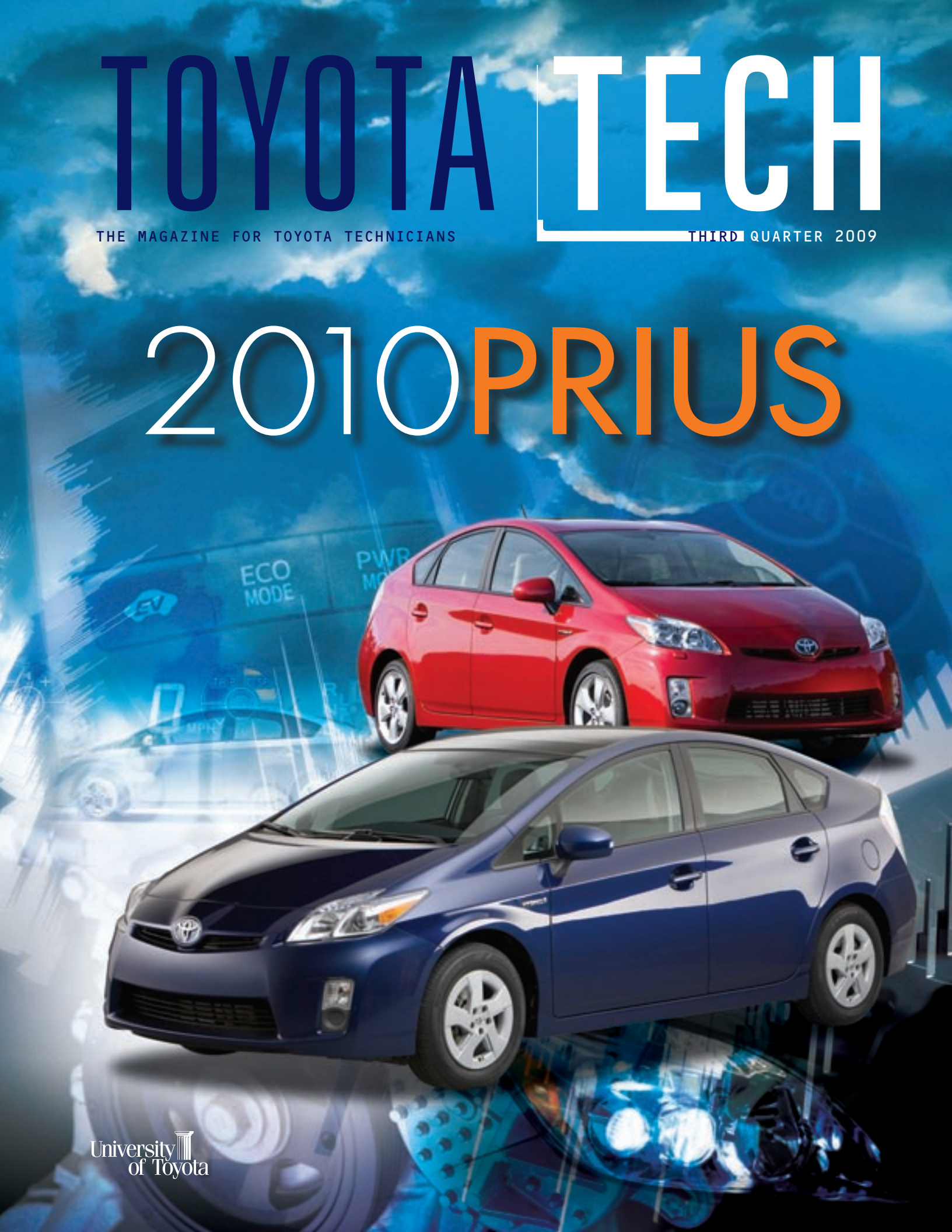
TOYOTA TECH

THE MAGAZINE FOR TOYOTA TECHNICIANS

THIRD QUARTER 2009

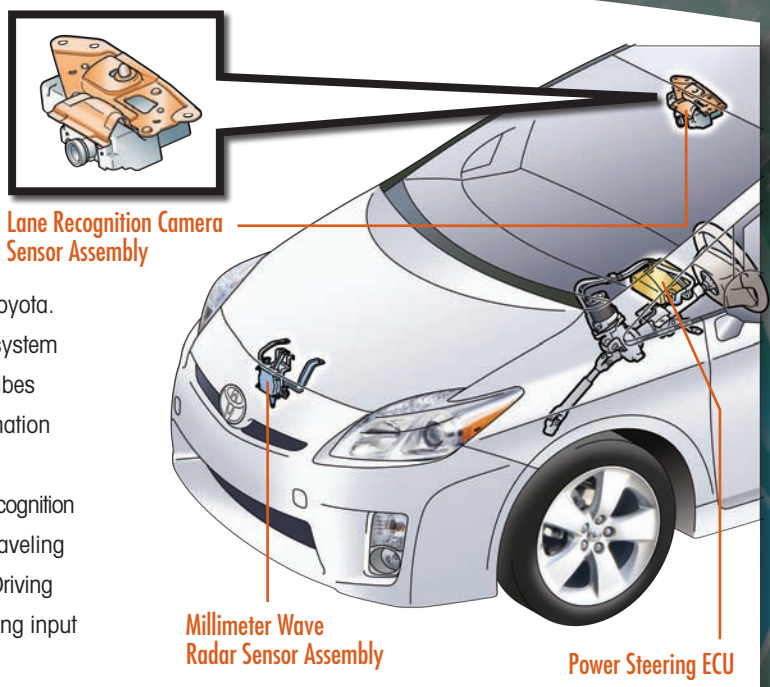
2010 PRIUS



University of Toyota

2010 **PRIUS:**

Normal System Operation for Lane Keep Assist



The Lane Keep Assist (LKA) system on the 2010 Prius is a first for Toyota. Understanding normal system operation and terminology for the LKA system will help you diagnose potential customer concerns. This article describes the functions of the LKA system and provides examples of Multi-Information Display (MID) screens while the system is operating.

The Lane Keep Assist system uses an image of the road from the Lane Recognition Camera Sensor to detect lane markers for the lane that the vehicle is traveling in. If the system detects the vehicle is about to move out of its lane, the Driving Support ECU uses the warning buzzer, Multi-Information Display and steering input (through the Power Steering ECU) to warn the driver.

Note: The Lane Recognition Camera Sensor is also referred to as the Object Recognition Camera in the Repair Manual. **Service Tip:** The Object Recognition ECU is integrated into the Lane Recognition Camera Sensor assembly and cannot be replaced separately.

The LKA system performs two distinct functions. The two functions are Lane Departure Warning (LDW), which alerts the driver of lane departure, and Lane Keep Assist (LKA), which helps the driver maintain the center of the cruising lane.

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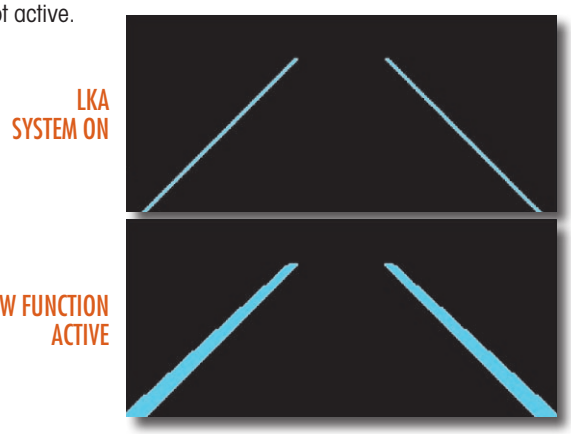
University of Toyota

Lane Departure Warning (LDW) Function

The Lane Departure Warning function can operate above approximately 30 mph, and it does not require Dynamic Radar Cruise Control. The Lane Keep Assist function, however, can only be operated above approximately 45 mph, and it is active only when the Dynamic Radar Cruise Control is in vehicle-to-vehicle distance mode.

The LKA system is turned ON/OFF with a switch on the steering wheel. When the system is switched ON, thin lane indicators are displayed on the MID. Thin lane indicators inform the driver that the system is ON, but not active.



Once the system recognizes painted lane markers, the MID lane indicators appear thick to inform the driver the LDW function is active.

