also dictated by manufacturer choice of components. The Association of Home Appliance Manufacturers ("AHAM") reported in testimony in Vermont that the average life

of a major appliance is now 12 years, down from 20. When asked why – they said simply "Electronics". Electronics have replaced sturdy mechanical parts not because they are better, but because they are cheaper. The use of adhesives has also proliferated as a lower cost method of manufacturing, and not as a consumer advantage. The European Union has begun to ban adhesives as fasteners in several categories of equipment [15]. We look forward to less glue and more durability requirements from the EU.

Digital Locks and the DMCA

Copyright Law already allows for repair, but has a loophole created in 1998 at the request of the makers of VCR tapes to block tools made to make copies more easily. The language created a new way for content creators to protect their materials, but with the unfortunate consequence of adding legal limitations on breaking digital locks for non-infringing uses.

Congress anticipated that the copy/tool restrictions in Section 1201 of the DMCA were not fully developed and therefore included a provision allowing for exceptions in the future. The US Copyright Office is required to evaluate requests for exemptions to Section 1201 every three years.

Our Coalition has been engaged in every triennial review since 2012 with petitions to the USCO requesting exemptions to breaking digital locks for purposes of repair. We have been almost completely successful - with exemptions now granted for repair of nearly everything short of computer gaming stations. In theory – we can all break digital locks and fix our stuff without being in violation of copyright law – but lock breaking is not easy.

Modern locks aren't just like luggage locks controlled by the luggage owner. Locks that come with the product are using increasingly complex cryptographic algorithms that are intentionally difficult to break. Lacking a physical key – legal owners of equipment are currently unable to access their legally acquired property for the legal purpose of repair without breaking sophisticated software locks. This requires help – and that help is currently illegal to sell.

Locks have become the new frontier of repair monopolization. Manufacturers are now adding locks that tie parts to the mainboard known variously as "VIN Burning" "Parts Pairing", "Serialization" or "Tying" The impact is the same regardless of wording. Installing a spare part now requires an extra step, and one which only the OEM or their authorized providers can make, that alters the settings of the part to match the specific serial number or VIN of the host machine.

Without action by Congress, we already know that our existing limited repair capabilities will drop to zero. No one will be able to stock parts for immediate use – and none will be able to use a 3rd party part or a used part as an alternative. Consumers will be forced to bring their purchases exclusively to the manufacturer for repair or maintenance. Recyclers will no longer

[15] https://ec.europa.eu/commission/presscorner/detail/en/ganda_19_5889

harvest parts for reuse. Billions of gadgets will cease to be useful because manufacturers will have to be involved in every repair.

This process does nothing for the consumer other than delay and add expense to an otherwise ordinary process. We have yet to hear a rational excuse for adding extra hurdles to repair other than to monopolize repair.

Only Congress can make sure that digital locks cannot be used to block access to repair, and only Congress can make sure that design patents do not thwart repair using shape as a cudgel. Both of these problems create monopolies which are damaging to all but the monopolist.

Federal Fair Repair / Right to Repair and Related Legislation

There are now several federal bills under consideration that are taking up issues specific to repair. Sponsors have made a concerted effort to work on a bipartisan basis. Some of the original sponsors lost their primaries and will have to be replaced. Yet others are still seeking a balance of co-sponsors on both sides of the aisle before pressing forward.

- H6566 (Jones/Spartz) was filed to allow the production of repair-specific tools to aid owners in repairing their legally acquired property.

- Congressman Joe Morelle filed HB4006 as a federal version of the NY Digital Fair Repair Act for which he was a prime sponsor while the Majority Leader in the NY State Assembly. The Digital Fair Repair Act was passed in June of 2022 and awaits the governor's signature before becoming law.

- Senator Ben Lujan filed a general Digital Right to Repair Act SB 3830 as a comparison to Congressman Joe Morelle's HB 4006.

- Senator Jon Tester of Montana has filed a Right to Repair bill specific to agricultural and ranch equipment. [16]

- Senator Ron Wyden of Oregon and Representative Yvette Clarke filed a Right to Repair bill specific to medical equipment,[17] related to the pandemic.

FTC Actions

The FTC is tasked with enforcement of the Magnuson-Moss Warranty Act ("MMWA") as well as consumer protection under the FTC Act. The FTC has recently become more aggressive in enforcement. We expect to see manufacturer's to clean up their contracts to remove language

[16] https://www.tester.senate.gov/newsroom/press-releases/pr-8866/

[17] https://www.congress.gov/bill/116th-congress/house-bill/7956

threatening to void warranties through the use of non-OEM original parts or non-OEM labor. Since consumers rarely read these documents, enforcement needs to be aligned with education so that consumers do not continue to assume their warranties will be voided.

FTC Nixing the Fix Workshop

The FTC did a two year study on repair access beginning as a workshop in July of 2019 called "Nixing the Fix". They asked all interested parties to provide empirical evidence of their view of repair both pro and con. The results were published in May of 2021 and concluded there is "Scant Evidence" that limitations on repair are of any value to consumers. They also concluded that lack of access to repair falls hardest on underserved communities.

The comment about underserved communities has raised some eyebrows which I can attempt to justify. I've been able to easily document that consumer electronics repair locations authorized by manufacturers, including those offered by large retailers such as Best Buy, are located only in relatively wealthy urban and suburban areas. This is logical since that's where the buyers with the means to buy new are located. However, the need for repair is not unique to wealthy people. The distribution of manufacturer directed repair options leaves most of the population without local access to repair services.

Local access is important even in urban areas as some items needing repair aren't easily dragged around on public transit or in a car. Apartment dwellers can call the "Super" but the Super can't fix what isn't repairable. As more and more older appliances, HVAC and other items common in cities are replaced by their non-repairable newer devices, the problems of access and costs of repair will only grow.

Digital Divide

Lack of options for repair of tech gadgets adds directly to the growing gulf between rich and poor and urban and rural. When repairs are not available locally – as is common in both rural and urban settings - distance and delays are damaging. Shipping products away for repair service isn't timely or practical for all but the lightest and least important devices. Maybe it works to send a watch out for repair but not a major appliance and definitely not a tractor.

For roughly half our population - new products are often unaffordable. Money to buy new tech has to compete with money for food ,housing or transportation. Historically, used cars, appliances, computers, tractors and even medical equipment is the lower cost alternative to new. But without robust options for repair spanning longer than a 1 year warranty, the market for used equipment is crushed.

Our divide cannot be resolved by mandating better broadband. Everyone needs modern technology to work, go to school, do our banking, get access to medical care and communicate. Functional broadband has to be paired with functional in-home technology. When consumers have no choice of repair, that in-home technology can easily be out of the financial reach of the

very customers that need it most. It does little good to provide school children with a brand new laptop if there is no provision to keep that equipment working without having to rely upon parental finances or school district budgets to buy replacements.

We must de-monopolize repair so that competition can drive lower costs and wider availability of both services and functional used alternatives.

Manufacturers are not in the Business of Repair

We should not expect manufacturers to be effective sources of repairs in the first place. Manufacturers are in the business of selling shiny new products. Every repair made is a replacement sale not made. Repair programs and policies designed by manufacturers will always be geared towards making repairs as unattractive and impractical as possible in order to drive new sales.

Worse, when repairs are totally controlled by the manufacturer, the products themselves can be made as cheaply as possible and repair options tuned to match projected failures with new product offerings. Even poorly made products can stay in use indefinitely when repairs are widely available. For example, products made with embedded batteries are doomed to fail when the battery dies – which is a known physical attribute of battery technology.[18]

This is why the real business of repair is done by small businesses outside of the manufacturer umbrella. Independent repair businesses serve the customer, not the manufacturer. They will repair things that the manufacturer never intended to be repaired, or no longer even offer an option. It is in the best interest of the repair shop to make good repairs and keep that customer happy with the things they already own.

Small Business Growth Potential

The more repair options can be restored for consumers, the more repair businesses will start up to serve the need. And those needs are not only in wealthy urban centers where leading manufacturers set up their retail outlets, but everywhere people live. Any town able to support an auto repair shop likely has more than enough customers nearby to support a tech repair business or two.

Repair jobs are good jobs that feed families and are part of making a rural community function. Repair techs do not need a fancy college degree - just a bit of attention to detail, nimble fingers and opportunity. The cost of opening a repair business is very low. Many geeky kids start by fixing stuff at the kitchen table. Many techs, particularly medical repair techs, start their careers in the military. Computer and cell phone repairs are taught in junior high and high schools and programs in Community Colleges often train repair techs for auto, appliance, HVAC and related

[18] https://batteryuniversity.com/article/bu-801b-how-to-define-battery-life

jobs. We have the ability to train people for repair jobs at the same time as those jobs are being systematically crushed.

In some industries there is a clear shortage of repair technicians – such as in agriculture. The problem is not that people aren't interested in repair jobs, but that the wages paid by dealerships aren't attractive enough for young people to pursue repair as a career. [19]Historically, the best way for a repair tech in the auto industry to make a good living is to open one's own repair shop. This option does not exist in Agriculture. Techs have no upward mobility to move from being an employee to becoming an employer. I've met personally with farmers that will happily build a stocked repair shop in their barns, set up a tech in business, and offer double the wages of the dealership in order to have techs on site. Farmers all benefit when there are more options for business growth and badly needed services at the same time.

Electronic Waste

Throwing away has its own consequences - driving the 17% CAGR[20] growth rate of electronic waste - now the fastest growing waste stream in the world. No matter how one calculates the impacts – it costs more to mine and manufacture electronics than can be recovered economically simply through recycling,

Studies confirm that the environmental costs of manufacturing are far greater than those of use. [21]All the mining, smelting, transportation and energy use needed to make products are generating pollution and harming human health. If we can just use a phone for 4 years rather than 2 – we halve the environmental and handling costs.

The costs of solid waste processing are mostly taxpayer funded. The more that gets thrown into the waste stream – the higher the costs. Many municipalities have mandatory recycling programs, but even with those programs, high-side estimates report less than 20% of designated products are recycled. [22]

Electronics which include lithium ion batteries are creating enormous fire hazards for processors. A small battery in household trash cannot be shredded or crushed without risking exposing explosive lithium to oxygen. Recycling and processing facilities are at particular risk of

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[19] https://www.farmprogress.com/technology/farmers-face-nationwide-shortage-trained-technicians

[20] https://www.environmentalleader.com/2022/08/e-waste-management-market-expected-to-grow-at-15-rate-through-2027/

[21] https://www.cnbc.com/2021/11/03/tsmc-samsung-and-intel-have-a-huge-carbon-footprint.html

[22] https://www.statista.com/topics/3409/electronic-waste-worldwide/

fire. [23]One of the larger problems of solid waste management is how to functionally separate these batteries from their housings. Without a library of schematic diagrams made in a consistent format – most pre-processing to remove batteries is currently manual.

How Big is the Problem?

Our research from 2019 for the Nixing The Fix Study concluded that roughly 90% of products using digital electronic parts on the market today either cannot be repaired at all or can only be repaired by the manufacturer. Outside of the market for laptops and desktops made using commodity components and readily available operating systems, nearly everything else is made so that only the manufacturer can fix the product, if the product is even repairable by design.

Both the EPA and back of the napkin calculations estimate the average household already owns 30 digitally driven gizmos and gadgets. These things range from major appliances to hot tub controls, garage door openers and personal computers. Multiply 30 x 122 million[24] households and we estimate 3.66 billion individual electronic devices are already in use just in households and headed to the dump with the first failure. There are billions more devices deployed in business, government, education and industry. No matter how one calculates the weight – the sheer volume of units that will either need repair or recycling is alarming.

Related Progress

Right to repair legislative efforts are already prodding manufacturers towards improving their repair policies and making their products more readily repairable. Microsoft has been reducing their use of strong adhesives in the tablets to enable repairs to be less physically destructive. Samsung, Google and Motorola have taken steps to set up retail distribution channels for parts and tools. Apple and John Deere have both made repair-friendly noises but have yet to actually deliver.

The Federal Trade Commission has begun to enforce laws intended to protect[25] consumers from losing their warranties under the FTC act. Just a few weeks ago they announced settlements with Harley-Davidson, Weber Grills and Westinghouse generators that violated the Act. More enforcement of existing laws will help dramatically

Politics

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[23] https://www.waste360.com/safety/five-alarm-fire-queens-ny-recycling-plant-caused-lithium-battery-fdny-says

[24] https://www.census.gov/quickfacts/fact/table/US/HSD410220

[25] https://www.ftc.gov/news-events/news/press-releases/2022/06/ftc-takes-action-against-harley-davidson-westinghouse-illegally-restricting-customers-right-repair-0

We have been able to document nearly uniform support for "right to repair" legislation in states regardless of political party. Everyone benefits from the legislation. Fixing things is part of our DNA as a society. Monopolization is bad public policy. Much as we would like – recycling cannot keep up. We have so few repairable options that what had been a free market for repair is no longer functional. If we could unlock repair monopolies without legislation we would gladly do so – but we don't see any alternative.

A survey done by Consumer Reports shows that consumers support their right to repair by a margin of 84% favorable. [26]. Votes have proven even more popular. Massachusetts passed their 2012 automotive Right to Repair law unanimously. NY passed the Digital Fair Repair Act with near unanimous support. Colorado's wheelchair right to repair bill passed easily. Farmers in Nebraska, a state where lack of repair options and rural locations are normal, voted by 99% favorable to support Right to Repair legislation when asked by the Nebraska Farm Bureau. [27]

Similar surveys have also been done in Canada with comparable results.[28] As Right to Repair becomes more demonstrably popular, we are seeing more political campaigns include Right to Repair support as platform issues. Legislators are consumers too and personally want their right to repair just as enthusiastically as everyone else.

Opposition

Opposition has become entirely predictable and impervious to facts. Even when clearly provided with evidence of their own poorly formed contracts, illegal acts and illogical arguments, the same groups repeat the same mantra as if they will achieve truth through repetition.

The one point that is consistently ignored by opposition is the nature of ownership. Consumers ALWAYS become responsible for their own property entirely at the point of sale. Contracts of sale ALWAYS (the use of caps indicates importance) disclaim every harm that the owner might do to themselves including loss of limb, life, lost crops and lost profits.

26

https://advocacy.consumerreports.org/press_release/consumer-reports-survey-finds-americans-overwhelmingly-support-the-right-to-repair/

27

https://pirg.org/articles/nebraska-farmers-vote-overwhelmingly-for-right-to-repair/#:~:text=by%20%40nProctor-,Delegates%20of%20the%20Nebraska%20Farm%20Bureau%2C%20which%20represents%2058%2C000%20member,or%20agreement%20with%20equipment%20manufacturers.

28

https://openmedia.org/press/item/poll-75-people-canada-support-right-repair-legislation#:~:text=An%20Innovative%20Research%20Group%20(INNOVATIVE,3%25%20of%20those%20surveyed%20opposed.

Manufacturers rely heavily on these disclaimers to protect themselves from retaining the obligations of ownership past the purchase. I worked for many manufacturers over the years and I've never seen or heard of an attorney that actually wanted the manufacturer to retain any actual hint of ownership. If manufacturers were actually responsible for errors made by customers – the resulting torrent of torts would crush the legal system.

Opposition knows that Proprietary "Rights" are not secrets. Copyrights protect the authors of creative works to control distribution. Such as having the right to publish a book. But the book itself is meant to be read and the contents are not secret. Congress intended for repairs to be legal and made specific provision in copyright law for computer users to make backup copies of all their copyrighted software for purposes of repair. Opposition arguments about illegal exposure to proprietary materials have failed in every instance because they are clearly not correct.

Similarly, Patents are also a form of proprietary right to control rights to manufacturing. The patent is not a secret - its already public in exchange for a monopoly on production. Patents are infringed through manufacturing without permission, but repair is not manufacturing. Manufacturers that refuse to sell their repair parts to their own customers are creating a market for counterfeits which would not otherwise exist.

We're also told that trade secrets and cyber secrets will be revealed by sharing of repair materials. Once again, I've never seen or heard of a single incident where a manufacturer included trade secrets in any repair materials even when those repair materials were provided under a non-disclosure agreement. Repair materials are made to be distributed and therefore do not meet any of the tests for protection as a trade secret under the Uniform Trade Secrets Act.

The same goes for cyber security information. Hackers are not browsing schematic diagrams and repair manuals to find software holes to exploit. Repair materials are utterly useless to hackers. The big problems, which are very real, in cyber security are due to flawed designs and inattention to good security on the part of manufacturers.

All of these arguments were made to the FTC in their Nixing the Fix Study – and rejected as lacking evidence. Opposition lawyers aren't lazy, but simply haven't been unable to cook up evidence that doesn't exist. In the sales business - we call such tactics "FUD" meaning Fear, Uncertainty and Doubt.

Summary

Our members are true experts in their fields and are often called on to provide industry expertise among their peers, with regulators, legislators, consultants and media. None of our members are paid to talk – they pay their own way to events. Please call on us to provide support for any of your questions or concerns.

About the Digital Right to Repair Coalition

The Coalition, commonly known as Repair.org, is a membership driven 501 (c) 6 Trade Association representing over 400 member organizations and businesses with common interests in secondary market uses of high-tech equipment. Our mission is to fight for repair-friendly legislation, regulations and standards wherever possible for owners, because if owners cannot fix their stuff, repair businesses cannot form to help them.

Ours is a big and growing umbrella – our members do everything that supports the equipment owner from the point of sale to the final shred. Some of our members handle returned merchandise for retailers, others provide in-warranty repair services for the OEMS, and at the same time compete against them for business contracts. Others handle the remarketing of used products in the worldwide market for whole machines and parts. Still others refurbish equipment for charities and provide recycling services. We are all united by being unable to do our work, expand our businesses, or even support consumers due to lack of repair information and materials.

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Sept. 12, 2022

Chairwoman Nydia M. Velázquez
Committee on Small Business
2302 Rayburn HOB

Ranking Member Blaine Luetkemeyer
Committee on Small Business
2230 Rayburn HOB

Chairman Jared Golden
Subcommittee on Underserved, Agricultural, and Rural Business Development
222 Longworth HOB

Ranking Member Claudia Tenney
Subcommittee on Underserved, Agricultural, and Rural Business Development
1410 Longworth HOB

Dear Chairs, Rankers and Members of the Subcommittee on Underserved, Agricultural and Rural Business Development,

Below, you will find my biography and testimony that I will be verbally summarizing at the upcoming hearing. Thank you for the opportunity to provide my testimony and expertise on this important topic.

Bio

My name is Brian Clark. Since the fall of 2012, I have been the co-owner of a small independent consumer electronics repair shop located in Conway, New Hampshire called The iGuys' Tech Shop. The founding of the business came from recognizing the need for repair services on increasingly popular electronic devices in a region of New Hampshire that, at the time, had no options to speak of.

Prior to becoming a small business owner and entrepreneur, I earned my degree in Meteorology from The Pennsylvania State University and worked in the field for about 6 years.

About Us

My shop specializes in repair of all smartphones and tablets from any manufacturer, as well as Apple branded computers. We also provide data recovery and microsoldering services for these devices. The town of Conway lies in a rural portion of New Hampshire, in the heart of the White Mountains which is a very popular tourist destination. The permanent population of the area that we serve is somewhere around 100,000 people based on 2020 census data, covering a large area at over 1,000 square miles.

About Authorized Repair

As an independent shop, we have no affiliation with any manufacturer. Even with industry changes over the last decade that we have existed, we still find that it is best for our business and more importantly for our customers to remain independent. Any paths to becoming an authorized repair facility are far from ideal and are generally incredibly invasive to our business. Of course, there are drawbacks to our choice, as most manufacturers continue to offer independent shops little to no official access to genuine parts, repair manuals, tools, or schematics.

Manufacturers want their devices be serviced solely by their authorized repair options. For Apple devices, the nearest authorized repair facility, in this case an Apple Authorized Service Provider or AASP, is about 45 minutes from our shop. The nearest Apple Store is about 1 hour, 15 minutes away. For Samsung devices, the closest authorized repair facility is about 1 hour, 30 minutes away. The same for Google Pixel devices. Have a device from another manufacturer such as Motorola or LG? You're completely out of luck for any brick and mortar authorized repair, making mail-in repair your only official option.

Because New Hampshire becomes increasingly rural as you go north, all of these authorized repair options are located in the more densely populated southern parts of the state. This means that most of our customers would need to drive an additional 45 to 90 minutes, after already frequently driving over an hour to reach us.

Authorized repair facilities are often severely limited by the manufacturer as to what devices are "supported" for repair. Even for these supported devices, frequently only a certain number of repairs on the supported devices are allowed to be completed. To continue to make matters worse, supported repairs on supported devices often require absurd turn around times.

All of these policies and procedures are incredibly unfriendly and unfair to consumers, especially those that live in rural areas, and are designed to push people to replace rather than repair. It is important to understand that this situation is far from unique to northern New Hampshire. There are countless locations around the country where similar, or worse, situations can be encountered.

Real World Examples

Over the decade that we have been in business, we have seen countless scenarios repeat and replay themselves over and over again for our customers. I'd like to take a moment to provide four examples of common scenarios that we see as an independent repair shop in a rural area.

Example #1

A local woman relies heavily on her MacBook Air for work. Since COVID, she primarily works from home and her computer is the crucial tool that allows her to do this. One morning, she goes to boot it up to start her work for the day and it simply won't turn on. She calls Apple technical support and they walk her through a few basic troubleshooting steps to no avail. Apple tells her she will have to either mail it to Apple or bring it to an authorized service provider to have the computer diagnosed and repaired. They don't even tell her about our shop because Apple does not see independent repair as a viable option. Mailing her computer to Apple will take too long. She also lives nearly an hour north of our shop, so she's nearly 2 hours from the nearest AASP. Thinking there must be someone local that can help her and feeling rather desperate, she creates a post on social media and is referred to us by multiple people. We had her computer diagnosed and repaired within 1 to 2 days of drop-off. Any Apple authorized repair options would have likely taken weeks.

Example #2

A family drives up from Boston for a week of vacation in the mountains. On the way, one of the children in the family drops his iPad, cracking the glass front. This iPad is very important to the young man and to the family as a whole. They too call Apple and are told that they can mail it in, or take it to an Apple Store to have the tablet replaced for several hundred dollars. This represents only a slightly reduced cost from replacing with a new one. This is due to the fact that Apple simply does not offer to repair a cracked iPad display, period. Thankfully, some Google searching leads the family to find our shop, where we do offer that service. Within a day, we have the cracked glass replaced at a very economical cost and the family can carry on with their vacation.

