



TOYOTA

Your Toyota Collision & Mechanical Repair Resource



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—Toby Jasmin, Owner, J.A.S. Auto Body, White River Junction, VT



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STARTING AT \$129.99 MSRP***



DON'T SETTLE, CHOOSE GENUINE

When it comes to customer confidence and your shop's bottom line, don't settle. Choose Toyota Genuine Parts for the perfect blend of quality, performance, fitment, and value. Contact your local Toyota dealer for more information and current pricing reductions. 📞

*Prices may vary according to model; prices subject to change; check with your Toyota Dealer for the most current retail and commercial pricing.

ALUMINUM Panel Repair

THE FINE ART OF WORKING WITH ALUMINUM

Today's vehicles are designed to be more fuel efficient and easier on the environment. Both of which have led to the increased use of aluminum in the production of vehicles in a variety of applications, from aluminum body panels to replacement parts. From a collision repair perspective, there are some things you should be aware of when working on aluminum body panels.

WORKING WITH ALUMINUM

Repairing aluminum body panels can be quite different than repairing steel. Aluminum is more prone to dents and scratches than steel, while steel is less likely to warp or bend from weight, force, or heat.* So, while a dent in mild steel may be able to be "popped" back to shape; repairing a dent in an aluminum body panel without damaging the surrounding area requires special skill and, in some cases, advanced repair techniques.

To learn these specific techniques, technicians can undergo specialized training in Toyota's PB301A Aluminum Body Repair Techniques E-Learning course.

PRECAUTIONS WHEN WORKING WITH ALUMINUM

Here are some basic guidelines:

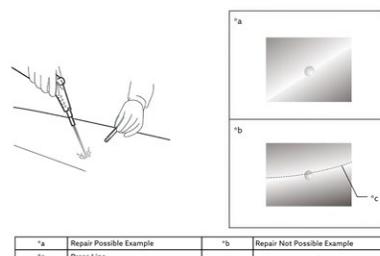
- Aluminum itself is corrosion resistant. If you are sanding metal (especially steel) and metal particles get on aluminum body panels, they can cause galvanic corrosion that causes the aluminum to corrode. To prevent this, tools and materials that come in contact with steel should be separated from those used for aluminum repair or cleaned and sterilized before they are used on aluminum.
- Prime aluminum substrates as soon as possible and no later than eight hours after cleaning steps.
- Aluminum is brittle and easily develops work hardening and cracks. Heating aluminum when restoring a deformed portion improves workability and prevents work-hardening and cracking, so be sure to use the optimal heating temperature to provide the best results (the optimal temperature varies based on the type of aluminum alloy).

- When the structure of an aluminum panel has been hardened through damage, annealing can be used to repair the panel. This special process removes hardness through heating.
 - Before performing repairs, heat the damaged area to approximately 392°F for 6000 series aluminum alloy and 482°F for 5000 series. Allowing the panel to then cool naturally helps eliminate the hardness in the panel and improves crack resistance and serviceability.
 - Aluminum has good heat conductivity. To ensure heat does not spread to unwanted areas, cover the areas you do not want to heat up with a wet cloth.

ALUMINUM PANEL REPAIR EXAMPLES

Here are some further guidelines for working on aluminum:

- Using the thermal expansion of aluminum, heat can be used to "push" the dents out (to around 212°F). This is effective for minor dents in planar panel surfaces, but can be difficult on concave surfaces, press lines or dents that are a part of bends or creases.





Aluminum is an exceptional material that helps to make vehicles lighter and, as a result, more fuel efficient.

- Pulling repairs for large dents is similar to repairs for steel panels. Just be sure to follow the correct procedures for aluminum.**
- Hammering repairs for broken ends is similar to working on metal. Be sure to use clean tools to ensure that no iron particles remain on the surface of the aluminum.**

ALUMINUM REPAIR RESOURCES

When working on aluminum, it's best to have the latest information. That's where Toyota's Technical Information System (TIS) comes in handy. Go on TIS and enter the specific information for the vehicle you're repairing and look under the Collision Repair folder. If the vehicle has aluminum panels, TIS will typically have a "Precautions for Repairing Aluminum Panels" document in that folder.