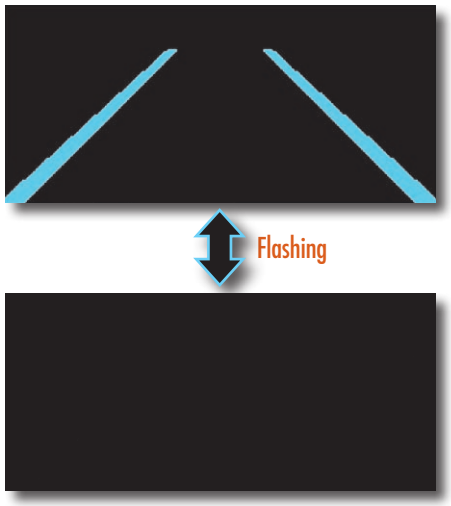
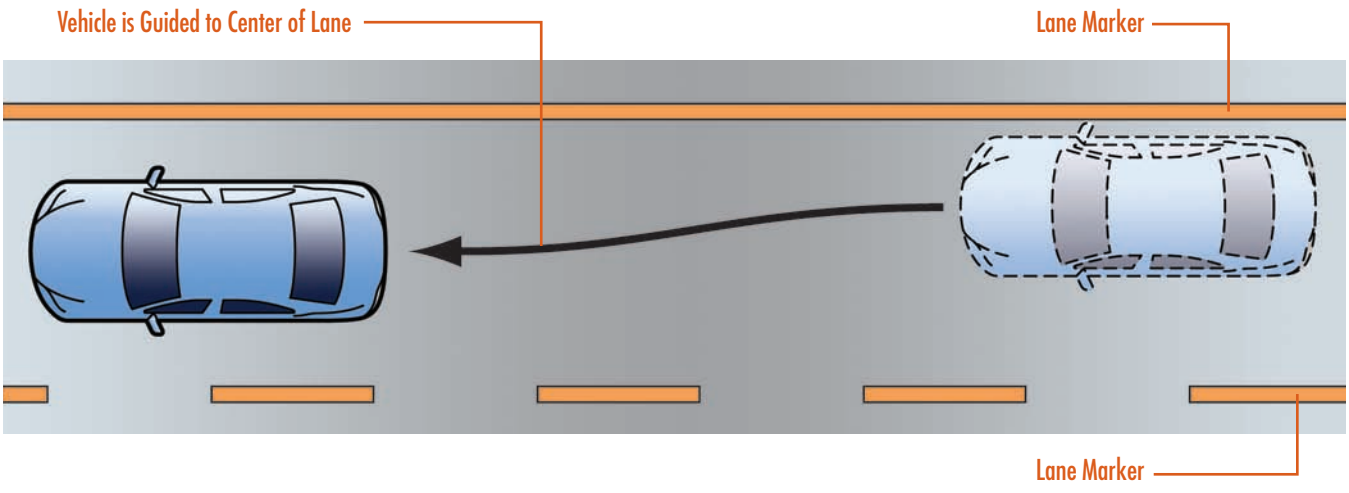


Figure 1 LDW Detected

Figure 1 is an example of the MID when Lane Departure Warning is active. If the driver begins to exit the cruising lane while Lane Departure Warning is active, a buzzer will sound, the lane indicators will flash on the MID, and slight steering input will alert the driver. **Note:** Turn signal switch input or steering wheel input will suspend the warning operation as the driver changes lanes.

Lane Keep Assist (LKA) Function



The Lane Keep Assist function operates much the same as the Lane Departure Warning function. However, there are differences. In addition to thick lane indicators, a steering wheel icon will appear in the top left corner of the MID while the LKA function is active. Remember, the Dynamic Radar Cruise Control must be engaged for the LKA function to operate.

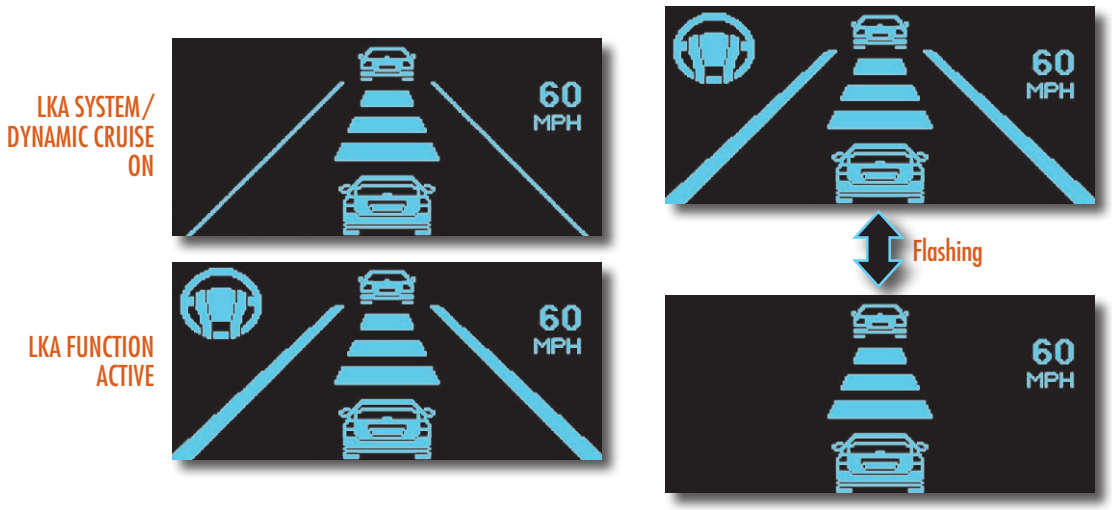


Figure 2 LKA Warning

Figure 2 is an example of the MID when the Lane Keep Assist function is active. The LKA function will provide steering input to help the driver maintain the middle of the lane while cruising. **Note:** The Lane Keep Assist system is not intended to allow for hands-free driving. The system will alert the driver and deactivate if steering input is absent for several seconds.

Because of the complex operation of the LKA system, it is important to get as much information as possible when diagnosing a customer's concern. Verify the following data or events:

- Ask for the speed of the vehicle when the concern occurred.
- Ask if the lane indicators on the MID were thin or thick.
- Ask if the steering wheel icon appeared on the MID.
- Ask if the lane indicators flashed on the MID.
- Ask if the Dynamic Radar Cruise Control icons appeared on the MID.

Also, the LKA system offers many data list items to aid in diagnosis. Several useful parameters for LKA include:

DATA LIST PARAMETER	DESCRIPTION
LKA MAIN SW	LKA switch ON/OFF
LEFT/RIGHT LANE TYPE	Type of lane detected by the Lane Recognition Camera Sensor
LANE-KEEPING ASSIST	LKA system is or is not providing steering assist
LANE WIDTH	Width of cruising lane as seen by the Lane Recognition Camera

Note: The items shown are only a small example of LKA data list items. Refer to the Repair Manual for additional parameters and parameter details.

Familiarity with the LKA system limitations will help you diagnose a customer's concern. Proper system operation depends on the Lane Recognition Camera Sensor's ability to accurately view the road in front of the vehicle. Always make sure that the windshield is clear of dirt and debris, especially items that could obscure the camera's view. Roads with no lane markings or non-painted lane markings (i.e., raised reflectors, "bot dots", etc.) may make it difficult for the system to identify the lane of travel. Also, anything that changes the brightness or appearance of the road surface (i.e., water, ice, snow, shadows, etc.) can prevent the LKA system from operating properly. **Note:** Activation of the windshield wipers (except intermittent) will prevent the LKA system from operating. **Note:** The Lane Recognition Camera Sensor can also prevent LKA operation if its internal temperature reaches 158° F. (70° C.) or higher.

Service Tip: The Lane Recognition Camera Sensor requires a new adjustment procedure. See the Repair Manual for detailed instructions.

The Lane Keep Assist system represents the type of advanced, innovative technology that is synonymous with Toyota. Don't be intimidated by such a complex system. You can diagnose an LKA concern if you use your knowledge of how the system operates and the resources and tools at your disposal.

Adam Crawford — Technical Training

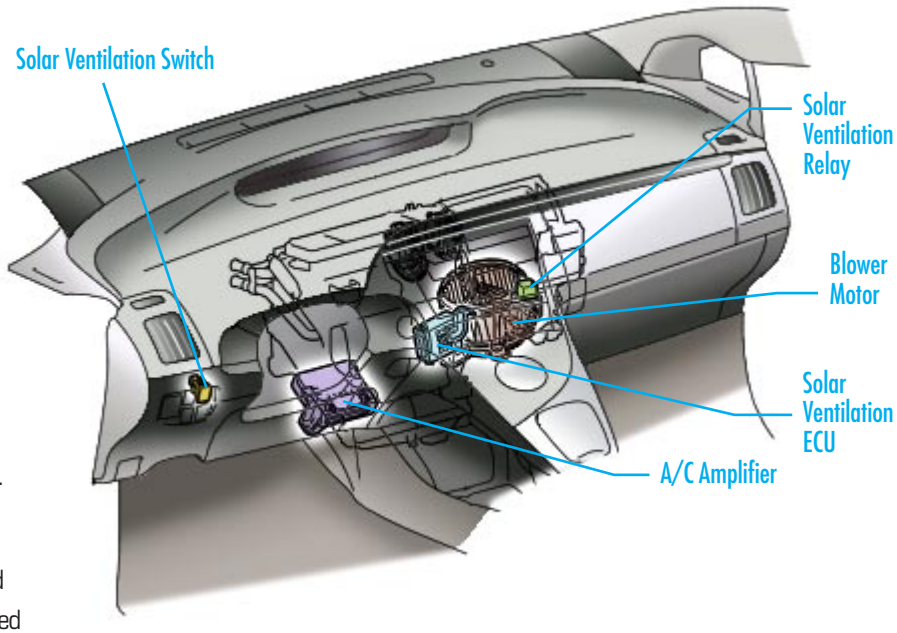
The

Toyota Hybrid System (THS) Charger

is UL®-approved and can be used by dealership hybrid technicians to charge HV batteries in Toyota vehicles. If you think the THS charger is necessary, contact your Regional Office or Private Distributor to make arrangements.

