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Correcting Toyota U150/U250  
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# GEARS

FOR THE TRANSMISSION REBUILDING INDUSTRY

JUNE 2017

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Be sure to read our Feature Story,  
*Lubegard: Positioned For Growth*  
on page 18.  
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**FROM THE CEO**

# TO THE CLASS OF 2017...

**E**very year around this time, students all across the country are finishing school and venturing out into a new phase of life as a working adult. I think of that every year as people here at ATRA take a day off to attend a graduation.

This year it was Rodger Bland's turn, as his son, Trenton, graduated college. Not to mention that my wife went back to school after 25 years and just picked up her degree. So it's a subject that's fresh in my mind.

As we were discussing this, Rodger posed this question: "What kind of commencement speech would you give?" We were talking about the current political climate and everything young people face these days, but it got me thinking: What kind of message would I offer to someone entering the transmission repair industry?

So here it is, my commencement message to people just entering this industry... the class of 2017:

"Forty years ago, I was right where you are now... I was a kid at 19. I didn't know what I wanted to do with my life. But I knew that, whatever I chose for a career, it'd have something to do with cars.

"It was a fluke that I wound up in a transmission shop and it was my first boss, Al Perry, who taught me what a terrific industry and career I'd chosen. It was mine for the taking, if I only had the courage to reach for the brass ring. What a blessing he gave me.

"You see, transmission repair isn't just a job or even a career: It's a *life-changing path* that takes you to the pinnacle of the automotive world. It demands that you become intimately

familiar with the one part of a car that everyone else fears. You are the person who does the impossible; the one who fixes the "mystery box" that the rest of the automotive industry avoids.

"Unfortunately, this elite position comes at a price. It's tough. It's not for the weak at heart and it'll take most of your spirit just to get by. What you've learned so far is just the beginning.

"Maybe you thought that choosing a path in auto repair would let you avoid the classroom; that your education was over. Nothing could be further from the truth: As a transmission technician, your job will demand constant education to keep up with our ever-changing market. You'll need a clear understanding of subjects that would make most people curl up in the corner, hoping it'll just go away. It won't.

"But for those of you who step up to the plate... who can meet the demands of this industry... the sky's the limit. You'll have the opportunity to go further... climb higher... and earn more than nearly anyone in auto repair. It's an impressive goal.

"As you begin your journey, keep these three things in mind:

"Never stop learning. Sure, you may have better things to do on a Saturday than attend a seminar, or somewhere you'd rather be than at Expo, but you earn what you learn. Your career and earning potential will depend on your ability to fix cars. And that ability will be based on your education: The more, the better. It's that simple.

"Be humble. You're a part of a team. You may be the smartest person in the room, but you can still learn



**by Dennis Madden**  
**"Class of 1976"**

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from others, even the person who sweeps the floor or empties the trash. Be the person others look up to.

"Never forget that you work for the customer. You may have a boss... an employer, but in the end, you work for the folks who are trying to get to work or take their kids to school. Your job... your future... depends on how well you can keep them happy.

"As you begin this next chapter in your life, always believe in yourself. Make the most of every day, and work hard to set an example for the ones who will one day turn to you as a leader in this industry.

"Know that you're walking in the paths of giants who built an industry for you. It's up to you to keep their vision... to help build a brighter future for those who will follow in your footsteps."

That's what I would say to them... and to you.

If you have any new hires, share this with them; it might give them a nudge in the right direction.



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# CORRECTING TOYOTA U150/U250 SHIFT TROUBLES

The ATRA Tech HotLine still receives calls on Toyota/Lexus U140/U240 and U150/U250 transmissions with shifting issues. These vehicles exhibit a number of conditions, including slipping or binding shifts.

Often these problem transmissions have already been rebuilt, with new gaskets, seals, O-rings, and sometimes new solenoids. But they still have problems: That's usually when we get the call.

The most common issues we hear about on U140/U240 are long, drawn-out, or flare 2-3 shifts, or a 2-3 flare with a bindup at the end of the shift. Sometimes there are even long, drawn-out, slipping 1-2 shifts. The U150/U250 complaints are usually

flares or slipping 2-3 shifts, or binding on the 3-4 shift.

In the previous installment, we covered the U140/U240 series transmissions and the slips and binds they run into. In this article, we'll look at the U150/U250.

Whenever one of these transmissions comes into your shop, first perform a *transmission memory reset* procedure. Some aftermarket scan tools can perform the transmission memory reset, but it's often best to use a factory Toyota/Lexus scan tool.

As we saw in the previous article, there's a factory bulletin, TC002-03, that covers all models from 2000–2005 (figure 1).

If you still have a slip or bind after performing the transmission



by David Chalker

[members.atra.com](http://members.atra.com)

## TRANSMISSION & CLUTCH TC002-03 REVISED

### Title: ECM RESET MEMORY FUNCTION

Models: '00 - '05 All Models

June 10, 2003

#### TSB REVISION NOTICE:

- December 20, 2004: Applicable Vehicles section has been updated 2004 and 2005 model years added, models and model years updated for various models; and Reset Procedure 2 has been revised.
- January 16, 2004: Tundra vehicles were added to the Applicable Vehicles chart.
- December 17, 2003: T100 vehicles were removed from the Applicable Vehicles chart. Previous versions of this TSB should be discarded.

SPECIAL SERVICE TOOLS (SSTs)	PART NUMBER	QUANTITY
Toyota Diagnostic Tester Kit*	01001271	1
CAN Interface Module Kit*	01002744	1
12 Megabyte Diagnostic Tester Program Card with version 12.01a Software (or later)*	01002593-005	1

\* Essential SSTs.

#### Applicable Vehicles

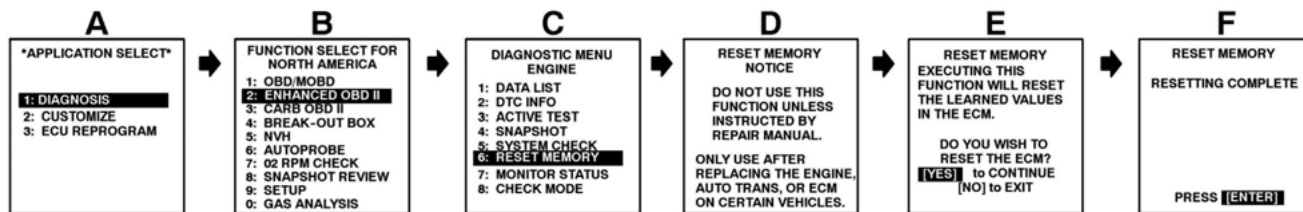
MODEL	ENGINE/ DRIVETRAIN	MODEL YEAR					
		2000	2001	2002	2003	2004	2005
4Runner	2UZ						
	1GR						
Avalon							
Camry	3MZ						
	2AZ						
Celica							
Corolla							
ECHO							
Highlander							
Land Cruiser							
Matrix	4WD						
RAV4							
Sequoia							
Sienna							
Solara	3MZ						
	2AZ						
Tacoma	1GR						
Tundra							
Scion xA							
Scion xB							
Scion iC							

■ = Applicable model years

Refer to Reset Procedure 1 for the vehicles with Electronically Controlled Automatic Transmissions:

#### Reset Procedure 1

1. Connect the Toyota Diagnostic Tester to the vehicle.



2. Reset the ECM (PCM). Refer to the procedures below.
3. Start the engine and warm it up to normal operating temperatures before test-driving.
4. Perform a thorough test drive with several accelerations from a stop with "light throttle" application until proper transmission shifting is verified.

#### Reset Procedure 2

1. Disconnect the negative battery cable for 5 minutes.
2. Reconnect battery cable.
3. Start the engine and warm it up to normal operating temperatures before test-driving.
4. Perform a thorough test drive with several accelerations from a stop with "light throttle" application until proper transmission shifting is verified.

