

# TOYOTA TECH

THE MAGAZINE FOR TOYOTA TECHNICIANS

FOURTH QUARTER 2009

## 2010 4RUNNER NEW MODEL HIGHLIGHTS



# 2010 TOYOTA 4RUNNER

**T**he 2010 Toyota 4Runner is a rugged, capable vehicle that represents the fifth generation for the nameplate. While many vehicle systems remain relatively unchanged from the previous generation, several important modifications are worth noting. The biggest changes to 4Runner for the 2010 model year are in the engine, suspension and brake control systems, and the audio system. Read on to learn more about the 2010 4Runner so you can better serve Toyota customers.

## Engine and Transmission

4Runner has two available engine/transmission combinations for 2010. The first is the 1GR-FE 6-cylinder paired with an A750E/A750F 5-speed automatic. The A750 remains virtually unchanged from previous models while the 1GR-FE incorporates several differences. Among other changes, the engine now employs Dual VVT-i, camshaft housing, and an element type oil filter.

The second powertrain available for 2010 is the 2TR-FE 4-cylinder with A343E 4-speed automatic transmission. The 2TR-FE is the same 2.7-liter unit found in the Tacoma, while the A343E has been updated and now uses Toyota WS fluid with a dipstick.

Both powertrains employ a Fuel Pump ECU to switch the fuel pump speed between three speeds, depending on driving conditions. The ECU is located on the left-rear frame rail and operates the same as for the Tundra.



## Body

Smart Key is now available on the 2010 4Runner with new lock/unlock switches located on the rear door. These switches can also be pushed and held to operate the power rear window from outside the vehicle.



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**John Saia** — Technical & Body Training Development Manager | **Miki Todd** — Editor-in-Chief | **Think Ink** — Design  
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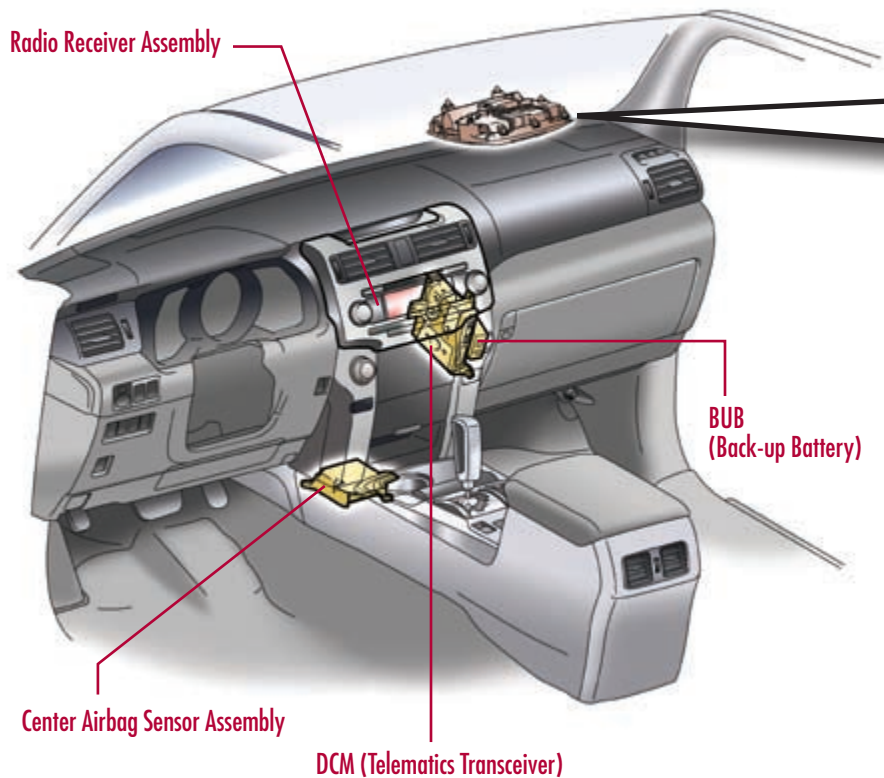
University  
of Toyota

Also available are a rearview monitor and Parking Assist System to aid in vehicle maneuverability. The rearview monitor camera image is displayed on the NAV screen or in the left portion of the interior rearview mirror if not equipped with NAV. The Parking Assist System uses four ultrasonic sensors in the rear bumper to detect objects near the vehicle. The Parking Assist System display is located below the HVAC controls to the right of the steering wheel.



The 2010 4Runner adds even more peace of mind with an optional Safety Connect system. As on other Toyota models, this system provides emergency call services through a cellular network. The system includes an SOS Switch in the map light assembly and a Back-up Battery located behind and to the left of the glovebox. Always refer to the Repair Manual for diagnosis and repair of the Safety Connect system.

## Safety Connect Component Location



## Sliding Deck



The 2010 4Runner is about more than safety, it is also great for tailgate parties. An all-new Party Mode adjusts the audio system equalizer settings and uses the back door speakers to enhance audio performance for outdoor activities. Party Mode is activated using a switch on the lower instrument panel. Combine 4Runner's Party Mode with the all-new Rear Sliding Deck and let the party begin! In addition to the AUX audio input, 4Runner includes Bluetooth® audio and a USB interface located in the glovebox.



Sliding Deck

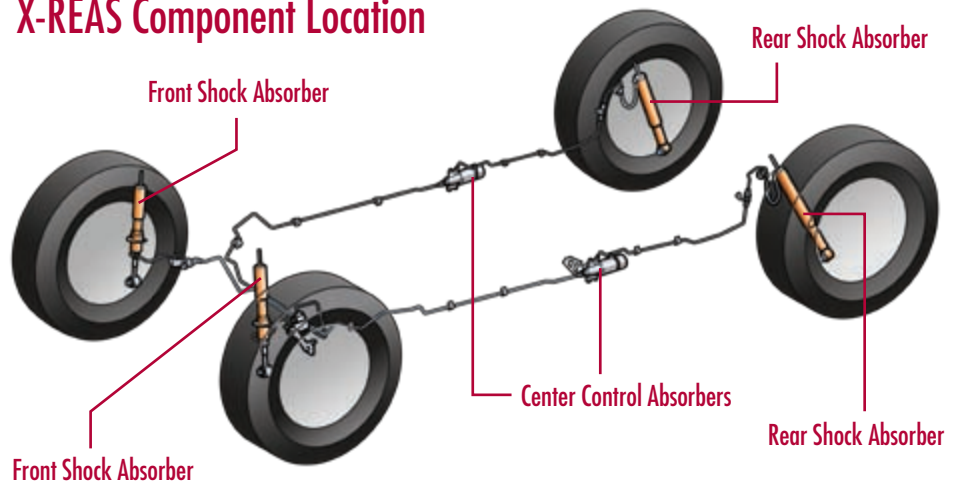
## Chassis

4Runner is now available with 17-inch or 20-inch wheels and includes 4-channel direct-sensing type tire pressure monitor system (TPMS). Suspension is unchanged from the previous model with a coil spring double wishbone setup in the front and 4-link with lateral rod in the rear.