Example #3

A local plumber effectively runs his business from his iPhone. He no longer has a landline, and as such, his sole method of keeping in touch with his customers is his iPhone. One afternoon, he plugs his iPhone 12 into the charger in his work van as he has done many times before. Shortly after plugging it in, the phone gets noticeably hot, the screen goes black, and now the device shows no signs of life whatsoever. He heads to the local Verizon store since that's where he bought the phone just over a year ago. He is told the phone is out of warranty, and as such his only option is pay off the remainder of the amount of money he owes for the phone (several hundred dollars) and replace with a new one. This is not an ideal option for the plumber as 1) he really doesn't have the funds available at the moment to pay off the phone and 2) he has important business related data on his iPhone 12 that he had not had a chance to backup. Thankfully, after expressing this to the Verizon store employee, he is pointed to our shop. We are able to set him up with a loaner phone so that he can immediately be in touch with his customers while we service his device. Within a couple days, we complete a microsoldering repair of the motherboard of his phone that both gets the phone back up and running at a fraction of the cost of replacement, and also gets the plumber his valuable business data.

Example #4

An elderly woman has a basic Samsung smartphone that she has owned for 4 to 5 years. She only uses it occasionally to make some phone calls, send and receive text message, and to generally keep in touch with her family. Though the phone is basic, it does what she needs it to do. It took her a lot of time and a great deal of effort to get it setup and learn how to use the basic functions. After having the phone for this long,

she is finding the battery life is extremely poor, with the phone turning off within 15 minutes of unplugging from a charger. She contacts Samsung, and is told that her phone is no longer supported and as such they do not offer battery replacement services any longer. She looks at the possibility of replacing the battery herself, but finds that the process looks to be far too complicated for her to attempt. Thankfully, a friend refers her to us. Though Samsung does not give us access to genuine batteries for older devices, we do have access to reasonable quality aftermarket batteries and as such are able to replace the battery in her phone and save her the cost and headaches associated with replacing her phone.

Summary

The presence of reliable independent consumer electronics repair in rural areas is crucial for the quality of life of the residents, as well as the economy of these areas. Despite this clear importance, manufacturers continue to ignore the need and make it difficult for businesses like mine to operate. Independent repair is ready, willing, and able to fill the void that major manufacturers have left, particularly in these rural areas. All we ask is that manufactures give us reasonable, paid access to the parts, tools, and documentation to continue to offer these services for years to come.

Right to Repair and What it Means for Entrepreneurs

Statement by Ken Taylor, President of Ohio Machinery Co.

On Behalf of Associated Equipment Distributors
before the U.S. House of Representatives
Small Business Committee's Underserved, Agricultural, and Rural Business Development Subcommittee

September 14, 2022

Chairman Golden, Ranking Member Tenney, and other distinguished members of this subcommittee, it is an honor to appear before you today both as Associated Equipment Distributors' (AED) 2022 Chairman and as president of Ohio Machinery Co.

AED is the international trade association representing companies that sell, rent and service equipment used in many applications, including construction, agriculture, forestry, energy, mining, material handling and industrial production. If you see a hydraulic excavator or a wheel loader moving dirt on an infrastructure project or a combine working on a farm during harvest, it was likely sold or rented by an AED member.

Established in 1919, our more than 800 members, including nearly 500 equipment dealerships, generate $60 billion in revenue annually, employ 125,000 workers and operate more than 5,300 locations across North America. Most AED members are small, family-owned, multigenerational companies.

Ohio Machinery Co. is a multifaceted, family-owned company that supplies the agriculture, construction, energy and transportation sectors. Essentially, our company is segmented into five divisions that operate like small businesses—a construction equipment dealership, an agricultural equipment dealership, a medium- and heavy-duty truck dealership, a school bus distributor, and a hydraulic and diesel component remanufacturing operation.

The company was founded in 1945, and I am the third generation from my family to run Ohio Machinery, following both my father and my grandfather. The entrepreneurial spirit is embodied in Ohio Machinery and our employees, which has allowed our organization to thrive for more than 75 years.

"Right to repair" is a simple slogan; however, as my testimony will highlight, the policy proposals surrounding the issue are complex with significant consequences. To that end, I will discuss the concerns of AED and its members, which are shared with many other economic sectors and industries surrounding the right to repair discussion.

For the equipment industry, the overly broad legislative proposals being considered in many states, and introduced in Congress, are based on a false narrative that customers are unable to fix their own tractors and machinery. To the contrary, equipment manufacturers and distributors make available diagnostic tools, repair information, parts, and remote customer support. Idle, non-functioning equipment equals lost time and money. Whether it's on a farm during harvest or a road building project there is absolutely zero incentive to not do everything we can as equipment dealers and manufacturers to keep a machine running. That can mean repairs completed by a dealership service technician, the customer, or a third-party provider. The equipment industry is highly competitive, and if Ohio Machinery Co. isn't providing proper and timely service, nothing is stopping the customer from moving to one of my many competitors and their products.

In fact, a significant percentage of our parts sales are sold directly to customers so they can repair their own equipment. However, the tractors we're selling today are not the same as those sold by my grandfather or even my father. While customers can complete most repairs to their machinery, government environmental and safety regulations, as well as technological developments that have made equipment more efficient and productive, necessitate restrictions in access to source code and software that ensure key operational functions aren't modified or disabled.

Consequently, while AED members support the right for customers to repair their machinery, we don't support unfettered access to critical on-board software and information pertaining to environmental and safety protections. Unfortunately, right to repair bills, including the Fair Repair Act (H.R. 4006/S. 3830) and similar legislative proposals, have serious environmental, safety, legal, economic, intellectual property and cybersecurity implications.

The Environment, Safety & Legal Liability

The equipment industry has invested significant time and resources to meet the Environmental Protection Administration's (EPA) Tier 4 diesel emissions standards. These specifications, applicable to engines used in off-road equipment, have resulted in a significant reduction in emissions. Of great concern, right to repair proposals threaten important environmental gains as they would permit unfettered access to embedded software to circumvent emissions protections.

Similarly, modern equipment has numerous safety features to protect both equipment operators and the public, the latter who oftentimes are driving or walking past construction sites and other areas while machinery is in use. Granting access to override safety features poses undue risk for operators and bystanders. Additionally, equipment dealers invest countless resources to train certified technicians to work on complex machinery. By mandating access to embedded source code, unqualified individuals will attempt to repair the world's most advanced and sophisticated equipment, at significant risk to themselves, operators, and the public.

The aforementioned begs the question, why would someone want to circumvent emissions or safety protections? The answer is simple: machine performance. Limits on horsepower and other functions the machine might be able to carry out are necessary to ensure equipment meets government emissions and safety standards. A simple Google search yields a plethora of vendors offering products and services that assist equipment owners to illegally modify their machines. Requiring access to source code and embedded software will only proliferate this practice, with significant negative ramifications for the environment and safety.

Proponents of right to repair initiatives tout the environmental benefits because customers won't need to discard products as readily if they are able to fix products themselves. However, heavy equipment is among the most durable manufactured products commercially available. Equipment will oftentimes be sold to a customer, traded-in when the customer purchases a new machine, and subsequently either resold or rented. Improper maintenance or modifications, related to granting unfettered access to source code, jeopardizes a machine's operation and longevity, which may cause negative environmental and safety impacts, and shorten its productive life.

Right to repair policies also create enormous liability issues for equipment dealers and manufacturers. Permitting access to source code allows end-users the ability to modify the equipment. If a tampered tractor causes personal injury or doesn't meet government regulatory standards, liability could fall on the dealer and manufacturer depending on a state's product liability laws. While many equipment manufacturers are large companies that can absorb litigation costs, distributors, which are

overwhelmingly small businesses, will be forced to endure costly litigation and possible judgments should modified machinery cause injury or not comply with laws and regulations.

Economic Impact

Right to repair proposals will completely alter the equipment industry's distribution model, putting countless small businesses at risk. Manufacturers of equipment rely on a network of independent, mostly family-owned small-to-medium-sized companies to sell, rent and service the equipment. These dealers make significant investments in their employees, including training service technicians to repair and maintain the latest high technology machinery. Many AED member facilities are located in rural and underserved areas, creating well-paying careers and economic opportunity.

Equipment dealers also invest extensive capital in parts inventories to ensure repairs and maintenance can occur as soon as possible. Out of service equipment isn't merely an inconvenience—it can ruin a farmer's harvest or delay completion of a bridge or roadway. However, many right to repair proposals require original equipment manufacturers to sell parts and diagnostic tools directly to the public at cost (without profit), completely circumventing the equipment dealer. Aside from effectively dismantling the equipment distribution industry's aftermarket parts business and thereby putting many equipment dealers out of business, logistically it is impractical and would only exacerbate inflationary pressures in the equipment market and create long delays in parts availability.

For many equipment dealers, parts revenue produces the majority of income for the business, though parts margins are far from inordinate. According to AED's most recent Cost-of-Doing Business Report, in 2020, the gross profit margin on parts sales was 27 percent, representing a stable stream of revenue for dealers (in 2014 it was 26 percent), which doesn't even approach price gouging territory. If parts are required to be provided at cost, many dealers would be put out of business, as the average net income for an equipment dealer is only around 3.8 percent.

Anyone can walk into an AED member facility (or go online) and buy OEM parts for their tractor. There's no restriction on who can purchase parts, whether it's an equipment owner, a third-party service provider, an equipment operator, or a member of the general public. However, there will be no incentive for an equipment dealer to carry parts inventory if the manufacturer (or the dealer) is forced to sell without the ability to make a profit.

Intellectual Property and Security Concerns

Manufacturers invest substantially in research and development to produce the most efficient, safe and environmentally conscious equipment possible. The technology is more complex than ever, but the benefits to consumers and the public are immense. As we move to electrification, autonomous tractors and precision agriculture and construction technologies, the complexity and sophistication of the machinery as well as the benefits to society will only increase.

It is this research and development and technological advancement that gives each manufacturer a competitive advantage in providing customer solutions. Forcing manufacturers to provide unfettered access to source code and software disincentivizes future research and development. Why would a manufacturer invest in research and development when the intellectual property developed will be available to anyone?

Additionally, the cyber and national security implications are substantial with broad access to embedded software and source code on equipment. The dangers associated with someone remotely hacking into a

machine for nefarious purposes or an adversary of the United States having access to this technology has broad security and economic ramifications.

Conclusion

For the equipment industry, right to repair proposals are a solution in search of a problem. AED members provide customers and third-party repair providers with parts, tools and other resources to complete the overwhelming majority of tractor repairs.

Enacting these proposals will stifle entrepreneurship and the result will be an unprecedented intrusion by government into the free enterprise system. I reflect on my grandfather and the reasons he got into the equipment distribution industry. He was looking for a better life for his family, the opportunity to create well-paying jobs and careers for his employees, and the privilege of giving back to the community, including in underserved areas like Appalachia.

Most equipment dealers have similar stories because the United States allows entrepreneurs to pursue their dreams. Unfortunately, I worry that should these right to repair policies become law, the viability of the equipment distribution industry will be severely hampered, resulting in lost economic activity, job creation, technological advancements, and a less competitive America.

September 12, 2022

Hon. Jared Golden, Chair & Hon. Claudia Tenney, Ranking Member
U.S. House of Representatives Committee on Small Business Subcommittee on Underserved,
Agricultural and Rural Business Development
2360 Rayburn House Office Building
Washington, DC 20515-0315

Dear Rep. Golden, Rep. Tenney, and Members of the Subcommittee,

Thank you for this opportunity to present testimony at the Subcommittee hearing titled, "Right to Repair and What it Means for Entrepreneurs."

I am a family farmer in Maine. I work closely with our son, Caleb Gerritsen, who is the chief mechanic on our farm. We both strongly support the concept of preserving the right of farmers and independent shops to repair the equipment farmers own. We urge Congress to codify traditional farmer and independent shop repair rights by passing legislation which serves the public good by leveling the economic playing field, restraining monopoly control, and thereby uplifting the economy and enhancing the freedom and liberty of working Americans.

For almost fifty years, along with my family, I have been growing organic crops on our farm. We are located in Aroostook County, the northernmost county in the State of Maine, still referred to as the "Potato Empire." Through the early 1950s, Maine led the nation with the greatest number of acres of potatoes grown in any State. Though in more recent decades potato production has shifted westward, to this day Aroostook County grows more acres of potatoes than any other county in the U.S., save one.

On our isolated farm, adjacent to the North Maine Woods, we raise organic Maine Certified Seed Potatoes and other types of organic seed. Our crops have all been Certified Organic for forty years, including the last twenty years under the regulation of the USDA National Organic Program. We are active, longtime members of numerous farm organizations, including National Farmers Union, Maine Organic Farmers and Gardeners Assn (MOFGA), Organic Eye, and Maine Farm Bureau.

For more than forty years we have directly-sold our crops to retail customers, originally selling at local farmers markets. Beginning thirty-three years ago we developed a mail order organic seed business and catalog, later adding an online store. We retail directly to home and market gardeners and have customers in all fifty States. We employ a dozen local co-workers. Virtually all positions are year-round, and our crew includes both family members and neighbors who help us serve the needs of the tens of thousands of customers in our database. The US Postal Service is our primary parcel delivery vendor, and Fedex is our secondary parcel delivery vendor.

My wife, Megan, and I have handed our farm down to our son, Caleb. He is a skilled mechanic and after high school he increased his knowledge and ability by earning a degree in Diesel Hydraulic Mechanics at the local community college. Caleb does an excellent job maintaining our tractors and equipment. In Aroostook County, it is extremely common for farmers to do most of their own equipment repair work.

By design, in order to increase our own financial farm viability, our farm stability and our overall independence, we long ago consciously made the strategic decision to *only* own farm equipment that we ourselves are able to repair. Therefore, we have avoided purchasing modern, electronically-sophisticated farm tractors and equipment which contain computer chips. For example, on our family farm we rely upon a fleet of older, sturdy, American-made tractors from the 1970s and even before, which we are capable of repairing and in fact have rebuilt ourselves.

We would never choose to place ourselves in the vulnerable position of being at the mercy of malfunctioning electronic sensors, then being involuntarily forced into "limp mode," and becoming locked out from using equipment we "own" until an expensive dealer mechanic arrives at their convenience with their rescuing computer software. When a problem as common and as minor as water condensation in a diesel tank can cause a sudden "limp mode" restriction during peak planting or harvest, not only is an individual farmer placed at risk, but extrapolating the system vulnerability, so is our nation's food security.

In recent years the media has been increasingly covering the widespread rejection by farmers of overly complicated, unreliable and excessively high-priced tractors. As a practical alternative, many farmers in addition to ourselves, are opting to purchase older, proven, reliable tractors which they can completely rebuild for a fraction of the price of a new tractor.

Resistance against dubious new tractor design was documented in a report released last year (https://pirg.org/resources/deere-in-the-headlights-3/). "Of 74 farmers across 14 states surveyed by U.S. PIRG Education Fund and National Farmers Union, 77% indicated that they had bought older-model equipment to avoid the software in newer equipment."

While the entire economy is under duress from the negative impacts of monopoly control, nowhere is the fallout from this concentration of power more apparent than it is in agriculture. At the same time as farmers are facing hard economic times, large multinational corporations are raking in record profits. This is due to massive economic consolidation and monopoly power in the food and agricultural sector, which currently sees two leading firms combining for 70% of corn and 61% of soybean seed sales in the U.S. In the meat industry today, according to a White House briefing addressing "concentration in the meat industry" published on September 8, 2021, the four largest beef beef-packing firms control 82% of the market; while in poultry, the top four chicken processing companies control 54% of the market, up from 35% in 1986; and in the pork industry the level of market consolidation is now up 66%, up from 33% of the market in 1976. (https://www.whitehouse.gov/briefing-room/blog/2021/09/08/addressing-concentration-in-the-meat-processing-industry-to-lower-food-prices-for-american-families/) This level of economic concentration and monopoly power in agriculture has led to a hollowing out of rural America, and a significant decline not only in the number of farms and jobs available in rural communities, but also a complete dismantling of local meat and food processing infrastructure.

Now they're coming for our equipment and our tractors.

As corporate concentration increases, farmers become increasingly disadvantaged on both ends: fewer input sources for farm production - including tractors and equipment - and fewer market opportunities for selling crops.

Dealership consolidation is a troubling manifestation of growing monopoly control. In a follow up PIRG report released this year (https://pirg.org/resources/deere-in-the-headlights-ii-2/), PIRG research indicated "82% of Deere's 1,357 agricultural equipment dealerships are a part of a large chain with seven or more locations. This mass consolidation means that there is one John Deere dealership chain for every 12,018 farms and every 5.3 million acres of American farmland." Even Aroostook County has been impacted by undesirable dealership consolidation. After sixty-three years of independent ownership by the local Theriault family, the local John Deere dealership in Presque Isle was sold last winter to United Ag & Turf which now **owns *63* John Deere agricultural equipment dealerships** (https://www.farm-equipment.com/articles/19872-united-ag-turf-expands-to-63-locations-with-northeast-acquisitions).

In closing, let me encourage your Subcommittee to work together and create legislative remedies which will provide America's ailing family farms with greater resiliency, increase fair market competition and provide Americans with a more stable food supply. Congress should enjoin the U.S. Department of Justice to vigorously enforce existing laws which restrain monopolies, including the Sherman Antitrust Act of 1890. We are living in a new era. Therefore, appropriate modernized legislation will be necessary to adjust to the times and force farm equipment manufacturers and software companies to play fair, prevent abuse and manipulation of markets, and be effectively restrained from negative monopolistic behaviors.

Thank you for this opportunity to testify to your Subcommittee via Zoom. I will be happy to try and answer any questions you may have.

Sincerely,

Jim Gerritsen

Jim Gerritsen
Wood Prairie Family Farm
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www.woodprairie.com

ALLIANCE FOR AUTOMOTIVE INNOVATION

September 14, 2022

The Honorable Jared Golden
Chairman
Subcommittee on Underserved, Agricultural,
and Rural Business Development
House Committee on Small Business
2361 Rayburn House Office Building
Washington, D.C. 20515

The Honorable Claudia Tenney
Ranking Member
Subcommittee on Underserved, Agricultural,
and Rural Business Development
House Committee on Small Business
2069 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairman Golden and Ranking Member Tenney,

As the singular, authoritative, and respected voice of the automotive industry, the Alliance for Automotive Innovation ("Auto Innovators") welcomes the opportunity to provide the Subcommittee with its perspective on the importance of right-to-repair to our companies, their customers, and automotive repair in the U.S.

Focused on creating a safe, clean, and transformative path for personal mobility, Auto Innovators represents the manufacturers that produce nearly 97 percent of cars and light trucks sold in the U.S., in addition to original equipment suppliers, technology companies, and others value-chain members within the automotive ecosystem. As the nation's largest manufacturing sector, the automotive industry is responsible for nearly 10 million U.S. jobs and represents 5.5 percent of the country's gross domestic product.

Competition is alive and well in the automotive repair industry. Consumers have a wide range of options on where to seek service or repair; these include a dealer repair facility, a national chain repairer, an independent repair facility, or individual vehicle owners undertake the repair themselves if technologically inclined. Independent repair facilities currently perform the vast majority of diagnostic and repair work. In fact, over 70 percent of out-of-warranty repair work is performed outside of an automaker's authorized dealer network. This is the very definition of consumer choice.

This well-established, competitive marketplace exists because automakers make all the information and tools necessary to diagnose and repair vehicles available to the independent repair community. This commitment was codified as the 2013 Massachusetts Automotive Right to Repair law, which guaranteed independent repair facilities access to the same information and tools needed to diagnose and repair vehicles that are provided to auto dealers, while respecting consumer privacy and maintaining cybersecurity. In 2014, representatives from the auto industry and the independent repair industry then came together to craft a national memorandum of understanding (MOU) memorializing automaker commitments to follow the Massachusetts law across the entire country. That MOU remains in place today and is working well. In fact, the automotive MOU has been cited by the Federal Trade Commission in their 2021 Nix the Fix report (Report) as an ideal model for other industries to follow when looking to ensure consumer repair options. Specifically, the Report states the automotive MOU

"…had the effect of creating a broad, if not complete, right to repair in the automotive industry across the United States."[1]

The existing MOU also had the foresight to recognize automotive industry is constantly evolving, and consciously futureproofed the law. For example, as vehicles become more connected, certain categories of vehicle data may be accessible via telematic data systems. The national MOU contemplated this evolution of the industry and explicitly requires that automakers make telematics information available to independent repairers and vehicle owners if that information is needed to repair a vehicle, available to an automaker's authorized dealer network, and not otherwise available through another source. Likewise – foreseeing the industry-defining shift toward electric vehicles – the MOU does not discriminate based on powertrain. Regardless of whether a vehicle is powered by an internal combustion engine or an electric motor, automakers are committed to the obligations laid out in the national MOU.

Auto Innovators appreciates the Subcommittee's attention to this important issue. We look forward to continued engagement with the Subcommittee to ensure that the experience and continued success of the auto industry in right-to-repair serves as a positive example in this ongoing dialogue.

Sincerely,

Garrick C. Francis

Garrick Francis
Vice President, Federal Affairs
Alliance for Automotive Innovation

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[1] Federal Trade Commission, *Nixing the Fix: An FTC Report to Congress on Repair Restrictions* (May 2021), *available at,* https://www.ftc.gov/system/files/documents/reports/nixing-fix-ftc-report-congress-repair-restrictions/nixing_the_fix_report_final_5521_630pm-508_002.pdf, p. 45.

AEM
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Equipment Manufacturers

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Subcommittee on Underserved, Agricultural, and Rural Business Development
U.S. House Committee on Small Business
2361 Rayburn House Office Building
Washington, DC 20515

September 14, 2022

Dear Chairman Golden:

The Association of Equipment Manufacturers (AEM) is the North American-based international trade group representing off-road equipment manufacturers and suppliers, with more than 1,000 member companies and more than 200 product lines in the agriculture and construction-related industry sectors worldwide. The equipment manufacturing industry supports 2.8 million jobs in the United States and contributes nearly $288 billion to the national GDP each year.