#### INTRODUCTION:

Whenever an automatic transmission is replaced, overhauled or individual components are replaced, use this procedure to clear Engine Control Module (ECM, SAE term: Powertrain Control Module, PCM) "Learned Values" to minimize subsequent performance concerns.

**CAUTION:** Failure to follow the procedure below may lengthen the time to readjust the ECM "Learned Values", potentially resulting in performance concerns.

#### NOTE:

Additional Diagnostic Tester Kits, CAN Interface Modules, Program Cards or other SSTs may be ordered by calling SPX/OTC at 1-800-933-8335.

#### Required SSTs

OP CODE	DESCRIPTION	TIME	OFF	T1	T2
N/A	Not Applicable to Warranty	-	-	-	-

#### Warranty Information

MODEL	ENGINE/ DRIVETRAIN	MODEL YEAR					
		2000	2001	2002	2003	2004	2005
4Runner	3RZ						
	5VZ						
	1GR						
Avalon							
Camry	5S						
	1MZ						
Corolla							
Land Cruiser							
Matrix	FWD						
RAV4							
Sequoia							
Sienna							
Solara	5S						
	1MZ						
Tacoma	2TR						
Tacoma PreRunner							
Tundra							

■ = Applicable model years

Refer to Reset Procedure 2 for the vehicles with Electronically Controlled Automatic Transmissions:

Figure 1

reset, you'll want to rule out the possibility of a faulty PCM. For that, follow the voltage tests for solenoids SL1, SL2, and SL3. Refer to the case connector and solenoid apply chart (figure 2) to follow the tests. Refer to a wiring diagram for wire colors.

We'll be using diagrams for a 2008 Toyota Sienna. To avoid connector pin configuration and wire color confusion, refer to the appropriate information for the vehicle you're working on.

**SL1 SOLENOID TEST**

- Put the car on a lift and raise the drive wheels off the ground.
- Backprobe terminals 6 and 13 in the case connector to check the SL1 solenoid.
- Connect your positive lead to terminal 6 and the negative lead to terminal 13 (figure 3).
- Set your voltmeter to VoltsDC.
- Start the engine and shift the transmission into drive. With the transmission in 1<sup>st</sup> gear, you should see about 6–7 volts on your voltmeter.
- Raise the engine RPM until the transmission shifts into 2<sup>nd</sup> gear. The voltage should drop to zero volts.
- Raise the engine RPM until the transmission shifts into 3<sup>rd</sup> gear. The voltage should jump back to about 6–7 volts again.
- Raise the engine RPM again until the transmission shifts into 4<sup>th</sup> gear. The voltage should drop to 0 volts again.

If the solenoid voltages change normally, the computer is controlling the SL1 solenoid properly. If not, suspect a computer problem.

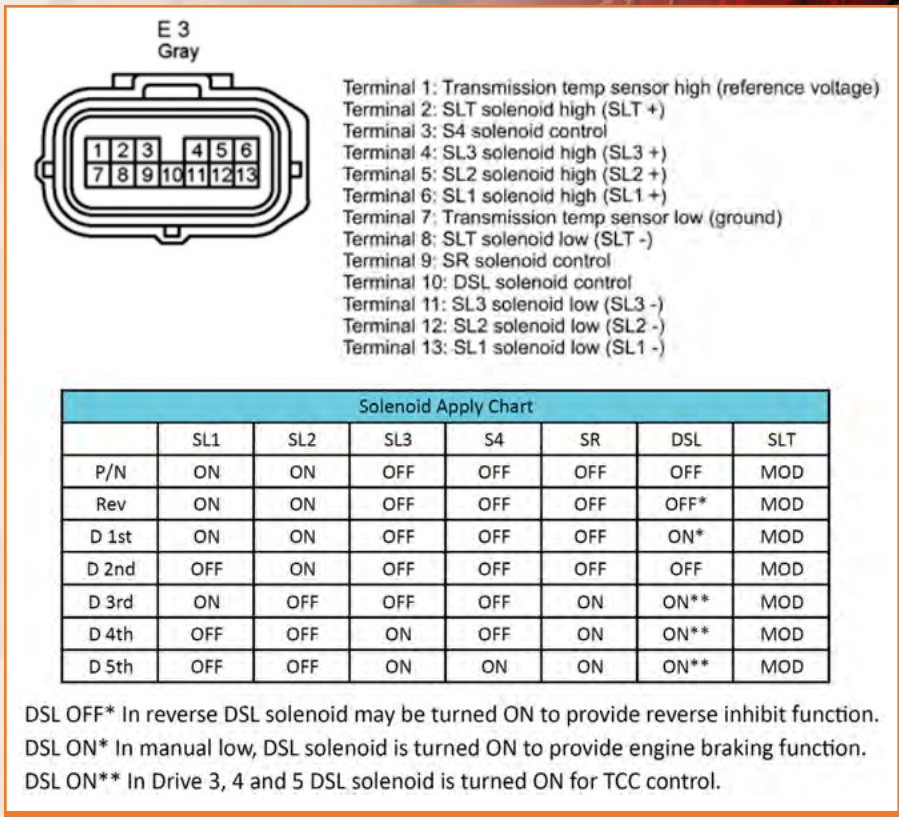


Figure 2

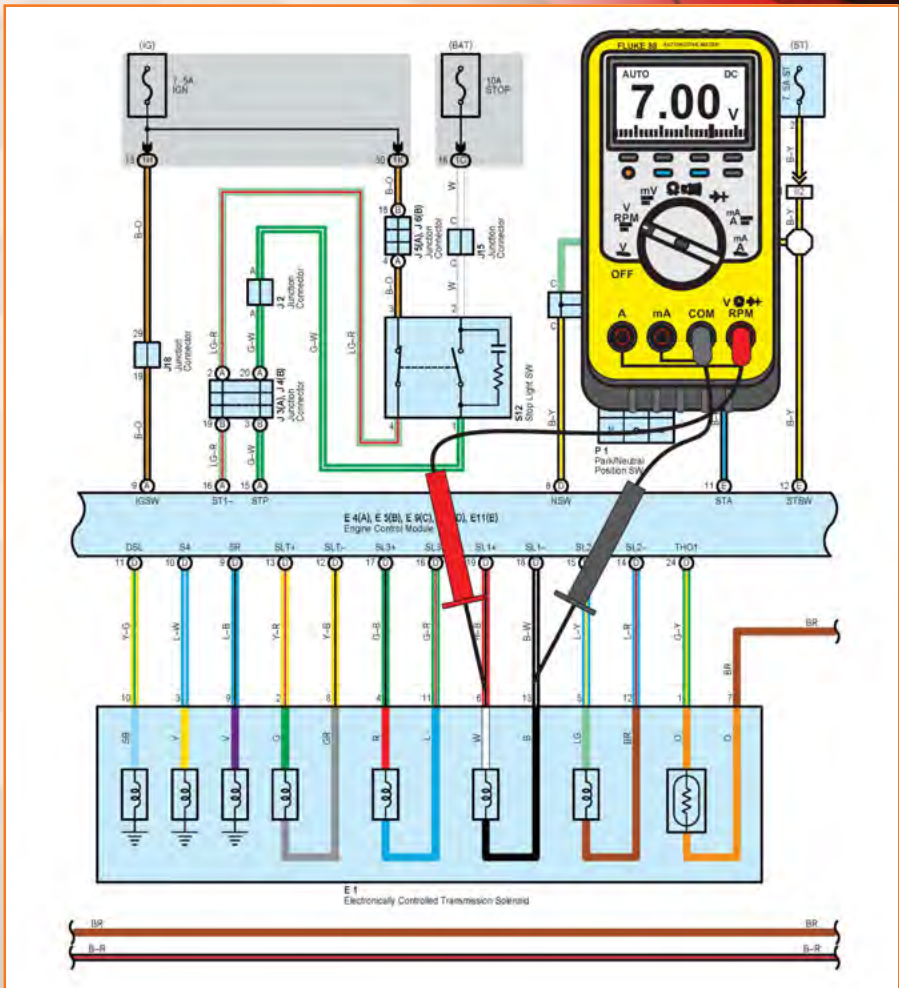


Figure 3

**If the solenoid voltages change normally, the computer is controlling the solenoids properly. If not, suspect a computer problem.**



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### SL2 SOLENOID TEST

- Put the car on a lift and raise the drive wheels off the ground.
- Backprobe terminals 5 and 12 in the case connector to check the SL2 solenoid.
- Connect your positive lead to terminal 5 and the negative lead to terminal 12 (figure 4).
- Set your voltmeter to VoltsDC.
- Start the engine and shift the transmission into drive. With the transmission in 1<sup>st</sup> gear, you should see about 6–7 volts on your voltmeter.
- Raise the engine RPM until the transmission shifts into 2<sup>nd</sup> gear. The voltage should remain between 6–7 volts.
- Raise the engine RPM until the transmission shifts into 3<sup>rd</sup> gear. The voltage should drop to zero. The SL2 voltage should remain at 0 volts in 4<sup>th</sup> and 5<sup>th</sup> gears.