2010 PRIUS: Solar Ventilation System

The Solar Ventilation System is all new on the 2010 Prius. As you will recall, this system operates the HVAC blower motor with power generated by the solar panel to move air through the cabin while the vehicle is parked. The system is controlled by the Solar Ventilation ECU located in the center dash area. The Solar Ventilation Switch turns the system ON/OFF and is used for system diagnosis. This new system has some unique diagnostic procedures that are provided here.



Overall system diagnosis can be accomplished by entering Test Mode. Test Mode cannot be entered using Techstream; however, the data list is used to confirm that Test Mode is active. Use the following steps to enter Test Mode (this procedure can also be found in the Repair Manual):

1. Park the vehicle in a sunny area and use the Techstream data list to confirm the "Solar Voltage" parameter is 10V or higher.
2. Turn the Solar Ventilation Switch to the OFF (out) position.
3. Starting with the power switch ON (IG), turn the power switch OFF and ON (IG) three times within 5 seconds. It might be helpful during this step to count the number of power switch operations. This part of the procedure is complete after 9 switch operations.
4. With the power switch in the ON (IG) position, turn the Solar Ventilation Switch from OFF to ON three times within 3 seconds (the switch will be ON when you finish).
5. You have successfully entered Test Mode when the data list parameter "Solar Ventilation Test Mode Status" is ON.

Solar Ventilation Switch

While in Test Mode, the Solar Ventilation Switch turns the HVAC blower motor OFF/ON. The blower motor should operate at a steady speed when the switch is ON and stop when the switch is OFF. Correct Test Mode operation confirms the functionality of several Solar Ventilation System components and circuits, allowing diagnosis to continue in the right direction.

ANNOUNCING

TOYOTA COURSE 673

Electronic and Computer Controlled Systems

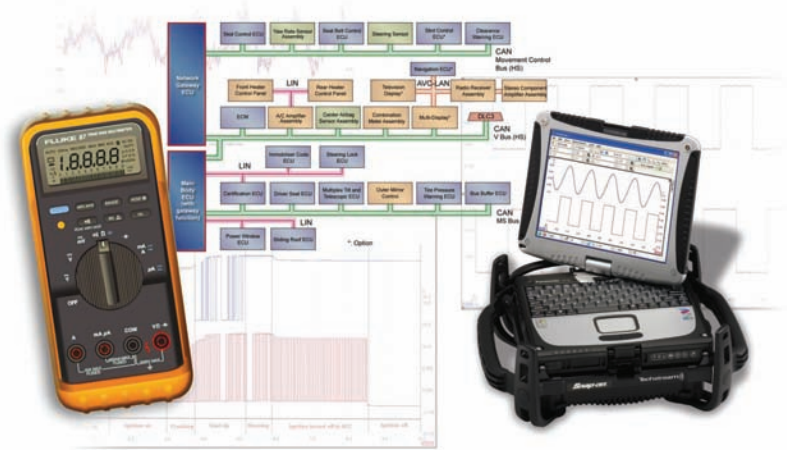
The University of Toyota is launching a new high-level, instructor-led course on electronic and multiplex networking systems.

Course Objectives

Course 673, Electronic and Computer Controlled Systems, provides:

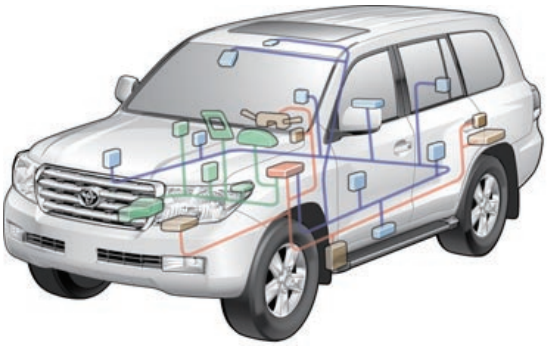
- Information on Electronic Control Units (ECUs) and how they operate,
- An overview of multiplex network architecture and communication protocols, and
- Waveform analysis and system diagnostics using the oscilloscope, DVOM and Techstream.

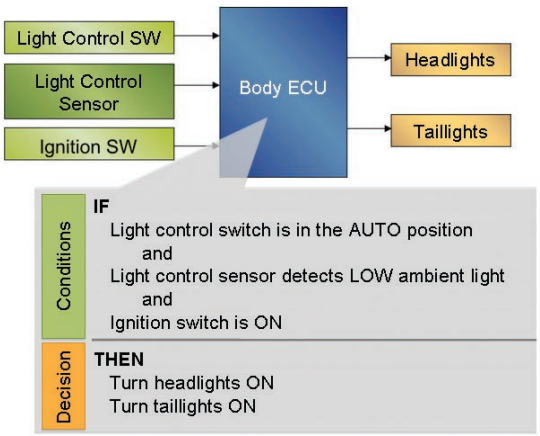
Technicians who complete this advanced electrical course will be able to apply a number of diagnostic techniques to monitor and repair faults in computer controlled electronic circuits.



Background

Automotive systems have become more complex due to the increased number of computers and sophisticated electronically assisted functions installed in a vehicle. Similarly, data transfer and communication among vehicle systems has increased in complexity and volume.



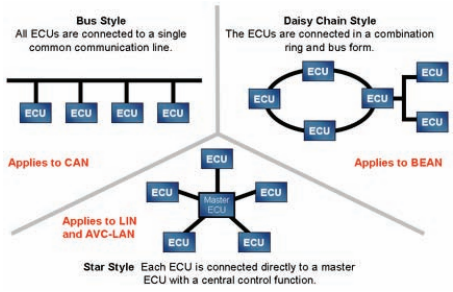


Basic Inputs and Outputs

Technicians will research technical information that explains the purpose and function of the ECU terminals, and identify inputs and outputs of the system to determine how they affect ECU operation. These preliminary steps are necessary to effectively diagnose electronic and multiplex circuits.

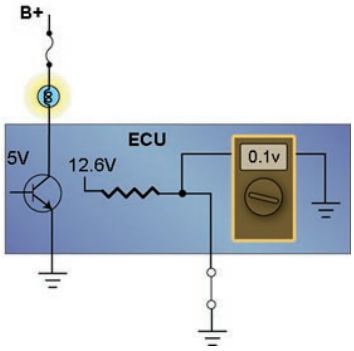
Network Architecture

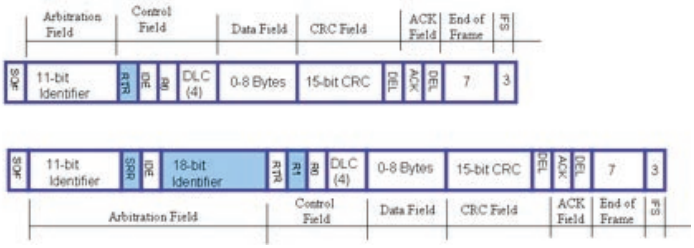
The course provides an introduction to the fundamentals of multiplex network architecture and communication protocols. Technicians will gain an in-depth understanding of how network communications occur in an automotive application. Later, technicians will apply this knowledge to differentiate between network malfunctions caused by various faults and to demonstrate the processes used to locate and diagnose these faults.

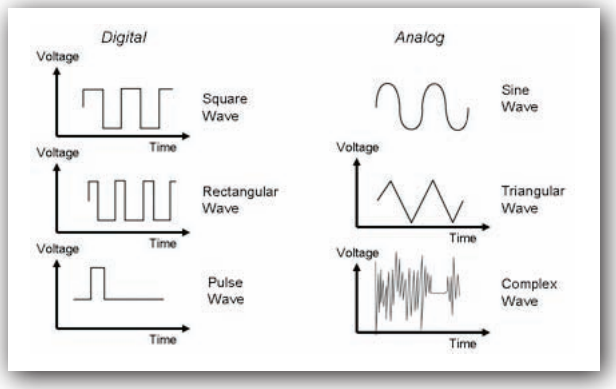


Protocol	BEAN (TOYOTA Original)	CAN (ISO Standard)	LIN (Consortium)	AVC-LAN (TOYOTA Original)
Application	Body Electrical	Power Train	Body Electrical	Audio
Communication Speed	10 kbps	500 kbps (HS)* 250 kbps (MS)	20 kbps	17.8 kbps
Communication Wire	AV Single Wire	Twisted-pair wire	AV Single Wire	Twisted-pair wire
Drive Type	Single Wire Voltage Drive	Differential Voltage Drive	Single Wire Voltage Drive	Differential Voltage Drive
Voltage	10+ volts	2.5v to 3.5v CANH 2.5v to 1.5v CANL	12 volts	2v to 3v TX+ to TX-
Configuration	Ring/Daisy Chain	Bus	Star	Star
Sleep/Wake-up	Available	N.A.	Available	N.A.

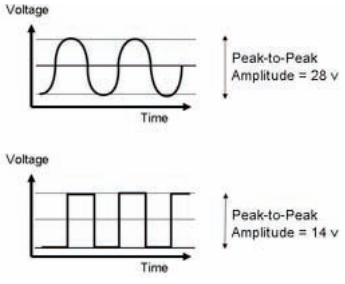
Electronic and computerized components communicate with each other using electrical signals. These signals can be as simple as the presence or absence of voltage (ON/OFF signals) or as complex as a series of 64 voltage pulses (bits) in a data packet containing precise instructions for a receiving ECU to execute.