While our industry supports customers' right to repair their own equipment, the "right to repair" policy proposals we have seen over the past seven years will not accomplish their stated goal of reducing the time and expense for equipment repair. They will, however, open the door to unintended safety, environmental, and economic consequences.

Today's heavy-duty, off-road agriculture and construction equipment has evolved significantly from the tractors of yesteryear. Thanks to American ingenuity and innovation, modern agriculture and construction equipment allows farmers and contractors to be more productive than ever. It reduces the environmental footprint of these sectors through the efficient use of inputs such as fuel, pesticides, water, and fertilizer. These highly complex machines safely enable Americans to build, power, and feed the world and protect the planet.

Equipment manufacturers have always supported customers' right to repair their own equipment and remain committed to providing them with the tools and information needed to reduce downtime and maximize productivity. Equipment manufacturers do not, however, condone modifications that are illegal, unsafe, and harmful to the public and the environment.

Equipment manufacturers empower their customers to perform most repairs on their equipment. In some extremely rare cases, where access to operating software is necessary, a trained and certified service technician may need to perform the repairs. There is a difference between consumers seeking to repair their own equipment—which they can do today—and those who seek access to the source code or operating software so they can circumvent safety and emissions standard or access proprietary intellectual property. Access to the source code or operating software embedded inside equipment is simply not necessary to successfully diagnose and repair problems that might arise.

When proponents of "right to repair" cite cases where customers are unable to repair their equipment, it is almost always due to underlying workforce shortages, poor wireless broadband coverage, the complexity of the repair needed, and/or supply chain issues. Proponents use these anecdotes to purposefully spread misinformation that farmers and contractors are unable to diagnose, repair, and maintain their equipment. If they understood the real issue and were interested in being true partners to address it, they would be joining in our calls to invest more in workforce training efforts for repair technicians, enhance wireless broadband connectivity in rural areas, or to tackle the root causes for why U.S. supply chains are in such crisis. Instead, they propose counterproductive, unnecessary legislative solutions that distract from the critical issues facing U.S. farmers and contractors. Thankfully, the tools and information provided by equipment manufacturers today ensure farmers and contractors can overcome these deep-seated issues on their own, without government intervention, and successfully carry out nearly all repairs on their own.

Regretfully, this misinformation continues to be purposefully circulated in capitals and the media to drum up support for "right to repair" laws at the state and federal level. As the committee considers legislation to require equipment manufacturers to allow unfettered access to the source code and operating software of equipment, we respectfully provide the following counterpoints:

Equipment manufacturers already provide the tools and information needed for diagnosis, repair, and maintenance.

"Right to repair" advocates claim equipment manufacturers do not make parts, manuals, and diagnostic software/tools available to customers. This is incorrect.

In February 2018, the Association of Equipment Manufacturers and the Equipment Dealers Association announced a new industry commitment to provide a comprehensive set of service information tools to customers to further empower them to perform diagnosis, repair, and maintenance of equipment. These tools are now widely available to customers and independent repair shops through authorized dealers. Customers can use these tools to diagnose issues in the field, troubleshoot problems, and clear error codes. In some cases, where adequate broadband is available, trained, and licensed service technicians can access the onboard computer remotely to assist the owner/operator with the repairs or make sure the right tools and parts are ready for field service or pickup at an authorized dealer. Most parts and components are sold directly to customers or independent repair technicians and are not installed by a trained and licensed service technician.

Unfettered access to the source code and/or operating software, which is what repair advocates are after, is simply not necessary for 98 percent of the work required to keep agriculture and construction equipment up and running. Despite this fact and in recognition of the need to help customers reduce downtime and maximize productivity, equipment manufacturers make the following tools and information available to customers and independent repair shops through purchase or subscription:

- Manuals (operator, parts, service)
- Product Guides
- Product Service Demonstrations, Training, Seminars, or Clinics
- Fleet Management Information

- On-Board Diagnostics via diagnostics port or wireless interface
- Electronic Field Diagnostic Service Tools, and training on how to use them
- Other publications with information on service, parts, operation, and safety

But it is important to note, even armed with these tools (or even the source code), repairing heavy, technologically advanced equipment is not quick or easy, nor is there any way to make repair quick or easy. Owners/operators must have a degree of technical experience and expertise to turn error codes into diagnoses, and appropriately remedy the problem. Oftentimes, do-it-yourself repair becomes an exercise in trial and error that last hours, or even days.

For those owners/operators who do not have the time, inclination, or comfort to make their own repairs, authorized independent dealers employ trained and certified service technicians to diagnose, repair, and maintain the equipment in a shop or in the field. Experienced dealer technicians are usually more efficient in diagnosing and repairing equipment, because of their training, expertise, and real-world practice.

Modern equipment is highly sophisticated and complex.

As a result of technological innovations that have greatly reduced emissions, improved safety, and increased efficiency, modern agriculture and construction equipment is highly sophisticated and complex. Many pieces of modern equipment have more lines of code than the original space shuttle. They are built to maximize productivity while carefully complying with federal (and sometimes state) mandates for emissions and safety controls. These machines run as a system; when something is changed, it has cascading impacts down the line. For example, if a farmer wants to increase the horsepower of his or her tractor, the emissions also increase, bringing the machine out of compliance with the Clean Air Act.

In an April 2019 survey of 770 equipment dealers, 33 percent reported seeing modified equipment brought in for service in the 24 months prior. Some dealers saw up to 50 percent of equipment brought in for service had been modified. Common examples of modifications were engine tuning or chipping and changes to hydraulic systems or safety mechanisms.

Equipment manufacturers support hundreds of thousands of family-sustaining jobs in rural areas through authorized dealer networks.

Virtually all agriculture and construction equipment in the United States is distributed via authorized dealer networks. Manufacturers and dealers offer scholarships, stipends, and other incentives to support aspirations to become trained technicians. These dealers are small business owners who employ nearly 300,000 trained workers in stable, high-paying jobs across America.

While repair advocates focus on the potential job growth for independent service technicians, they ignore hundreds of thousands of existing trained and licensed service technicians who take pride in the work they do to support consumers and provide a vital service to their communities. It is inaccurate to assume that trained and licensed service technicians in rural areas will simply open their own repairs shops if they lose their jobs.

Repair advocates callously disregard the role that trained and licensed service technicians play in the diagnosis, repair, and maintenance of agriculture and construction equipment and demonstrate a disturbing lack of awareness of how this sector operates.

"Right to repair" laws will not make repairs faster or less expensive.

The equipment manufacturing industry, like many domestic industries, is in the midst of both a workforce crisis, and a global supply chain crisis. For several generations, secondary schools have pushed students into a "college at any cost" path, instead of educating them about the benefits of a career in technical trades. Coupled with an ongoing pandemic, school and business closures, and occupancy restrictions, our industry simply cannot get enough workers in manufacturers' factories or dealers' shops to meet demand.

Additionally, global supply chain disruptions have made it difficult for anyone to get specialty tools and parts. Due to crumbling infrastructure, our ports are clogged, and our roads and railroads are not adequate to get products to market. It is not a situation of manufacturers and dealers withholding access to these items; these items are simply not arriving in our distribution centers in a timely manner.

"Right to repair" legislation does not solve workforce problems, nor does it address supply chain issues. It does not even promote reliable, wireless rural broadband infrastructure that would allow dealers to "remote on" to a machine in the field or on a jobsite, to diagnose, and offer repair assistance. While these issues are outside of the scope of this committee, legislators wishing to solve repair-related issues should lean on their fellow state and federal legislators to find solutions to state and federal infrastructure, workforce, and trade problems.

In summary, while the equipment manufacturing industry has always supported our customers repairing their own equipment, we do not support "digital right to repair" legislation. These bills will not solve the problem they claim to, and present serious environmental, safety, and rural economic impact consequences.

Sincerely,

Kip Eideberg
Senior Vice President, Government and Industry Relations

Cc: Members of the Subcommittee on Underserved, Agricultural, and Rural Business Development

September 19, 2022

The Honorable Jared Golden
Chairman
Subcommittee on Underserved, Agricultural,
and Rural Business Development
Committee on Small Business
U.S. House of Representatives
Washington, D.C. 20510

The Honorable Claudie Tenney
Ranking Member
Subcommittee on Underserved, Agricultural,
and Rural Business Development
Committee on Small Business
U.S. House of Representatives
Washington, D.C. 20510

Dear Chairman Golden and Ranking Member Tenney:

The Automotive Aftermarket Suppliers Association (AASA) is a division of the Motor & Equipment Manufacturers Association that represents aftermarket suppliers which manufacture motor vehicle parts, components, and systems for use in the vehicle aftermarket industries. Aftermarket suppliers ensure that quality parts and service choices are available to the 281 million vehicles on our nation's roads. Suppliers are the foundation of a vibrant aftermarket industry, which employs more than 4 million Americans across manufacturers, motor vehicle repair facilities, and distribution and services providers. Over two-thirds of AASA's member companies are small manufacturers.

The independent aftermarket currently services around 70 percent of motor vehicle repairs in the United States. AASA's member companies manufacture the parts, tools, chemicals, diagnostics, and technologies that support the small, local businesses throughout the country that complete this important vehicle service and maintenance.

On behalf of this industry, we respectfully share our views on "Right to Repair and What it Means for entrepreneurs." We applaud the Subcommittee for holding this hearing to examine these critical issues.

As vehicle technology continues to advance and vehicle systems become more automated, new barriers to the competitive auto repair market are emerging. Federal and state policies, including cybersecurity and privacy provisions, must not inherently limit a consumer's choice in where, how, and with what parts to repair their vehicles. The automotive aftermarket industry is committed to ensuring safe, affordable, and accessible vehicle service, maintenance, and repair for consumers. Without action by either federal or state legislatures, we are concerned that vehicle original equipment manufacturers and their dealer networks will have a monopoly, preventing consumer choice. A lack of competition in the aftermarket could increase the costs to consumers, limit interoperability and advancement, and impact consumer safety.

The aftermarket industry seeks policy solutions that will allow competition to continue in the aftermarket. Vehicle manufacturers have historically shared with Congress that providing access to vehicle data with the independent aftermarket would create a vehicle safety and cybersecurity risk. Currently, both dealer service bays and independent aftermarket repair shops use real-time,

bidirectional data to repair and maintain vehicles. This bi-directional interaction with the vehicle is used to diagnose and test vehicle systems requiring repair and to turn off dashboard warning lights that indicate that something on the vehicle needs attention after the repair is complete. Aftermarket repair shops are already facing difficulties accessing some vehicles' data, requiring the consumer to make unnecessary choices. These choices can include visiting the dealer to perform a repair, ignoring the light, or, even worse, deactivating the warning light entirely. Each of these choices has a downside for the consumer, from increased costs for the dealer visit to environmental impacts and safety risks from unperformed repair and maintenance.

New technologies are creating technological barriers that can impair the ability of a motor vehicle owner and their chosen vehicle repairer to diagnose, repair, and maintain their vehicles. Additionally, federal and state requirements have not been updated to take into consideration emerging technological barriers. Taken together, technological and legal barriers could eliminate consumer choice and a competitive market.

Allowing the independent aftermarket access to vehicle data for repair, service, and maintenance needs can be done in a safe, cybersecure, and controlled manner that will not put the motoring public at risk. MEMA supports policies that would allow the vehicle original equipment manufacturer (OEM) to utilize cryptographic or technological protections as long as the aftermarket industry continues to have the same ability to diagnose, repair, and maintain a motor vehicle in the same manner as any motor vehicle manufacturer or motor vehicle dealer.

Preventing the aftermarket from having access to vehicle data will remove the choice consumers can now make to repair and maintain their vehicle by relying on the independent aftermarket. In a competitive market, consumers prefer independent service providers over OEM dealers by a ratio of 70 percent to 30 percent; a split that has persisted for decades. An independent study conducted by a firm that works with both automakers and the aftermarket estimated that if repair restrictions were not addressed, that share would drop to 56 percent by 2035 and continue to decline in the future.[1] By locking independent service providers out of the market, repair restrictions artificially distort consumers' natural preference for more cost-effective independent maintenance and repair services and implement monopoly pricing.

The independent aftermarket can continue to be trusted partners in repairing, maintaining and servicing Americans' cars and trucks. The aftermarket can ensure safety, cybersecurity and privacy. We have repaired electronics, software, & safety systems – effectively – for decades. We have dealt with private, security data – such as key codes giving access to vehicles - in an effective, cooperative way with automakers – for decades. The aftermarket has well-established training and certification systems in the industry. As many technology leaders among our members can attest, the technology solutions are available to ensure both cybersecurity and vehicle repair.

In the recent *Cybersecurity Best Practices for the Safety of Modern Vehicles*[2], the National Highway Traffic Safety Administration (NHTSA) recognizes the need for a balance between third party serviceability and vehicle cybersecurity. NHTSA states, "cybersecurity should not become a reason to justify limiting serviceability. Similarly, serviceability should not limit strong cybersecurity controls."

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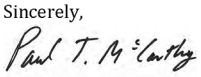
[1] Roland Berger. *"The U.S. Automotive Aftermarket in 2035."* May 1, 2022.
[2] National Highway Traffic Safety Administration. *Cybersecurity Best Practices for the Safety of Modern Vehicles.* September 2022.

AASA welcomes the opportunity to constructively engage with stakeholders on how to best protect consumers financially and against potential cyber-threats, how to secure the intellectual property of the OEMs and the original equipment suppliers who developed much of the systems and components that are subject to this debate, and how to preserve the competition within the aftermarket that provided consumers a choice in how to maintain a vehicle for decades.

AASA is available to discuss this with the Committee and would like to reach a solution that is acceptable to all parties. Should you have questions or concerns, please contact Catherine Boland, vice president, legislative affairs at cboland@mema.org or 301-509-2791.

Sincerely,



Paul McCarthy
President and Chief Operating Officer

ALLIANCE FOR AUTOMOTIVE INNOVATION

Automotive Right To Repair

Myth and Fact

MYTH

Independent repair facilities do not have access to the information they need to diagnose and repair vehicles.

FACT

For decades, automakers have made all the information and tools necessary to diagnose and repair vehicles available to independent repair shops. This commitment was most recently memorialized in the 2013 Massachusetts Automotive Right to Repair law, which guaranteed independent repair facilities access to the same information and tools needed to diagnose and repair vehicles that are provided to auto dealers, while respecting consumer privacy and maintaining cybersecurity. Representatives from the auto industry and the independent repair industry then came together to craft a national memorandum of understanding (MOU) in which automakers agreed to make available to consumers and to independent repair facilities throughout the country the information and tools necessary to diagnose and repair vehicles. That MOU remains in place today and is working. In fact, the automotive MOU has frequently been cited as a model for other industries to follow when looking to ensure consumer repair options.

MYTH

A telematics loophole prevents independent repair facilities from accessing information needed to diagnose and repair vehicles.

FACT

The national MOU specifically requires that automakers make telematics information needed to diagnose and repair a vehicle available to independent repair facilities if such information is provided to auto dealers and is otherwise not available to independent repair facilities. This provision precludes any possibility of automakers using telematics systems to avoid their obligation to provide independent repair facilities with access to the same information needed to diagnose and repair a vehicle that is provided to auto dealers.

MYTH

Independent repair facilities will not have access to information needed to diagnose and repair electric vehicles.

FACT

Under the national MOU, automakers must make the tools and information required to diagnose and repair any vehicle available to independent repair shops. Regardless of whether a vehicle is equipped with an internal combustion engine or an electric motor, automakers are committed to the obligations laid out in the national MOU.

MYTH

Consumer choice is limited in automotive repairs.

FACT

Competition is alive and well in the automotive repair industry. When seeking to have their vehicle serviced or repaired, consumers have a wide range of options – including a dealer repair facility, a national chain repairer, or an independent repair facility. Independent repair facilities currently perform the vast majority of diagnostic and repair work. In fact, over 70% of out-of-warranty repair work is performed outside of an automaker's authorized dealer network. This competitive marketplace is possible because automakers make available the information and tools needed to diagnose and repair a vehicle.

Hi Matt,

I started FiXCO ten years ago last month out the room I was renting in Bellingham, WA. Since then I've built up a great reputation in my community and I am the last local shop left. The others are national franchises some of which have contracts with device manufacturers where they can receive parts directly. I'm not allowed to get parts directly from manufacturers so I have to rely on the 3rd party market.

For the last number of years manufacturers have made it increasingly more difficult to repair the devices we supposedly own. Whether it's gluing in batteries, programming software locks to prevent 3rd party parts from working properly, or simply designing them to be unfix-able.

I find what I do to be very rewarding because it allows me to get my community back up and running again. Often times when customers come into my shop they are very stressed out because when the phone or computer breaks, their world comes to an end. A mom with a broken phone can't get in touch with her kids and vice versa. Or a small business owner who is on their phone all day can't reach customers. The stories are endless.

Having a local shop to bring devices to is essential to healthy communities across this country. We all depend on these devices today and most of us lead very busy lives in this fast paced world. Many people already spend too much time just trying to figure out how to use the devices, new apps, new features, etc and the last thing we need is to spend even more time worrying about where to get them fixed when they break. It's nothing short of insane to have to send an essential device off to a manufacturer or drive two or more hours to the closest manufacturer store/shop in order to get it fixed.

In a divided country, Right to Repair is an issue that can bring us all together. I don't need to know my customers political views when I talk to them about Right to Repair. It doesn't matter if you're a Republican, Democrat, or Independent. We are all sick of not being able to fix things in this country (which we were always able to do in the past) and we are all sick of the monopolistic practices that have consolidated almost every industry in this country.

If we get Right to Repair on the books it will be a giant step in taking back our freedoms and making The United States a better place for all of us.

Thank you for your time,

Mitch

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Chairwoman Nydia M. Velázquez
Committee on Small Business
2302 Rayburn HOB

Ranking Member Blaine Luetkemeyer
Committee on Small Business
2230 Rayburn HOB

Chairman Jared Golden
Subcommittee on Underserved, Agricultural, and Rural Business Development
222 Longworth HOB

Ranking Member Claudia Tenney
Subcommittee on Underserved, Agricultural, and Rural Business Development
1410 Longworth HOB

Sept. 12, 2022
Right to Repair and American Small Business

Dear Chairs Velázquez and Golden, and Ranking Members Luetkemeyer and Tenney,

iFixit is an international, open-source, online repair manual for everything. Our mission is to provide people with the knowledge they need to make their things work for as long as possible. In 2021, the iFixit community taught repair to over 75 million people from almost every country in the world. The strongly collaborative group has published over 85,000 repair guides.

Our business is focused on supplying repair needs to tinkers, fixers, and repair professionals around the world—providing free information and selling high-quality tools, repair kits, and spare parts. iFixit stands firm in its support of the tinkerers and independent repair professionals in our community.

In our role as a repair information business and also a supplier for thousands of small, independent repair shops (many in rural areas), we have a unique perspective on how manufacturers restrict repair, and the impact that has on businesses in repair markets. Rural repair shops are disproportionately burdened by these restrictions, because they have fewer local options for supplies; customers, meanwhile, disproportionately rely on their services, when manufacturer-authorized repair centers may be hundreds of miles away.

In 2019, we organized a detailed breakdown of manufacturer repair restrictions that we have encountered. We submitted this information to the Federal Trade Commission, as part of its “Nixing the Fix” investigation that resulted in their 2021 report concluding that manufacturer justifications for consumer repair restrictions have “scant evidence” to support them. We are

attaching an updated document to this letter to help you understand how manufacturers frustrate or prevent small repair shops across America from completing repairs.

We believe that owners should have the right to repair, modify, and tinker with the things they own. Our local repair businesses are critical infrastructure making our local communities resilient to supply chain disruptions. We support legislation that empowers product owners to fix products, fights inflation, and ensures an open market for repair.

Thank you for investigating this important issue.

Sincerely,

Kyle Wiens
iFixit CEO

Contact:
Elizabeth Chamberlain
Director of Sustainability
liz@ifixit.com

Barriers to Repair:

iFixit Observations for the House Committee on Small Business

September 12, 2022

Executive Summary

Not long ago, repair was most Americans' default course of action when something failed: Repair shops abounded, appliances came with circuit schematics and parts catalogs, and you could open most things with a common screwdriver. But **our things have become increasingly difficult to open and service**. Parts have become scarce. Software has begun to restrict access to repair. Too often, people assume these changes are a technological necessity. Manufacturers lean on the fiction that computational complexity requires them to restrict repair to their own services.

On the contrary, the increasing difficulty of repair is a deliberate manipulation of the market. There has been a **massive, multi-industry push by large corporations to develop and maintain a monopoly on repair**—with similar strategies evident in agriculture, consumer technology, appliances, vehicles, and medical devices. Repair is, for many manufacturers, a big business. Keeping repair in-house lets them tie repair service to product sales and push consumers to replace instead of repair whenever possible. Anticompetitive repair restrictions on parts, tools, diagnostics, and software funnel consumers to manufacturer-authorized service centers. At these centers, repair prices are often deliberately set right at the point where research finds customers will decide instead to buy new. Repair restrictions thus **hurt independent businesses, cost consumers money by driving up the cost of repair, and result in unnecessary toxic waste** when electronics end up in landfills.

The effort to remove these restrictions on repair is called **the Right to Repair movement**. Right to Repair laws have been introduced in 36 states, and three state Right to Repair bills have passed:

- Massachusetts passed the Automotive Right to Repair Act in 2012.
- Colorado passed the Consumer Right to Repair Powered Wheelchairs Act in June 2022.
- New York passed the Digital Fair Repair Act, also in June 2022 (currently pending signature by Gov Hochul).

Federal interest in Right to Repair has also grown. Repair is the subject of **five Federal Congressional bills**, many of which are bipartisan.[1] In 2021, President Biden signed an executive order promoting competition, encouraging the FTC to establish rules supporting the right to independent and DIY repair. The FTC conducted an investigation and concluded in mid-2021 that there is significant evidence of repair restrictions and "no substantial evidence" supporting manufacturers' counterarguments.

We call on Congress to take action in support of Right to Repair by passing the bills before them and by introducing legislation that addresses aspects of this issue not yet touched by proposed legislation. It is **especially crucial that Congress address the copyright restrictions** preventing repair (covered in the Jones-Spartz House Freedom to Repair Act), as these restrictions can only be lifted at the Federal level.