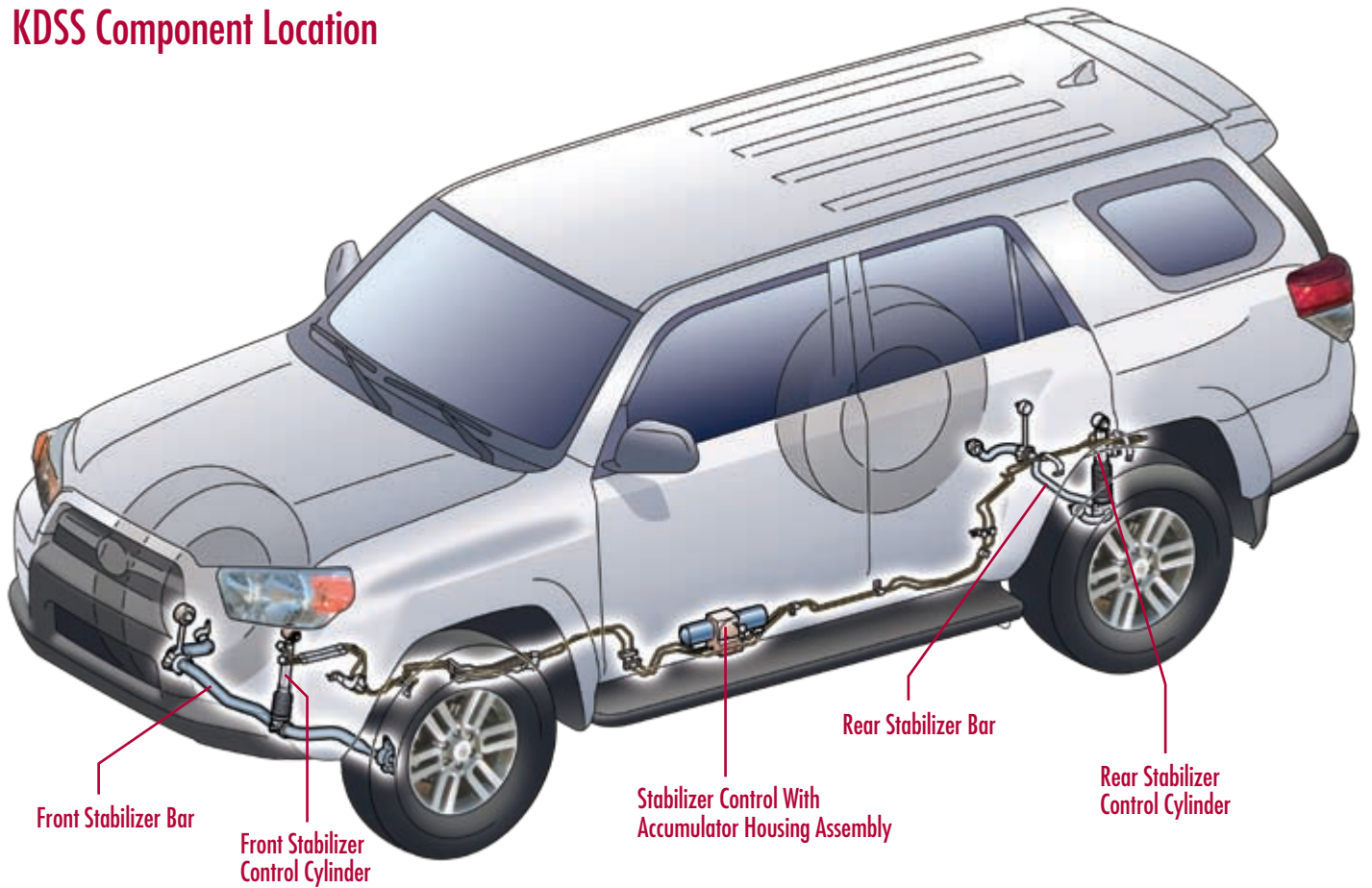
While four-wheel-drive is only available on vehicles with the 1GR-FE, two different transfers are available to distribute power to the drivetrain. The VF4BM two-speed transfer is similar to the previous model and provides full-time 4WD. This transfer features a Torsen® LSD center differential that can be locked. The VF2A transfer is a part-time 4WD design similar to that found in the FJ Cruiser.

The Cross-Relative Absorber System (X-REAS) from previous models has been carried over to the 2010 4Runner. This system uses front and rear shock absorbers connected diagonally by tube assemblies through Center Control Absorbers. As the front and rear shock absorbers compress and extend, hydraulic oil is forced back and forth through the Center Control Absorber. The resulting flow acts as a dampening force, which improves vehicle handling. **Service Tip:** Never loosen the union bolt on the shock absorbers; these components must be replaced as a unit.

## X-REAS Component Location



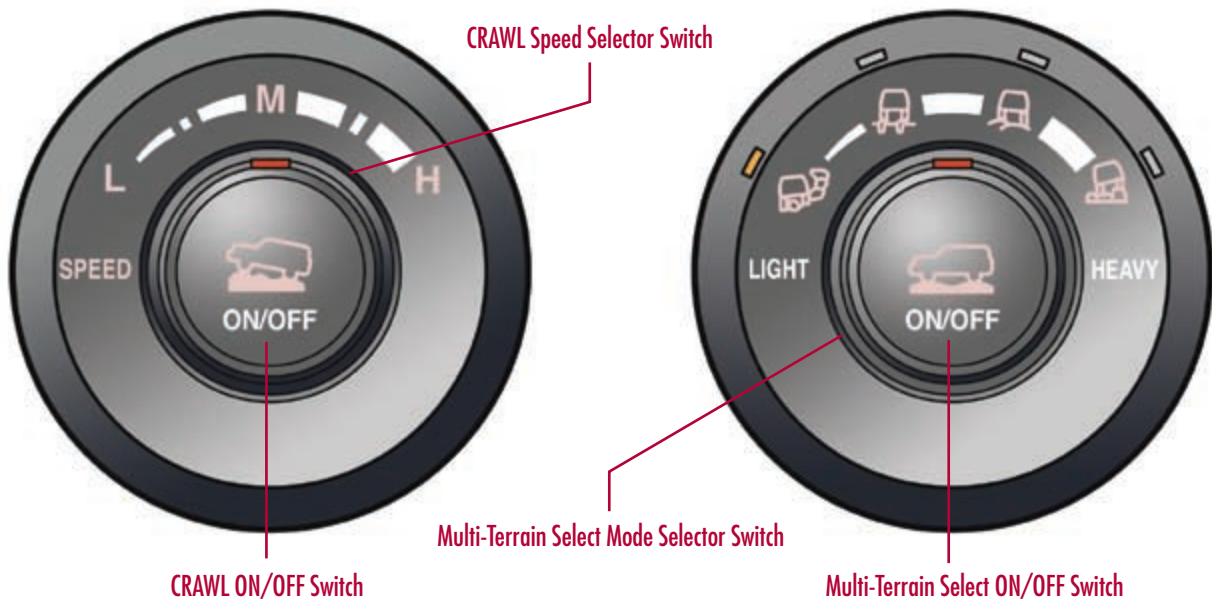
## KDSS Component Location



New to 4Runner is the Kinetic Dynamic Suspension System (KDSS), which is similar to Land Cruiser. The front and rear stabilizer bars are connected through a set of hydraulic lines and control cylinders. During body roll, the hydraulic pressures of the front and rear cylinders are the same, so the cylinders do not operate; this allows the stabilizer bars to operate similar to traditional suspension systems. However, during off-road driving, the wheels move in different directions, causing the cylinders to operate in opposite direction from each other. This allows the stabilizer bars to move freely, providing unhindered suspension travel and helping maintain tire contact with the driving surface. An SST is required to bleed the KDSS following service. **CAUTION:** The fluid sealed in the hydraulic circuits of the KDSS is at very high pressure.

### KDSS SPECIAL SERVICE TOOL (SST)





CRAWL ON/OFF Switch


Multi-Terrain Select Mode Selector Switch

Multi-Terrain Select ON/OFF Switch

Another system new to 4Runner but similar to Land Cruiser is CRAWL Control. This system automatically controls engine output and braking force to maintain a manually-selected speed between 1 and 3 miles per hour. This allows the driver to focus on steering when driving in difficult terrain. The system is turned ON/OFF and one of five set speeds is selected using controls located in the overhead console.

Finally, the 2010 4Runner is available with an all-new brake control system called Multi-Terrain Select. This system allows the driver to select between four modes based on off-road driving conditions. Once a mode is selected, the system controls both the ABS and VSC to provide optimum traction for each condition. The driver can turn the system ON/OFF and select between Mud & Sand, Loose Rock, Mogul, and Rock using controls in the overhead console.

## Conclusion

The 2010 4Runner continues the tradition of capable, useful models that came before it. The combination of proven drivetrain components and innovative driver support systems results in a vehicle that is fun to drive and comfortable without sacrificing off-road performance or utility. Be sure to check out the e-learning module O10B – 2010 4Runner New Model Technical Preview to learn more about the 2010 4Runner. 