If the solenoid voltages change normally, the computer is controlling the SL2 solenoid properly. If not, suspect a computer problem.

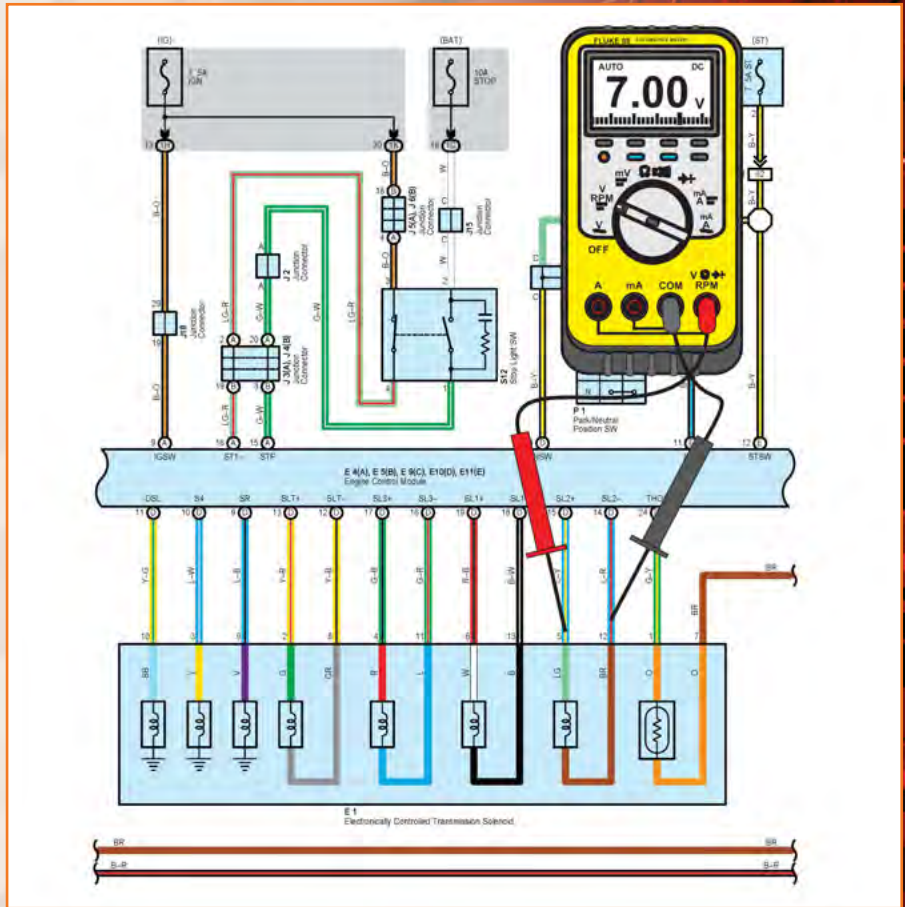


Figure 4

### SL3 SOLENOID TEST

- Put the car on a lift and raise the drive wheels off the ground.
- Backprobe terminals 4 and 11 in the case connector to check the SL3 solenoid.
- Connect your positive lead to terminal 4 and the negative lead to terminal 11 (figure 5).
- Set your voltmeter to VoltsDC.
- Start the engine and shift the transmission into drive. With the transmission in 1<sup>st</sup> gear, you should see about 0 volts on your voltmeter.
- Raise the engine RPM until the transmission shifts into 2<sup>nd</sup> gear. The voltage should remain at 0 volts.
- Raise the engine RPM until the transmission shifts into 3<sup>rd</sup> gear. The voltage should remain at 0 volts.
- Raise the engine speed until the transmission shifts into 4<sup>th</sup> gear. The voltage should jump to about 6–7 volts.

If the solenoid voltages change normally, the computer is controlling the SL3 solenoid properly. If not, suspect a computer problem.

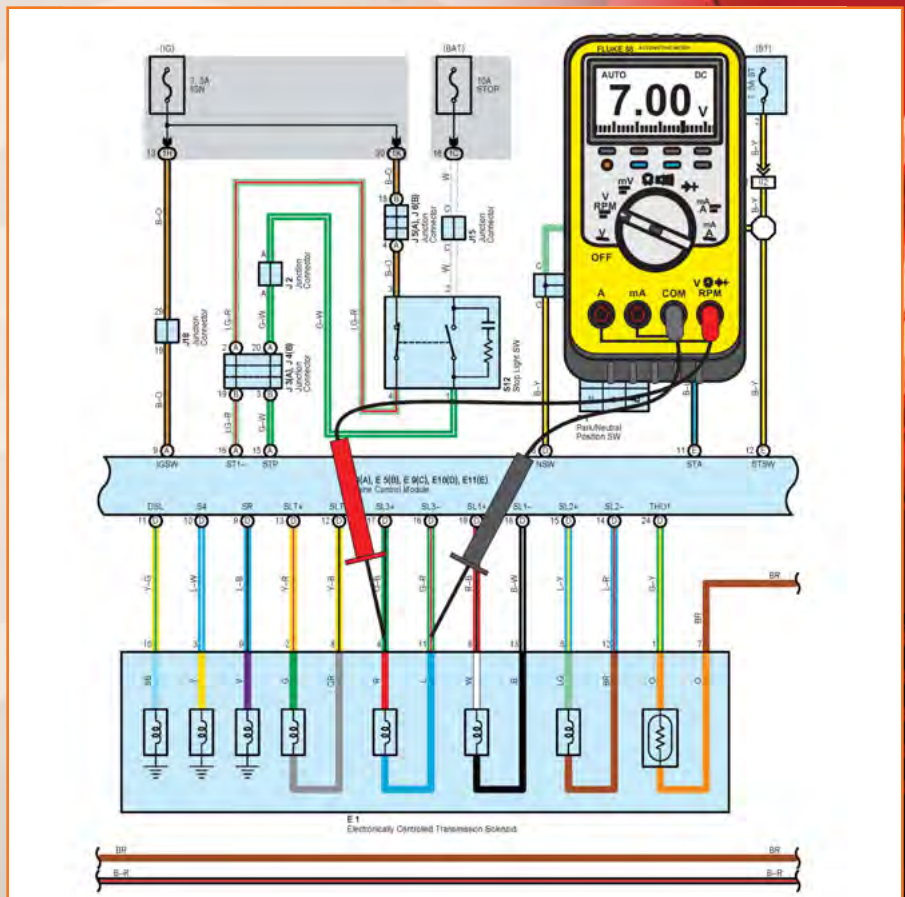


Figure 5

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**Go Further**

## CHECK COMPUTER GROUNDS

Your next step should be to check the grounds to the computer (figure 6).

Connect your meter's negative terminal to a chassis ground and backprobe the individual ground wires to the computer using the positive lead. With the engine running, each ground wire should have less than 0.1 volts.