Through iFixit's position—offering a free open-source online repair manual and working with independent repair businesses—we have encountered **evidence of a wide variety of repair**

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[1] The House Fair Repair Act (Khanna, Norton, Meng, Panetta, Bonamici, Porter, Malinowski);
the House Freedom to Repair Act (Jones, Spartz, Porter, Stansbury, DeGette);
the House REPAIR Act (Rush, Davidson, Jones, Dunn, Reed, Boyle, Thompson, Evans);
the Senate Fair Repair Act (Lujan, Lummis, Wyden); and
the Senate Agricultural Right to Repair Act (Tester)

restrictions. In this document, we enumerate those restrictions, record the evidence we've seen, and share the rationale for our support of Right to Repair legislation.

iFixit's Members Regularly Encounter Repair Restrictions

iFixit is an international, open-source, online **repair manual for everything**. Our mission is to provide people with the knowledge they need to make their things work for as long as possible.

We represent a global community of makers, tinkerers, fixers, and repair professionals. In 2021, the iFixit community taught repair to over 75 million people from almost every country in the world. The strongly collaborative group has published over 80,000 repair guides. This massive, free resource has helped people fix **everything from cellphones and game consoles to tractors and musical instruments**.

Many people who come to iFixit are looking to fix something themselves because repairing it at home is cheaper and more convenient than other possibilities. Some live hours away from manufacturer repair options. Others have visited manufacturers' repair centers and been told their device was unrepairable, or that repair would cost nearly as much as a new device. Often **our users are able to prove the manufacturers wrong** by repairing their things affordably.

iFixit also supports independent repair businesses, as well as IT departments at schools and government agencies, by providing free repair documentation and offering wholesale parts and tools. The owners of these businesses frequently describe how manufacturers' repair restrictions hamper their ability to compete in the marketplace. They often cannot get reliable parts or the tools they need to complete repairs consistently.

Increasingly, both individuals and independent repair businesses encounter repair restrictions even after installing a new part: Manufacturers have begun to pair parts via serial number with other parts, which means that error-free repairs require the use of pairing software that manufacturers keep proprietary. We hear from repair business owners about **stacks of broken devices piled in their back rooms**, unrepairable only because of these software limitations.

For our members—and American consumers more generally—the problems of being unable to repair their things are vast and will continue to grow, unless legislators **introduce common sense regulation to restore competition in the repair market.**

More Repair Would Make America Better

We are facing a crisis of global proportions. The material economy is out of control—we're using too many resources to make short-lived electronic products. Unsustainable mining practices ravage the environment. Electronic waste ends up in landfills and waste dumps around the world. Usable products and device components are scrapped instead of salvaged, fixed, and reused.

The material and human cost is significant. We can improve working conditions in factories, restrict mining companies from dumping toxic wastes, limit exports of electronic waste, and tighten enforcement of laws keeping electronics out of landfills. But that will not stem the tide of obsolete devices. It will treat the symptoms but do nothing for the cause of this crisis.

We need to make our products last longer. That includes optimizing electronics not only for the first owner, but also the fourth, the fifth, and the sixth owner by encouraging informal reuse and repair.

More electronics repair is not just good for the environment; repair presents business opportunities with a lot of growth potential. Already, there are many repair jobs: The Bureau of Labor Statistics estimates there are 325,400 electronics and mobile equipment repair technicians (working in repair-related NAICS codes) in the US. Yet there could be more people working in repair, if technicians had more access to parts, tools, and documentation. There are millions of service technicians in informal repair markets around the world—in places like Guangzhou and Shenzhen—that import used electronics from the US for repair and resale. They are able to perform repairs rarely completed in the US. These technicians are more skilled at the repairs because they have local manufacturing expertise and access to copyrighted service documentation and circuit schematics. Decriminalizing access to those schematics would open a pathway to domestic economic growth. The Fair Repair Act under consideration in both the House and Senate would grant independent technicians access to these schematics.

Repair jobs have been lost in many markets as product replacements (particularly consumer products) drop demand for repair. Fortunately, iFixit's community has collaboratively closed some gaps in the manufacturer's planned obsolescence strategy. Thousands of cell phone and tablet repair shops using iFixit repair guides have sprung up around the country in the last few years—representing tens of thousands of jobs that never existed before.

Environmental Benefits of Repair

Repairing and refurbishing electronics has tremendous potential to impact carbon emissions. A 2013 report by McKinsey & Company and the Ellen MacArthur Foundation [1] found that increasing reuse and refurbishment could reduce the production of emissions of mobile phones by 3 million tons of carbon dioxide. Currently, market experts estimate that only 15% of smartphones are recycled—the rest are either put in storage or thrown away. According to McKinsey, increased resale of refurbished cell phones alone could generate $9.4 billion USD in additional economic opportunity annually. If we don't facilitate that economic growth here at home, it will happen overseas.

Repair is an Economic Backstop for Recycling Programs

The US electronics recycling industry is substantially funded by repair and resale. Electronics recyclers were a key driver behind passing the Unlocking Consumer Choice and Wireless Competition Act in 2014. On the surface, that bill was a modification to copyright law that had nothing to do with recycling. But recyclers are some of the largest volume repairers and exporters of smartphones in the country.

An Illinois Economic Activity survey [2] recently showed that repairing electronics creates 13 times as many jobs as recycling it. Thus, a growing contingent of electronics recycling facilities has developed repair and refurbishment operations. Recyclers, thus, face the same problems that repairers do: They struggle with access to information, parts, and tools. But they also face some unique challenges. For instance, they need information about where embedded batteries are located, because if lithium-ion batteries enter a shredder, they can start a facility fire. Unlike repairers, who can call a device's owner to bypass security locks that might impede repair,

recyclers interested in refurbishing all too often encounter anti-theft cloud activation locks. These locks result in products getting shredded instead of repaired.

It's prohibitive to expect recyclers to pay each manufacturer for information, translate the documentation, and convert it into a standardized format for use in their content management systems. Recyclers, consumers and reuse centers alike need access to standardized service documentation at no charge for the complex electronic equipment they own.

Guidelines on electronics reuse released in April 2012 by respected engineering association VDI [3] found that it was "absolutely necessary" to adopt policies to support reuse of electronics. The study found that cannibalization of new product sales would not occur because "the markets of new products and reused products can be well differentiated from one another." VDI also identified social opportunities for reuse: "An increasing number of companies offer work to disabled people by refurbishing electronic data processing technology." For this reason, it is important that service information be made available in a blind/screen-reader friendly, standardized electronic format accessible to people with disabilities.

But there is insufficient research into interface, product, and systems designs that facilitate repair. It's imperative that we strengthen repair infrastructures, institutions, and practices.

We've exported the manufacturing and engineering, but we've also inadvertently lost the knowledge to repair in the process. Technicians here don't have the information they need to repair complex electronics. Every broken electronic that is exported without being repaired is a lost opportunity for job creation. It's time to get that know-how back in America where it can create jobs.

A Brief History of Right to Repair

Local shops are the place to take your car for most fixes. That's largely due to the foundational laws of the Right to Repair movement: the Clean Air Act Amendments of 1990 and the Motor Vehicle Owners' Right to Repair Act of 2012.

The 1990 Amendments demanded that every US car be able to monitor its own emissions by 1996. In order to do that, repair shops needed a standardized way to interface with the car's monitors. Thus was born the OBD-II port, which ensured that you didn't have to pay a ransom to the dealer for every Check Engine light.

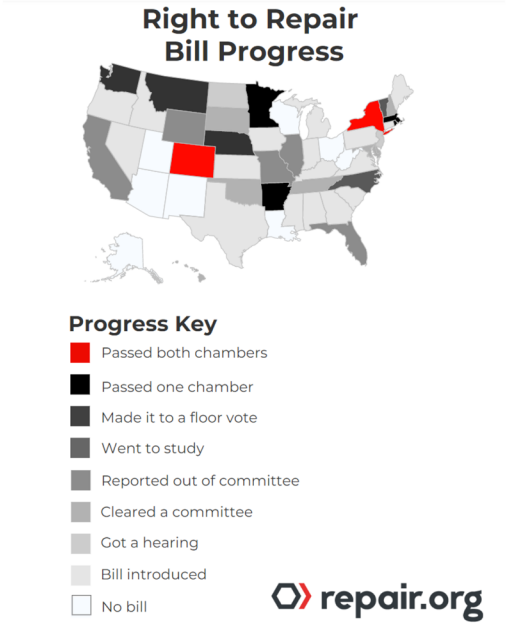
But cars continued to get more complicated, and companies more secretive, after 1996. Massachusetts residents responded by voting in a repair-minded ballot initiative in 2012. After that, the major trade groups representing car makers agreed to incorporate the initiative as a national standard, rather than wait for a patchwork of state bills to follow. Now repair shops can access the same diagnostic tools and data as dealerships, beyond just the OBD-II port. Before this legislation and the more even playing field it created, car makers had an incentive to exaggerate the danger or uncertainty of "unapproved" repairs. (In 2020, Massachusetts voters overwhelmingly approved another ballot measure to expand this to wireless diagnostics. Implementation is currently delayed while automakers appeal the law.)

In early 2012, Nikon sent a letter to their independent service network. Nikon flatly stated that they would no longer supply repair parts to anyone—except 23 Nikon authorized repair facilities.

In one fell swoop, Nikon secured for itself an absolute monopoly over the repair of their products. And it put thousands of qualified, established camera repair technicians out of business.

In January of 2013, the Librarian of Congress effectively banned unlocking cellphones without the permission of the carrier. His reasoning: that modifying a phone's programming was a violation of US copyright law. The effect: cellphone refurbishers wouldn't be able unlock cell phones for reuse. Members of this coalition banded together with other advocates and fought to re-legalize cell phone unlocking. On August 1, 2014, President Obama signed unlocking legislation—ensuring that both consumers and refurbishers would be able to unlock phones.

States began introducing electronics Right to Repair legislation in 2014. Starting with South Dakota, 43 different states have introduced a variety of measures to restore competition in the repair marketplace. In 2022, a bil ensuring the right to repair powered wheelchairs passed in Colorado, and another ensuring the right to repair electronics passed in New York.



Right to Repair Scales Back Other Overreaching Regulations Like Copyright

States' proposed Right to Repair legislation has addressed repair restrictions in a wide range of industries, and as more of these bills continue to pass, many of the mechanisms through which manufacturers restrict repair will become illegal. However, there is one area of repair restriction that states can't touch: Copyright law.

Copyright law hampers repair primarily through Section 1201 of the Digital Millennium Copyright Act, which prohibits circumvention of anti-tampering technological protection measures, even for the purposes of repair. Though the Librarian of Congress has repeatedly approved exemptions to Section 1201 for repair of specific categories of products, the exemptions continue to prohibit distributing software tools for getting around those anti-tampering measures. Effectively, this means that anyone who wants to repair these categories of electronics also has to be a high-level software hacker. Repair technicians rarely have the software skills to get around technological protection measures themselves.

Thus, we believe Section 1201's continued restriction of repair represents a regulatory overreach, running counter to the spirit of the Librarian of Congress's repeated exemptions of repair. The House Freedom to Repair Act (H.R. 6566) would make those exemptions permanent and remove the barriers to distributing software tools, which would help restore competition in the repair market.

We're not the only ones that think so. Reason, a libertarian magazine, wrote about this misuse of copyright in June 2018, after Eric Lundgren was sentenced to prison for cloning Windows restore CDs. Reason quotes Kit Walsh, attorney with the Electronic Frontier Foundation, on the clash between strict copyright restrictions on software and living with software all around us:

> "The list of products and technologies that are affected by this restriction is practically infinite because it's anything that has software embedded in it," says Walsh. "There's a lingering hook that the seller has in your property that they are arguing gives them really broad powers to dictate how you use that property going forward."

Demanding that companies stop putting artificial limits on your ability to make your stuff work better and last longer is not intrusive regulation. It's giving people—and the market—the freedom to work toward something better. That's why the Times endorsed the movement, and why we fight for it.

Independent Repair Is an Effective, Safe Option for Consumers

If you haven't been to an independent repair shop, you're missing out on some true art. Take Steven and Nicole Spink, owners of Olympia iPhone Repair in Washington. They can seemingly fix anything—board-level repairs that Apple would refuse to perform are a piece of cake for them, and far less costly than replacing your device. (You can hear Nicole describe these challenges in this Washington hearing on Right to Repair laws—just skip to 6:40.) Unfortunately, without device schematics and other tools from Apple, they can't always do those jobs, causing them to lose business and forcing customers to pay much more for a full part replacement from Apple.

Apple has long taken a firm stance against these types of repair shops. With scandals like the Error 53 debacle, they've clearly planted their feet on the ground and said "you should repair your phone at an Apple store, or you should buy a new phone." Apart from a few very select Apple Authorized Repair Providers, no one has access to the genuine, OEM parts Apple uses to

make these devices, or the diagnostics and schematics that Apple keeps so close to the chest. As a result, they're stuck turning people away, or settling for third-party components instead. If you go to a good shop, they'll use high-quality replacement parts, but Apple could still brick those at any time. Apple's lobbyists claim that allowing independent shops access to their diagnostic data and parts will threaten their security model, which we think is rather silly—not to mention something other manufacturers have proven wrong time and again.

Manufacturers are focusing on one big lie in order to halt local repair: That you can't trust independent repair shops, only the manufacturers themselves.

Corporate lobbyists paint a bleak picture of third-party shops, arguing that these places use low-quality parts, install them improperly, and grift their customers. This couldn't be further from the truth. In reality, most independent repair shops are no different than your friendly, local auto mechanic whom you recommend to your friends and family any chance you get. And many of them are fully capable of performing the same repairs that manufacturers do—plus some repairs the manufacturers *won't* do.

Independent Shops Are Often as Good as the Manufacturers—If Not Better

Manufacturers constantly tell us that those who are properly trained,"authorized," or "certified" by said manufacturers are the only ones who should be repairing our devices. But more often than not, independent repair shops are just as "properly trained" as anyone to fix your broken stuff.

Many independent repair technicians have gone through the same training and certification processes that manufacturers require out of their own technicians. It's also not uncommon for independent repair shops to have former technicians from big manufacturers on staff, especially from companies like Apple, HP, Microsoft, and others.

What's more, many common repairs don't require extensive expertise. You don't need years and years of training to replace a smartphone battery or a cracked screen. In fact, we constantly receive success stories from folks all over the world who have fixed their own device without any former training or knowledge. From retirees to teenage enthusiasts, our members are impressively capable. Obviously, you want your professional repair technician to be competent, but you don't need a master's degree in engineering and a handful of certifications to be good at fixing stuff.

Gabriel, who has been in the industry since 2002 and is currently the Operations Manager at The Computer Cellar in Durham, NC, can attest to this. "We've met teenagers that have walked into the shop and started discussing computers and technology with us and we've said to each other, 'that kid could do our job,'" he says.

This is true even of those more complex repairs the manufacturers won't tackle. "One of our ex-techs joined us at 19 with only hobbyist experience," Gabriel says. "When he left, he was teaching himself board-level repairs. He's now, at 22, pulling a better salary than me, plus some stellar benefits, working for a university."

"Board-level" repairs involve fixing the circuit board itself by replacing individual components, instead of replacing the entire expensive circuit board. These advanced repairs require microsoldering skills, specialized equipment, and a very steady hand.

So what about those repair parts that manufacturers keep harping on? Well, your local shop has a reputation to uphold. It's in their interest to use a reliable part that meets your high expectations. While it can be difficult (or impossible) to source genuine OEM parts (many manufacturers don't sell their parts to anyone), it's not too difficult to find aftermarket components that come from the same suppliers that manufacturers use.

Furthermore, a lot of shops will harvest the good parts out of other broken devices in order to get that coveted OEM logo.

In fact, we know that a lot of repair shops use high-quality and often OEM parts, because in some cases, we're the ones that supply those parts. We have partnered with several major manufacturers and are now the official parts supplier for Google Pixel, Samsung Galaxy, and Valve Steam Deck.

Through our iFixit Pro wholesale parts program, we partner with independent repair shops and offer our parts, tools, and support so that those repair shops can offer their customers a great experience. All of our parts, even those not directly from the OEMs, are sourced from reputable, trustworthy suppliers, and we do extensive in-house testing on everything to make sure it's up to snuff.

Independent Shops Can Perform Repairs That Manufacturers Won't

Most manufacturers focus their repair training on the most frequent repairs. Apple, for example, won't replace lightning ports in their stores—getting this service requires shipping your device to a dedicated Apple service center. It's not uncommon for manufacturers to turn away repair jobs, either because it's not worth their time and effort, or because they don't have the proper tools and expertise to do the repair. Independent repair shops, however, are much more willing to do these more challenging jobs.

Isaac can attest to this, explaining that manufacturer technicians "are usually 'good repairmen,' but they don't have the level that people repairing boards have, and will never have unless they train. So the Genius from Apple is even worse. He only knows how to use software that says a few things about the phone."

Josephine and Dave Billard's experience with their water-damaged iPhone is a great example. Here's the short version: the couple wanted their photos recovered from an unresponsive iPhone, but Apple said they couldn't help. They were able to find an independent repair shop (iPad Rehab in Honeoye Falls, NY) that could perform more complex board-level repairs, getting the phone up and running just long enough to back up the photos. Apple doesn't have the necessary tools for jobs like this, so without this independent repair shop, Josephine and Dave would've lost their vacation photos forever.

"My own father-in-law experienced an unresponsive screen one random day with his 5th-generation iPod Touch," says Craig Lloyd, former staff writer at iFixit. "Apple said they couldn't fix it, so he ended up just buying a new iPod Touch."

This kind of repair is definitely possible, and a whole new screen assembly is just $40. A local repair shop could perform this repair for much less than the cost of a new iPod Touch.

Allow Consumers to Manage Their Risk Tolerance

No matter what the situation is, there's always going to be *some* risk involved during a repair, whether it's a phone, car, refrigerator, or toaster. But for the most part, that risk is pretty low.

For starters, taking your broken device to an independent repair shop won't void the device's warranty with the manufacturer. Contrary to popular belief, it's actually illegal for a company to void your warranty just because it was opened up and repaired by you or someone else. So don't worry: According to the FTC, those warranty-voiding stickers are completely unenforceable and should be ignored.

Secondly, going to a reputable and trustworthy independent repair shop is perhaps no riskier than bringing the device to the manufacturer itself. Again, many shops are highly trained and use high-quality parts in their repairs. Plus, any good shop worth its salt will offer their own warranty on both the repair and the parts.

Finding a quality local repair shop is no different than finding a good, reputable auto mechanic. Ask for recommendations from friends and family who have patronized independent repair shops in the past—this is probably the best way to find a good shop that can service your broken device, as those who have gone through the same thing as you're about to go through can provide valuable insight into a shop's trustworthiness and level of customer service. We have found that pros who contribute to iFixit tend to run pretty fantastic businesses, and we have a directory of them.

New Obstacles to Service in the Twenty-first Century

Over the last two decades, we've gone from a world where software is rarely seen outside of a general-purpose computer, to a world where billions of microprocessors are embedded in virtually every type of device. As a result, software has become central to the repair of devices.

Manufacturers are, unfortunately, taking this opportunity to prevent users from repairing or modifying the devices they have bought, from tractors to printers to coffee makers.

As the years have worn on, manufacturers have made more and more choices that prevent you from repairing your devices—some may be mere cost-cutting measures, while others are more egregious, locking you out for the sole purpose of preventing you from repairing your own device. Here are some of the most common examples.

Repair Restriction: Slapping "Warranty Void If Removed" Stickers on Your Gadget

Warranty void if removed sticker on a PlayStation 4.

When you crack open the back panel on your device—or perhaps even before—you'll often find a sticker that claims your warranty will be void if you break the seal. But that's illegal under the Magnuson-Moss Warranty Act of 1975. A manufacturer can't deny a warranty repair for, say, your screen just because you replaced your own battery. There are a lot of things manufacturers do to sort of passive-aggressively discourage you from fixing your stuff, but the warranty-void-if-removed stickers are much more overt. This law has gone unenforced for too long, but thankfully the FTC has begun cracking down on this misleading practice—though many manufacturers are still doing it.

Here is a list of big tech companies that we know have used or are still using warranty-voiding stickers:

Acer	AMD	Asus	Crucial
Kingston	Microsoft*	MSI	Nintendo*
PNY	Samsung	Seagate	Sony*
Western Digital			

*Has since updated its policy on warranty-voiding stickers

Additionally, a recent US PIRG study found that manufacturers are routinely flouting Magnuson-Moss with no-disassembly clauses in their user manuals.

Repair Restriction: Using Rare or Proprietary Screws

Most people don't have a tri-wing screwdriver lying around in their garage to open Amazon's Fire TV gaming controller.

Everyone has a screwdriver at home, and some tech-savvy individuals may even have a set of Torx bits in their toolbox. But manufacturers are increasingly using even harder-to-find screws that prevent you from getting inside your device.

"The easiest one to pick on is Apple, because they picked a screw design so obscure we'd never even heard of it," says Jeff Suovanen, Senior Teardown Engineer at iFixit. "And we know it wasn't for engineering reasons, because the iPhone got along fine with ordinary Phillips screws—until all of a sudden the iPhone 4 switched to pentalobe screws. But only on the outside—none of the interior screws were changed. Since no one had a pentalobe driver, the clear intent was to tamper-proof your iPhone."

Apple isn't the only manufacturer to do this, of course—Nintendo was doing it all the way back in the 80s with a special security bit on NES cartridges and, later, on the Super Nintendo. These kinds of lock-out moves have only proliferated. These days, Nintendo uses rare tri-point screws on their hardware, Amazon uses tri-wing screws on the Fire TV, and Sony uses Torx security screws in the PlayStation 4.

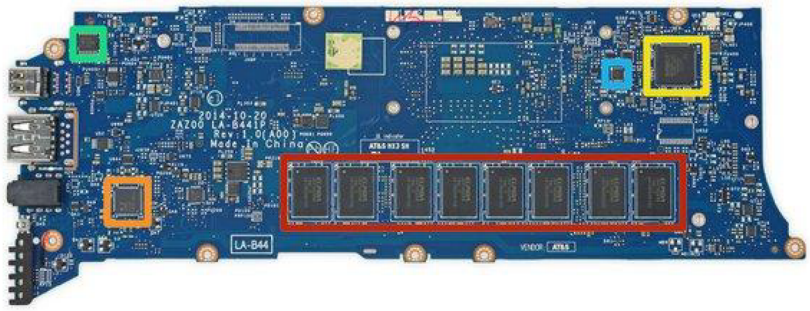
"Torx security screws are some of the most frustrating ones, because a lot of people have torx drivers in their toolbox," says Suovanen. "But manufacturers take that extra little step and use a torx security bit—which again, adds nothing engineering-wise to the device. It's just an attempt to keep you out." Some manufacturers don't go quite this far, but will still hide screws under rubber pads or other panels.