**Adam Crawford** — Technical Training



# Your **DPRs** Make a Difference!

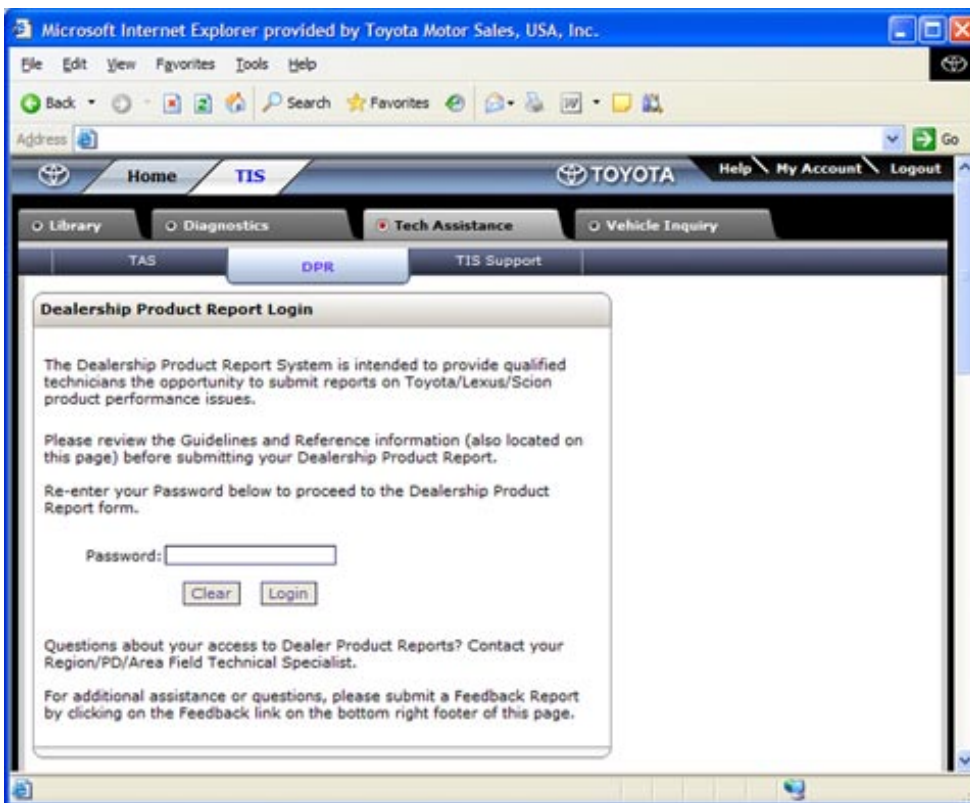
**B**y now you've read last quarter's *Toyota Tech* magazine article on how Dealership Product Reports (DPRs) help Toyota identify and resolve customer concerns. This is a special page that recognizes technicians' contributions to product quality.

**January 1 through October 31, 2009:** Did you know that technicians at 670 dealerships have written nearly 4,800 DPRs? That's a 40 percent increase in reports and dealer participation compared to the prior year.




TMS Product Quality & Service Support (PQ&SS) would like to thank the following technicians for their outstanding support of the DPR program:

TECHNICIAN	DEALERSHIP	REGION
CHRIS BRUNETTI	ADVANTAGE TOYOTA	CENTRAL ATLANTIC TOYOTA
FARZAD MAKAREHCHI	355 TOYOTA	CENTRAL ATLANTIC TOYOTA
JEFF ALLBRIGHT	KENNY KENT TOYOTA	CHICAGO
VICTOR CAMPERI	FINDLAY TOYOTA AND SCION	DENVER
JOHN MORSE	JOHNSTONS TOYOTA AND SCION OF MIDDLETOWN	NEW YORK
KEN KELLY	DCH FREEHOLD TOYOTA AND SCION	NEW YORK
SCOTT CARROLL	JOHNSTONS TOYOTA AND SCION OF MIDDLETOWN	NEW YORK
SCOTT VON TUNGLN	KEYES TOYOTA	LOS ANGELES
JAN SIEBEN	VENTURA TOYOTA	LOS ANGELES
JOHN VON HARTMAN	DAVID MAUS TOYOTA AND SCION	SOUTHEAST TOYOTA



As a group, these 10 technicians have submitted 565 DPRs! Great job and please continue to submit your high-quality reports.

Through your efforts, Toyota design and manufacturing engineers are constantly improving the Quality, Durability, and Reliability (QDR) of Toyota and Scion vehicles.

Look for future articles on QDR, how DPRs are used at the factory, and exciting new programs that will recognize you and your contributions to Toyota. 

**Howard Abrahams** —  
Group Manager,  
Product Quality and Service Support

# "Quality Is Our Future" You're A Part of It!



## How We Respond to Change

It is clear that our "Quality First" initiative that began in 2008 is working. Our new vehicles are better than ever, as you can see in the IQS results for Highlander. This was the first vehicle produced under this new initiative. You should know that the entire company has been mobilized to maintain our leadership in quality. We count on you to make the final link to the customer, whether through scheduled maintenance, or through problem solving when the customer needs a repair. By focusing on doing the best job possible on every customer's vehicle, we'll maintain our top quality position in the industry.

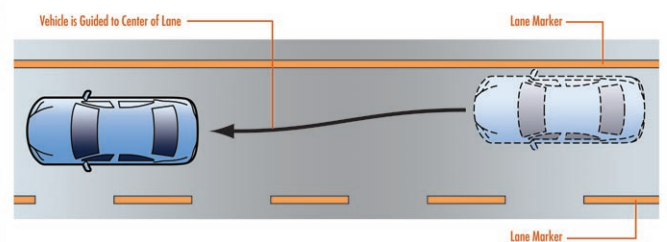
**Q**uality remains the hallmark of the Toyota brand and the foundation of our future success. The latest Consumer Reports results brought this message into sharp focus, with Toyota taking 18 top picks in the most reliable category, with Honda the next closest competitor at 8. Any way you look at it, we're winners in the industry and in the eyes of the customer.

What has always set Toyota apart from other companies is our ability to focus on quality, develop new products for the future and to bring the best people in the industry together to satisfy our customers. Most important, however, is our commitment to stand behind our products through the entire ownership cycle.

## Message to Toyota Technicians

We have such a bright future ahead of us. Of course, that future involves lots of new technology which means new things for you to learn. For example, you're probably already up to speed on the all-new Lane Keep Assist system in the new Prius. We will continue to share information about innovative new technologies like this through *Toyota Tech* and other publications. It is important for you to know that as a valued member of our quality team you are not alone. In order for you to do your best, Toyota must do its part to be the best in technician support. We will make certain you are "in on" the latest features of our cars, through our commitment to the kind of technical training and service support you need to provide our customers with the best service experience in the industry.

### Lane Keep Assist (LKA) Function





## Toyota Culture

A big part of our winning formula is your contribution to the team. Now more than ever in our history, we have the ability to listen to you in real time, make discoveries and resolve problems together, and collaborate in ways that take us to new heights.

When you call the TAS Hotline, write a Dealership Product Report, or simply file a warranty claim, we incorporate all of that information into what we call an "obeya" process. This process involves a systematic analysis of all the different data sources available to help us look for trends to develop. The results are posted in a common location called the Obeya Room so at any time our engineers can very quickly identify those trends. Based on that analysis, we can prioritize our efforts, focus on what's important, and strive for excellence. Your feedback, through one of these channels may result in a Technical Service Bulletin that helps other technicians across the country or lead to a new manufacturing procedure that is implemented during the assembly process.



### To Our Future: Focus on Quality

I firmly believe that we'll continue to be winners in the way our cars will evolve into the future — The technologies in these vehicles will make them more environmentally friendly, safer, fun to drive, and will better support customer lifestyles.

It's going to be an exciting time. You should take pride in the fact that you're an essential part of an integrated and powerful network that delivers quality to our customers, which is a part of the Toyota promise. Your contribution in this process is pivotal in helping all of us to deliver on that promise.

Well I hope you enjoy this edition of *Toyota Tech*...and, remember, everything you do does make a difference! 🏠

**Jane Beseda** — Group Vice President and General Manager,  
Toyota Customer Services





# What Is JKK?

## JKK (*Jikotei-Kanketsu*) Process

**J**ikotei-Kanketsu is Japanese for "Built-in Quality with Ownership."

JKK is a process. It is a tool you can use every day as you perform your job. Each step you take can be approached with an eye toward delivering a service or a product that someone else will use. Your actions and the care you put into executing the service, repair, or component installation directly affect the person who receives your service or product. Your customer may be the person who brings a Toyota to your dealership for a 1OK service. Just as easily, your customer may be your co-worker.

The flowchart shows the five steps of JKK. Each step is an action. The box next to each action is a question you can ask yourself as you perform your job. The questions enable you to build in quality from the beginning. Ownership implies taking responsibility for the outcome.