Voltage greater than 0.1 indicates a faulty ground, and that could cause a variety of problems. Repair any ground problems as necessary. If all grounds are good, the computer is probably the culprit.

If the voltage checks for SL1, SL2, and SL3 are okay, you'll need to check the solenoids and valve body. To understand which solenoid to consider, you'll need to know what function each solenoid performs (figure 7).

Solenoids SL1, SL2, and SL3 block solenoid modulator oil when energized; they allow modulator pressure through when de-energized.

**Solenoid SL1** — A normally open (NO) linear solenoid. When the solenoid is energized in first gear, it blocks modulating pressure from passing through. The PCM turns the SL1 solenoid off during the 1-2 shift to regulate the B1 brake apply. The solenoid turns off during the 2-3 shift to regulate the B1 brake release and then turns off again for the 3-4 shift to regulate the B1 brake apply.

**Solenoid SL2** — The SL2 solenoid is a normally open (NO) linear solenoid. When the SL2 solenoid is energized in first and second gears, it blocks modulator pressure from passing through. During the 2-3 shift, the PCM turns the solenoid off, opening the passage to regulate the C0 clutch apply.

**Solenoid SL3** — The SL3 solenoid is a normally open (NO) linear solenoid. With the solenoid de-energized in first, second and third gears, modulator pressure passes through the solenoid to apply the C1 clutch. During the 3-4 shift, the PCM energizes the solenoid, which blocks the passage to regulate the release of the C1 clutch.

Now that you know which solenoid operates to control the shifts, it makes it easier to determine which solenoid to check or replace. The best

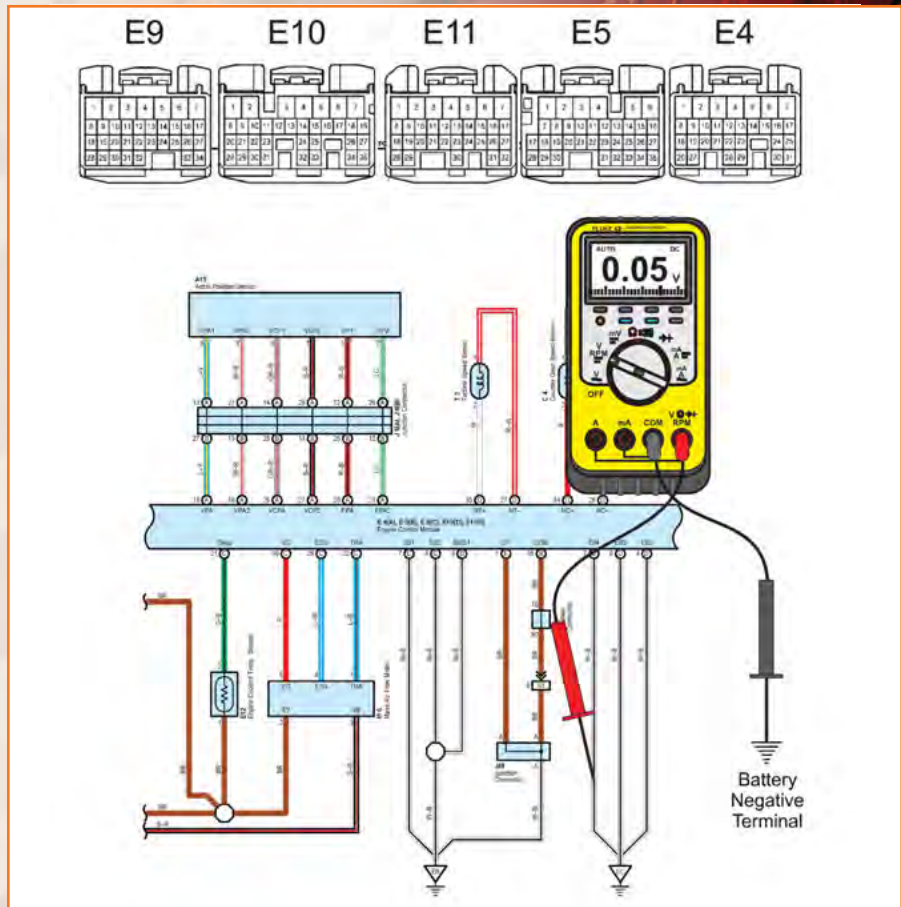


Figure 6

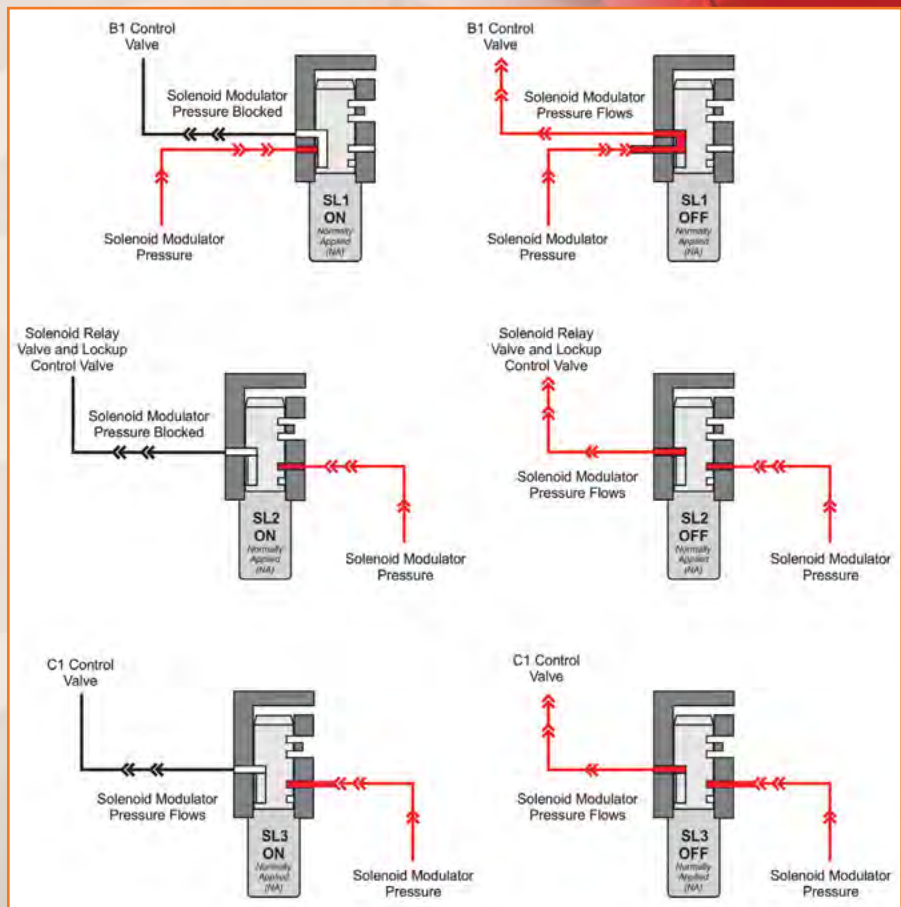


Figure 7



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way to check these solenoids is to use a solenoid test machine; energizing the solenoid on the bench isn't a very effective test method.

### VALVE BODY CHECKS

This leads to the next item: the valve body. Solenoid modulator pressure feeds the solenoids to control the shifts, so these solenoids need modulator pressure to operate. Another valve that commonly causes slips and binds is the clutch apply control valve.

Look for the solenoid modulator valve (figure 8) in the upper valve body, and the clutch apply control valve (figure 9) in the lower valve body. Both of these valves can wear; always examine them for wearing or sticking, to avoid slipping or binding shifts. There are valve repair kits and oversized valves available to correct these conditions.

So here are the easiest steps to identify the problems which can cause slips or binds in U150/U250 transmissions:

- Perform a transmission memory reset after every rebuild or repair.
- Test the solenoids to pinpoint whether you're dealing with a solenoid or PCM failure.
- Check the grounds at the PCM.
- Look for solenoid or valve problems.