Repair Restriction: Gluing Instead of Using Screws

Microsoft's Surface Pro 3 is one of many devices held together with glue rather than screws. Since then, Microsoft has made incremental gains to improve repairability of their devices.

In the age of sleek, curved devices with no obvious seams, many manufacturers have turned to glue instead of screws to hold things together. "There are legitimate reasons to use glue—like waterproofing," says Suovanen. "But there is almost always a better way, like using screws and gaskets. Glue is very difficult to work with if you're trying to repair something. It's difficult to separate without breaking things, and it's a pain to replace." And when you use glue to hide those seams, it makes the device appear impossible to open, disincentivizing users to repair their device, instead of grabbing the ol' Phillips head and taking a look inside.

Repair Restriction: Soldering Components Together to Make Upgrades Impossible



The Dell XPS 13 is one of many laptops with RAM soldered directly onto the motherboard.

Once upon a time, you could open up your laptop, pop in some new RAM or a bigger hard drive, and get an extra couple years out of your computer. But that's often not the case anymore.

“We’ve grudgingly accepted that most mobile CPUs are soldered onto the motherboard these days, and frequently that’s the only option the manufacturer has—that’s how they come from Intel,” says Suovanen. But RAM and storage are often soldered to the motherboard unnecessarily, eliminating the possibility of otherwise easy upgrades. “There’s no reason why you can’t have a very thin, very light device with modular RAM and a removable blade SSD. We know because we’ve seen it done in devices like the LG Gram and the HP EliteBook line (which is particularly repair-friendly).” When you see a label that says “no user serviceable parts inside,” you know the manufacturer has soldered everything together and you have no chance of squeezing a few extra years out of the device when it slows down.

Repair Restriction: Making It Impossible to Disassemble a Device Without Destroying It

Good luck trying to put this original Microsoft Surface Laptop back together.

In the most egregious cases of planned obsolescence, manufacturers will make a device difficult or impossible to open—at least, without inflicting irreparable damage. “The Surface Laptop is one of the only devices that we’ve awarded a 0 out of 10 in repairability, because it was so obvious that it was designed never to be taken apart or serviced—even by professionals,” says Suovanen. “In a nutshell, Microsoft ultrasonically welded the chassis together and then glued a fabric cover down over the top. There’s no way to take that apart without destroying it. You could put it back together with a roll of duct tape, but that’s about it.” That means if your device breaks, you’re completely out of luck—the manufacturer may give you a new device under warranty, but if your warranty has ended, you’re basically stuck buying an entirely new laptop.

In our Answers forum, one member's question about how to fix the broken glass on your Microsoft Surface has been viewed over 30,000 times. Another member asked whether they could upgrade the RAM on their Surface—proving that they want to hold onto their device instead of buying a new one—and racked up another 30,000 views. In both scenarios, there is no repair solution.

In 2021, Microsoft reached a groundbreaking settlement with shareholders: it committed to studying the environmental impact of making parts and repair information available to shops and individuals, and implement the findings of that study within the next year. Microsoft also pledged to activist shareholder As You Sow to make parts available outside its authorized repair network, and "initiate new mechanisms" to give consumers local repair options.

Microsoft commissioned a report looking at the impact of design for repair on their products by Oakdene Hollins, who found that "all forms of repair offer significant greenhouse gas (GHG) emission and waste reduction benefits. It also found that enabling repair through device design, spare part offerings, and localization of repair have significant potential to reduce carbon and waste impacts."

Repair Restriction: Refusing to Sell Replacement Parts

iFixit's iPhone X battery service manual. The battery is securely glued in place.

Design choices aren't the only way manufacturers prevent repair. Many companies, for example, choose not to offer official replacement parts to individuals or repair techs. "We're used to being able to buy replacement parts for our cars and appliances, but that's often not the case with your smartphone or laptop," Suovanen says. And when manufacturers refuse to sell Original

Equipment Manufacturer (OEM) parts, repair shops and users have to turn to third-party components instead, which can be problematic.

"It's very hard to find good parts when the market is flooded with low-quality imitations that don't perform well. In the case of batteries in particular, some of those third-party components can be dangerous—a cheap battery can destroy your device, or burn down your house." Here at iFixit, we do the legwork for you, sourcing the highest quality parts we can find and testing them thoroughly before selling them in our store. But if you search for a replacement battery elsewhere, there's no guarantee of what you'll get. This whole process would be much easier and safer if people were able to buy official parts directly from the manufacturer.

Even when you *can* find an OEM part, some manufacturers put restrictions in place that prevent you from using it to the fullest. "If you replace the screen on your iPhone—even if it's with a brand new OEM screen off of another identical iPhone—certain features like TrueTone won't work correctly," says Suovanen. This compels users to go directly to the manufacturer for repairs, no matter what they cost.

Responding to pressure from Right to Repair advocates, in 2022 Apple, Samsung, and Google began to make parts and manuals available for some of their products, including smartphones. Google and Samsung are partnering with iFixit to sell these parts.

Repair Restriction: Claiming Repairs Are Impossible or Too Expensive

Removing an iPhone circuit board to recover the data, a service that Apple does not provide.

Finally, manufacturers will falsely tell users that certain repairs can't be done, even when independent shops are perfectly capable of performing them. "People go to the Genius Bar with very common problems that our repair community knows how to fix, but Apple tells them it can't be done," says Suovanen. For example, Apple won't help you recover data on a water-damaged iPhone, and they won't refer you to third-party repair shops who can. In other cases, they may quote a repair price that's high enough that most customers will just throw up their hands and buy a new device.

Repair Restriction: Diagnostic Software

In 2016, Apple confirmed that a software update had been quietly killing phones repaired outside of their "authorized" service network. Initially, the software giant defended "Error 53" as a security measure—and put the blame on independent repair shops and shoddy parts. Consumers, DIY hobbyists, and repair pros called out Apple for misrepresenting the facts. Apple apologized, admitted that Error 53 was a software mistake, and issued a software patch that fixed phones "bricked" by the error.

Apple reversed its position because consumers and repair professionals took a stand. It was a clear victory for the right to repair your stuff. But they continue to indicate that this software may be necessary for repairs going forward: "MacRumors obtained an internal document from Apple stating that Macs with the Apple T2 chip, including the iMac Pro and 2018 MacBook Pro, must pass Apple diagnostics for certain repairs to be completed."

Apple is not the only one limiting access to diagnostics. Farmers need access to John Deere's diagnostic software to debug their equipment. Deere doesn't make it available to anyone except their authorized technicians, driving farmers to extreme options. A Motherboard investigation found underground forums trafficking in pirated diagnostics:

> "Once I was on it, I found dozens of threads from farmers desperate to fix and modify their own tractors. According to people on the forums and the farmers who use it, much of the software is cracked in Eastern European countries such as Poland and Ukraine and then sold back to farmers in the United States. ... "
>
> "Farmers worry what will happen if John Deere is bought by another company, or what will happen if the company decides to stop servicing its tractors. And so they have taken matters into their own hands by taking control of the software themselves."

Repair Restriction: Wireless Telematics

Who owns our vehicles? The answer used to be obvious. But with the advancement of telematics, safety, usage, location, system health, error codes and other data from a car are now tied to cloud services controlled by the manufacturer, so the answer has changed. Manufacturers can shut off remote services at any point and render hardware inoperable, and modifications to software to restore functionality can be illegal under DMCA Section 1201. These restrictions are impacting more people than ever before because the line between hardware and software, physical and digital, has blurred.

Using, repairing, and modifying modern products requires access to information: code, service manuals, error codes, and diagnostic tools. Silicon permeates and powers almost everything we own.

Access to telematics is a property rights issue. Who has the right to the data from our products? Should we be able to reprogram devices to talk to our own servers, rather than the manufacturer's?

The current state of affairs is biased against product owners, turning regular people — like students, researchers, and small repair business owners — into criminals. Fortune 500 telecom manufacturer Avaya, for example, is known for suing service companies, accusing them of violating copyright for simply logging in to their customer's phone systems. With modern telematic systems, automotive manufacturers could use the same techniques to prevent independent management and service of automobiles.

Independent repair shops and software developers can only innovate around open products. The process to create new repair services and apps is only possible if the design is open and supports new ideas, products, and markets. Unfortunately, the manufacturer's approach to telematics has been anything but transparent.

Our industry, and the members that we serve, need to be able to access telematics information. Product owners' data should be used to serve more than the narrow commercial interests of a few large corporations.

In 2020, 74.8% of Massachusetts voters approved a ballot measure, the Vehicle Data Access Requirement Initiative. It demands that carmakers allow owners and repair shops to access their own cars' wireless repair data, starting with model year 2022.

That law is being challenged in Federal court by automakers, who charge that it usurps federal authority and safety standards. Testimony in that case wrapped up in early 2022, with a decision still pending. But Subaru and Kia have already started disabling telematics enabled features in their vehicles rather than complying with the expanded right to repair law. Regardless of the decision, appeals are likely and the ultimate fate of the law may rest in the hands of the Supreme Court.

If this information was available, then governments, researchers, and software startups would be able to innovate with it. They could build pro-active repair apps to help people maintain their equipment more effectively. Imagine if consumers had the information that their vehicle emissions were spiking, and could proactively get it fixed rather than waiting for a smog check. Innovative companies could develop monitoring applications for fleets of equipment.

Open data breeds innovation. Guaranteeing access to telematics information will benefit local innovators, consumers, and the environment.

Manufacturers are unfortunately using new technology to prevent users from accessing their data and repairing or modifying the devices they have bought, from tractors to printers to coffee makers. They are invoking vague 'intellectual property' concerns to justify and protect these anti-consumer behaviors.

These concerns are outweighed by the urgent needs of citizens to maintain their equipment. Property owners should have control over how their property is repaired or modified.

Right to Repair will enable better security. Security professionals agree that if the security of a product relies on nobody knowing how it works, it is much less likely to be effective. Opponents of the Right to Repair appeal to "security through obscurity" as a justification to keep products closed, even though this approach has been discredited by the security community. Kerckhoffs's principle states that a cryptosystem should be secure "even if everything about the system, except the key, is public knowledge."

Repair Restriction: Parts Pairing

One significant obstacle to repairing software-enabled products is parts pairing, the practice of requiring remote authentication to enable a new part. Many manufacturers do this, from John Deere to General Motors to Apple. This practice effectively enables manufacturer control of every single repair, in dramatic contrast to how the free market of resale and repair has traditionally functioned.

We've gotten in the habit the last few years of testing which parts you can swap between iPhones. We test whether parts can be swapped between the same models (iPhone 13 to iPhone 13, 13 Pro to 13 Pro) and across the "Vanilla" / "Pro" divide (iPhone 13 to iPhone 13 Pro).

In 2020, we tested the iPhone 12, which shipped with a rear camera that could not be swapped. Apple provided documents to its techs suggesting that was intentional. Later software updates made the cameras work, but added a warning about a non-"genuine" camera inside.

In 2021, we conducted the same testing on the iPhone 13 Pro, and found yet another parts-swapping conundrum. Replacing the screen disabled Face ID entirely. This was later fixed in iOS 5.2, but True Tone and auto brightness functionality is disabled after a screen replacement, even when using an original Apple screen.

Apple's new consumer repairs program, launched in 2022, allows only a limited, serial number-authorized set of repairs. You cannot purchase key parts without a serial number or IMEI. When you're done installing the part, you need to pair it with the phone you indicated in your purchase, via an over-the-air configurator software Apple says they will make available through their parts store.

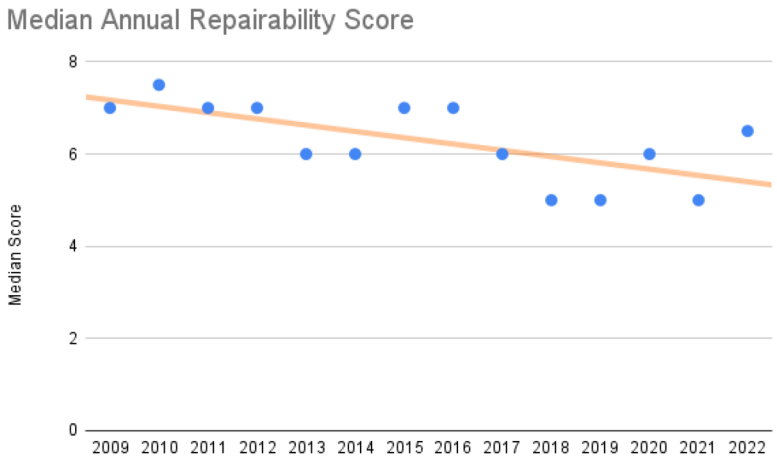
If you use an aftermarket part, there's an "unable to verify" warning after installation. This strategy hamstrings professional third-party repair with feature loss and scare tactics and could dramatically limit options for recyclers and refurbishers, short-circuiting the circular economy.

Requiring parts pairing essentially puts an expiration date on iPhones. When a refurbisher gets a functioning phone with no parts support, there will be no way for them to fully restore a

product that needs a display replacement—even if they have an original Apple display from another phone.

Consumer Electronics Repairability Trends

Note to Small Business Committee: This section was written for the FTC in 2019. More recent scoring and data is available upon request.



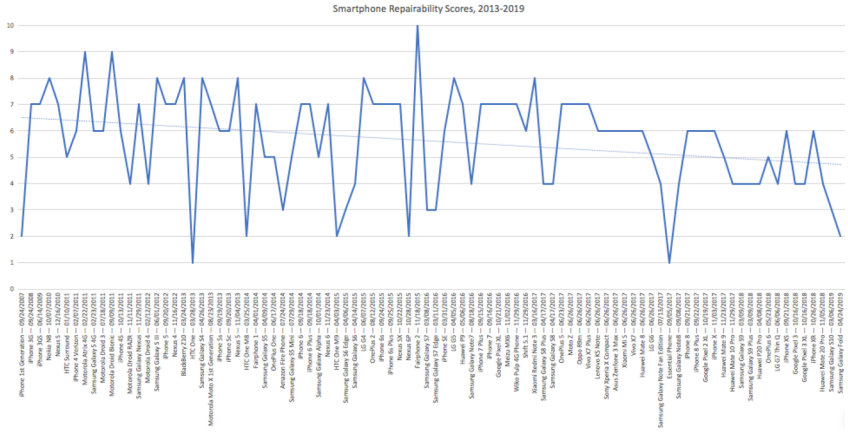
iFixit is the electronics industry leader in rating products for ease of disassembly and repair. Unlike the rest of the tech media, we don't judge products for their release-day usability or aesthetics—we focus on what will happen when the device (inevitably) fails. How time-consuming is it to open? Can broken components be replaced individually, or will you have to swap out more expensive larger modules? Are the components that are most likely to fail easily accessible by consumers? Our score provides a consumer with an educated guess of repair difficulty before they buy the product.

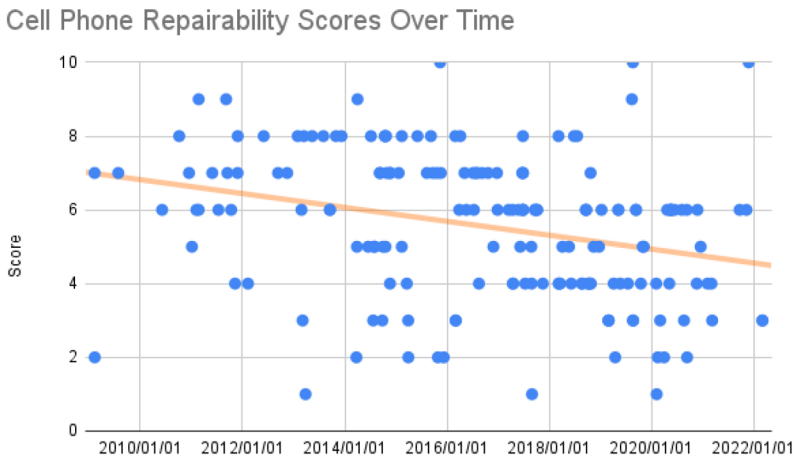
A device with a perfect score may be relatively inexpensive to repair because it is easy to disassemble and has spare parts and a service manual available. Points are docked based on the difficulty of opening the device, the types of fasteners found inside, and the complexity involved in replacing major components. Points are awarded for upgradability, use of non-proprietary tools for servicing, and component modularity.

While our analysis represents a solid cross-section of the market, it is by no means exhaustive. iFixit has repair manuals for many thousands of devices, but our engineers only have time to perform repairability analysis on a much smaller subset. OpenSignal estimates there are tens of thousands of different Android handsets, while our analysis only covers 92 smartphones. These models are chosen primarily for their relevance to the future market (e.g. the Samsung Galaxy Fold), the likelihood of high sales (e.g. the iPhone XR), or design notability (e.g. the Fairphone 2).

Smartphone Repairability

iFixit started scoring cell phones in earnest in 2011, but this data includes the early iPhone products because of its significance to the industry. In the feature-phone and Blackberry heyday, cell phones were known for being highly repairable. Early Nokia phones have achieved an almost mythical reputation for their indestructibility. The iPhone changed the market dramatically.





Notable historical anomalies are the original iPhone, in which serviceability suffered because of the rush to market; the HTC One that became notorious for difficult serviceability; and the Fairphone 2 that was marketed primarily as a socially responsible phone with the aim of perfect serviceability (the phone ships with a service manual and the manufacturer sells service parts).

The iPhone is designed for serviceability by Apple at their retail stores. The physical design is optimized for relatively fast replacement of the two most common failure items, the screen and the battery, at Apple's retail locations. This somewhat repair-friendly design has helped catalyze the independent repair industry, despite a few bumps in the road (e.g. the Touch ID sensor on iPhones is not repairable by independents due to lack of diagnostic software).

The overall trend in the smartphone industry is toward integrated batteries that are glued down and difficult to remove safely, thin designs that require complete disassembly in order to replace the screen, and thin components that are very challenging to remove without damage during disassembly. The last flagship smartphone to include a user-replaceable battery was the LG G5 in 2016.

Parts pricing also has an impact. Samsung parts are notoriously expensive, which makes repairs less likely. "A lot of people don't want to pay $200 for a repaired phone, and a lot end up upgrading instead," wrote Tracey Chancellor, a sales and service manager at Experimac in Midlothian, Va., via Twitter DM to iFixit. "I think people are more inclined to fix an iPhone because it also holds its value much longer than Samsung (phones) do." On the used device market Swappa, an S8 released in mid-2017 for $750 now goes for about $200. A 2017 iPhone X, on the

other hand, still nets more than $500 as of this writing, and even the LCD-screen iPhone 8 from that year goes for $300.

“They’re (also) more expensive because you have to work from the back in, unlike iPhones which (you can work) from the front,” Chancellor wrote. Read our guide to replacing the screen on a Galaxy S9, and you’ll see Chancellor is understating the challenge. The process involves a number of warnings, very delicate finger work, and possibly more part replacements than you anticipated.

With no viable aftermarket parts and few refurbished screens to compete with, Samsung has shaped the repair market for their products.

For the sake of brevity, we have included a summary score for each device. A complete teardown and repairability report for each product is available on iFixit.com.