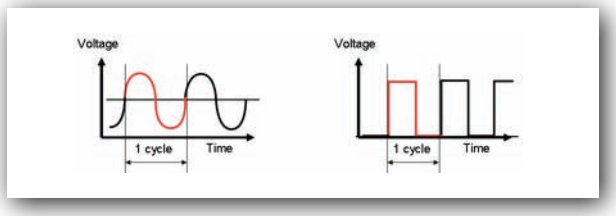


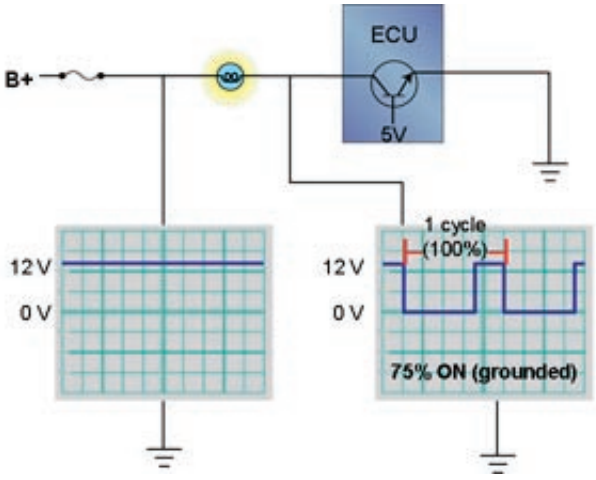




Signaling between these electronic components is often determined by the characteristics of the waveforms and the ways in which they change. Because it is important to understand the different types of waveforms, the course includes a general overview of various waveform types and the criteria used to define them. Topics such as amplitude, frequency, pulse width modulation, and duty cycle are covered. This foundation provides technicians with standard concepts and terminology they need to describe and measure signals and waveforms.

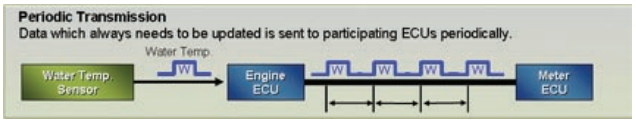


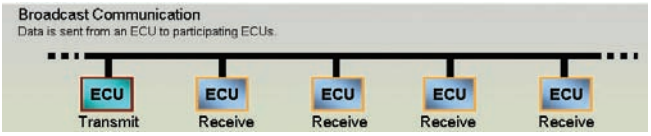


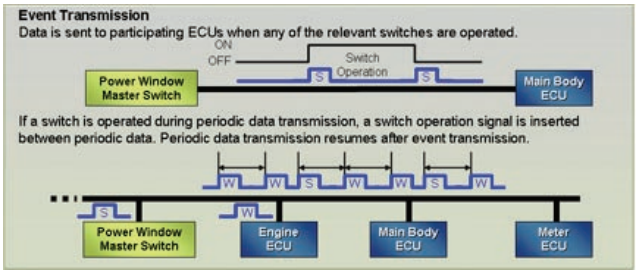


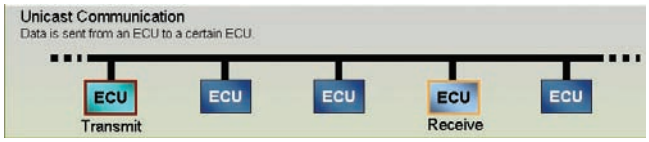
Serial Data Transfer

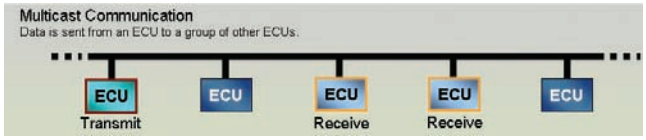
Large volumes of data from different sources are transferred using serial data bus systems developed to accommodate complex computer systems in modern automobiles. To accurately diagnose these systems, technicians must have an understanding of how the large volumes of data are managed. The course includes subjects that promote this understanding, such as communication direction, collision detection, data casting methods, and periodic and event driven transmission timing.





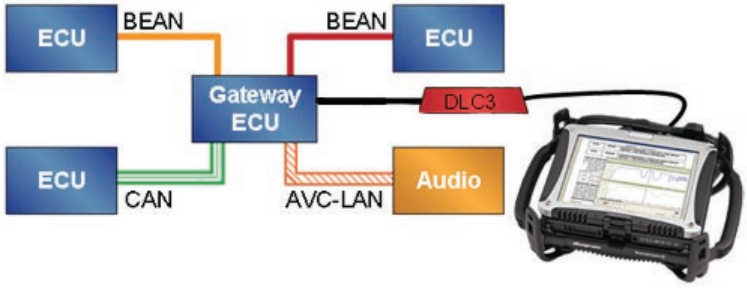






Gateway ECUs

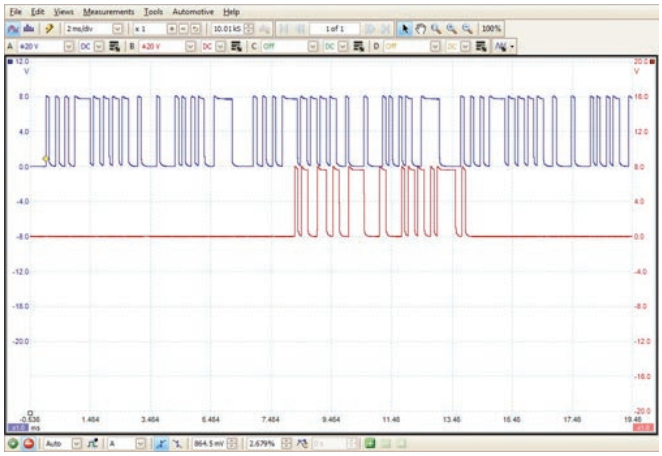
Technicians will learn that signals processed in one control unit may need to be transmitted to another control unit via the communication network. Communication among multiplex systems that have different protocols require a specialized ECU, called a "GATEWAY," to interface between networks. The GATEWAY ECU assists with the smooth transfer of data by converting from one format to another and relaying messages between networks and Techstream via DLC3. This course provides technicians with an understanding of how GATEWAY ECUs operate and the specialized functions of GATEWAY ECUs used in Toyota Multiplex Networks.



Course Tools

This course focuses on how to use three tools to monitor networks: the oscilloscope, Techstream, and the advanced features of the DVOM. The use of the inductive clamp along with the DVOM for quick diagnostic analysis is an additional technique that is introduced.

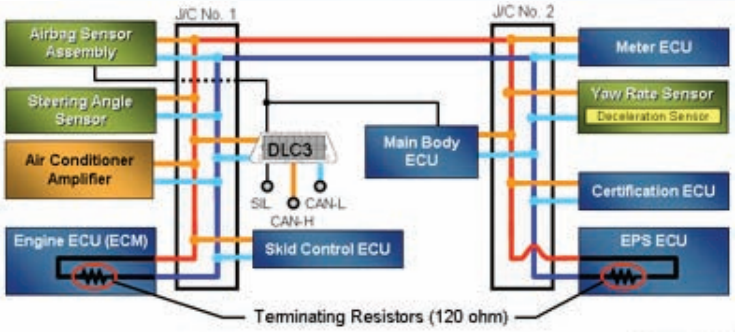
The diagnostic features of the three tools and their application as they relate to Toyota Multiplex Networks will be covered by the instructors in the classroom and with "hands-on" application in the shop.

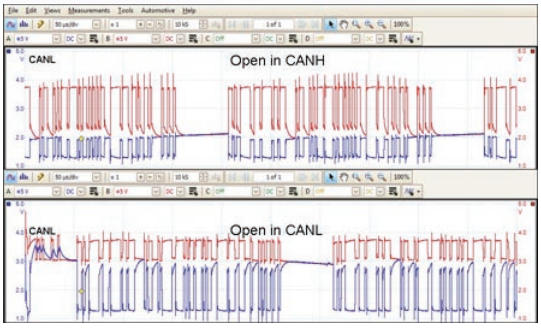


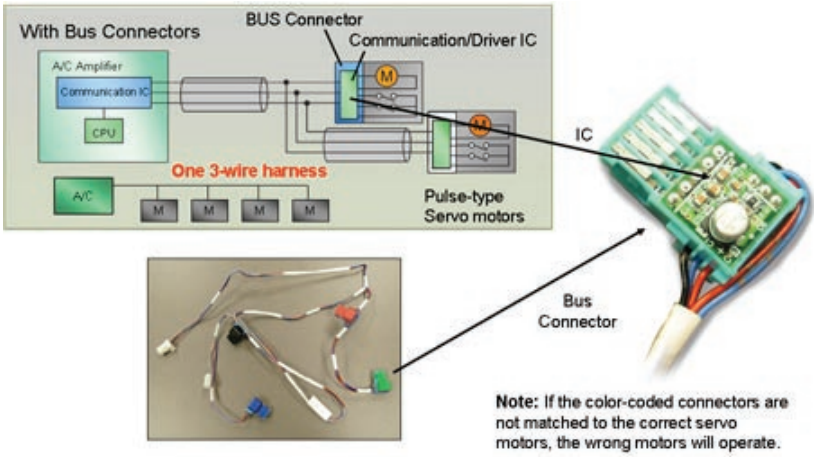
Diagnostic Applications

The new Course 673 promotes a better understanding of each of the multiplex networks, establishes technicians' confidence in dealing with these networks, and provides the foundations for technicians to build a diagnostic strategy. Instructor demonstrations are also featured and technicians will apply a number of diagnostic techniques to monitor and repair faults using "hands-on" exercises on a variety of different Toyota Multiplex Networks.