### Thumbnail Sketch of JKK

The theme of JKK is quality within your group and your own job function. If everyone at your job site uses the JKK process, you will receive work that does not need to be redone. If you make it a priority to give your best efforts on the job, when you give your work to the next person, corrections will not be needed and the customer will be satisfied.

**1. Identify Your Work Objectives/Targets**

Do you know what your customer expects and needs?

**2. Visualize the Job and Break It Down into Smaller Steps**

Can you visualize the job elements and the correct sequence?

**3. Verify the Necessary Conditions to Complete the Job**

Do you have the information and the tools you need to correctly complete the job?

**4. Use Your Judgment**

Can you evaluate the condition as "good" or "no good"? You have the authority to stop when you have a "no good" condition.

Document and Share the Job Process

Can you document the process for your team members? Use the JKK process to improve communications with your team.

**5. Implement and Monitor the Job Process**

The JKK process promotes ownership and confidence on the job. The process can be used for training and is used to build quality into every job element.



## TMS Recognizes Quality at Headquarters

In October, TMS groups from across the organization participated in Quality Month events that recognized what each group produced and the value of their products when they were delivered to their customers at TMS, or delivered to the regional offices or dealerships. Displays that were created for Quality Month were about passing on a better quality product, process or procedure so that whoever became the owner of that would have little or less work before going on to the next assignment.

## 2009 Quality Month Video


Toyota Motor Engineering & Manufacturing (TEMA) has celebrated Quality Month for the past five years. This year, TEMA and TMS produced a video to promote JKK. Associates at headquarters and the regional offices could view the video featuring Jane Beseda, Group Vice President and General Manager, Toyota Customer Services. The video was also shown to the manufacturing plants and the engineering groups in Kentucky and Michigan.

**Note:** For your convenience, a link to the TMS Quality Month video is on the Toyota Tech page on TIS. Look for the Fourth Quarter 2009 cover. Click on the blue hyperlink text to launch the video. You'll find that the JKK process does not only apply to vehicle assembly. JKK applies to the things you do every day.



## JKK Is A Symbol of Toyota

Jeff Northrup, Tools & Equipment and Serviceability Manager, was a member of the Quality Month committee and was responsible for promoting and communicating the Quality Month events for this year. He believes that JKK symbolizes Toyota.

"Toyota is a quality organization," says Jeff. "For as long as I can remember (way back to my years working at a Toyota dealership), the one thing that has set Toyota apart from any other manufacturer has been the overall quality of our vehicles. We are a process-driven organization that continually works at trying to improve what we do. The simple act of trying to do something better is what JKK is all about. As with any process that involves other people or groups, you rely on everyone involved to do their job the best they can before passing on their work." 

# Toyota Technicians Benefit from JKK

**Y**ou may ask how the JKK process is used to help you on the job. This article features two groups that produce special service tools, technical instructions and numerous other resources that you use every day. The two groups are the TMS Corporate Accessories Department (CAD) and Product Quality and Service Support (PQ&SS).



## Support Materials for Accessory Installations

The connection to CAD is that some Toyota technicians install accessories. The group at CAD works hard to provide technicians with products that come with instructions that enable them to install the product on correctly, actuate the product if it's electronic, and finish within a certain time period. It's important to the CAD group that the product meets the customer's needs.

"We try to simplify the process the best we can," says Michael Collinsworth, Corporate Accessories Department (CAD) Quality Assurance Manager. "We try to provide the right tools and the right information. For electronics, a lot of what we do is tear the car down and then put it back together. We try to make sure we've covered our bases and applied foam tape on any added wiring to eliminate any possible rattles and things like that."

Technicians are encouraged to send feedback on the quality of the accessories, the accuracy of the installation instructions, and how customers like the accessories. If technicians see a better way, the CAD group would like to know. Technicians can provide feedback through a PQ&SS Dealership Product Report (DPR) or through a Field Technical Report (FTR) from your local Field Technical Specialist (FTS) or Field Product Engineer (FPE).

The CAD group relies on technicians at the TLS processing facilities to install their accessories. If technicians report that they don't need to remove the panel if the installation is done another way, it will save time and you won't have to worry about causing a rattle. Then the CAD group makes the change in installation instructions. Good feedback from technicians is valuable in helping us save time and money.

As an example, Michael says, "At the dealerships, we rely on Toyota technicians if customers are having issues with our products. Tell us what the issue is or if there is a failure, tell us what that is."

For TLS installations, the CAD group identifies that feedback as a proactive quality because that vehicle isn't in the customer's hands yet. It's a great opportunity to get feedback and be proactive. If the installers call and say this isn't working right or this is causing a rattle, CAD can call the suppliers and change the parts or CAD can rework the parts in the system or tell the suppliers to do something different. That way, the customer never sees it.

It's much more important for CAD to hear from the Toyota technicians at the dealerships because that's reactive. The CAD group would like to hear more proactive and less reactive quality reports, but both are important. The Toyota technician's voice and their information and the quality of that information are paramount because it takes it to a different level. In this case, because it's from a dealership, it's in the customer's hands.

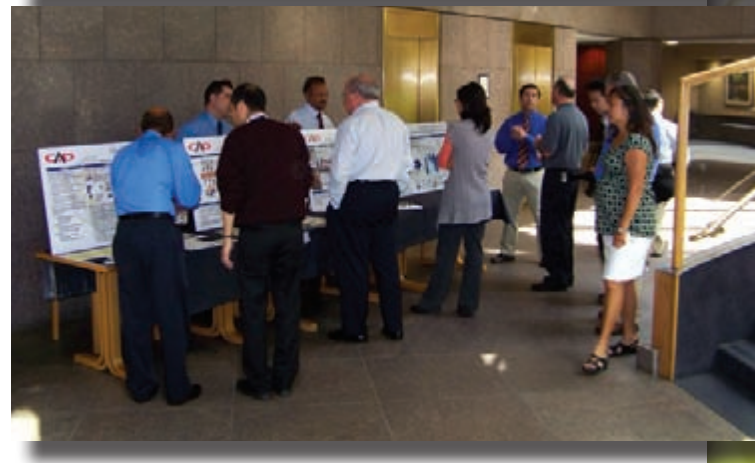
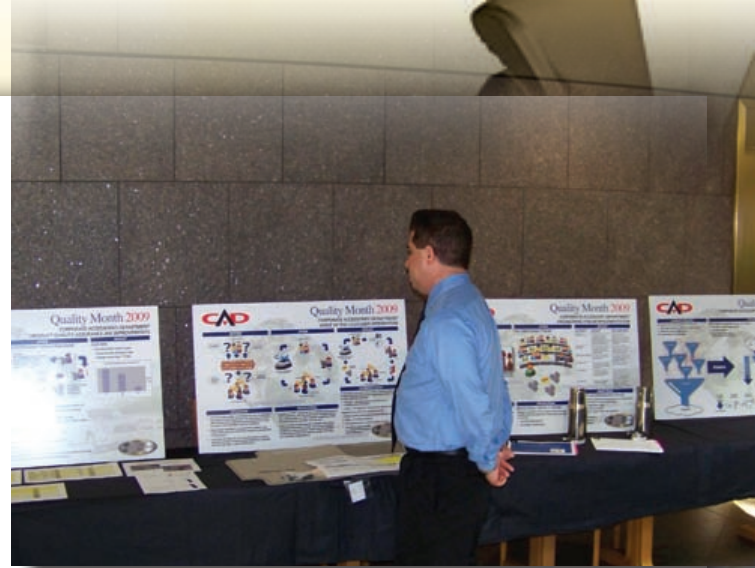
If the technicians can give CAD more information with photos, it helps them make a quantum leap in the investigation process, which is all about speed. The CAD group has a direct role with the suppliers and they are producing parts every day. If CAD receives detailed information from the technician, CAD can tell the supplier right away. The change can be made to that day's production from the supplier.

The CAD group is always thinking about the customer.

"To the customer, it is not an accessory, it's a Toyota and that's all they see," says Michael. "To the customer, that radio or that spoiler is Toyota. We make accessories. We are making a profit for the company and we're providing the customers with products and enhancements to the car."

It is impossible to separate the accessories from the nameplate.

"My responsibility is to protect the integrity of the nameplate on the car," says Michael. "I always keep that in the back of my mind. That nameplate, Toyota, and the integrity behind it is the most important thing to protect for all of us here at Toyota because it means so much and it means quality to people. For our group, we try to solve issues, solve concerns and protect the nameplate. We make sure that whatever we are putting on the car is an enhancement and continues to be an enhancement to the car."