That covers the U140/U240 and U150/250 series transmissions. Always follow these simple steps to keep your customers' vehicles where they belong... on the road.



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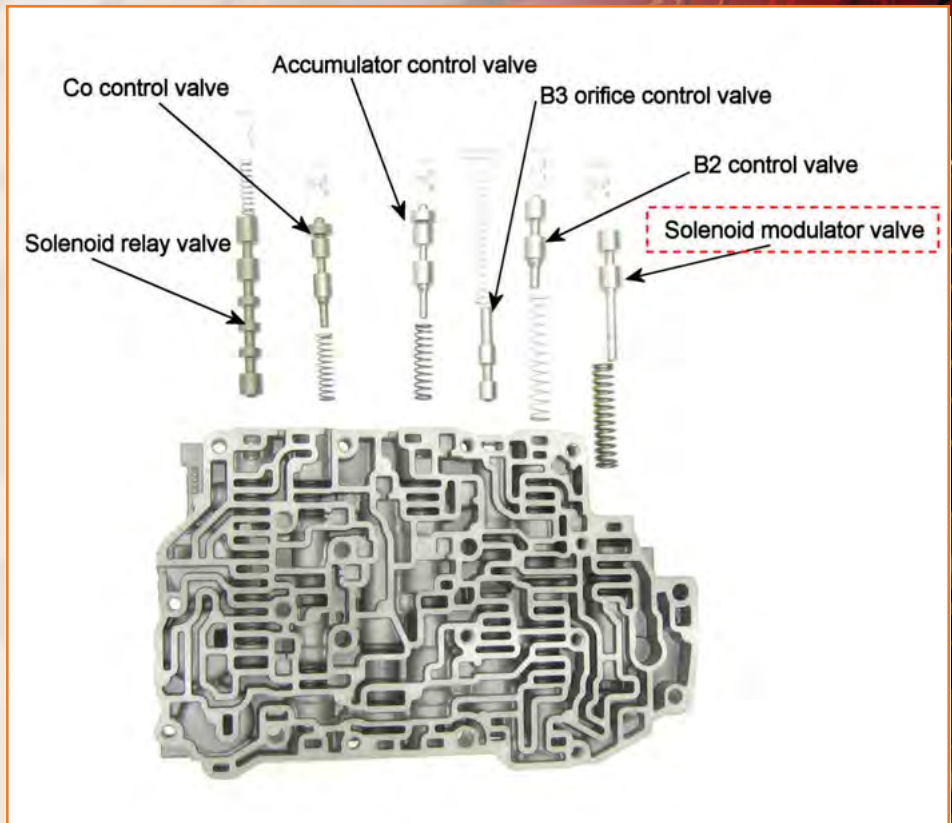
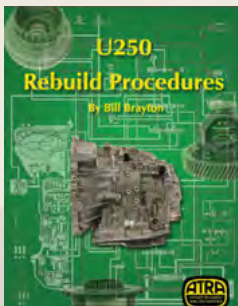


Figure 8

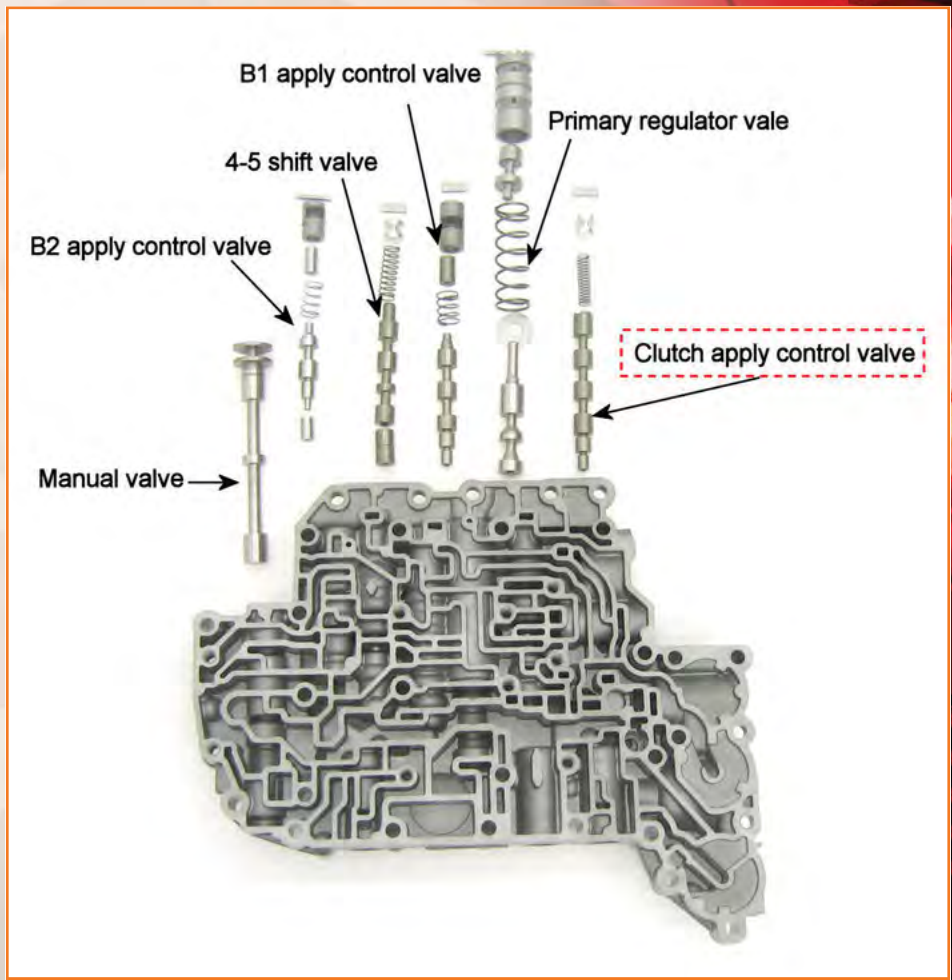


Figure 9



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# GEAR RATIO CODES VS SOLENOID PERFORMANCE CODES

***There was no activity on the scan tool and no voltage on the wire. He traced the external wiring to where the wire loom had fallen out of a bracket and rubbed against the body...***



by Rob Faucett  
[members.atra.com](http://members.atra.com)

**Y**ou've no doubt heard the old saying: "Don't judge a book by its cover." That old saying can be revised for the modern diagnostician: "Don't judge a code by its description." Many code descriptions can be very misleading, and jumping to conclusions by what's in front of you can become a costly mistake.

Here's a story about a technician who was working on an AS68RC that was displaying a P0756 shift solenoid B performance code. He had a few of these valve bodies on the shelf from cores, so he grabbed a solenoid, installed it... and the same code came back.

On these units, the computer controls the solenoid; it strokes shift valve two, which is monitored by pressure switch four. The problems can be a solenoid mechanical failure, a sticking valve, a faulty pressure switch,

or even a problem with the pressure switch circuit.

I recommended he drop the pan, and, with a scan tool still connected, remove the wire to pressure switch four, ground it, and check for change on the scan tool display.

There was no activity on the scan tool and no voltage on the wire. He traced the external wiring to where the wire loom had fallen out of a bracket and rubbed against the body. The wire was cut and several others damaged. He repaired the wire harness and out the door it went.

A couple days later, he was checking a 6F35 with a P0761 SSC solenoid performance code. He assumed it could be a stuck valve or a solenoid mechanical problem, so, without any further diagnosis, he pulled the valve body. All of the valves were working freely.



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So, assuming the problem was in the solenoid body, he replaced it, reprogrammed the solenoid strategy, and guess what: the same code came back.

P0761 is pretty much a gear ratio code: The computer commands the solenoid and, if it doesn't see the gear ratio it was expecting, it sets the code. This can indicate a solenoid mechanical problem, a stuck valve, a failed clutch, or a problem in the geartrain.