Chris La Rocca — Technical Training







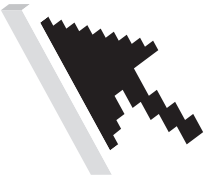
SOLVING UIN CONCERNS with NEW UIN WEB MODULE TRAINING

You might wonder why Toyota would develop a new course to address customers' noise concerns. After all, Toyota vehicles are known for smooth, aerodynamic styling and for tight fit and finish. Isn't it enough to produce vehicles with a comfortable ride, good performance with minimal wind noise and road feedback? However, other factors may make the driving experience a bit annoying with a few unusual sounds.

Maybe the answer is because Toyota cares about its customers. Or maybe it's the satisfaction that comes from making the riding experience even better and more comfortable for our customers.

Recently, the University of Toyota launched a new web training module that helps technicians locate, diagnose and silence those unusual noises.

With the vision and planning of Rich Weeda in Technical Training and the field development team, Course E081 — Unusual Interior Noise Concerns, took on a solid form. Let's ask Rich a few questions about what happened behind the scenes.



Q: When you were planning this course, what did you have in mind?

We wanted to reach the largest audience with a web module that would provide technicians with information that would help them identify the source of UIN (unusual interior noise) and the techniques and materials to use to repair the cause.

Q: How did you develop the course materials?

I visited dealerships to interview technicians and their service management regarding repair techniques and best practices in dealing with customers' UIN concerns. I visited with the interior design engineers at an assembly plant and learned about their efforts to reduce the likelihood of UIN. This includes altering the length and isolating wire harnesses, and insulating air ducting. The development team included Field Technical Specialists, a Service Training Instructor and a dealership shop foreman. The team met to set the course's Final Student Performance objectives.

Q: What are some highlights from the UIN web module?

First, UIN diagnosis begins with gathering specific information with a customer questionnaire. If necessary, set an appointment so the vehicle can be cold-soaked overnight. And most important, the customer must identify the noise during a test drive.

The next step in diagnosis is to review Technical Service Bulletins for the specific model. If needed, ask another technician to help you listen for the source of noise. It's very helpful to have an extra set of ears to diagnose the source of UIN because some interior noises travel. Sitting in different locations in the vehicle can also help pinpoint the source of UIN.

Further, keep the work area organized so the customer's parts and vehicle remain clean and undamaged. Before disassembly, take time to set up and label separate storage containers on a mobile cart. Another benefit of organizing parts in containers is that it saves time during reassembly.

And finally, verify the repair and ensure that no new noises have been introduced.

Figure 1 The customer questionnaire is used to gather information from the customer about the UIN. This information will assist you with diagnosis.

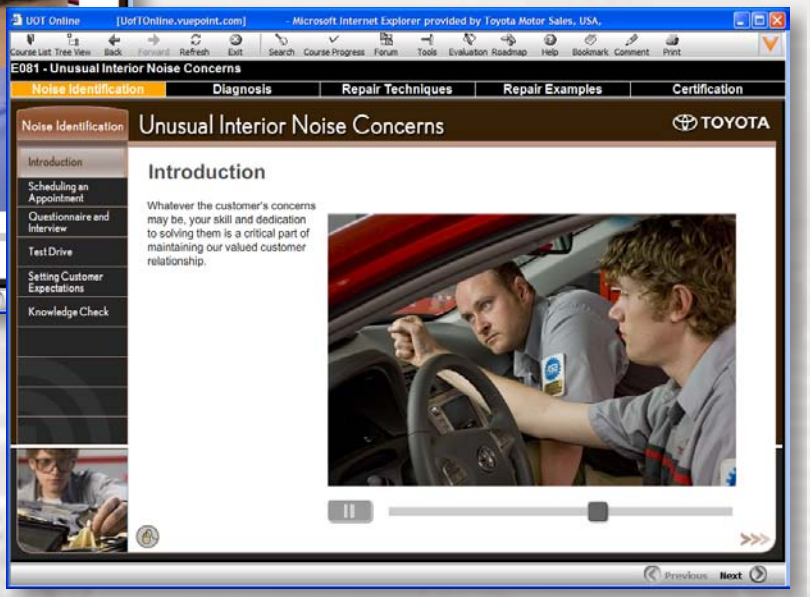


Figure 2 Your skill and dedication to solve a customer's concern is a critical part of maintaining our valued customer relationship.

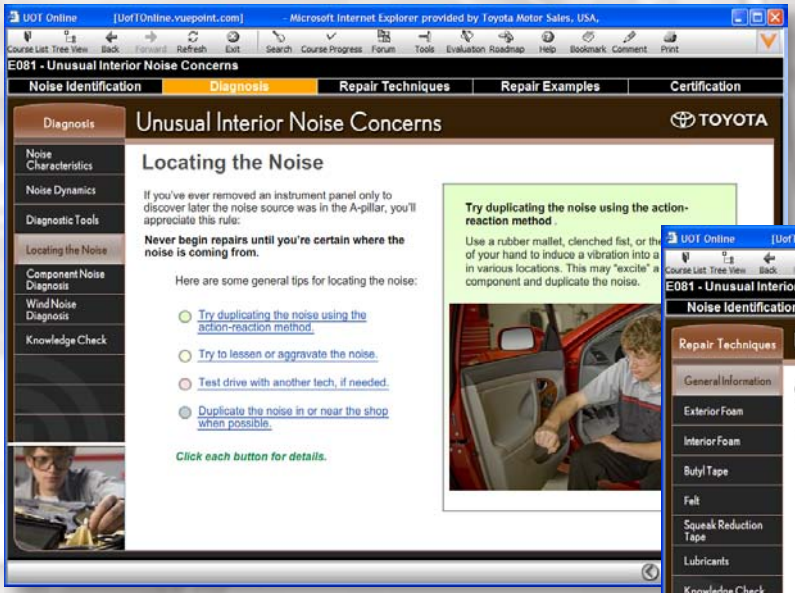


Figure 3 Inducing a vibration at the door panel may excite a loose component and duplicate the noise.

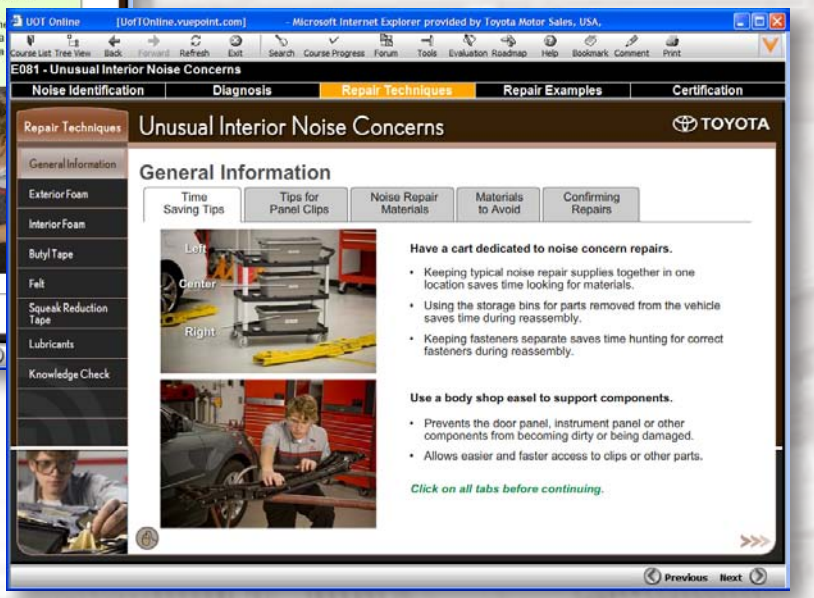


Figure 4 Place parts in storage containers and a cart to keep parts clean, organized, and to save time during reassembly. Use a shop easel to provide a clean work surface for IPs, door panels and cowls.