## What PQ&SS Does for You

What can technicians expect from PQ&SS? They can expect accurate bulletins, easy to understand technical information, and corrections to the service publications. Technicians can expect technical support information that is timely, written well, with illustrations that are correct. The PQ&SS group wants to know when they don't deliver on those expectations, either through feedback on the repair manual system on TIS or through DPRs or through the regional office. Providing the best support materials will help technicians perform quality repairs.

"I have a fundamental belief that people want to do the right things," says Rick DuFresne, National Technical Support Manager. "If we make it easy for technicians and dealerships to do the right things, by building a high-quality car or having policies that make sense, people would rather go in that direction."





For the PQ&SS group, the Toyota regions and the Lexus area offices are their main customers, with an eye toward the technicians, and the customers. The PQ&SS group is responsible for the administration of special service campaigns, Pre-Delivery Inspection (PDI) process, technical bulletins, and the TAS Hotline. They are responsible for delivering the best products to the dealerships. That's back to JKK. Each person has to deliver the right service publications at the right time. The PDI process must be complete, easy to understand, and applicable. Technical bulletins must be developed to fix the problem on a timely basis. Service procedures must be doable and reasonable.

"I've been to the manufacturing plants and I've seen product reports displayed alongside the assembly line. Most are PQ&SS reports, but I was surprised when I saw three reports from the field product engineers," says Rick. "I'm sure they are doing the same thing with DPRs. They are right there at the assembly line. In the plan, do, check, and act process, the DPRs are the 'check' portion that comes from technicians. The DPRs are immensely helpful."

The technicians see the cars day in and day out. They see that this door fits this way every day, and then one day this door has interference.

The technicians can provide a part number. They can send in a DPR with a photograph. Then PQ&SS can work back through the assembly process and can determine what caused that door to fit that way and then eliminate that problem. It's critical. Technicians see the cars every day. They know what is good quality and what is not.

"The technician's role is pointing out how we can improve the product," says Rick. "When a technician has been working on Toyotas for years and sees something that isn't normal or sees something new, we want to hear about it."

Rick identified a JKK process for the technician:

1. Clarify → Exactly what am I going to repair on this car?
2. Visualize → If I can visualize the repair, then I know what tools to use, I know what parts I need, and I know if I need to look at the repair manual.
3. Prepare → I can road test the car to confirm the condition. I can hook up the car to Techstream to check the systems.
4. Clarify → Now that I have more information, how am I going to repair the car?
5. Execute → Do the repair.

## The Importance of JKK

A quality product isn't always a car. It's service technical information. It's the special service tool. It's TAS Hotline support. It's technical training support.

"I would like everyone at TMS to know what JKK is and how to implement JKK in their departments," says Rick. It's very important to retain customers at the dealerships so they return for vehicle service and maintenance. It's the technician's job to do the best possible work for the retail customer. It's our responsibility to support the regions, the area offices and the technicians. We want to hear from technicians through DPRs or through TIS feedback."



The technician is the hub of everything we do in PQ&SS. Their work is the final link to customer satisfaction.

# 2009 QUALITY MONTH at TMS

In October 2009, TMS celebrated Quality Month at its headquarters in Torrance, California. The idea is to celebrate and promote quality as it relates to our business. TMS dedicates a month each year to promote quality and to make sure people are thinking about quality, the theme of JKK (Built-in Quality with Ownership) across the organization, and *kaizen* (continuous improvement). This is the second year of Quality Month at TMS.

## Background

Toyota Motor Engineering & Manufacturing (TEMA) celebrated its fifth year of Quality Month in October. Because of its close relationship to manufacturing in Japan, TEMA was already trained on JKK and how to implement the process to their jobs. JKK is a philosophy created by Toyota Motor Corporation (TMC) in Japan. It is not new. It's similar to other processes, but the approach is different.

"Last year, my TEMA counterparts in the quality group were very surprised that I didn't know what JKK meant. It was like finding someone at TMS who didn't know about PDCA (plan, do, check, and act)," says Michael Collinsworth, Corporate Accessories Department (CAD) Quality Assurance Manager. "Now we are being pulled into the loop with Quality Month and JKK is recognized and celebrated at TMS."

## Preparing for 2009 Quality Month

This year, a video was used to spread the news about Quality Month. It features Jane Beseda, Group Vice President and General Manager, Toyota Customer Services.

"The message in this video has reached out to so many different groups here in the U.S. and has received praise from our parent company in Japan," says Jeff Northrup, Tools & Equipment and Serviceability Manager, who was responsible for promoting and communicating the Quality Month events. "This is mainly due to the way Jane delivered the message. She truly believes in the message, therefore, it was easy for her to be sincere."

Rick DuFresne, National Technical Support Manager, chaired the 2009 Quality Month activities at TMS. "I was impressed with the Quality Month committee. Some of the members served on the committee last year. They always came prepared. They had good ideas and gave me great input. They had good suggestions and it all worked out."

## September 30, 2009, Kick-Off at South Campus Courtyard

"Our kick-off meeting was not just about quality, but it was about being the 'Most respected car company.' I like the idea of promoting actions instead of just words," says Rick. "We had speakers who represented different things. It's easy to write as an objective that we're going to be the most respected car company, but how do we as an organization promote that?"



## October 6, 2009, Quality Show at TMS Headquarters

The first quality show was held in the headquarter's atrium.

"Having Quality Month at headquarters is great," says Michael Collinsworth, Corporate Accessories Department (CAD) Quality Assurance Manager. "People at TMS get to see what other groups are doing. Going forward, we are going to involve more groups."

Michael was the chair for TMS's first Quality Month events last year, in October 2008.

"For Quality Month, I learned a lot the first year," says Michael. "It was fun. I had a great time. This year, with Rick DuFresne, it's been a great experience. He took it to another level. I think it's going to be part of Toyota now."

The displays at the tables showed examples of JKK being used in different groups.

"No matter what your job, you are producing something, whether it's a report, a system or a process. Someone has to use it, so the quality of what you produce goes forward," says Michael. "We want to include more groups so they can see JKK or quality as part of their job. At Toyota, we are all providing a product of some kind."

## Special VIP Event, October 15, 2009, at the Service Development Center (SDC)

PQ&SS hosted a special event in the SDC service shop. The participating groups from TMS brought their displays and representatives to meet with Mr. Sasaki, who is the Executive VP from TMC, and Mr. Agata, who is the President from TEMA. Joining them were TMS executives.

"The displays from all the groups came out very well. Mr. Sasaki was very impressed," says Rick. "By the time we completed an hour walking around the displays, I could tell he was totally engaged. He was listening to the people and really interested in what was going on."

To the participants, who were waiting for the VIPs to come to their table and displays, it was worth it.

"I could see everyone's eyes light up during the sessions," says Jane. "As the VIPs were going along and talking to the people who had their displays, they engaged so deeply with those teams. Our guests really wanted to understand what each group had prepared. I heard them ask a lot of questions."

Jane says it was a great walkaround. She was proud of the TMS associates and pleased that the VIPs could see what the groups at TMS had contributed to Toyota's reputation, to the future of the company, and the experience of customers.







## October 28, 2009, Quality Show at the South Campus Lobby

The final quality show for 2009 was held at the South Campus building.

Looking back on the entire month's activities and the effort of everyone involved, Jane sums up her experience.

"Quality month was really exciting for me," says Jane. "It was an opportunity for us to pause and think about what quality means to us and how each person makes a difference in quality. No matter what your role, it's up to you to do your best and to deliver quality to whoever uses the results of what you do every day. The stories of what our people are doing are an inspiration to me. To share the creativity and ingenuity of the groups with everyone at the events and to see the excitement that we all got from sharing our stories was great."

## Toyota Motor Corporation's 20-year Tradition


The concept of JKK comes from Toyota Motor Corporation in Japan. *Jikotei Kanketsu* (JKK) focuses on what I do and what I control. This focus on building in quality involves answering the question what can I do to improve the process in my area?

At TMC, Quality Month has been celebrated for 20 years. It is typically in October and it is a recognition of quality in the industry. Being a quality engineer at Toyota is different than being a quality engineer for another manufacturer because Toyota processes are used, like the Toyota Production System.