Since he eliminated the valve body and solenoid with "parts replacement diagnostics," I recommend he pull the transmission, which he was reluctant to do since he told the customer the solenoid would fix the problem.

After disassembly, he found the 2-6 piston molded seal was peeling off. So he built the transmission and out the door it went.

Two weeks later a 6T40 rolls in the door with system performance code P0965 for the CPC solenoid 2. P0965 is generated when the TCM detects an invalid voltage in a pressure control solenoid circuit for more than 4.4 seconds, so this is generally a solenoid circuit code. That would usually mean replacing the TECHM with no need to rebuild the transmission.

Solenoid-stuck-on or stuck-off codes for GM have essentially replaced gear-ratio codes. The computer commands the solenoid on or off and looks for a specific gear ratio. It sets this code if it sees the input shaft speed is at least 60 RPM higher than it should be for 2.25 seconds.

Diagnostic trouble codes are very helpful in narrowing what possible problems exist in the transmission. But, as technology progresses and changes, so do trouble code descriptions and definitions.

Gear ratio codes have been vanishing, and now we're seeing solenoid performance and solenoid-stuck-on or stuck-off codes replacing them. It's always a good idea to learn exactly what a code means, what the computer is monitoring, and why it sets that code. Never assume by its description that the problem will be automatically be the same as another manufacturer's code.

When working in a transmission repair shop, two main things are always top priority: customer service and making money. It's all too common for management to rush you into getting things done quickly to satisfy their customers, but sometimes you just have to slow down and open the book to see what's inside, and not go by what's on the cover.

---

***Gear ratio codes have been vanishing, and now we're seeing solenoid performance and solenoid-stuck-on or stuck-off codes replacing them.***

---

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# LUBEGARD: POSITIONED FOR GROWTH

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excels. With our patented liquid wax ester technology, or better known as “LXE” for short, we are confident our products meet the demands and compatibility requirements for our customers now and for years to come.”

“Now Stellar! – Keith Simmerer, our specialist for all research and design projects for parts, has been equally busy. With over 35 years in the transmission industry, he sees many new opportunities with all the new transmissions coming out. Our focus on bushing, washer, and piston kits will solve many of our customer’s problems for years to come. We have additionally added some “young blood,” to the team as you will see in the rest of this article and their knowledge of today’s technologies is tremendously improving our day to day operations.”

“When Stellar Automotive Group and Lubegard were two separate companies,

we noticed that there were many customers who were buying both lines, independent of one another,” states Mark Roach, Vice President of Sales & Marketing “Now that both companies are under the same ownership, we have successfully leveraged both companies to the benefit of our total customer base. In addition to vendor consolidation, customers can now benefit by putting Transmission Parts (over 15,000 SKUs), Filter Kits, and Chemicals all on the same PO, and have them ship together to meet the freight prepaid minimum. This reduces the amount of dollars invested in inventory, and at the same time - increases turns, which leads to greater profitability for our customers.”

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Development



**Neil Smith**  
Director of  
Operations

**“With our patented liquid wax ester technology, or better known as “LXE” for short, we are confident our products meet the demands and compatibility requirements for our customers now and for years to come.” – Justin Archer, President**



markets, and acquisitions, our total program provides: high quality products, field training/support, and superior customer service, all of which our customers have come to depend upon to help them grow their business.”

“At Stellar/ILI, we believe people do business with people,” Mark continues, “That’s how and why we built our customer base - one repair shop at a time. Lubegard offers continuous training and fieldwork so that we are always engaged with our Manufacturer Representatives, Warehouse Salesmen, and ultimately, the Customer. In addition to training and fieldwork, we also offer several promotional opportunities such as: spiff programs, BOGO offers, starter kits, and gift card incentives, all supported with in-store POS materials. We also customize seasonal and quarterly promotions, and create full-year promotional calendars for those partners that qualify.”

“When you stitch together our breadth of quality products, field support, and superior customer service with a knowledgeable and personable sales team, we feel that puts us on track for a successful program to fuel our growth and that of our customers.”

“Located in Seville, OH, Stellar Automotive Group recently added 30,000 sq. ft. to its existing space so that International Lubricants Inc. would have the room to grow with current demands,” explains Neil Smith, Director of Operations at ILI, “shortly after that, in June of 2015, ILI blended and packaged its first bottle of CVT Fluid in its newest manufacturing facility. This new facility is outfitted with the latest in blending, packaging, and testing technologies, and is prepared to serve the rigorous demands in today’s industry. Countless hours were put into the planning and designing of the warehouse layout as well as hand selecting the blending, bottling, and packaging equipment to make sure things run as they were intended to, this will also allow for future expansion when the time comes.” Smith concludes, “These facets allow Lubegard to better serve its customers in the coming future and is something that we are already seeing a difference in when compared to our previous functions.” ■

## MEET OUR NEW TEAM MEMBERS



### **CHRISTOPHER MONKS-GREEN**

is one of Stellar Automotive Group’s latest additions, having been with the company since October of 2016. Thanks to Chris’s father, Anthony Monks, an Aircraft Tooling Engineer by trade and an industry veteran, Chris was brought up with industry guidance, knowledge, and expertise.

Before Stellar, Chris was directly responsible for all sales and operations as General Manager at his father’s Southern California Aamco Transmissions. During his time there, Chris received the highest sales-based recognition, the President’s Club Award, which is given to the best performing center in the region during the calendar year. Aamco and Lubegard (International Lubricants Inc.) have been long-time partners, so it was natural for Stellar to see a good fit with Chris.

Currently, Chris is in charge of sales and operations as the Branch Manager of Stellar’s California Distribution Center. Additionally, he has been heavily involved with Stellar’s website improvements and upgrades. You can also find Chris at a plethora of industry trade shows, including ATRA, ATSG, AAPEX, and more.



**MARK ROACH JR.** is new to the Automotive Aftermarket Industry; however, he is a third generation in this industry. He has been ingrained in the car scene for the better part of his life, dating back to starting a local car club when he was just 16 years old. He is a Cleveland native who graduated from St. Ignatius High School to Kent State University where he obtained his B.B.A. in Marketing and a minor in Entrepreneurship.

Mark’s prior automotive experience doing field work for Roach-Sabo & Associates representing several of the industry’s top brands, doing pull through selling, working local trade shows, and creating social media content, has led him to International Lubricants Inc.

At International Lubricants Inc., under the Lubegard brand, Mark is currently carrying rep responsibility as a territory sales manager doing pull through selling alongside field work, and has recently taken on all current marketing, advertising, and promotional endeavors. You’ll find Mark at several industry trade shows, such as ATRA and ATSG within the north-eastern United States, as well as AAPEX this fall. Mark is also currently a member of YANG, living in the Cleveland area.

Outside of work, Mark enjoys spending time with friends & family cheering on the Cleveland Cavaliers, Indians, and Browns, or partaking in fishing, boating, hiking, and powersports.



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# Understanding GM 6T40 SOLENOIDS

**T**he GM 6T40 is becoming very familiar in transmission shops; some are calling it the new breadwinner. The 6T40 came out in 2008 in the Chevy Malibu, but you'll see it in the Chevy Aveo, Cruze, Equinox, and Sonic; the Buick LaCrosse, Encore, and Regal; the Saturn Aura; and the GMC Terrain. There are two generations of 6T40: generations one and two.

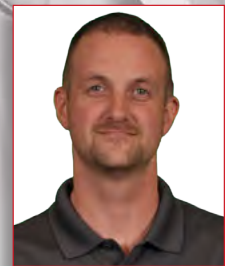
In this article, we're going to look at the solenoids and pressure switches,

and discuss how they operate. And we'll look at how you can replace the solenoids so you don't have to replace the TEHCM.

There are two generations of the 6T40, they are not interchangeable! So the first thing you'll need to do is verify which one you have.