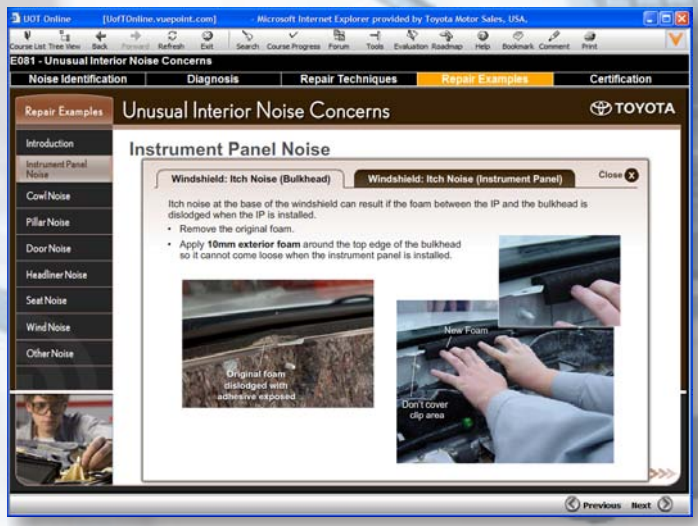


Figure 5 Apply foam around the top edge of the bulkhead to reduce the chance of dislodging the foam when the IP is installed.

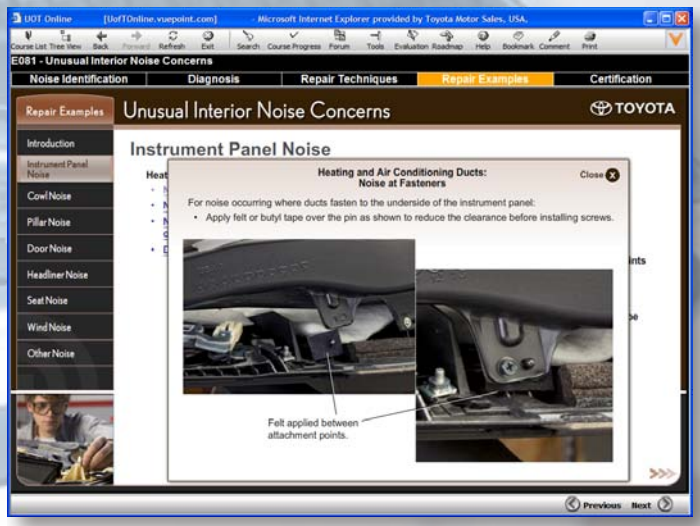


Figure 6 Insulate two plastic surfaces with felt or butyl tape to reduce the likelihood of noise.

How can Toyota technicians benefit from completing the UIN web module?

Technicians learn what to look for and what material to use to insulate various parts. They learn how to isolate the noise to various component areas such as the cowl, roof, A-pillar, seat or instrument panel. For example, when pulling an instrument panel, there are multiple sources for noise on the IP as well as the IP support tube and wire harnesses.

The web module helps you identify the sources so that you can insulate the parts, preventing their contact and noise generation. Removal and replacement of an instrument panel is time consuming, and gets even worse if it has to be removed a second time. Spending a little extra time to eliminate potential sources of UIN will help ensure that the panel doesn't come out a second time.

What is different about today's vehicles that might produce more noise than cars that were made in the 1980s?

Earlier models had a higher content of metal in the instrument panel as well as lower panel covers with multiple fasteners that provided rigidity that reduced movement. To minimize vehicle weight and improve MPG, the instrument panel is a reasonable source for weight reduction.

What was it like building this web module from scratch?

There are multiple sources of automotive training that provide lots of opportunity to learn about electrical, engine, transmission, climate control, suspension systems and management systems but there's very little focus on interior noise detection and repair procedures. To build this module, we had to review multiple service bulletins, talk with TAS Hotline engineers and Field Technical Specialists, and speak with technicians who have consistently had success meeting customer expectations.

Is there anything you discovered while working on this course?

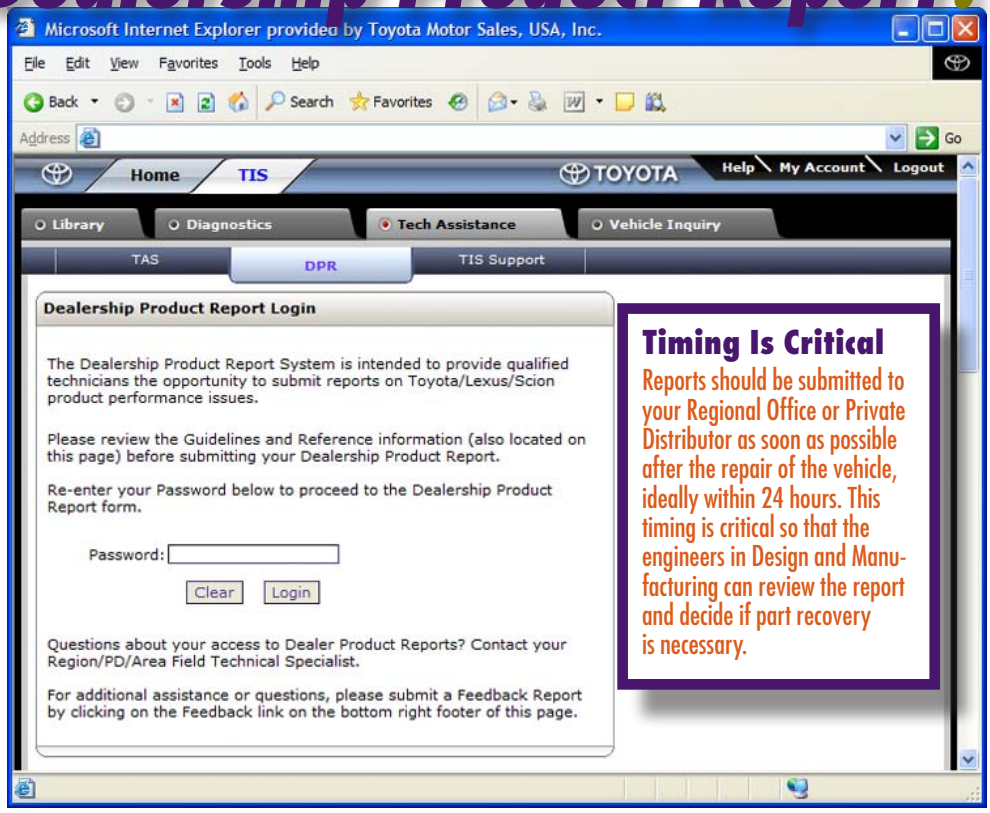
Those who are successful with UIN repair have a positive attitude about their ability to satisfy the customer with the repair. Successful service teams use best practices from the time a test drive appointment is scheduled, specific information is gathered using the customer questionnaire, and customer expectations are set.

Do you have advice for a technician who is trying to find the source of an unusual noise?

It is essential that the customer identify the UIN during a test drive. It is important to gather information from the customer. If UIN cannot be identified, there should be no repair attempt, unless the concern is outlined in a published Technical Service Bulletin.

OVERVIEW: What Happens to Your Dealership Product Report?

Dealership Product Reports (DPRs) are one of the key sources of information for the Product Quality and Service Support (PQ&SS) department at TMS. DPRs help us understand what concerns customers may be experiencing with their vehicles.



It Starts with You

The DPR is written by Toyota Master Diagnostic Technicians and Master Technicians. These reports are extremely useful because, other than the customer, the technician has the best first-hand experience with the issue.

Your FTS Reviews the Report

Once the report is written and submitted, it is quickly reviewed by your Field Technical Specialist (FTS) at the Regional Office or Private Distributor. Then it is sent to TMS where an engineer reviews the document, enters it into a database, and a tracking number is established. Once this number is assigned, the report is sent to design engineers in Japan, Michigan, and Kentucky, as well as to manufacturing engineers and workers at the factory where the vehicle was built.

While this sounds like it might take weeks to complete, this is often accomplished on the same day that you write the report.

DPR Guidelines

Instructions on how to write a DPR can be found on TIS by clicking the "Tech Assistance" → "DPR" tabs. You will find an overview and highlights of the program, directions on how to submit a report, and how to attach media such as photos, video, even Techstream files.

How Old Is the Vehicle?

While most DPRs will be written on newer products, Dealership Product Reports may be written for vehicles as old as 10 years. In many cases (when the repair is paid by the customer) your DPR may be our only resource to let us know that the customer has a concern with their Toyota or Scion vehicle. This is an important means for Toyota to monitor the long-term durability of our products.

Benefits to You and Your Customer

High quality Dealership Product Reports help support vehicle investigation activities that may result in a Technical Service Bulletin (TSB).

Remember…You *do* make a difference!

Howard Abrahams — Group Manager, Product Quality and Service Support

ENTERING **DPR** DATA

Toyota MDT and Master technicians have reporting privileges. Your personal information and the vehicle information are automatically populated.

REPAIR INFORMATION SECTION

1 Component and Subcomponent Area

Identify the affected component and subcomponents. Select the same area as when calling the Technical Assistance Systrem (TAS) Hotline.

REPAIR DETAILS SECTION

2 Condition/Concern

Enter the customer concern from the repair order. Be sure to note if you were able to duplicate the concern.

3 Inspections/Diagnostic Steps Performed

Enter a concise description of what tests or checks you did to determine the cause of the concern. If necessary, cite the repair manual processes and relevant test results.

4 Possible Cause Determined

If you were able to determine the most likely cause for the concern, enter a clear and concise summary of your findings. Be sure to remain factual and specific to the current vehicle.