Michael Collinsworth's team is responsible for Toyota accessories. His favorite quote is "Quality is never an accident. It is always the result of intelligent effort." To him, quality is the act of intelligent effort. He looks at all the aspects of what this product is, and then what it's supposed to do, and then who it is going to serve. With JKK, you look at the entire line. Michael defines quality as planned systematic actions, which provide adequate confidence that a product will conform to requirements and meet customer needs, and then continue to refine it going forward.

It does not seem at all unusual to celebrate Toyota products, people and processes at TMS. Learning about JKK and what it means to everyone is a reward of working on the Quality Month committee, or putting displays together to describe what a TMS group has been up to. Without the participants who took the time to learn about the displays and to ask questions, JKK would not have had much impact.

Jeff has a few closing remarks about Quality Month.

"I am pleased that we are making it an important point to promote quality," says Jeff. "Keeping everyone focused on the true meaning of quality is an ongoing process that takes a large commitment from everyone. One key element is our belief in the people who work in this organization, including the dealerships. Motivating them to do their very best can have a tremendous impact on everything we do. I hope TMC and TMS continue to practice what they have been preaching for so many years." 



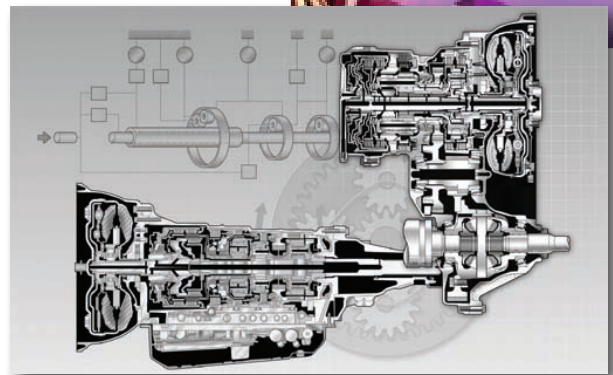
# TOYOTA COURSE 274

## Automatic Transmission Diagnosis

**M**onday morning the ASM hands you a repair order with “Check Trans” in the customer’s concern section. If you’re in this business long enough this scenario is bound to happen and your next step makes all the difference in whether or not that customer leaves satisfied.

Now, it’s up to you. Do you know what to do? How would you verify the condition and plan a diagnostic approach?

Tip the scale in your favor by completing the University of Toyota’s updated instructor-led course on automatic transmission diagnosis.



### Course Overview

Course 274, Automatic Transmission Diagnosis, provides:

- A 6-step diagnostic process that is logical, easy to follow, and promotes repeatable results,
- Shop activities that demonstrate techniques to monitor and diagnose component failures, and
- Resolution of the customer’s concern using a tactile diagnostic approach.

### The 6-Step Diagnostic Process

<b>1. Verify the Complaint</b>	<ul style="list-style-type: none"><li>• Analyze trouble reported by customer</li><li>• Confirm symptoms</li></ul>
<b>2. Determine the Related Symptoms</b>	<ul style="list-style-type: none"><li>• Check DTCs and save all data</li><li>• Inspect battery voltage</li><li>• Service history</li></ul>
<b>3. Analyze the Symptoms</b>	<ul style="list-style-type: none"><li>• Utilize the DTC chart</li><li>• Consult the Problem Symptoms Chart in the Repair Manual</li><li>• Check TSBs</li></ul>
<b>4. Isolate the Trouble</b>	<ul style="list-style-type: none"><li>• Isolate possible problem areas and determine where to begin</li><li>• Consult Circuit or Part Inspection step from Repair Manual</li></ul>
<b>5. Correct the Trouble</b>	<ul style="list-style-type: none"><li>• Adjust, repair, or replace</li></ul>
<b>6. Check for Proper Operation</b>	<ul style="list-style-type: none"><li>• Confirm repair</li><li>• Check for proper operation of all systems</li><li>• Look for repair-related issues</li></ul>

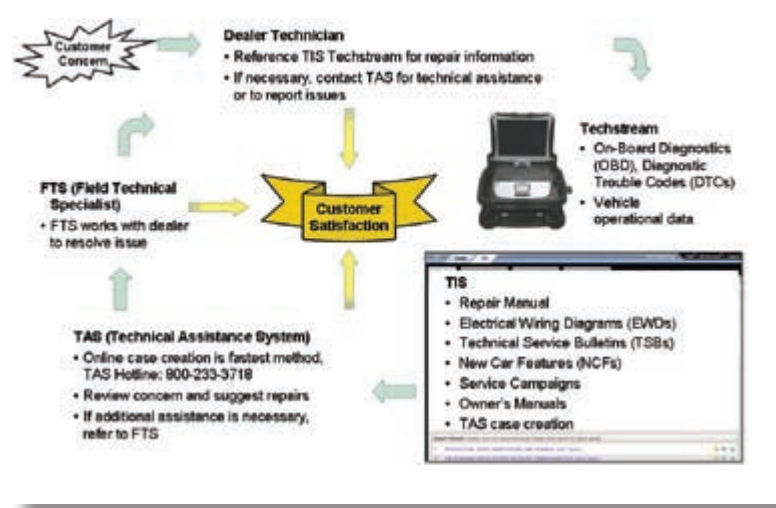
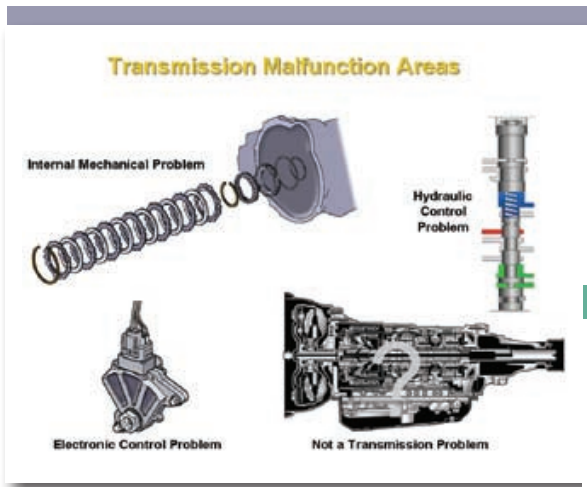
### Course Highlights

To become successful at diagnosing an automatic transmission issue, you’ll need a logical, step-by-step procedure to establish the root cause of the customer’s stated vehicle condition.

Further, to ensure that diagnostic clues are not lost when components are removed or when Diagnostic Trouble Codes (DTCs) are cleared prematurely, technicians are encouraged to follow the 6-step troubleshooting process.

New sections were added to Course 274 to clarify and illustrate the steps that should be used for diagnosis. This article highlights the following course topics:

- Customer problem analysis,
- Powerflow model,
- Troubleshooting, and
- Remove and Replace (R&R) best practices.



## Customer Problem Analysis

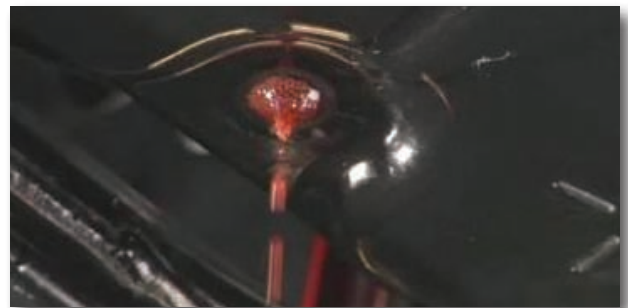
Customer problem analysis is the most crucial step for vehicle system diagnosis. This is especially important for automatic transmission diagnosis. Course 274 separates customer problem analysis into three components:

- **Verify Customer Complaint**

Although the ASM may have sole contact with the customer, it is the job of the technician to obtain additional information to be certain that their focus is the customer's actual concern. A Customer Problem Analysis Check Form is used to pinpoint the area of concern and prompt the ASM with diagnostically relevant questions for the customer.

- **Check Fluid Level and Condition**

Before taking the vehicle on a test drive, check the transmission fluid level. Adjust the fluid level only if it is so low that a test drive risks causing damage. Otherwise, adjusting the fluid level may alter the transmission symptoms, which would make it difficult to duplicate the customer's concern. A new instructor led demonstration has been added to focus on overflow type transmissions with WS fluid due to their inherent difficulty in fluid level verification.