## GENERATION 1

To identify what generation you're working on, look at the eighth digit on the TEHCM (figure 1). On generation



by Jarad Warren  
[members.atra.com](http://members.atra.com)



Figure 1



## **Automatic Transmission Parts**

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- Drums
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- Washers
- Bearings
- Gaskets
- Bands
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- Coolers
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- Superior Shift Correction Packages
- Transgo Reprogramming Kits
- Transgo Shift Kits

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- Gasket Sets
- Forks & Sliders
- Gears & Shafts

### **Rebuilt Transmissions**

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- Standards & Automatics

### **Clutch Parts**

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- Forks
- Pilot Bushings & Bearings
- Clutch Alignment Tools

### **Transfer Case Parts**

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- Chains & Sprockets

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## Understanding GM 6T40 Solenoids

1 units, the eighth digit will be a 1, 2, or 3. Generation 1 also has pressure switches, which we'll look at later.

Generation 1 units have six pressure control solenoid and one on/off shift solenoid (figure 2).

The line pressure control solenoid is a normally high solenoid. With low current applied, the solenoid creates high pressure; in effect, the transmission has high line pressure. The line pressure control solenoid sends oil to the pressure regulator valve to control line pressure.

Pressure control solenoids 2 and 3 (PCS2 and PCS3) are normally high, just like the line pressure control solenoid.

Pressure control solenoid 2 (PCS2) controls oil to the 3-5-R clutch regulator valve. With low current applied, it sends oil to the 3-5-R clutch regulator valve, which applies the 3-5-R

clutch. Applying high current releases the clutch.

Pressure control solenoid 3 (PCS3) controls oil to the R-1/4-5-6 clutch regulator valve. Applying low current sends oil to the R-1/4-5-6 clutch regulator valve, which applies the R-1/4-5-6 clutch. Applying high current releases the clutch.

The TCC pressure control solenoid is a normally low solenoid. With low current applied, the solenoid sends little to no oil to the TCC control valve and TCC regulator valve. Increasing the current allows a controlled flow of oil to the TCC control and TCC regulator valves, to control converter clutch apply.

Pressure control solenoids 4 and 5 (PCS4 and PCS5) are normally low, just like the TCC pressure control solenoid.

Pressure control solenoid 4 (PCS4) controls oil to the 2-6 clutch regulator

valve, which sends oil to the 2-6 clutch. With high current applied, the solenoid sends oil to the 2-6 regulator valve; with low current, it sends little to no oil to the valve, releasing the clutch.

Pressure control solenoid 5 (PCS5) controls oil to the 1-2-3-4 clutch regulator valve and 1-2-3-4 boost valve that send oil to the 1-2-3-4 clutch. With high current applied, the solenoid sends oil to the 1-2-3-4 regulator valve and boost valve; with low current applied, no oil gets to the valve, which releases the clutch.

The shift solenoid is an on/off, normally closed solenoid that controls oil to the clutch select valve.

All of the pressure control solenoids should measure 3-5 ohms; the shift solenoid should be 16-20 ohms. When testing solenoids' resistance, always remove the solenoid from the TEHCM to prevent damage.

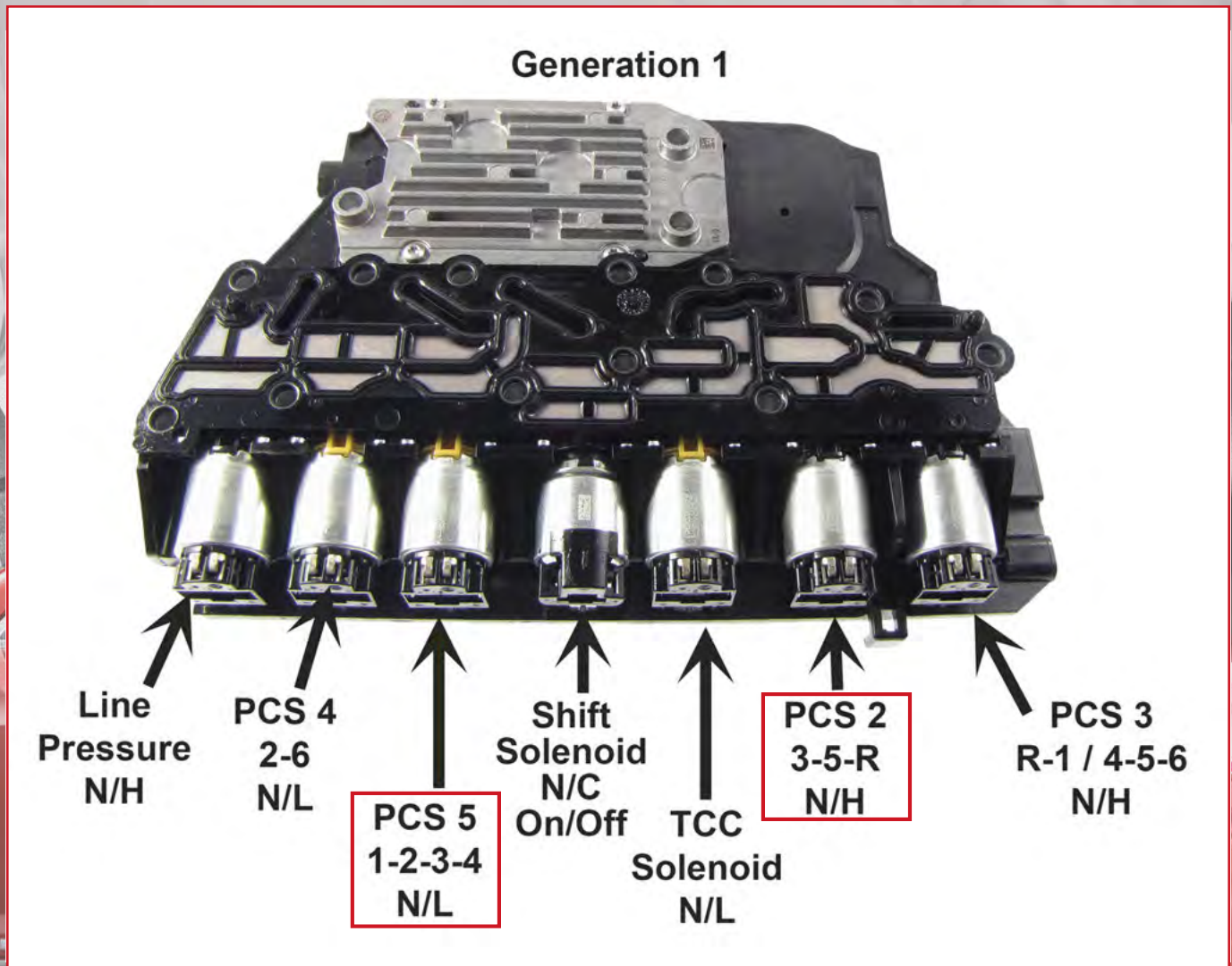


Figure 2



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## Understanding GM 6T40 Solenoids

The transmission fluid pressure switches are normally closed, allowing current to flow with no pressure applied (figure 3). When there's pressure at the switch, it opens the circuit.

Transmission Pressure Switch Application	
Pressure Switch	Clutch Circuit
1	1-2-3-4
2	2-6
3	3-5-R
4	R-1/4-5-6

## GENERATION 2

The eighth digit on the generation 2 TEHCM is going to be a B, C, or D. These units have six pressure control solenoids, one shift solenoid, and no pressure switches. The PCS2 and PCS5 solenoids are in different locations and operate differently from those in generation 1 units (figure 4).