5 Action/Repair Steps

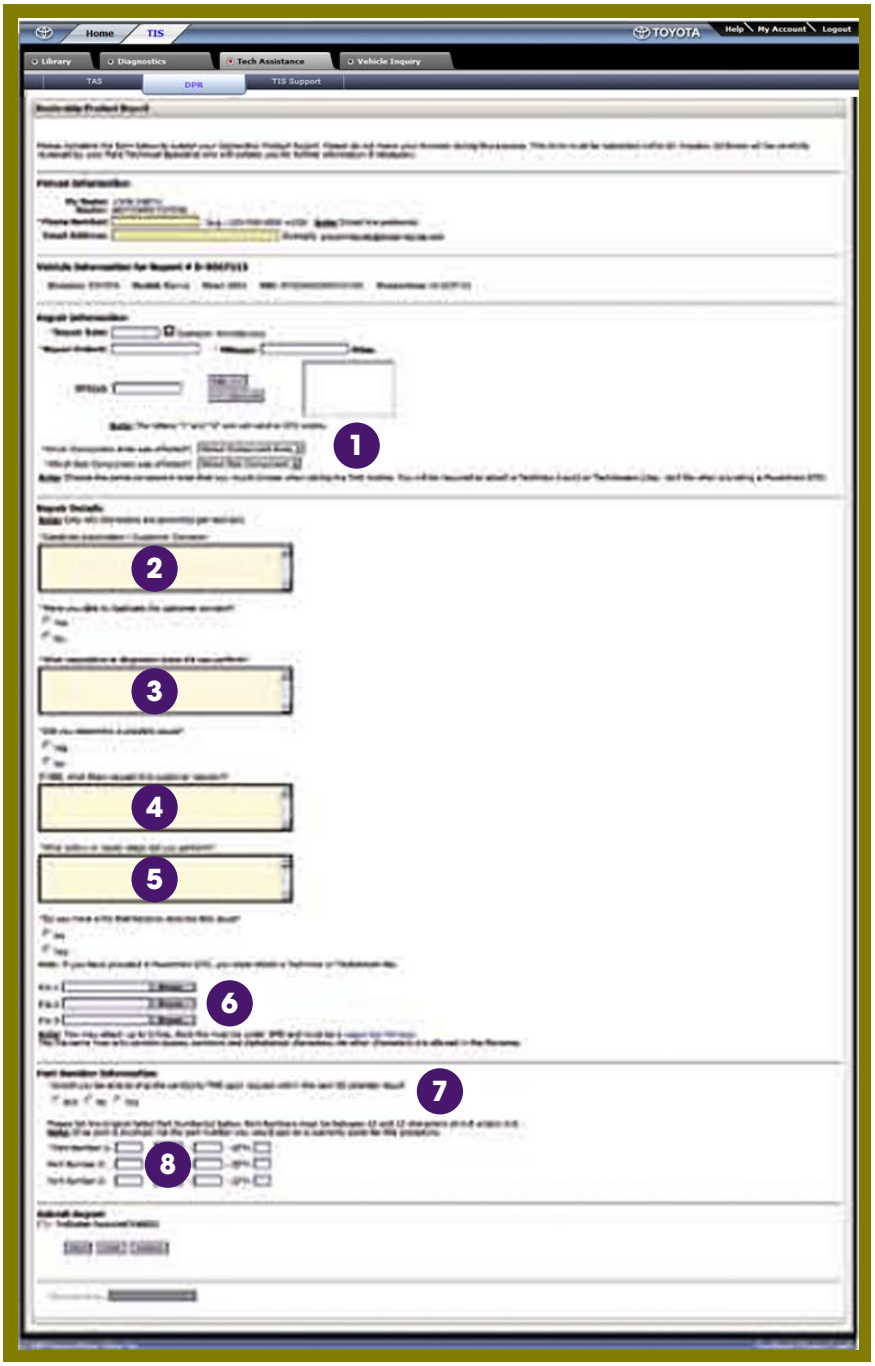
Enter a concise description of the steps taken to repair the vehicle, including all components replaced.

6 Attach File

Include up to 3 pictures or TIS techstream data files to support the issue reported. Each file must be under 3 MB and must be a supported file type.

FILE TYPES (Max. 3 MB for each file)

PHOTOS	.bmp, .gif, .jpg, .jpeg, .png
MOVIE CLIPS	.avi, .mpg, .mpeg, .mov, .wma, .wmv
ADOBE PORTABLE DOCUMENTS	.pdf
TIS TECHSTREAM FILES	.tse, .ter
TECH VIEW FILES	.evn



PART NUMBER INFORMATION SECTION

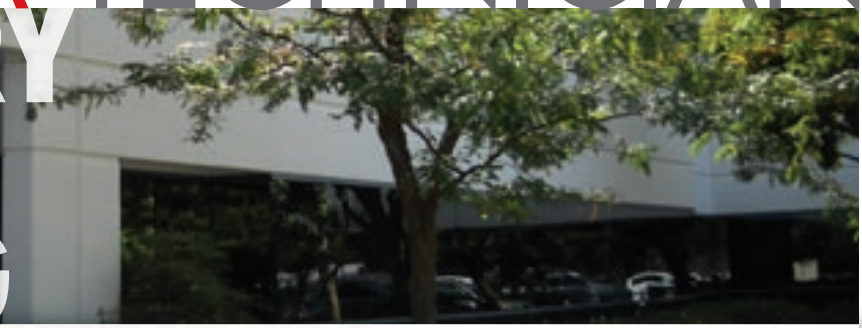
7 Shipping Parts

Check whether you would be able to ship the part(s) to TMS upon request from a Product Engineer.

8 Part Number

At least one part number is required on all reports. If no parts were replaced during the repair, use the original failed part number as entered on the warranty claim. Be sure to note the quantity for all parts. *Fill in zero (0) quantity if no parts were replaced.*

TOYOTA TECHNICIAN ADVISORY COUNCIL MEETING



The summer 2009 Toyota Technician Advisory Council meeting was held at Toyota Motor Sales' headquarters in Torrance, California. The group met in Toyota's Service Development Center — home of the University of Toyota Technical Training department, Product Quality and Service Support (PQ&SS), Technical Assistance System (TAS) Hotline, and Service Technology.

Toyota technicians were represented by Tom Damon of Kenosha Toyota in Wisconsin; Mike Bacon of Prime Toyota in Saco, Maine; Chris Owens of Fort Myers Toyota in Florida; and Mike Luman of Performance Toyota in Memphis, Tennessee.

The council was joined by Toyota Service Training Specialists (STSs): George McWilliams of the Denver Region; Grant Buske of Southeast Toyota; and Don Connors of the Cincinnati Region. Several TMS associates, representing the University of Toyota, PQ&SS, and Technician Training and Education Network (T-TEN), welcomed the technicians to the meeting.

The business meeting opened with a tour of the TMS campus and an in-depth walk-through of the Service Development Center. A warm welcome set the tone for discussions.

Council Members Speak Up

The advisory council members were invited to share with the group those topics that were "hot" at the dealership. Items for discussion included the following:

- Electrical Wiring Diagrams (EWDs) in book form for dealerships,
- Oscilloscope capabilities for Techstream,
- TIS search functions,
- Basic engine service and technology course, and
- Desire for a basic maintenance course.

Discussion of EWDs confirmed that technicians need printers at the dealership to print wiring diagrams. The Service Technology group is exploring an O-scope package that can be used with Techstream.

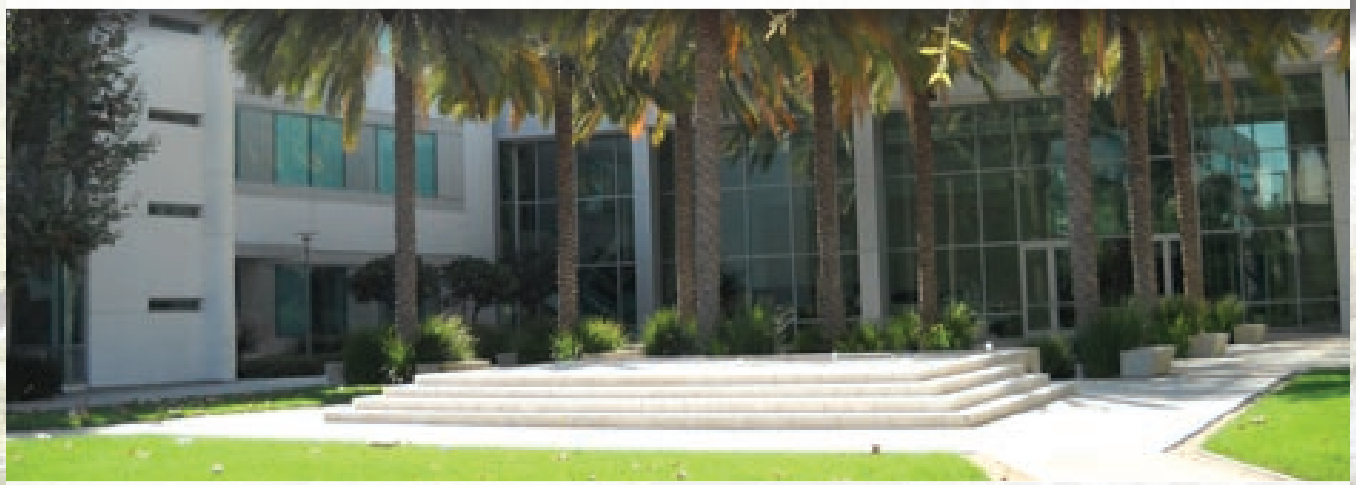
Improving results when using the search feature on TIS may be included in a future web module. **Note:** In the meantime, technicians are encouraged to submit feedback using TIS. The technicians' feedback is then reviewed by service technology engineers and helps to improve TIS usability.