In addition, if you go to the "Technical Training" section of TIS and look under Course Books, you can find all of the reference material for course T301, which specifically focuses on aluminum repairs.

Aluminum is an exceptional material that helps to make vehicles lighter and, as a result, more fuel efficient. Be sure to review these materials before you start working on aluminum to help ensure that you do the job right the first time. 📖

ALUMINUM AND AUTOMOBILES

Aluminum and steel are two distinctly different metals. Here's a chart to help you know some of their differences.*

| MILD STEEL | ALUMINUM |
|---|---|
| Has a memory and often can be popped back into its original shape | Has no memory and has to be reshaped |
| Can rust; requires painting or corrosion-resistant coating | Does not rust; is corrosion-resistant |
| Can be welded | Welding is not an approved repair procedure |

Other interesting facts about aluminum:

- Aluminum can absorb twice the crash energy of mild steel
- Steel is typically 2.5 times denser than aluminum, which is why aluminum can weigh up to 50% less than mild steel
- Aluminum requires different procedures for the application of primers and sealants than steel does
- When priming bare aluminum, it must be cleaned of all oxides; if oxidation has occurred, it must be removed before priming and painting

*How Aluminum Repair Differs from Steel Repair | D&S Automotive (dsautomotive.com)

**INTRODUCTION: WORK NOTICES AND PRECAUTIONS: PRECAUTIONS FOR REPAIRING ALUMINUM ALLOY PANELS; 2021 MY Mirai

ECU REPROGRAMMING AND ECU SECURITY KEY WRITING

USING TECHSTREAM AND THE LATEST TSBs TO HELP KEEP ECUs UP TO DATE

Today, each vehicle has numerous computers that have to communicate with one another for the vehicle to operate as designed. At the center of that communication is the Electronic Control Unit, or ECU. During some repairs, you may need to flash reprogram or replace the ECU on the engine, which could be caused by an accident or ECU failure. Some replacement ECUs are merely “plug and play”—when you install the new ECU, the vehicle is good to go. Others may require flash reprogramming. Yet others require that the new ECU’s Security Key be written in order for the ECU to communicate on the vehicle’s network. This is true on select 2021 and newer Toyota models, like the RAV4 Prime, Sienna Hybrid and the Venza Hybrid.

To help you understand the procedures for flash reprogramming an ECU and how to write the ECU Security Key, Toyota has prepared two Technical Service Bulletins:

- T-SB-0134-16 Rev2 outlines the process for flash reprogramming Toyota ECUs
- T-SB-0111-20 outlines the process for writing the ECU Security Key

To perform these tests, you need any one of these: J2534 compliant hardware, Techstream ADVi, Techstream 2.0, Techstream Lite, or Techstream Lite (green cable). Regardless of the hardware, it has to be running the latest Techstream software version found on Toyota’s Technical Information (TIS). Toyota recommends using Toyota Approved J2534 Hardware found at <https://techinfo.toyota.com>.



One advantage of using a Techstream device is that when it is configured correctly and connected to TIS, it will automatically search for the appropriate Service Bulletin using the current calibration ID from the vehicle.



TECHSTREAM ECU FLASH REPROGRAMMING

The flash reprogramming process may be available for various 2001 – 2020 model year Toyota vehicles, including the 4Runner, 86, Avalon, C-HR, Camry, Celica, Corolla Hatchback, Echo, FJ Cruiser, Highlander, iA, iM, Land Cruiser, Matrix, Mirai, MR2 Spyder, Prius, Prius c, Prius Plug-In Hybrid, Prius Prime, Prius v, RAV4, Sequoia, Sienna, Solara, Tacoma, Tundra, Venza, and Yaris.