- **Test Drive**

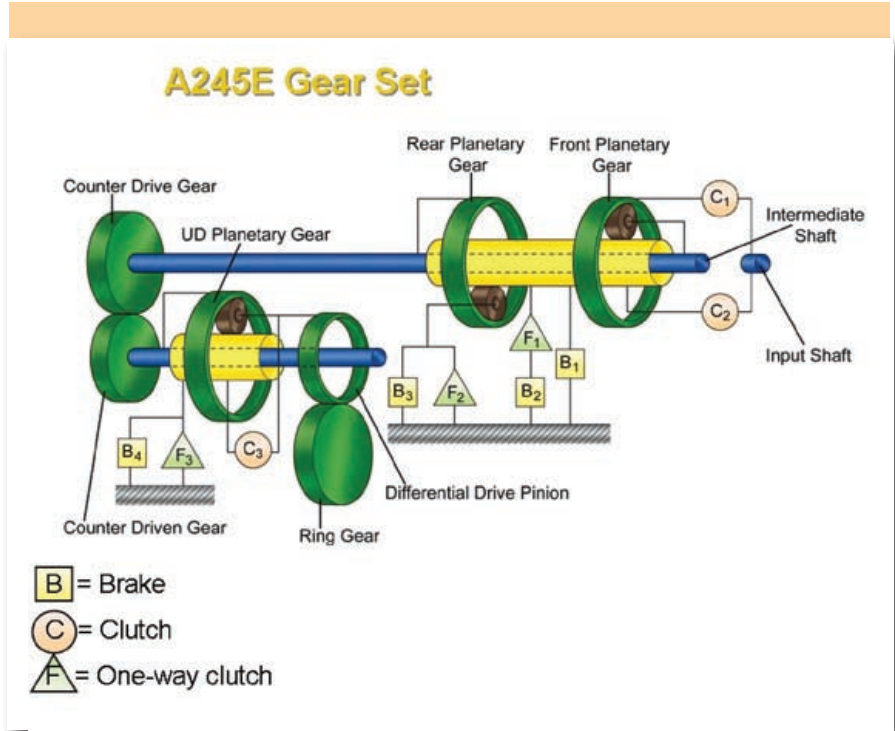
The test drive is the technician's first chance to experience the customer's concern. It is important to obtain an accurate and thorough Customer Problem Analysis Check Form from the ASM to aid in duplicating the concern. If a concern is difficult to duplicate, it may be necessary to ride with the customer and witness the concern firsthand, or have your ASM test drive the vehicle with the customer, or call your Field Technical Specialist (FTS) for further instruction. Never make a repair to a customer's vehicle without fully duplicating the customer's concern.

## Powerflow Model

The concept of powerflow can be a difficult subject for technicians to master. Movement and interaction of moving parts without hands-on exercise can make powerflow even more difficult to comprehend.

To help reinforce the concept of powerflow and holding device interaction, an A245E powerflow model has been added to give technicians a chance to simulate holding device interactions, powerflow, and gear ratio changes.

The powerflow model also allows technicians to see the function of actual parts not typically seen in the shop environment. This enables technicians to make connections between concepts presented in the classroom to actual parts used in the transmission and further enhances their skills.



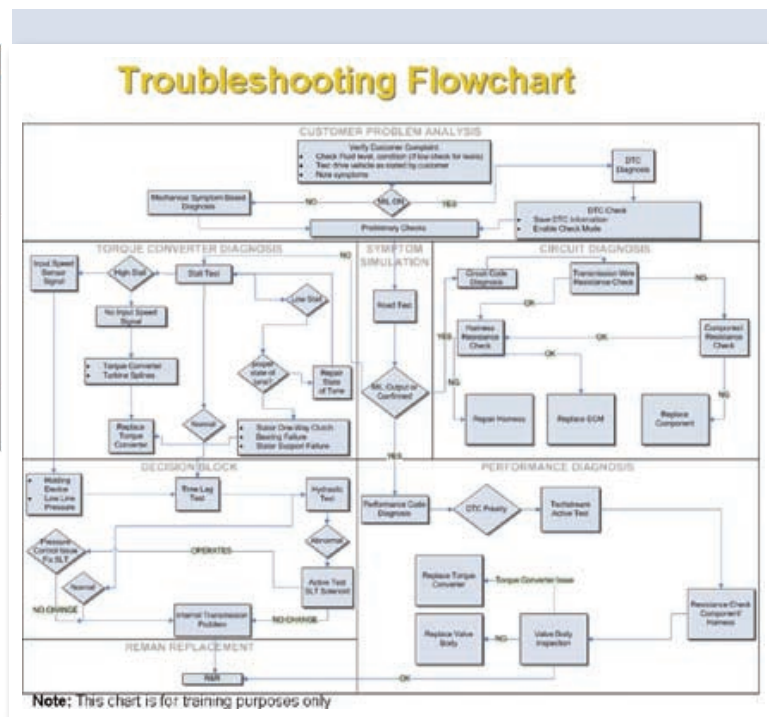
Test	Test Summary
<b>Time Lag Test</b>	Measures time between shift lever movement and engagement Delayed engagement indicates low line pressure and/or worn holding devices
<b>Hydraulic Test</b>	Provides information on the integrity of the hydraulic control system
<b>Manual Shift Test</b>	Tests non-ECT controlled gear ranges Determines whether the cause of the malfunction is electrical or mechanical
<b>Stall Test</b>	Stall test determines the condition of: <ul style="list-style-type: none"> <li>- Torque converter</li> <li>- Specific holding devices</li> <li>- Engine state of tune</li> </ul>
<b>Techstream Active Test</b>	Actively controls electronic components to validate intended outcome Varies with vehicle year and model

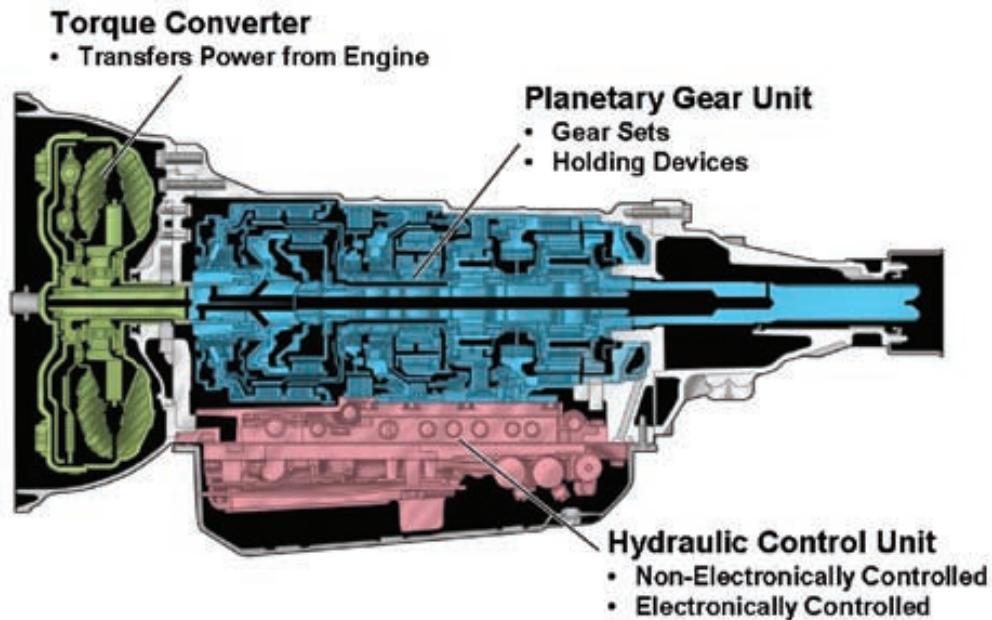
## Troubleshooting

A troubleshooting section has been added to further validate the technicians' skills presented throughout the course.

The technician will be expected to complete a customer problem analysis and determine the possible malfunction area and additional testing needed to confirm their diagnosis.

Technicians will use their skills to diagnose real world issues on training vehicles in a controlled shop environment allowing them to sharpen their skills and practice the concepts presented in the course.