Phone	Release Date	Score
Samsung Galaxy Fold	4/24/19	2
Samsung Galaxy S10	3/6/19	3
Huawei Mate 20 Pro	11/5/18	4
iPhone XR	10/26/18	6
Google Pixel 3	10/16/18	4
Google Pixel 3 XL	10/16/18	4
iPhone XS	9/21/18	6
LG G7 Thin Q	6/6/18	4
OnePlus 6	5/23/18	5
Huawei P20 Pro	4/8/18	4
Samsung Galaxy S9	3/9/18	4
Samsung Galaxy S9 Plus	3/9/18	4
Huawei Mate 10 Pro	11/29/17	4
Huawei Mate 9	11/23/17	5
iPhone X	11/3/17	6
Google Pixel 2 XL	10/19/17	6
iPhone 8 Plus	9/22/17	6
iPhone 8	9/21/17	6
Samsung Galaxy Note8	9/8/17	4
Essential Phone	9/5/17	1
Samsung Galaxy Note Fan Edition	7/13/17	4
Moto Z	6/26/17	7
Oppo R9m	6/26/17	7
Vivo X7 Plus	6/26/17	7
Lenovo K5 Note	6/26/17	6
Sony Xperia X Compact	6/26/17	6
Asus Zenfone 3 Max	6/26/17	6

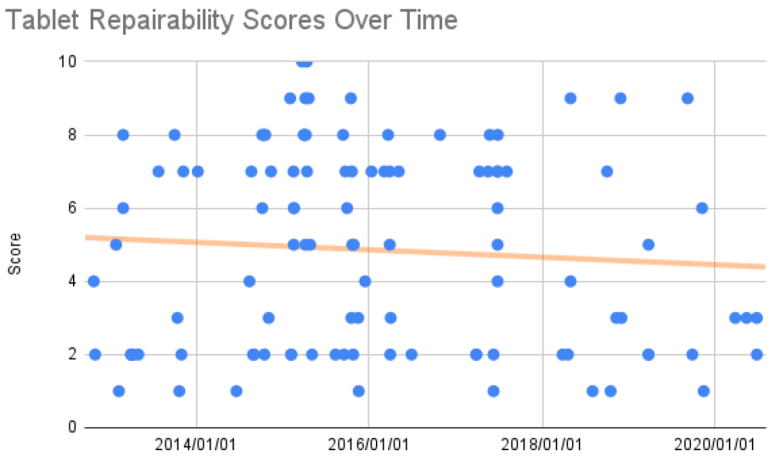
Xiaomi Mi 5	6/26/17	6
Vivo X7	6/26/17	6
Huawei Mate 8	6/26/17	6
LG G6	6/26/17	5
OnePlus 5	6/23/17	7
Samsung Galaxy S8 Plus	4/17/17	4
Samsung Galaxy S8	4/17/17	4
Xiaomi Redmi Note 3	3/16/17	8
Wiko Pulp 4G Phone	11/29/16	7
Shift 5.1	11/29/16	6
Meizu MX6	11/2/16	7
Google Pixel XL	10/21/16	7
iPhone 7	9/16/16	7
iPhone 7 Plus	9/15/16	7
Samsung Galaxy Note7	8/18/16	4
Huawei P9	5/6/16	7
LG G5	4/5/16	8
iPhone SE	3/31/16	6
Samsung Galaxy S7 Edge	3/11/16	3
Samsung Galaxy S7	3/8/16	3
Fairphone 2	11/18/15	10
Nexus 6P	10/28/15	2
Nexus 5X	10/22/15	7
iPhone 6s Plus	9/25/15	7
iPhone 6s	9/24/15	7
OnePlus 2	8/12/15	7
LG G4	6/7/15	8
Samsung Galaxy S6	4/14/15	4
Samsung Galaxy S6 Edge	4/6/15	3

HTC One M9	4/3/15	2
Nexus 6	11/23/14	7
Samsung Galaxy Alpha	10/1/14	5
iPhone 6	9/18/14	7
iPhone 6 Plus	9/18/14	7
Samsung Galaxy S5 Mini	7/29/14	5
Amazon Fire Phone	7/24/14	3
OnePlus One	6/17/14	5
Samsung Galaxy S5	4/9/14	5
Fairphone 1	4/1/14	7
HTC One M8	3/25/14	2
Nexus 5	11/4/13	8
iPhone 5c	9/20/13	6
iPhone 5s	9/19/13	6
Motorola Moto X 1st Generation	8/23/13	7
Samsung Galaxy S4	4/26/13	8
HTC One	3/28/13	1
BlackBerry Z10	3/24/13	8
Nexus 4	11/16/12	7
iPhone 5	9/20/12	7
Samsung Galaxy S III	6/1/12	8
Motorola Droid 4	2/12/12	4
Samsung Galaxy Nexus	11/29/11	7
Motorola Droid RAZR	11/11/11	4
iPhone 4S	10/13/11	6
Motorola Droid Bionic	9/9/11	9
Motorola Droid 3	7/18/11	6
Samsung Galaxy S 4G	2/23/11	6
Motorola Atrix 4G	2/22/11	9

iPhone 4 Verizon	2/7/11	6
HTC Surround	1/10/11	5
Nexus S	12/16/10	7
Nokia N8	10/7/10	8
iPhone 3G	9/24/09	7
iPhone 1st Generation	9/24/07	2
iPhone 3GS	6/14/08	7

Tablet Repairability

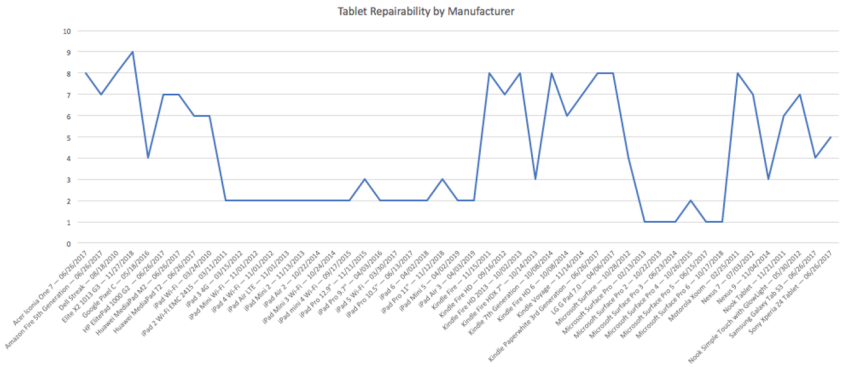
Tablets are effectively smartphones with a large battery and a large screen. The extra space could allow for improved serviceability relative to a smartphone, but only some manufacturers are taking advantage of this.



Serviceability in the tablet market is bimodal. With the exception of the original iPad, Apple and Microsoft sell tablets that are very difficult to disassemble. HP, Lenovo, Acer, Amazon, and others have sold tablets with a more serviceable design but have had trouble differentiating themselves in a market that rewards thin, glued together designs. Apple's iPads are dramatically more challenging to repair than their iPhones.

That's problematic for schools, which Apple has heavily targeted. Schools are a brutal place for electronics—they need to be long-lived and fixable within limited education budgets. iPads are particularly poorly configured for education. A combination of minimal waterproofing, a non-replaceable charging port, integrated battery, zero upgradability, and glue throughout makes repairs challenging enough that it can drive schools to replace devices.

Our serviceability conclusions in the tablet market were replicated by Fraunhofer IZM in an independent study. [4]



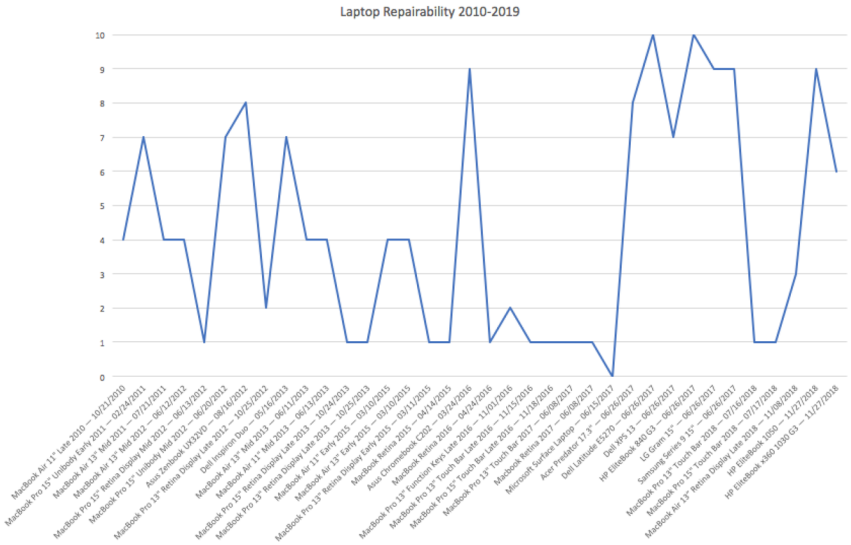
Tablet	Release Date	Score
iPad Air 3	4/3/19	2
iPad Mini 5	4/2/19	2
Elite X2 1013 G3	11/27/18	9
iPad Pro 11"	11/12/18	3
Microsoft Surface Pro 6	10/17/18	1
iPad 6	4/2/18	2
Acer Iconia One 7	6/26/17	8
Kindle Paperwhite 3rd Generation	6/26/17	8
HP ElitePad 1000 G2	6/26/17	7
Huawei MediaPad M2	6/26/17	7
Amazon Fire 5th Generation	6/26/17	7
Huawei MediaPad T2	6/26/17	6

Sony Xperia Z4 Tablet	6/26/17	5
Samsung Galaxy Tab S3	6/26/17	4
Microsoft Surface Pro 5	6/15/17	1
iPad Pro 10.5"	6/13/17	2
LG G Pad 7.0	4/6/17	8
iPad 5 Wi-Fi	3/30/17	2
Google Pixel C	5/18/16	4
iPad Pro 9.7"	4/3/16	2
iPad Pro 12.9"	11/11/15	3
Microsoft Surface Pro 4	10/26/15	2
iPad mini 4 Wi-Fi	9/17/15	2
Kindle Voyage	11/14/14	7
Nexus 9	11/4/14	3
iPad Mini 3 Wi-Fi	10/24/14	2
iPad Air 2	10/22/14	2
Kindle 7th Generation	10/8/14	8
Kindle Fire HD 6	10/8/14	6
Microsoft Surface Pro 3	6/23/14	1
iPad Mini 2	11/13/13	2
iPad Air LTE	11/1/13	2
Microsoft Surface Pro 2	10/22/13	1
Kindle Fire HDX 7"	10/14/13	3
Kindle Fire HD 2013	10/2/13	8
Microsoft Surface Pro	2/13/13	1
iPad Mini Wi-Fi	11/1/12	2
iPad 4 Wi-Fi	11/1/12	2
Microsoft Surface	10/28/12	4
Kindle Fire HD	9/16/12	7
Nexus 7	7/3/12	7

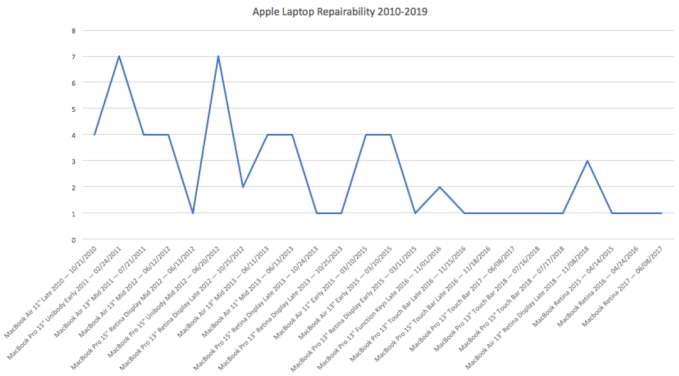
Nook Simple Touch with GlowLight	5/30/12	7
iPad 3 4G	3/15/12	2
Nook Tablet	11/21/11	6
Kindle Fire	11/15/11	8
iPad 2 Wi-Fi EMC 2415	3/11/11	2
Motorola Xoom	2/25/11	8
Dell Streak	8/18/10	8
iPad Wi-Fi	3/24/10	6

Laptop Repairability

Due to the associated cost, iFixit assesses fewer laptops than tablets and smartphones.



Because of our revenue model, most of the laptops that we assess are manufactured by Apple, and we have particularly deep insight into their serviceability trends. While the industry as a whole has many repairable laptop options still available, Apple steadily shifted toward glued-together, difficult-to-repair products since 2012. Somewhat predictably, those 2012 models are still in heavy demand, and still sell for upwards of $700.



Tablet	Release Date	Score
MacBook Air 11" Late 2010	10/21/10	4
MacBook Pro 15" Unibody Early 2011	2/24/11	7
MacBook Air 13" Mid 2011	7/21/11	4
MacBook Air 13" Mid 2012	6/12/12	4
MacBook Pro 15" Retina Display Mid 2012	6/13/12	1
MacBook Pro 15" Unibody Mid 2012	6/20/12	7
Asus Zenbook UX32VD	8/16/12	8
MacBook Pro 13" Retina Display Late 2012	10/25/12	2
Dell Inspiron Duo	5/16/13	7
HP EliteBook 1050	11/27/18	9
HP EliteBook x360 1030 G3	11/27/18	6
MacBook Air 13” Retina Display Late 2018	11/8/18	3
MacBook Pro 15" Touch Bar 2018	7/17/18	1
MacBook Pro 13" Touch Bar 2018	7/16/18	1
HP EliteBook 840 G3	6/26/17	10
Dell Latitude E5270	6/26/17	10
Samsung Series 9 15"	6/26/17	9

LG Gram 15"	6/26/17	9
Acer Predator 17.3"	6/26/17	8
Dell XPS 13	6/26/17	7
Microsoft Surface Laptop	6/15/17	0
MacBook Pro 13" Touch Bar 2017	6/8/17	1
Retina MacBook 2017	6/8/17	1
MacBook Pro 15" Touch Bar Late 2016	11/18/16	1
MacBook Pro 13" Touch Bar Late 2016	11/15/16	1
MacBook Pro 13" Function Keys Late 2016	11/1/16	2
Retina MacBook 2016	4/24/16	1
Asus Chromebook C202	3/24/16	9
Retina MacBook 2015	4/14/15	1
MacBook Pro 13" Retina Display Early 2015	3/11/15	1
MacBook Air 11" Early 2015	3/10/15	4
MacBook Air 13" Early 2015	3/10/15	4
MacBook Pro 13" Retina Display Late 2013	10/25/13	1
MacBook Pro 15" Retina Display Late 2013	10/24/13	1
MacBook Air 11" Mid 2013	6/13/13	4
MacBook Air 13" Mid 2013	6/11/13	4
Dell Inspiron Duo	5/16/13	7
MacBook Pro 13" Retina Display Late 2012	10/25/12	2
Asus Zenbook UX32VD	8/16/12	8
MacBook Pro 15" Unibody Mid 2012	6/20/12	7
MacBook Pro 15" Retina Display Mid 2012	6/13/12	1
MacBook Air 13" Mid 2012	6/12/12	4
MacBook Air 13" Mid 2011	7/21/11	4
MacBook Pro 15" Unibody Early 2011	2/24/11	7
MacBook Air 11" Late 2010	10/21/10	4

Apple's newer laptops have suffered from a spate of keyboard reliability problems. Because the design integrates multiple parts—the keyboard, trackpad, battery, and upper case are a single replaceable module—aftermarket keyboard repairs are not cost effective.

Additionally, most new laptops solder down both the RAM and storage to the board, preventing users from upgrading their devices to meet their needs. Integrating the storage into the main board is a particular challenge for service, because the device is inseparable from the data. This is a particular challenge for secure military installations and government research facilities at the Department of Energy.

The Failure of Green Standards to Inform Repairable Device Design

Tech companies are standing in the way of stronger green electronics standards in the US, according to a report by Repair.org. It finds that device manufacturers have systematically blocked attempts to promote longer-lasting, more repairable devices.

Green electronics standards help people identify sustainable products and reward manufacturers that incorporate green designs. New products are scored against environmental performance criteria and are included on the EPEAT registry with a Bronze, Silver, or Gold designation. Eco-minded buyers—including the US government—rely on the EPEAT registry to guide billions of dollars in purchasing.

But manufacturers have been watering down the standards, as detailed in an analysis—Electronics Standards Are In Need of Repair—commissioned by Repair.org. The standards are supposed to be written by a balanced group of volunteer stakeholders, including representatives from major electronics producers. But manufacturers now occupy a large number of seats on the standards boards. They are abusing their position, diluting the standards to meet their existing products instead of designing leadership standards that encourage better products.

Despite overwhelming consensus that extending product lifespans is better for the environment, tech companies have largely blocked efforts to award points for products that are easier to repair, easier to upgrade, and easier to disassemble for recycling.

Instead of leading the way, green standards in the US "have become a complicated way for manufacturers to greenwash products that have a devastating environmental impact and pat themselves on the back for business as usual," the report concludes.

Relevant Supreme Court Decisions

The Supreme Court has repeatedly upheld that reuse and repair do not infringe on a manufacturer's rights. In Kirtsaeng v Wiley (2013), they affirmed that a copyrighted work (like a book or a software program embedded inside electronic equipment) can be resold.

That's important, because this case could have had far-reaching implications on the legality of reselling *any* product made overseas... which is pretty much everything.

Over $2.3 trillion worth of foreign goods were imported in 2011 alone, SCOTUS reported. These days, everything—from cars to computers to cell phones—contains copyrighted materials. A ruling in favor of John Wiley & Sons could have made selling your iPhone on eBay or your Toyota on Craigslist illegal—a fact that influenced the court's decision.

"A geographical interpretation would prevent the resale of, say, a car, without the permission of the holder of each copyright on each piece of copyrighted automobile software," wrote Justice Stephen Breyer. "[. . .]Without that permission a foreign car owner could not sell his or her used car."

In Lexmark v Impression (2017), they again sided with product owners, ensuring that owners couldn't be prosecuted for patent infringement for reselling products (or parts of products). Impression Products wanted to make toner a bit cheaper by refilling Lexmark printer cartridges. Lexmark of course hated that and sued.

Impression Products vs. Lexmark International hinged on two points: Did Impression infringe upon Lexmark's patents by (1) reselling cartridges in the United States when Lexmark explicitly prohibited reuse and resale, and (2) importing without authorization cartridges Lexmark sold abroad. Various courts split on these questions, and everyone from the AARP and Huawei to Costco and the Auto Care Association weighed in when the case finally reached the Supreme Court.

"This case raises important questions about the reach of American patent law and how much control a manufacturer can exert after its products have been lawfully sold," the editorial board of The New York Times wrote in 2015. "Taken to their logical conclusion, Lexmark's arguments would mean that producers could use patent law to dictate how things like computers, printers, and other patented goods are used, changed, or resold and place restrictions on international trade."

"Take a shop that restores and sells used cars," chief justice John Roberts wrote in the majority opinion. "The business works because the shop can rest assured that, so long as those bringing in the cars own them, the shop is free to repair and resell those vehicles. That smooth flow of commerce would sputter if companies that make the thousands of parts that go into a vehicle could keep their patent rights after the first sale." No one besides the dealership would fix your car if it meant risking a patent lawsuit.

With the Supreme Court issuing definitive rulings on copyright and patent exhaustion, expect manufacturers to turn to contract law—like sneaky end user licensing agreements—to enforce their will. You already see it happening. John Deere, after losing a DMCA 1201 exemption fight to Repair.org, simply updated its EULA to block software modification in its tractors. Litigation dodged, problem solved. "They can't infringe upon your ownership rights if you've already signed them away," Gay Gordon-Byrne, director of Repair.org, told iFixit.

A Plan to Restore Our Right to Repair

This section outlines four steps that would increase access to repair options across America.

1. Make Service Manuals Public

To keep electronic devices working for as long as possible, recyclers, professional technicians, and home repair experts need information about how to safely and successfully disassemble their electronics. Publishing comprehensive service documentation will extend electronics' useable life better than any other single action.

These manuals should include exploded diagrams of parts, compatibility charts, wiring diagrams, step-by-step disassembly instructions with required tools, product specifications, maintenance procedures, and troubleshooting information. When good repair documents are freely and easily available, people will fix their old devices instead of buying new.

Fortunately, almost all manufacturers already have this information, and could enact real, immediate change by simply making it publicly available. Historically, manufacturers always provided this information to their customers. Recently, though, some companies have chosen to treat service documentation as proprietary information and guard it from public view. Apple in particular is known for using copyright law and legal threats to prevent retransmission of their service manuals.

Of course, not all manuals are created equal. Some manufacturers have some service documentation available, but it is not as useful as it could be. Open and useful service manuals will have these characteristics:

1. **User-friendly formatting**. Large images and diagrams make manuals easier to follow. Manuals should be available on the web and as downloadable PDFs for offline viewing.
2. **Machine-friendly file format**. In addition to being user friendly, manuals need to be available in a format that is adaptable for future uses. Machine-readable formats like XML and oManual (IEEE 1874) make full use of the information available to new distribution channels. Examples include allowing developers to use it in a cell phone app or using it at a disassembly bench in a recycling facility.
3. **Open-source license that allows redistribution and modification**. If licensed under a license like the Creative Commons (CC-BY), repair experts can improve repair documents in the future. Plus, an open license allows the documents to be distributed across jurisdictions.

Dell, HP, and Lenovo already make their documentation public, which has helped create tens of thousands of repair jobs. But it would be more effective if technicians could reproduce the documentation the way that foreign technicians do. Fixing this copyright issue would bring us up to par with where the Chinese are now.

2. Make Circuit Diagrams Public

Repair isn't always a matter of simply swapping out trouble components. When complex components fail, they should be fixed instead of sent off for recycling. Board-level repairs require circuit schematics, which include component layout and electronic wiring diagrams. These documents make it possible for technicians to replace individual capacitors, for example, instead of scrapping an entire circuit board. Since circuit diagrams are largely standardized for

international use, these diagrams are especially useful to aftermarket refurbishers overseas, where much of the component-level repair actually takes place.

These schematics are in high demand by technicians. iFixit received a DMCA takedown notice from Apple on December 8, 2015, demanding the removal of a circuit schematic uploaded by a community member for a MacBook Pro logic board. YouTube personalities Louis Rossman and Jessa Jones post popular training videos for technicians using schematics that are not available through legal means.

The circuit diagram should include the approved vendor list, or AVL, and Bill of Materials (BOM) detailing the specific part number and manufacturer for each component. It's important to know precisely which parts are needed.

The capacitor plague caused millions of electronics over the last twenty years to fail prematurely. The parts needed to fix the failing devices usually cost less than $1, but knowing which parts to buy requires access to manufacturer information. Because this information is not available, relatively few machines have been repaired. Most were shredded. Some particularly savvy repair technicians have reverse engineered the circuit and created informal diagrams, which vary widely in quality and availability. Authoritative circuit diagrams would make component repair more attainable for both professional technicians and do-it-yourselfers.

3. Make Semiconductor Documentation Datasheets Public

Microchips are the most toxic part of electronic devices. Massive amounts of high-purity water, electricity, and toxic chemicals such as arsenic are used in semiconductor fabrication. Despite the enormous environmental costs, microchips are everywhere—from children's toys to complex computers.

Running any functional chip through a shredder is a massive waste of resources. Even when a device is beyond repair, chips can be recovered and repurposed. Made widely available on the internet, semiconductor engineering documentation would allow technicians around the world to recover microchips and reuse them in other devices.

4. Make Service Parts Available to Third Parties.

California law requires manufacturers make a service option available for seven years after the sale of a device. Manufacturers generally comply with this by providing repair service for a fee, rather than selling parts to independent service technicians and consumers.

Without access to OEM parts, service technicians are reliant on gray market parts and parts scavenging, where they pull parts from non-functional devices.

Conclusion

A robust repair market creates and expands job opportunities in the US, keeps reusable and repairable products out of the waste and recycling streams, and gives consumers more options for what to do with a malfunctioning product.

Over the last few decades we've gone from a world where software is rarely seen outside of a general-purpose computer, to a world where billions of microprocessors are embedded every year in virtually every type of device. Essentially all categories of manufactured products, from lightbulbs to toothbrushes, now contain software that is central to their functionality. As a result, software has also become central to their repair. Manufacturers are, unfortunately, taking this opportunity to prevent users from repairing or modifying the devices they have bought, from tractors to printers.

Americans expect to be able to tinker with and repair their devices. Allowing more people to repair devices is a broad public good that is hindered by a number of companies' short-term focus. We can, and should, do better.