ECU flash reprogramming allows the ECU to be updated and recalibrated without having to be replaced. Be aware that flash reprogramming updates can only be applied to the vehicle/ECU combination for which they are intended because ECUs have internal security that will not allow them to be reprogrammed with another ECU's information.

- ECU flash reprogramming requires that you use any one of these tools: a J2534 compliant device, Techstream ADVi, Techstream 2.0, Techstream Lite, or Techstream Lite (green cable). Regardless of what you use, you must run the latest Techstream software version found on TIS.

For step-by-step instructions on how to perform ECU flash reprogramming, please refer to the complete procedures listed in T-SB-0134-16 Rev 2.

- Be sure to follow the flash reprogramming procedures as indicated in the Service Bulletin to help prevent damage to the ECU.

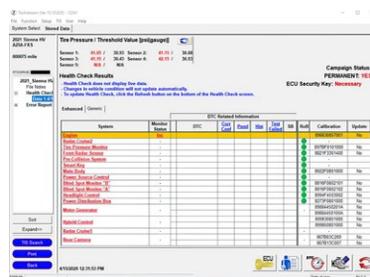
FYI: Techstream devices can be obtained through our Toyota Approved Dealer Equipment program at www.techstreamsupport.com or call 1 (800) 368-6787.

One advantage of using a Techstream device is that when it is configured correctly and connected to TIS, it will automatically search for the appropriate Service Bulletin using the current calibration ID from the vehicle. The calibration links will be embedded in that Service Bulletin.

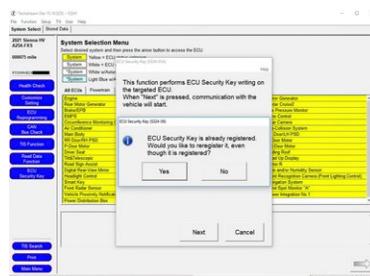
DETERMINING IF THE ECU REQUIRES AN ECU SECURITY KEY

There are two ways to confirm if the ECU Security Key writing is required:

1. Performing a Health Check—it will display “Necessary” when an ECU Security Key needs to be written and “-” when it is not.



2. Using the ECU Security Key button—Techstream will indicate if the ECU Security Key has already been registered prior to starting the registration process.



ECU SECURITY KEY WRITING PROCESS

To ensure you follow the correct steps when you have confirmed that ECU Security Key writing is required, refer to T-SB-0111-20.

Remember that, in some instances, the automatic vehicle detection feature may not be functional after ECU replacement. If that is the case, you will have to manually select the appropriate vehicle information.

If you have completed the procedure and the ECU Security Key indicator is still showing “Necessary”—then the Security Key was not written properly and you will need to repeat the process.

THE IMPORTANCE OF PROPER FLASH REPROGRAMMING AND ECU SECURITY KEY WRITING

Whether flash reprogramming the ECU or writing the Security Key, this is an essential step as it will ensure that the ECU is up to date and in-sync with the rest of the vehicle. 📄



MORE TOYOTA EVs, HYBRIDS AND HYDROGEN VEHICLES

TIME TO GET PREPARED!

As Toyota moves forward with the production of Electric Vehicles (EVs), Hydrogen Fuel Cell Vehicles (FCVs), and Hybrid Vehicles (HVs), the question is: Is your collision repair facility prepared for the challenges that these vehicles present?

LIGHTER, MORE SOPHISTICATED VEHICLES

To make vehicles more efficient, Toyota is making vehicles lighter and more sophisticated:

- Reduced weight means the vehicle requires less power to get moving.
- More sophistication means implementing technology that makes the powertrain more efficient.

What does that mean for your collision repair facility?