### Remove & Replace Best Practices

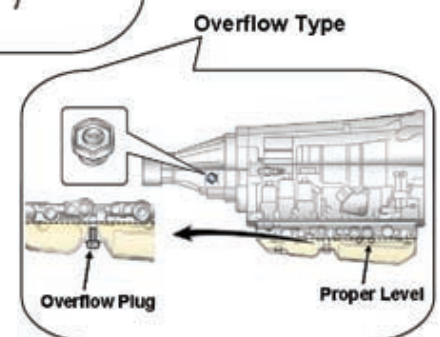
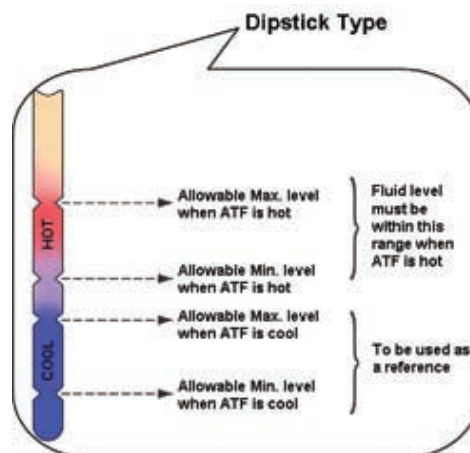
There are those who believe the diagnostic process ends with the repair. For automatic transmission diagnosis, however, steps are required after a repair has been completed which are just as important as the repair itself.

Course 274 includes a new R&R Best Practices section to enforce post-repair steps that are essential for successful automatic transmission repairs. These steps are critical to ensure that the customer's concern has been fully addressed.

#### Key Focus:

- Cooler Flushing
  - When should the cooler be flushed?
  - What should be used to flush the cooler?
- Torque Converter Inspection
  - Are torque converter bolts interchangeable?
- Installation
  - Don't forget the transmission serial number.
- ECU/TCM Initialization
  - What's the difference between memory reset, compensation code reset, and TCM/ECU learn?
- Transmission Core Return
  - What is the technician's role in the transmission core return process?

Course 274 has several new enhancements to enforce your diagnostic skills which will save you time diagnosing these complex systems. The topics covered in this article are only a glimpse of the enhancements made to Course 274 and can only begin to showcase the added benefits found in this three-day diagnostic course. If you have not taken Course 274, talk to your service manager about attending or review the updated materials hosted on TIS under the Technical Training tab. Hopefully, the next time the ASM hands you a repair order with "Check Trans" you'll know just what to do. 

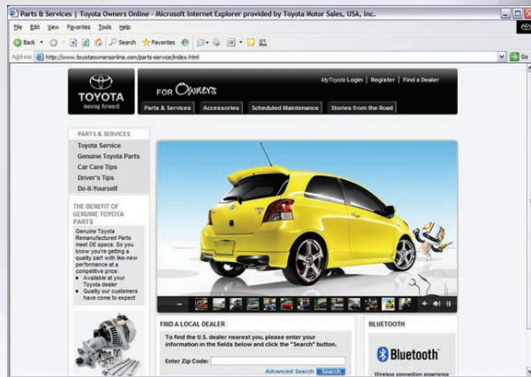
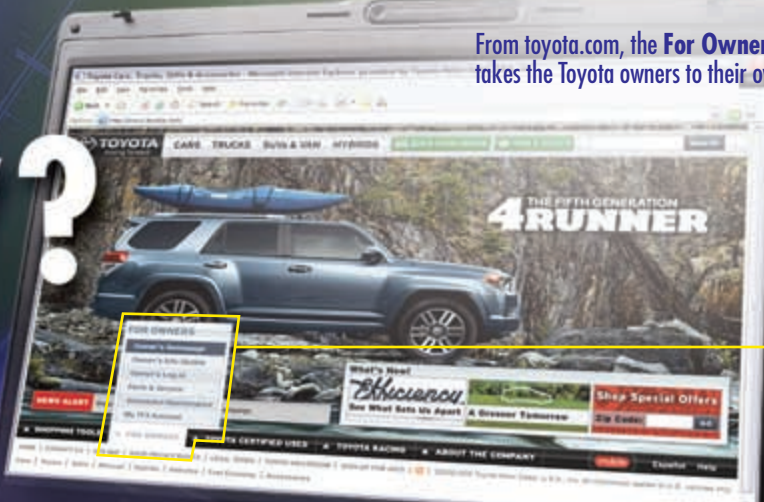




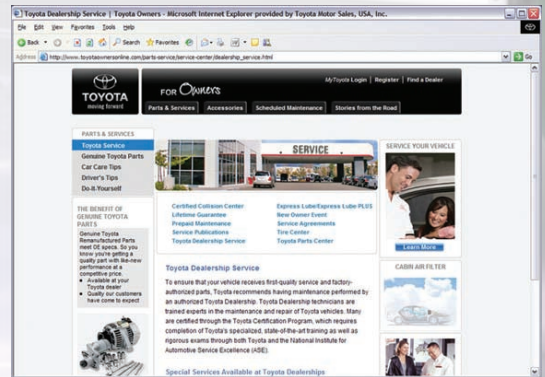
# Did You KNOW?

**T**oyota owners can go to their own home page from [toyota.com](http://toyota.com). You may want to check out these features.

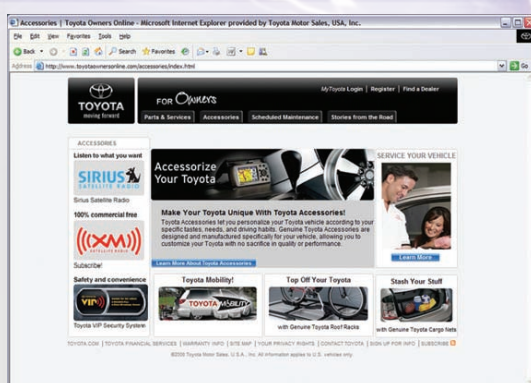
From [toyota.com](http://toyota.com), the **For Owners** pull-up menu takes the Toyota owners to their own home page.



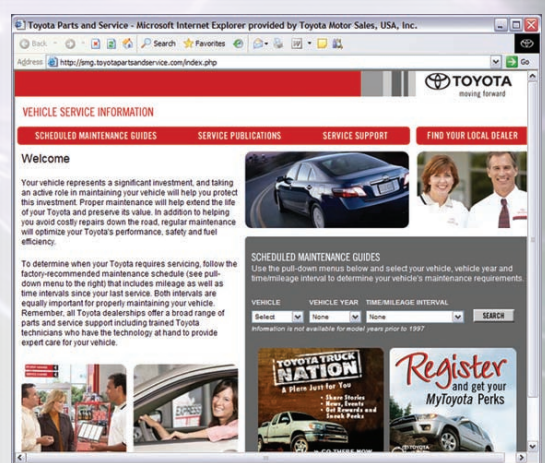
**Parts & Services** is the first tab. From this page, owners can find a local dealership, Toyota Service, Genuine Toyota Parts, Car Care Tips and other information.



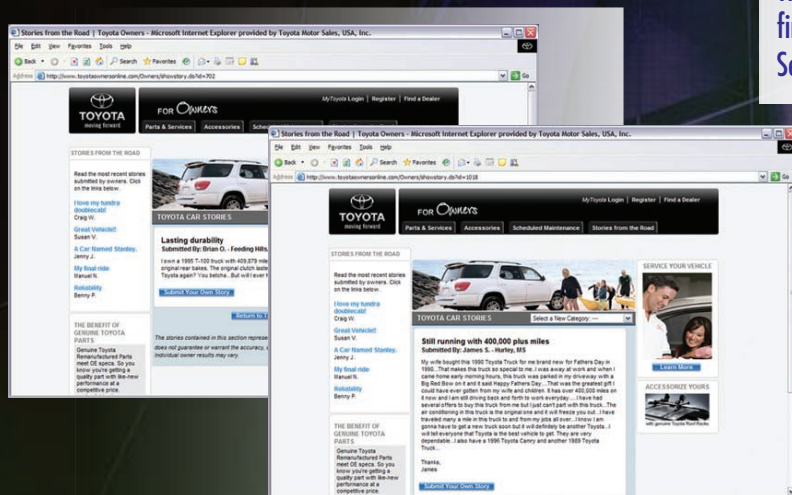
This is the **Toyota Service** page. Owner resources are here as well as the benefits of going to a Toyota dealership for service.



**Accessories** is the second tab. From this page, an owner can find information on Genuine Toyota Accessories.



This is the **Vehicle Service Information** page. Owners will find Scheduled Maintenance Guides, Service Publications, Service Support and a link to find their local dealership.



This is the **Stories from the Road** page. Owners can share their Toyota experiences here. You may want to see what they have to say. Go to [toyota.com](http://toyota.com) → **For Owners** → **Stories from the Road**.