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[4] Fraunhofer IZM. "Disassembly analysis of slates: Design for repair and recycling evaluation." http://publica.fraunhofer.de/starweb/servlet.starweb?path=epub0.web&search=N-255111

Illegal Tampering Coalition

September 12, 2022

The Honorable Jared Golden
Chairman
Subcommittee on Underserved, Agricultural, and Rural Business Development
U.S. House of Representatives
Washington, DC 20515

The Honorable Claudia Tenney
Ranking Member
Subcommittee on Underserved, Agricultural and Rural Business Development
U.S. House of Representatives
Washington, DC 20515

Dear Chairman Golden, Ranking Member Tenney & Members of the Committee:

Our coalition is unified in opposition to policies that would allow for unfettered access to the software governing safety and security of our products. And, in the case of engine-powered products, the software controlling emissions technology on products manufactured, sold, and operated by coalition members.

Often, we find proponents of "Right to Repair" policies include the need for access to this software in their advocacy. However, we believe giving access to source code will increase the risk of tampering that runs afoul of applicable Federal safety, security, and emission requirements. Additionally, it threatens to undermine manufacturers' innovation and intellectual property rights.

Another potential risk is due to damage from modifications, which must be understood as distinctly different than repairs, by untrained individuals. Modifications create product safety and performance issues, which can lead to claims against the original equipment manufacturers (OEMs). In addition, dealers who take trade-ins or refurbish used equipment, as well as subsequent owners, may not know the equipment is modified and are at risk of catastrophic failures.

Our industries and customers share in the desire to minimize downtime and maximize productivity. That is part of the reason why our broad coalition has invested significant capital in cutting-edge proprietary innovations that incorporate the latest technology, training, and support for end users.

Our coalition members do not believe that proprietary software, developed specifically for the safe operation of equipment that meets strict government regulations, should be used to "legalize" tampering. Because of these substantial concerns, Right to Repair legislation affecting our coalition members has been rejected in every state it has been introduced. You can find more information on the website www.illegaltampering.com.

COALITION MEMBERS

Associated Equipment Distributors
Association of Equipment Manufacturers
Connecticut Construction Industries Association
Deep Southern Equipment Dealers Association
Diesel Technology Forum
Equipment Leasing and Financing Association
Far West Equipment Dealers Association
International Snowmobile Manufacturers Association
International Union of Operating Engineers
Iowa-Nebraska Equipment Dealers Association
IPC
Latino Landscape Network
Marine Retailers Association of the Americas
Montana Equipment Dealers Association
National Association of Landscape Professionals
National Marine Distributors Association
National Marine Manufacturers Association
North American Equipment Dealers Association
Northeast Equipment Dealers Association
Outdoor Power Equipment Institute
Outdoor Power Equipment and Engine Service Association
Passenger Vessel Association
Pioneer Equipment Dealers Association
Portable Generator Manufacturers Association
Power Tool Institute
Professional Grounds Management Society
PRBA - The Rechargeable Battery Association
Truck & Engine Manufacturers Association


AEM
Association of Equipment Manufacturers
NAEDA
NORTH AMERICAN
EQUIPMENT DEALERS ASSOCIATION
AED
Associated Equipment Distributors
Truck & Engine Manufacturers Association
PGMA
PRBA
LLN
LATINO
LANDSCAPE
NETWORK
PGMS
OPEI
Outdoor Power Equipment Institute
pti
power tool institute, inc.
NMMA
National Marine Manufacturers Association
ELFA
EQUIPMENT LEASING AND FINANCE ASSOCIATION
IPC
CCIA
ISMA
International Snowmobile Manufacturers Association
DIESEL
TECHNOLOGY FORUM
FARWEST
EQUIPMENT DEALERS ASSOCIATION
INEDA
Northeast
Equipment
Dealers
Association
DEEP SOUTHERN
EQUIPMENT DEALERS ASSOCIATION
MEDA
Montana Equipment Dealers Association
PIONEER EQUIPMENT DEALERS ASSOCIATION
Passenger Vessel Association
NATIONAL ASSOCIATION OF LANDSCAPE PROFESSIONALS
MRAA
NMDA
YOUR LINK TO THE SUPPLY CHAIN
OPEI
OUTDOOR POWER EQUIPMENT INSTITUTE

September 21, 2022

The Honorable Jared Golden
Chairman, Underserved, Agricultural, and
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1222 Longworth House Office Building
Washington, DC 20515

The Honorable Claudia Tenney
Ranking Member, Underserved, Agricultural, and
Rural Business Development Subcommittee
1410 Longworth House Office Building
Washington, DC 20515

RE: Digital Right to Repair and What It Means for Entrepreneurs: Exclude Motorcycles and OHVs

Dear Chairman Golden and Ranking Member Tenney:

We appreciate the opportunity to provide written testimony for your hearing titled *The Digital Right to Repair and What It Means for Entrepreneurs*. Hundreds of companies represented by the Motorcycle Industry Council (MIC)[1], the Specialty Vehicle Institute of America (SVIA)[2], and the Recreational Off-Highway Vehicle Association (ROHVA)[3] urge that Federal legislation relative to the digital right to repair of products specifically exclude motorcycles, all-terrain vehicles and recreational off-highway vehicles from the scope of its provisions.

Legislation introduced in Congress and in several states includes overly broad provisions requiring manufacturers to provide source code material and to sell parts at cost to individuals outside the dealer network. Providing source code opens manufacturers up to intellectual property theft both domestically and abroad by competitors. It also allows for manipulation of sophisticated systems – intentionally or unintentionally – that could have catastrophic results for the vehicles and/or their operators. Additionally, being forced to sell tools and replacement parts at the manufacturer's cost means that dealerships – many of which are family-owned small businesses – would be harmed by lost sales.

There are already many replacement parts, tools, and equipment on the market which allow mechanics and individuals to work on their vehicles. However, we have serious safety concerns relating to the inherent danger of allowing non-factory trained technicians, untrained mechanics, and owners to perform certain work on motorcycles and off-highway vehicles. For example, today's motorcycles are highly computerized with systems that control emissions, stability control, antilock brakes, and a host of other activities. Many of these controls are a result of government mandates. Untrained individuals tampering with coding could cause vehicle failure, endanger vehicle riders/drivers, and increase emissions that violate government standards.

Many manufacturers require dealer technicians to attend continued technical training programs to instruct them on computer systems, specialty tools, system updates, and on-going skills evaluation/training. This training and knowledge is extensive and vital to ensuring the correct repair of the product line and maintaining safety for customers.

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[1] The Motorcycle Industry Council (MIC) is a not-for-profit, national trade association representing several hundred manufacturers, distributors, dealers and retailers of motorcycles, scooters, motorcycle parts, accessories and related goods, and allied trades.

[2] The Specialty Vehicle Institute of America (SVIA) is the national not-for-profit trade association representing manufacturers, dealers, and distributors of all-terrain vehicles (ATVs) in the United States. SVIA's primary goal is to promote safe and responsible use of ATVs.

[3] The Recreational Off-Highway Vehicle Association (ROHVA) is a national, not-for-profit trade association formed to promote the safe and responsible use of recreational off-highway vehicles (ROVs – sometimes referred to as side-by-sides or UTVs) manufactured or distributed in North America. ROHVA is also accredited by the American National Standards Institute (ANSI) to serve as the Standards Developing Organization for ROVs. More information on the standard can be found at https://rohva.org/ansi-standard/.

Another concern with allowing non-factory trained technicians to perform certain work on motorcycles and off-highway vehicles comes from a liability standpoint. If override attempts or tampering has been done to a motorcycle or off-highway vehicle that results in destruction of property, injury, or death, the question of who is liable for such damage and injuries comes to the forefront.

Recent legislation in New York was amended to specifically exclude motorcycles and off-highway vehicles from the digital right to repair provisions. New York wisely included the following language in SB 4104 which was passed by the Assembly and Senate:

1. *(h) "Motor vehicle" means a vehicle that is designed for transporting persons or property on a street or highway and is certified by the manufacturer under all applicable federal safety and emissions standards and requirements for distribution and sale in the United States.*

4. *Exclusions. Nothing in this section shall apply to:*
   (a) a motor vehicle manufacturer, manufacturer of motor vehicle equipment, or motor vehicle dealer acting in such capacity, or to any product or service of a motor vehicle manufacturer, manufacturer of motor vehicle equipment, or motor vehicle dealer acting in such capacity.

   (c) a manufacturer, distributor, importer, or dealer of any off-road (non-road) equipment, including but not limited to, all-terrain sports and recreational vehicles (including racing vehicles).

We suggest that any federal legislation follow a similar approach. It is inappropriate to include any type of motor vehicle[4], motorcycle, off-highway vehicle, or recreational vehicles in the scope of a law designed to address the digital right to repair of consumer electronics and farm equipment.

Thank you for your consideration of these comments. The technical nuances and legislative history regarding this issue can be confusing, so should you have any questions please do not hesitate to contact me at 703-416-0444 (x3202) to further discuss the issue.

Sincerely,

Scott P. Schloegel
Senior Vice President, Government Relations
Motorcycle Industry Council
Recreational Off-Highway Vehicle Association
Specialty Vehicle Institute of America

cc: House Underserved, Agricultural, and Rural Business Development Subcommittee Members

[4] The definition of motor vehicle in digital right to repair legislation appears to be drawn from state legislation that deals specifically with motor vehicle "right to repair" (originating in Massachusetts as part of their motor vehicle right to repair law which has been used as a model for other states and for a national Memorandum of Understanding). Motorcycles were ultimately excluded from the Massachusetts right to repair law (and automobile MOU) because they are different than automobiles in terms of the diagnostic connector standard mandated by motor vehicle right to repair laws. Motorcycles cannot comply with provisions typically included in motor vehicle right to repair legislation. Therefore, Massachusetts legislators specifically excluded motorcycles from the definition of motor vehicle for purposes of the right to repair law. Off-highway vehicles are also excluded from the Massachusetts law because it applies only to on-highway motor vehicles.

Chris Netram

Managing Vice President,
Tax and Domestic Economic Policy

September 14, 2022

The Honorable Jared Golden
Chairman
Subcommittee on Underserved, Agricultural, and Rural Business Development
Committee on Small Business
U.S. House of Representatives
Washington, DC 20515

The Honorable Claudia Tenney
Ranking Member
Subcommittee on Underserved, Agricultural, and Rural Business Development
Committee on Small Business
U.S. House of Representatives
Washington, DC 20515

Dear Chairman Golden and Ranking Member Tenney:

The National Association of Manufacturers appreciates the Subcommittee addressing issues facing manufacturers in its hearing on "Right to Repair and What it Means for Entrepreneurs."

The NAM is the largest manufacturing association in the United States, representing 14,000 manufacturers of all sizes, in every industry sector and across all 50 states. The NAM is the voice of the manufacturing community and the leading advocate for a policy agenda that helps manufacturers compete in the global economy and create jobs for the women and men who make things in America.

Manufacturers applaud the work of the Small Business Committee to strengthen the free market and reduce burdens on manufacturing growth. However, the NAM has serious concerns with recent efforts to impose unnecessary and misguided restrictions on manufacturers in the name of so-called "Right to Repair." Calls for a new "right" to repair imply that consumers and purchasers do not *currently have* the ability to fully repair and maintain their equipment. Yet consumers across the agriculture, automobile, consumer electronics, medical device and industrial sectors can already access the information, tools and parts necessary to repair virtually any malfunction with a piece of equipment they own. In short, Right to Repair is a misguided and overly broad solution in search of a problem that simply does not exist.

Manufacturers provide a wide range of resources that enable consumers and third-party repair businesses to maintain, diagnose and repair their products. These include manuals, product guides, product service trainings, diagnostics tools and more. Allowing unrestricted access to the software and coding embedded inside machinery would not bolster purchasers' ability to repair their own equipment given the resources currently available. Rather, over-broad Right to Repair regulations could create a new right to *modify*, potentially endangering consumers and allowing for modifications that undermine government-mandated safety and emissions limits. Further, new such policies could give competitors—both in the U.S. and abroad—unimpeded access to manufacturers' intellectual property, severely undermining U.S. competitiveness and free market innovation.

Critically, manufacturers have incorporated safeguards mandated by Congress and regulators into their products. Allowing consumers to bypass these safeguards could lead to violations of the Clean Air Act, which authorizes EPA limits on emissions attributable to the operation and use of equipment and machinery. Consumer modifications of these limits would expose manufacturers to potential legal liability and increase emissions associated with operating equipment and machinery in a wide range of industrial sectors. Right to Repair could also allow for the modification of critical safety measures, leading to equipment malfunctions and threats to consumer safety. Moreover, the access required to make these modifications would undermine manufacturers' intellectual property rights by forcing them to publicly expose competitive and proprietary information.

Smart regulation is critical to protecting worker and consumer safety, public health and our environment, while overregulation in the form of unnecessary and counterproductive Right to Repair restrictions will hold back our country's economic potential. Manufacturers are committed to commonsense legal and regulatory standards that ensure public health and safety, including the safeguards currently in place to protect workers and consumers. Implementing new repair restrictions could potentially disrupt these safeguards and endanger public health and safety.

The NAM respectfully encourages the Subcommittee to carefully consider the ramifications of any Right to Repair legislation. These policies could undermine manufacturers' intellectual property rights while endangering public health and worker and consumer safety. The NAM looks forward to working with the Subcommittee on policies that promote a fair, open and competitive marketplace and bolster pro-competitive actions by manufacturers across the country to support to job creation, investment in research and development, and economies of scale across the manufacturing economy.

Sincerely,

Chris Netram
Managing Vice President, Tax and Domestic Economic Policy

TESTIMONY OF ROB LAREW

President
National Farmers Union

SUBMITTED TO THE U.S. HOUSE COMMITTEE ON SMALL BUSINESS

SUBCOMMITTEE ON UNDERSERVED, AGRICULTURAL, AND RURAL BUSINESS DEVELOPMENT

"Right to Repair and What it Means for Entrepreneurs"

September 14, 2022

2361 Rayburn House Office Building

Washington, D.C.

Chairman Golden, Ranking Member Tenney, and members of the committee:

On behalf of the more than 200,000 family farm and ranch families of National Farmers Union (NFU), we write to thank you for holding a hearing to investigate the issue of Right to Repair. Farmers are heavily reliant on equipment such as tractors, combines, and other tools to do their jobs. The digitization of these technologies has benefited farmers, but it has also resulted in significant repair headaches and reduced options for repair due to the restrictions imposed by manufacturers. Paired with consolidation in authorized equipment dealership networks, farmers have fewer repair options, and report facing higher costs and longer wait times for repair.

NFU's *Fairness for Farmers* Campaign and "Right to Repair"

NFU is fighting for "Fairness for Farmers"[1] to address decades of industry consolidation in agriculture that has led to excessive costs for farm inputs, supply chain vulnerabilities, and the devastation of our communities. Another symptom of this consolidation is increased equipment costs and reduced repair operations for farm machinery. NFU's grassroots, member driven policy supports "Fair Repair and Right to Repair legislation that would allow farmers and independent mechanics access to diagnostic software, information, and other tools to repair modern equipment."[2]

Why "Right to Repair" matters to farmers and rural communities

With the increasing incorporation of advanced technology into production agriculture where repair of that technology is restricted, it has become increasingly difficult for farmers and ranchers to fix their own equipment, hurting the bottom lines of both producers and local non-dealer-certified repair shops. Major farm equipment manufacturers restrict repairs by requiring certain software and software tools to make repairs to their tractors and by refusing to make these tools available to farmers or independent mechanics.[3]

Without access to the software and information needed to fix modern equipment, farmers rely on dealership technicians for many repairs. That can lead to service delays, putting a farmer's crop and livelihood at risk by impinging on their ability to operate during tight planting or

[1] Learn more about NFU's *Fairness for Farmers* campaign at https://nfu.org/fairness-for-farmers/
[2] National Farmers Union, *Policy of the National Farmers Union*, (March 2022).
[3] Some manufacturers have made limited tools, such as John Deere's Customer Service ADVISOR, available for public purchase. These tools, however, have limited use—they do not provide information required to diagnose all problems with a tractor, nor do they enable a farmer to digitally approve all repairs once they have been made. Farmers still need to turn to the dealership for many repairs.

harvesting windows. Farmers Union members have also told us they have been facing higher repair costs, a major challenge for farmers who often operate on razor-thin margins.[4] Of the 74 farmers we surveyed, 92 percent believe they could reduce their costs if they had better access to independent repair or could make all repairs themselves.[5]

A trend of dealership consolidation is exacerbating the problems farmers face accessing repair.[6] Our members are feeling the effect of this: 65% of respondents to our survey report having access to fewer dealerships than they did five years ago.[7] John Deere, which controls more than 50 percent of the large tractor market, has the most consolidated dealerships. As a result, there is one John Deere dealership chain for every 12,018 farms and every 5.3 million acres of American farmland.[8]

This consolidation not only hurts farmers, it also impacts small rural businesses that sell and repair agricultural equipment. Independent repair shops cannot complete all repairs without access to repair software tools and information, meaning they cannot fully compete with manufacturer-branded dealerships and their technicians. These factors make it more difficult for these kinds of small business owners to provide needed services to their rural communities and help maintain the vibrancy of rural small towns.

"Right to Repair" and Policy Solutions in Agriculture

NFU is working to advance solutions to the problem of repair restrictions, including by endorsing bills introduced during the 117th Congress; these include the *Fair Repair Act* (H.R.4006 and S.3830) and the *Agricultural Right to Repair Act* (S.3549). These bills would provide farmers, consumers, and independent mechanics, access to parts, software tools, and documentation – on fair and reasonable terms – to complete repairs, and directs the Federal Trade Commission to enforce these provisions. The bills also preserve the manufacturers'

[4] An independent technician told *Reuters* he often gets calls from former customers that complain of being overcharged as much as $10,000 for repairs. Repair restrictions can prevent independent technicians from providing competitive services. *See* https://www.reuters.com/markets/us/fewer-us-tractor-dealerships-raise-costs-farmers-sector-consolidates-2022-09-01/

[5] Kevin O'Reilly; "Why Farmers Need Right to Repair"; *U.S. PIRG Education Fund and National Farmers Union Report*; January 2022. *Available at* https://pirg.org/edfund/resources/why-farmers-need-right-to-repair/

[6] Bianca Flowers; "Fewer U.S. tractor dealerships raise costs for farmers as sector consolidates"; *Reuters*; 1 September 2022. *Available at* https://www.reuters.com/markets/us/fewer-us-tractor-dealerships-raise-costs-farmers-sector-consolidates-2022-09-01/

[7] Kevin O'Reilly; "Deere in the Headlights II"; *U.S. PIRG Report*; February 2022. *Available at* https://pirg.org/resources/deere-in-the-headlights-ii-2/

[8] Ibid.

intellectual property. We urge members of the committee to review these bills and to work with the bill sponsors to advance this legislation.

NFU was pleased when the Federal Trade Commission (FTC) released a policy statement in July 2021 that it planned to ramp up law enforcement against illegal repair restrictions, and more should be done to enforce existing law.[9] NFU, along with several state Farmers Union divisions and other organizations, filed a complaint with the FTC alleging that "John Deere withholds from its customers diagnostic software and other information necessary to repair the Deere equipment they own."[10] Furthermore, the complaint alleges that this withholding violates the Sherman Act and constitutes an unfair and deceptive trade practice.

NFU is hopeful that the FTC will take strong action to address the complaint. But current laws relevant to the issue of repair restrictions are not strong enough. These laws include the Magnuson-Moss Warranty Act, antitrust laws (for example, when repair restrictions constitute tying arrangements or monopolistic practices that violate the Sherman Act), and relevant prohibitions under Section 5 of the Federal Trade Commission Act. Thus, legislative solutions, like the *Fair Repair Act* and the *Agricultural Right to Repair Act*, may be needed to bolster existing law.

Conclusion

Thank you again for holding this hearing, and for the opportunity to share the views and experiences of NFU and its members with the committee. We welcome the opportunity to speak with the committee more about the need to protect farmers and rural businesses from repair restrictions, and to work together to craft solutions.

[9] "FTC to Ramp Up Law Enforcement Against Illegal Repair Restrictions," July 21, 2021. https://www.ftc.gov/news-events/news/press-releases/2021/07/ftc-ramp-law-enforcement-against-illegal-repair-restrictions

[10] "Complaint requesting investigation and action to enjoin unfair methods of competition and trade practices by Deere & Company," March 3, 2022, *Fairmark Partners, LLP*. https://drive.google.com/file/d/1h6HVLFq491dyAhcdYM-w5v_FpVKmtOB3/view.

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September 12, 2022

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Ranking Member
Subcommittee on Underserved, Agricultural
and Rural Business Development
U.S. House of Representatives
Washington, DC 20515

Dear Chairman Golden, Ranking Member Tenney & Members of the Committee:

The North American Equipment Dealers Association is an international trade association representing 4,500 farm, industrial and outdoor power equipment dealers in North America.

Our equipment dealer members are committed to supporting the Right to Repair and increasing uptime for customers. That is why our independent dealers, most of whom are small businesses themselves, and manufacturers have made a voluntary Industry Commitment to provide parts, tools, documentation, and diagnostics directly to equipment owners and independent repair shops. Our industry leads the country in providing repair and maintenance options for customers.

We support the Right to Repair, not to modify. Modern farm equipment is technologically advanced and strictly regulated by EPA standards. We do not support legislation that would facilitate circumvention of technology protection measures allowing modification of emissions and safety criteria. Doing so would jeopardize the safety of our dealer's employees, violate Clean Air Act regulations, create an unreliable used equipment market and lead to volatile liability concerns.

Allowing unfettered access to intellectual property is unnecessary for the purpose of repair and maintenance given what is available on the market today. The attached infographic based on a survey of our industry provides a clearer picture of the reality of repair for farm equipment. As you can see, nearly 60 percent of repairs to farm equipment are performed by someone other than the dealership. In addition to that, independent repair shops are frequent customers of dealerships and rely on a dealer's inventory to keep their own overhead low.

Our industry wants to make sure repair is done right-in a way that ensures the safety of dealer employees, protects the environment, and increases uptime for customers. There are many facets to the complex issue of Right to Repair, and we ask that you take into consideration the distinguishable factors farm equipment presents. Our association is here to answer any questions you may have about how we support customer repair.