A new course for engine technology is on the horizon, however, the content and delivery method are still to be determined. Council members suggested using engine photos as part of the training materials.

A basic engine course may include cylinder head removal and installation, valve adjustment, timing chain replacement, VVT-i, and other engine service and maintenance procedures.

Technical Training Courses and Skill Level Guidelines

The discussion turned to core course requirements for instructor-led courses: Course 010C – 2010 Prius New Model Technical Introduction; Course 673 – Electronic and Computer Controlled Systems, and Courses 973A/973B (High-Tech Engine Controls and High-Tech Smart Key). The advisory council members expressed their enthusiasm for Courses 973A and 973B.



The STSs were also recognized for their hard work in improving and maintaining skill level guidelines. Technicians expressed that skill level guidelines are affected by the timing and types of courses that are released during the year. The University of Toyota is aware that spreading out courses more evenly throughout the year may lessen the impact on training center capacity. The advisory council confirmed that skill level guidelines encourage dealerships to enroll technicians in technical training courses.

Service Technology Updates

The Product Quality and Service Support department was represented by Jeff Northrup, Tool/Equipment Manager; Rusty Brown, Product Engineer; and Zachary White, Product Engineer.

Regarding Techstream, several items were addressed:

- For longer DLC3 cables, a resource is OBD2cables.com.
- The current standard is one Techstream for every five technicians at the dealership.
- As an alternative for the Techstream tool, a software and vehicle interface module (VIM) package will be announced later in 2009. This option enables the use of a personal laptop and a VIM which can be used to create a functional Techstream tool. This option would be used in addition to the existing Techstream tool and standard.

Updates for the GR8 battery tester/charger: A field fix for known issues will be released. Replacement cables for the GR8 battery are in the works. Technicians are asked to retrieve the old cables so new cables can be installed in their place.

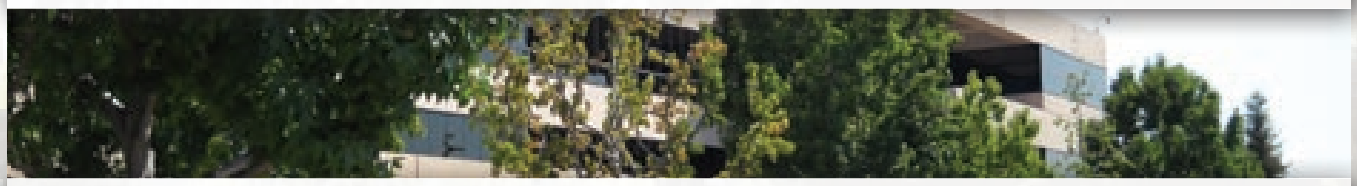
Oscilloscopes: The council requested an oscilloscope function for use with Techstream. They stated that the scope function would be used regularly if it were available. While oscilloscopes are important, timing is dependent on an economic recovery. Investigation of oscilloscopes by the service technology group is ongoing.

Docking stations for Techstream: The council members requested investigation into the docking stations that may prevent charging of Techstream units. Council members who are having this issue will submit photographs to assist in the investigation.

Request for a special service tool (SST) for use on the "pentagon" bolts on VVT-i actuators: Council members suggested that a special socket would be very helpful. The request requires further research to determine if an SST will be developed.

e-Learning Opportunities

Electronic-based technical training continues to grow. The mid-year total for the Toyota division is 47 e-learning modules. This year's web modules include Course 010A – 2010 Prius New Model Technical Preview, Course E081 Unusual Interior Noise Concerns, Course E084 Toyota Safety Connect, P673 Electronic and Computer Controlled Systems Pre-work, and 2009 4Runner and carryover models.



Dealership Product Report (DPR) Dialogue

Attendees for the DPR discussion: Bob Waltz, Vice President, Product Quality and Service Support; Gary Smith, Corporate Manager, Quality Assurance and Compliance; Greg Bryan, National Quality Operations Manager; and Howard Abrahams, Quality Assurance Group Manager.

DPRs are a great indicator of product issues because the reports are submitted directly to PQ&SS by MDTs and Master technicians. The council discussed various challenges faced by dealership technicians regarding DPRs. PQ&SS responded that the quality of the reports remains high and PQ&SS indicated that further training on DPR development is in the works. An article on the DPR process is in this issue of *Toyota Tech*.

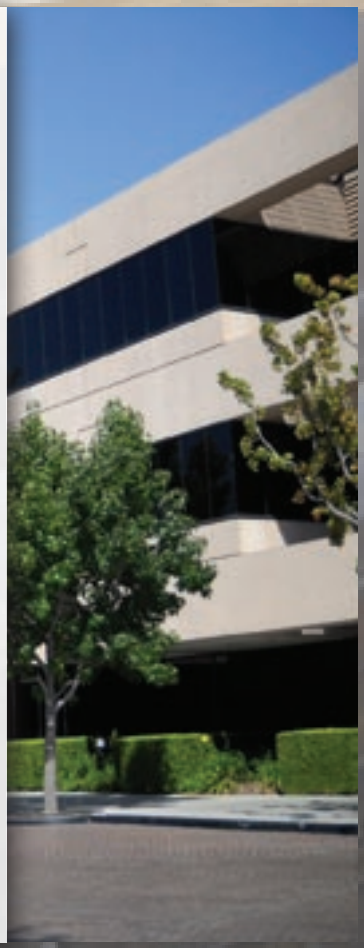
Technicians desired some sort of feedback that their DPR has been received. Perhaps this could be an in-box message to the technician or an e-mail that is sent to the dealership general manager. A recognition and feedback system for creating a DPR is also being explored.

Other opportunities included establishing a new category of technician references, such as Tech Tips, which could provide information to the technician that a Technical Service Bulletin is imminent or request that the TAS Hotline be contacted for further information.

Core Curriculum Development and Maintenance

Tom Brenneman, Toyota New Model and Core Curriculum Team Leader, updated the group on new or updated core technical courses:

- Courses 071/256 – Toyota Hybrid Systems (3 days): The development team is hard at work. Look for an all-new Course 071 by the end of the year. Course 256 will be an e-learning course.
- Course 072 – Toyota Hybrid Diagnosis (3 days): Launch occurred earlier in 2009.
- Course 673 – Electronic and Computer Controlled Systems (3 days): Launched in June 2009. Look for this new course on your Region or Private Distributor's technical training schedule.
- P673 Pre-work – All-new, engaging content that will challenge your electrical diagnosis skills and reveal a few diagnostic tips.
- Course 274 – Automatic Transmission Diagnosis (3 days): Updates to this course are underway. Technicians will learn how to diagnose automatic transmission issues to determine if replacement is needed.
- Course 852 – Engine Control Systems I (3 days): Minor updates, including permanent diagnostic trouble codes (DTCs).
- Course 753 – Air Conditioning (2 days): A new pre-work web module launched in May 2009.
- Course E081 – Unusual Interior Noise Concerns: A new web module launched in July 2009.
- Course E084 – Toyota Safety Connect: Launched in August 2009.



High-Tech Training

Ed Ralbovsky, High-Tech Team Leader, provided an update on high-tech projects that have been completed: E078 – Tire Pressure Monitoring System; and two one-day instructor-led courses: 973A Engine Controls and 973B Smart Key. **Note:** Calls to the Technical Assistance System (TAS) Hotline regarding tire pressure monitoring/warning systems decreased 55 percent after the launch of the TPMS e-learning web module.

Future projects in the high-tech arena include multiplex systems, Toyota Navigation systems, and Bluetooth™.

Telematics

Tracy Bauer explained the new Safety Connect system. It is an emergency response system that consists of a communication module, and on some Toyota models, a backup battery. During diagnosis and repair, technicians need to follow specific procedures. Many technical details you need to know are in the Course E084 – Toyota Safety Connect web module. **Note:** Do not swap components between vehicles because the parts are registered to a specific VIN.

Technician Handbooks

John Saia, Technical and Body Training Development Manager, asked if the new method to provide printed technician handbooks used in technical training centers is working. All the council members agreed that the paper copy works well in the classroom setting. **Note:** Technician handbooks are available for viewing or downloading from TIS. Most technical training centers use a printed copy of the handbooks in the classroom and make the electronic version available to technicians.

The technicians who attended the advisory council meeting did what they do best: They provided candid comments and requests for more information, tools and service procedures. Toyota relies on its technicians and their candid feedback to improve its technical training, dealership product reports, customer satisfaction levels and its reputation in the automotive industry. **Note:** Your input is valuable. Contact one of the advisory council members if you would like a topic discussed at the next advisory council meeting.