It means that estimating, diagnosing, and repairing an EV, FCV or HV damaged in a collision presents new challenges that shops have never seen, including:

- Disarming the high voltage systems
- And additional refinishing time

Toyota's Technical Information System (TIS) techinfo.toyota.com provides you with assets that will help you get up-to-speed on these high-tech vehicles. When a Toyota EV, FCV or HV comes into your shop for collision repairs, Toyota has a bulletin that outlines how to protect yourself during repairs and provides precautions that need to be taken prior to the inspection and service of the high-voltage circuit.

BEST PRACTICES

When an EV, FCV or HV has been in a collision, there's a chance that the battery and its contents have been compromised. The major dangers of damaged batteries and wiring are electrocution and combustion. As a precaution, all high-voltage batteries should be treated as though they are unstable.

Here are some procedures technicians need to be aware of when working on an EV, FCV or HV:

- Wait at least 10 minutes to discharge the high-voltage capacitor inside the inverter.
- If the battery has been damaged or punctured, the vehicle should be isolated in a place at least 50 feet away from other flammable or combustible materials (due to some batteries being extremely difficult to extinguish once they are on fire).
- Place any object that could start the engine or hybrid system, including key fobs, away from the vehicle. They should be locked in a container and moved out of range from the vehicle.
- Once a high-voltage battery is disabled and discharged, the vehicle should never be rolled on its wheels, as this can generate voltage to the battery system.
- High-voltage personal protection equipment may be necessary, including gloves (rubber and leather), boots, face shield, and safety glasses.
- Check insulated gloves to be sure they are free of cracks, tears, and other types of damage before starting your work.
- When servicing the vehicle, do not carry any metal objects—like mechanical pencils or rulers—that can be dropped accidentally and cause a short circuit.
- Before touching a bare high-voltage terminal, wear insulated gloves and use a tester to make sure that the terminal voltage is 0 V.
- After disconnecting or exposing a high-voltage connector or terminal, insulate it immediately using insulating tape.



- Bolts and nuts used for high-voltage terminals should be tightened to the specified torque—insufficient or excessive torque could cause a failure.
- Use the “CAUTION: HIGH VOLTAGE DO NOT TOUCH” sign to notify others that the high-voltage system is being inspected and/or repaired.
- When welding on an EV, FCV, or HV, follow the same precautions as when welding on a conventional vehicle; as a best practice, disconnect both the 12 V battery and the high-voltage battery service disconnect.
- After servicing a high-voltage system and before reinstalling the service plug grip, check that you haven’t left any parts or tools inside, that the high-voltage terminals are firmly tightened, and that the connectors are correctly connected.
- When working on a high-voltage circuit, use either a tool wrapped with vinyl insulation tape or use an insulated tool.

There are additional guidelines and cautions, so be sure to read the appropriate bulletin before starting repairs.

WORKING ON THE MIRAI FUEL CELL VEHICLE

Before starting repairs on a Mirai, an FCV-Qualified Toyota Dealership and Technician must be consulted to assess the damage to the hydrogen fuel system components (i.e., the fuel cell stack, fuel system piping, receptacle, tube joints, sensors,