PIRG

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Sept. 12, 2022

Chairwoman Nydia M. Velázquez
Committee on Small Business
2302 Rayburn HOB

Ranking Member Blaine Luetkemeyer
Committee on Small Business
2230 Rayburn HOB

Chairman Jared Golden
Subcommittee on Underserved, Agricultural, and Rural Business Development
222 Longworth HOB

Ranking Member Claudia Tenney
Subcommittee on Underserved, Agricultural, and Rural Business Development
1410 Longworth HOB

PIRG Testimony for the Record: Right to Repair and What it Means for Entrepreneurs

Dear chairs and ranking members,

My name is Nathan Proctor and I am the Senior Right to Repair Campaign Director for U.S. PIRG, a national nonpartisan, nonprofit organization which works to protect consumers, public health, the environment and democracy. PIRG has become a leading voice on Right to Repair issues over the last few years.

When something breaks, you fix it. That's just common sense. But when only the manufacturer or their "authorized technician" has the necessary parts, tools or information needed, they can charge whatever they want or push you into buying a new device. These manufacturer-imposed repair restrictions affect a wide variety of products from toasters to tablets, and even tractors. The result is surging repair costs and a massive amount of waste. For example, Americans dispose of some 416,000 cell phones every day. Meanwhile, farmers across the country report losing time in the field waiting on "authorized" dealer service.

Much of our campaign work has involved mobilizing small independent repair shops, in partnership with Repair.org and iFixit, two other leading organizations working on Right to Repair.

We've worked with hundreds of repair shops to collect their stories, and trained many of those shop owners to engage in local and federal policy discussions on Right to Repair. As your hearing aims to examine the impact of repair restrictions on those local businesses, we wanted to share some of our findings from research, interviews and other advocacy work.

In addition, we are **delivering a letter signed by 105 rural repair shops** from around the country calling for congressional action to help rural communities by removing barriers to repair.

In early 2020, U.S. PIRG Education Fund surveyed 302 independent phone technicians about what repairs they offer and what the barriers to their business were. Some highlights include:

- Manufacturers make diagnostic tools and refuse to sell them. Often these tools are embedded on your phone, but you can't access them, making it harder to diagnose and fix issues. 89% of independent repair technicians said their businesses would be more successful if they had access to repair software from Apple and Samsung.
- Independent repair offers a broader range of services. Apple told the House Judiciary Committee it provides only four different types of repair in their "Apple Authorized" locations. Our survey found that 78% of repair technicians offer additional repairs over the four repairs Apple offers. Additionally, 41% of repairs done by independent technicians are types of repair Apple will not do in-store.
- Independent repair shops strongly support action. When asked if they support Right to Repair reforms, 92% of surveyed shops answered "Yes," and only 2% said these reforms were not needed.

Additionally, we have worked with allies in the farming community to catalog impacts on farm equipment repair, and investigate the ways in which repair is restricted. A survey released in February from U.S. PIRG Education Fund and National Farmers Union shows:

1. **Farmers want to fix their own equipment.** Of the 74 farmers across 14 states surveyed by U.S. PIRG Education Fund and National Farmers Union, 95% support Right to Repair.
2. **Reliance on dealer technicians leads to high repair costs.** 92% of farmers surveyed believe they could save money if they had better access to independent repair or could make all repairs themselves.
3. **Many farmers opt for older equipment to avoid software repair hassles.** Of the farmers surveyed, 77% indicated that they had bought older-model equipment to avoid the software in newer equipment.

PIRG released two reports on farm equipment repair, "Deere in the Headlights" and "Deere in the Headlights II," which additionally show:

- Many repairs which included changes in the electronics are *impossible* without access to software tools. The equipment is designed to require a dealership computer to connect to it in order to return to working order.
- Modern equipment is loaded with networked electronic parts. There are as many as 125 software-connected sensors in a single combine harvester.
- John Deere, which controls 53% of the country's large tractor market, has been working to consolidate dealerships since the mid-2000s. Our research shows Deere has been quite successful: 82% of Deere's 1,357 agricultural equipment dealerships are a part of a

large chain with seven or more locations. This mass consolidation means that there is **one John Deere dealership chain for every 12,018 farms** and every 5.3 million acres of American farmland. This further undermines competition and drives up cost. It can also mean a dispute with your local dealer requires you to travel hundreds of miles to find another option.

Beyond impacted repair shops and farmers, the broader public is harmed by repair restrictions as well. Our research finds that repair can save the average household about $330 per year, which totals $40 billion across the country. These savings leave more money in consumers' pockets when costs are rising. And with stronger repair rights, this money spent on repair will circulate with local repair shops, and reduce reliance on offshore manufacturing thus reducing supply chain pressure.

We deeply appreciate the committee investigating these matters which impact all Americans, and rural and agricultural communities in particular.

Sincerely,

Nathan Proctor

Senior Director, Right to Repair Campaign
United States Public Interest Research Group (U.S. PIRG)
600 Pennsylvania Ave. SE, Ste. 400, Washington, DC 20003

Rural Businesses for Right to Repair

As repair businesses and professionals in rural communities, we are writing to ask your support for Right to Repair reforms.

When something breaks, you fix it. That's just common sense. But when only the manufacturer or their "authorized technician" has the necessary parts, tools or information needed, they can charge whatever they want or push you into buying a new device.

When you live hundreds of miles from the nearest "authorized" shops, it makes repair even more of a hassle. Manufacturers aren't looking to open up shops in rural communities, but still limit third-party or DIY repair. When we can't get what we need to repair a customer's gadget they must either replace their expensive devices, drive hours to the nearest manufacturers' location, or ship it out and wait days, weeks, or even months. These manufacturer-imposed repair restrictions affect a wide variety of products from toasters and tablets to tractors and televisions.

Our repair shops are critical small businesses for our communities. We provide affordable, quick repairs for our customers. We provide jobs and services that stimulate local economies. As people have relied on working phones and laptops to work remotely in the pandemic, that also means they need speedy repairs. We can't do that if manufacturers are allowed to block our Right to Repair. We need Congress to level the playing field for repair work, and advance solutions such as the Fair Repair Act (HB 4006). Allow us to compete for repair business in an open market.

Sincerely,

1. Steven Watts, Watts Repair, Cullman, Alabama
2. John Duren, Professional Audio Visual, Gordo, Alabama
3. Jack Saturn, Recursive Delete Audio/Visual, Huntsville, Alabama
4. Jeff Dissinger, DigiTech Sedona, LLC, Sedona, Arizona
5. Carlos Ramirez, Bit by Bit Services, Russellville, Arkansas
6. Elijah Joers, Edgemont AVL, Mountain View, Arkansas
7. Daisy Hernandez, Jd Wireless , Watsonville, California
8. George Felton, Service By George, Dixon, California
9. James Porath, Digital Paragon, Twentynine Palms, California
10. Steve Elman, The Mac Man, Paonia, Colorado
11. Marty Casey, Casey Tech Services, LLC, Meeker, Colorado

12. Jeff Breuer, Breuer Tech Solutions, Kersey, Colorado
13. Matthew Evangelisti, Sad Mac Repair, Litchfield, Connecticut
14. Craig Butler, Impact Computers, Gainesville, Florida
15. Simon Barnett, TECHY Parkland, Coral Springs, Florida
16. Rasheed Qasem, Boost Mobile, Fort Pierce, Florida
17. David Daniell, West Georgia Technology, Carrollton, Georgia
18. Donzell Bland, On Your Way Technology, Lawrenceville, Georgia
19. Josh, Sylvester Computer Guy, Sylvester, Georgia
20. Rolf Nordahl, MacMouse.com, Honolulu, Hawaii
21. Greg Uhlenkott, The Computer Man, Grangeville, Idaho
22. Doug Manley, Fix My Cell, Olney, Illinois
23. Jesse Martin, Computer Pros of Illinois, Inc., Freeport, Illinois
24. Terry Ballantini, Normal Gadgets LLC, Bloomington, Illinois
25. Blake Coultas, Blake Tech, Tower Hill, Illinois
26. Justin Davidson, Orion Solutions, Inc., Huntington, Indiana
27. Chris Bass, KRACKED LLC, Franklin, Indiana
28. Paul Greenberg, Stress Less Tech Solutions, Decorah, Iowa
29. Thomas Niegisch, KissTECH, LLC, Columbus, Kansas
30. Jordan Tucker, JJ Tech Solutions, Longton, Kansas
31. Keith Corpstein, Keith Corpstein, Tipton, Kansas
32. Michael Gevedon, Mitek Computers LLC, Berea, Kentucky
33. Robert Garner, Garner Co Electronics LLC, Owensboro, Kentucky
34. Roger Whittaker, WTech LLC, Owensboro, Kentucky
35. James CraddoCraddock, The fix it Guy for electronics, Cadiz, Kentucky
36. Bo Soileau, ISS - Information Systems Solutions, Ville Platte, Louisiana
37. Matthew Valentin, Apple Pie Repair, Lafayette, Louisiana
38. Tom Beal, MacRevival LLC, Ellsworth, Maine
39. Michael Henyon, Acceptech LLC, Mount Airy, Maryland
40. Todd Woodward, The Good Geeks, Hull, Massachusetts
41. Tony Jillson, Make Your Mac Sing!, Ashfield, Massachusetts
42. Stu Roy, Laser Connection LLC, Auburn, Michigan
43. Michael B Schwerin, The Undercroft LLC, Standish, Michigan
44. Chris Fagerstrom, Any Key PC, Cambridge, Minnesota
45. Brad Sandnas, EZ Screen Fix , Virginia, Minnesota
46. Paul Scariano, iTek Repair & Consulting, LLC, Magnolia, Mississippi
47. Jorge Garcia, iBuy and Repair, Springfield, Missouri
48. Victor Urtiz, CPR Cell Phone Repair North Kansas City, Kansas City, Missouri
49. Joshua J. Lewis, Miles City Cellular, Miles City, Montana
50. Chad Penewell, Missoula Mac Repair LLC, Missoula, Montana
51. Bob Segil, Rainbow Enterprises , Livingston, Montana
52. Skylar Ittner, Netsyms Technologies, Helena, Montana
53. Wally Walton, Computer & Printer Repair, Inc., Belgrade, Montana
54. Paul Anthony, IFix Screen Repair , Scottsbluff, Nebraska
55. Brian Clark, The iGuys' Tech Shop, Conway, New Hampshire

56. Chad Johansen, NH iPhone Repair, Bedford, Portsmouth, Nashua and Salem, New Hampshire
57. Akshit Topiwala, A&h tech center, Iselin, New Jersey
58. Bradley Coulter, UR Gadget Doctors, Berlin, New Jersey
59. Michael Ferrara, Electric Sheep Computers, Taos, New Mexico
60. Yaz, MM Tech Doctor, Canastota, New York
61. Dave Yannascoli, Yanntech Computer Solutions, Fayetteville, New York
62. Shahin Ahmadov, Screensavers , Hartford, New York
63. Ahmed Aswad, Flash Fix Mobile, Mattydale, New York
64. Brian Young, Young's General Store , Catskill, New York
65. Richard Canavan, Empire Computers, Sidney, New York
66. Aaron Minner, Minn Tek, Salamanca, New York
67. John Brehm, HPM Tech Services, Ithaca, New York
68. Michael Wilcock, Locust Hollow Technologies, Stone Ridge, New York
69. Jose Alvarenga, XtraOptions, Dunn, North Carolina
70. Ben Grubbs, The Resistance, Hillsborough, North Carolina
71. Edward Glackin, Mr Phix, Wilmington, North Carolina
72. Matt Ferguson, Geek Housecalls LLC, Durham, North Carolina
73. Michael Tillett, TILLETTTECHS, Manteo, North Carolina
74. Tom Landen, The Mac Doctor Inc., Wendell, North Carolina
75. Steve Baker, Expert PC, Elizabeth City, North Carolina
76. Jacob Nelson, Giraffe Systems, Bottineau, North Dakota
77. John Goon, Armordyne Computer Solutions, Ashland, Ohio
78. Mark Long, In Home TV Repair, Norman, Oklahoma
79. James Backes, Projects Made Simple LLC, Hermiston, Oregon
80. Dawn Heller, iDropped, Scranton, Pennsylvania
81. Stephen Malizia, Montour wireless , Williamsport, Pennsylvania
82. Josh Turkovich, Mon Valley Phone repair, Monessen, Pennsylvania
83. Carter Thielemier, Repaired Right LC, Bluffton, South Carolina
84. Charlie Davidson, Charlie's Computer Service, Dickson, Tennessee
85. Tyler Bird, TBird Technologies, Greenville, Tennessee
86. Dustin Wood, ITSUPPORT4U, La Vergne, Tennessee
87. James McKeand, McKeand Consulting, LLC, Mexia, Texas
88. Jennifer LaChance, Device Rx of Texas, Muenster, Texas
89. Brian Williams, Tek Toyz, Wharton, Texas
90. Robbie Closson, Bausen Technology LLC, Kerrville, Texas
91. Addison Dailey, Addison Dailey LLC., Huntsville, Utah
92. Kienan Maxfield, Maxfield Solar, Indianola, Utah
93. Perry Heller, Mac Nurse, Stowe, Vermont
94. Joe Sullivan, 802 Mobile, Stowe, Vermont
95. Steven L'Heureux, The Mac Doctor, Inc., Bristol, Vermont
96. Jeff Lephew, Twin County Tech Inc, Galax, Virginia
97. Calvin O. Evans, COE Computer Repair & Service, LLC, Smithfield, Virginia
98. Moises Mauser, MDR Smartphone Repair, Forest, Virginia
99. Philip Sowers, MyTechnoGuy, Warrenton, Virginia

100. Calvin O. Evans, COE Computer Repair & Service, LLC, Smithfield, Virginia
101. Robert l Chambliss, Mellofahess Technologies inc., Mechanicsville, Virginia
102. Marc, Affordable iRepair, Lake Stevens, Washington
103. Robert Donaldson, Port Townsend Computers, inc, Port Townsend, Washington
104. Rebecca Neal, Sutinen Computers, Longview, Washington
105. Matthias Minnig, Mac Help, LLC, Viroqua, Wisconsin

Right-to-Repair in the Auto Industry

Automobile owners today have a wide and diverse range of repair options available to them when deciding on where to service their vehicle. This includes the ability to seek repairs within an authorized dealer network, at a national chain repairer, at an independent shop, or even conduct a repair themselves if technically inclined.

When compared to any other consumer product, the repair options available for today's automobile are unmatched. **In fact, it is estimated that over 70% of all post-warranty work is completed outside an automaker's authorized dealer network.** That is the very definition of consumer choice.

This competitive marketplace is possible because **automakers make available all the information necessary to service, diagnose and repair a vehicle**. Beyond just repair information, parts and tooling are broadly available either directly from an automaker or from a host of third-party manufacturers.

The FTC's *Nixing the Fix* report released in May 2021 recognizes the auto industry's forward leaning approach to Right-to-Repair.

- *"**For any manufacturing sector interested in creating a self-regulatory mechanism for expanding repair options, the experience of the automobile industry provides some guidance**. In January 2014, two car manufacturer trade groups and two trade groups representing independent repair shops and manufacturers of aftermarket parts entered into a Memorandum of Understanding ("MOU") that had the effect of creating a broad, if not complete, right to repair in the automotive industry across the United States.*[1]

    - This MOU contains a mechanism for obtaining any information one believes is missing. This process has never been formally triggered, a testament to the fact that all the repair documentation or instruction necessary to conduct a repair is available.

    - In addition, the association and our members have worked with service technicians over the years to support and facilitate education for repairing vehicles.

- *"While the car manufacturing industry has taken important steps to expand consumer choice, other industries that impose restrictions on repairs have not followed suit."*[2]

- *"Providing individuals and independent repair shops with the diagnostic software to fix devices and with firmware patches is fully consistent with Commission staff's 2015 Internet of Things report and its subsequent Start with Security guidance. Manufacturers can provide others with access to the same parts and tools that they provide to their authorized service providers. And, by providing such access to individuals and independent repair shops, manufacturers would have greater confidence in the repair activities that occur outside of their authorized networks."*[3]

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[1] P. 45
[2] P. 6
[3] P. 31

- This passage, from the report's section on cybersecurity risks, appears to validate the approach currently in place across the auto industry.

- In a recent Washington Post OpEd focused on the Biden Administration's Executive Order on Competitiveness, a leading advocate for the broader Right to Repair movement, which targets all other digital products available for sale, confirmed that the auto industry is distinct from other products and the leader in this space. He stated:

  - *"In some sectors, notably the automotive industry, independent repair shops are thriving. The ability of individuals and third-party shops to obtain the same electronic-diagnostic information available to dealers was codified in a 2013 Massachusetts law (initiated by referendum in 2012); auto manufacturers agreed to abide by that rule nationwide to avoid a potential patchwork of legislation varying by states. Thanks to that agreement, you have the choice to get your car fixed at a local shop or at the dealership. Nationwide, independent mechanics perform about 70 percent of all automotive repairs. That competition keeps prices reasonable while also stabilizing car insurance rates."*

  - *"Software-based diagnosis can seem daunting. But the problems it identifies are often within the ability of the ordinary consumer to fix. The other day, for example, the check-engine light went on in my Toyota Highlander Hybrid. I plugged in a $30 scanner and Googled the error code. The Internet said that my cylinder-two misfire error could be easily fixed with a new $9 spark plug. Sure enough, popping in a new part fixed the issue. Without the ability to decode that error, I would have been stuck paying a lot more to have a dealership diagnose the problem with a proprietary tool".*

U.S. PIRG IAMERS

Sept. 12, 2022

Chairwoman Nydia M. Velázquez
Committee on Small Business
2302 Rayburn HOB

Ranking Member Blaine Luetkemeyer
Committee on Small Business
2230 Rayburn HOB

Chairman Jared Golden
Subcommittee on Underserved, Agricultural, and Rural Business Development
222 Longworth HOB

Ranking Member Claudia Tenney
Subcommittee on Underserved, Agricultural, and Rural Business Development
1410 Longworth HOB

Re: Right to Repair issues facing rural hospitals and local repair providers

Dear Chairs and Ranking Members of the Committee on Small Business and Subcommittee on Underserved, Agricultural and Rural Business Development:

As the Committee investigates how repair restrictions impact rural and underserved communities, we, the undersigned health care and public interest organizations, would like to highlight the need for repair access to support rural health care. Rising health care costs are at the center of the crisis facing rural hospitals. According to some estimates, as many as 600 rural hospitals—some 30%—are at risk of closing.[1] Any step we can take to bring down unnecessary costs can help save these critical hospitals.

For decades, our respective organizations worked to reduce the cost of healthcare while maintaining its quality—either as public interest advocates or service providers.[2] The pandemic underscored important flaws in our current medical device repair environment. Manufacturers too often restrict access to necessary repair materials like parts, manuals and software tools to only their technicians, the result of which reduces competition by effectively precluding hospital engineering departments and independent service organizations (ISOs) from making many repairs on medical equipment.[3] When equipment repair needs increased during the height of the pandemic, these restrictions caused bottlenecks. In a survey conducted by U.S. PIRG in

[1] Center for Healthcare Quality and Payment Reform, https://ruralhospitals.chqpr.org/
[2] Kerwin testimony, Hearing on "Examining Improvements to the Regulation of Medical Technologies," Subcommittee on Health (May 2, 2017) | Democrats, Energy and Commerce Committee (house.gov). Available at https://energycommerce.house.gov/committee-activity/hearings/hearing-on-examining-improvements-to-the-regulation-of-medical
[3] K. O'Reilly and N. Proctor; "Hospital Repair Restrictions"; *U.S. PIRG*; 8 July 2020; available at https://uspirg.org/reports/usp/hospital-repair-restrictions

December 2020, 80% of biomedical repair technicians reported having equipment that they could not service because of restrictions to service keys, parts or other repair materials.[4] These issues were especially pronounced for rural health care providers. Already, rural hospitals struggle to manage the delays and high costs for such service. For the early part of the pandemic, travel was strictly limited, which meant some manufacturer service technicians were not always available to travel to repair broken equipment.

Rep. Neal Dunn, a surgeon from Florida who ran a cancer practice, explained this issue during the markup of Medical Device User Fees portion of H. R. 7667. "I want to give you an example: It's Friday, and your linear accelerator broke down. You are treating people with radiation therapy for cancer. The literature is replete with stories that show that if you delay treatment ... more than three days, that you have a much higher failure rate of that therapy. That is to say that the cancer comes back and the patient dies. I'm here to tell you that slow service kills patients ... I never would have bought the machines I bought unless I had a cadre of reliable prompt servicing people available to me. Now why isn't it available to me? If you live in New York City, Atlanta, Miami, Chicago, you probably have a Siemens, GE, Varian rep in your city, ready to come to your side when you need them. But if you live in North Florida, that's just not true, I have to wait for someone to fly in from one of those cities."

There are many safe and competitive service companies whose team members live in the rural communities and have worked for some time with rural hospitals to maintain equipment. However, the all too frequent lack of adequate repair information has had real consequences to rural hospitals.

It is for this reason that we engaged extensively on Medical Right to Repair to remove manufacturer-imposed restrictions on repair that not only run up costs[5] but contribute to the overall strain on rural health care. These efforts are included in the Biden Administration's priorities to spur more competition in the economy.[6]

Repair restrictions are making it harder for rural hospitals to keep equipment running and deliver the care patients require. We need Right to Repair to ensure that we can continue to provide vital services to our communities.

We would welcome the chance to speak with the Committee further about the need to protect rural hospitals by supporting repair providers that help maintain local access to critical equipment so necessary for hospital care.

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[4] Kevin O'Reilly; "Hospital technicians renew urgent call for Right to Repair medical equipment"; *U.S. PIRG*; 10 February 2021. ***Available at*** https://uspirg.org/blogs/blog/usp/hospital-technicians-renew-urgent-call-right-repair-medical-equipment

[5] See Federal Trade Commission "Nixing the Fix: An FTC Report to Congress on Repair Restrictions referencing IAMERS and other sources on the price of repairs, page 40. Available at https://www.ftc.gov/system/files/documents/reports/nixing-fix-ftc-report-congress-repair-restrictions/nixing_the_fix_report_final_5521_630pm-508_002.pdf

[6] "FACT SHEET: Executive Order on Promoting Competition in the American Economy"; *The White House*; 9 July 2021; available at https://www.whitehouse.gov/briefing-room/statements-releases/2021/07/09/fact-sheet-executive-order-on-promoting-competition-in-the-american-economy/

Sincerely,

Kevin O'Reilly
Director, Campaign for the Right to Repair
United States Public Interest Research Group (U.S. PIRG)

Rob Kerwin
General Council
International Association of Medical Equipment Remarketers and Servicers (IAMERS)

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