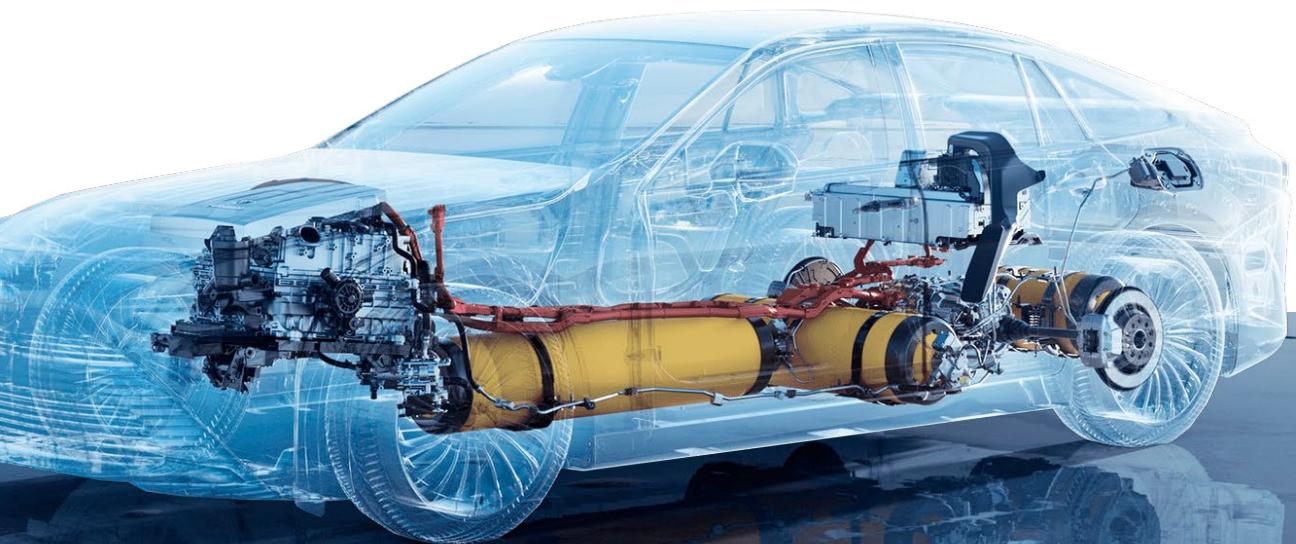
regulator, and tank assemblies) prior to collision repairs. Please contact the Toyota Customer Experience Center for FCV-Qualified Dealers: 800 331-4331.

Many of the precautions for EVs and HVs are the same for the Mirai, but you must remember you are dealing with compressed hydrogen stored in tanks.

- The tanks on Mirai store hydrogen at high pressures and the hydrogen must be released prior to removing the tanks from the vehicle. Have an FCV-Qualified Toyota Technician assist in the releasing of the hydrogen.
- High-pressure hydrogen pipes have red insulation for identification purposes.
- Toyota genuine fuel cell stack coolant cannot be reused – refill only with new Toyota Genuine FC Stack Coolant Full Service Kit-20L (P/N 08889-80350).
- When cutting and welding, do not allow sparks or hot fragments to contact the hydrogen fuel components. If that occurs, remove the hydrogen tanks before proceeding.
- Do not allow solvents to contact the hydrogen fuel tanks.

SAFETY FIRST

Safety is key. Always be sure to do your research and take the appropriate precautions prior to working on one of these sophisticated vehicles. 🚗



The Consultative Selling Approach

LEGITIMATE REPAIR OPPORTUNITIES

Collision repair shops sometimes offer additional services to their customers who may be unaware of items that need attention. While it is your responsibility to point out legitimate issues, the way you do so makes all the difference in the world. The key for offering additional services is to focus on helping your customer maintain the health and appearance of their Toyota by using a collaborative, consultative style.

USE TECHNOLOGY TO LEND A HELPING HAND

When you offer to help your customer, you establish your competence. Tools like Toyota Techstream lend credibility to the advice you are giving and build your customer's confidence in you. Use the Techstream scan tool to produce an instant pre-repair vehicle "Health Check," which will give you reliable information to share on diagnostic trouble codes (DTCs) that should be addressed while the vehicle is in your care.

Mike Anderson, CEO of Collision Advice, offers practical advice on how to effectively share pre-repair scan data to partner with your customer in making sound repair and maintenance decisions. "The way that you present the information from the report is critical," explains Anderson. "Here's an example: depending upon climate, about 20% of the vehicles that come into the repair shop are on the verge of needing a new battery. The Techstream pre-scan checks the voltage state of the vehicle's battery. If it looks like the vehicle will need a new battery soon, don't sell: offer help!"

Anderson advises that your conversation with the customer should go something like this:

"At our shop, we use Toyota's Techstream to scan the health of each Toyota before starting a repair. This helps us identify how the collision may have impacted the vehicle's electric components. Your vehicle health check shows that you will need a new battery soon. You don't have

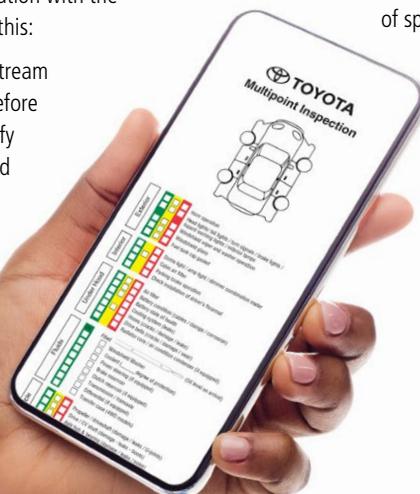
to do it right away. But, if you choose to replace the battery today, you'll have labor savings because we need to remove the battery to repair the collision damage anyway."

Then, offer to email a PDF of the Techstream report. The result? You have demonstrated to the customer that their vehicle's health is your priority. You have reassured them that you have the right expertise to take care of their vehicle. And you have helped the customer by offering a way to save some time and money!

PUT YOURSELF IN YOUR CUSTOMER'S SHOES

When recommending additional collision repairs, it is important to consider the impression you are making on the customer. People hate to be sold, but they love to buy! Put the offer in the context of helping the customer make an informed buying decision, and this will make their buying experience more enjoyable.

According to Ryan Taylor, CEO of Bodyshop Booster customers are more afraid of making a wrong decision than they are of spending money. "The idea of 'scarcity' can help the customer make the right decision. If consumers feel that there is a short period of time to take care of a special one-time offer, they will make their decision," said Taylor. "And don't forget to ask the customer if they want to schedule the job. Otherwise, they think you don't want their business!"



“The idea of ‘scarcity’ can help the customer make the right decision. If consumers feel that there is a short period of time to take care of a special one-time offer, they will make their decision, and don’t forget to ask the customer if they want to schedule the job. Otherwise, they think you don’t want their business!”

—Ryan Taylor, CEO of Bodyshop Booster

USE CHECKLISTS TO IDENTIFY NECESSARY REPAIRS & ADDED VALUE SERVICES

When your customers take delivery of their vehicles after repairs are complete, they expect them to be in perfect operating order. If they find an issue, they can lose faith in both your facility and the vehicle itself.

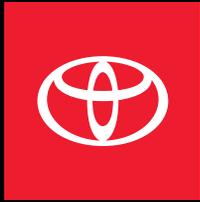
The *Collision Pros* article [Checks & Balances—Ensure Customer Safety](#) is a great resource on how to use pre- and post-repair checklists to manage repair details and help keep customers satisfied and safe. These processes provide an excellent way to identify necessary repairs and maintenance opportunities.

It is in the shop’s best interest to make the customer aware of repair or maintenance needs in order to keep the vehicle in proper running condition and keep the customer happy. Your shop can use a check list process to point out other areas of the vehicle that could be repaired or painted, outside the insured damaged area, to make the overall vehicle look new again.

CONSULTATIVE SELLING

Consultative selling prioritizes relationships and opens dialogue to serve your customer’s needs. Remember to focus on the customer. After all, you are the expert. By alerting the customer to additional enhancements or possible issues, you are building their confidence in you, your shop and their Toyota.

*Stay tuned for our next issue of *Collision Pros* where we will share consultative selling techniques for service repair shops. 📖*



IT'S GOOD TO BE
GENUINE



GENUINE • QUALITY • RELIABILITY • FIT • VALUE

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EXCLUSIVELY FROM YOUR TOYOTA DEALER



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For complete details about Toyota's warranties, please refer to the applicable Warranty & Maintenance Guide or see your Toyota Dealer.