These four solenoids are identical to the generation 1 solenoids in operation and location:

- Line pressure control solenoid
- Pressure control solenoid 3
- Pressure control solenoid 4
- TCC pressure control solenoid



Figure 3

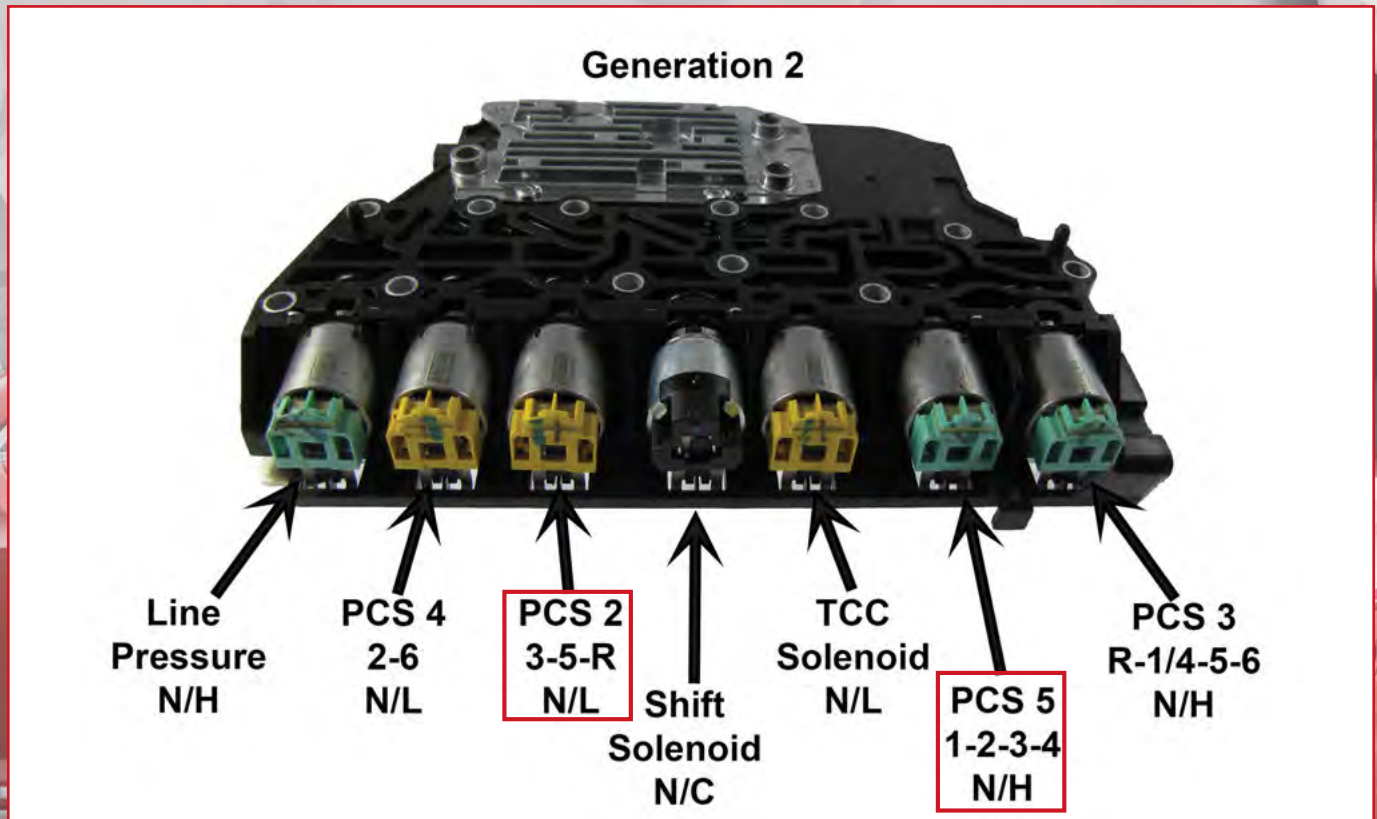


Figure 4

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## Test Ports Gen 1 and 2

Solenoid Air Test Procedures		
Solenoid	Entry Port	Exit Port
Line Pressure	6	6A — Open
PCS4	5	5A — Closed
PCS2	4	4A — Closed
Shift	3	3A — Closed
TCC	2	2A — Closed
PCS3	1	1A — Open
PCS5	1	1B — Open

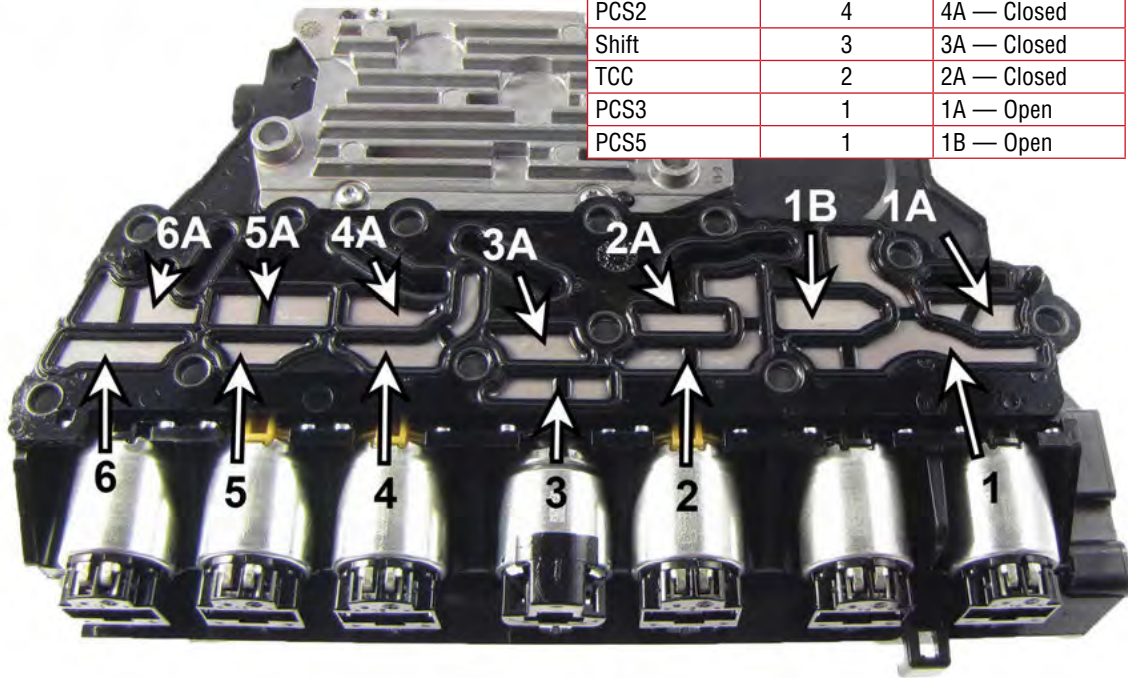


Figure 5

The solenoids that have changed in generation 2 units are pressure control solenoids 2 and 5 (PCS2 and PCS5).

Pressure control solenoid 2 (PCS2) is now normally low, just like the TCC solenoid, and it's in a new location on generation 2 units.

Pressure control solenoid 2 (PCS2) controls oil to the 3-5-R clutch regulator valve. With high current applied, it sends oil to the 3-5-R clutch regulator valve, which applies the 3-5-R clutch. Low current releases the clutch.

Pressure control solenoid 5 (PCS5) is now normally high, just like the line pressure control solenoid, and it's in a new location on generation 2 units.

Pressure control solenoid 5 (PCS5) controls oil to the 1-2-3-4 clutch regulator valve and 1-2-3-4 boost valve that sends oil to the 1-2-3-4 clutch. With low current applied, the solenoid sends oil to the 1-2-3-4 regulator valve and boost valve; applying high current shuts off oil to the valves, releasing the clutch.

Just as with generation 1 units, all of the pressure control solenoids should measure 3-5 ohms; the shift solenoid

should be 16-20 ohms. When testing solenoids' resistance, always remove the solenoid from the TEHCM to prevent damage.

There are no pressure switches in the generation 2 TEHCM.

### DIAGNOSING PROBLEMS

Among the more common 6T40 transmission problems to reach the ATRA HotLine are units with no forward or no reverse. Here are a few tests that may help identify whether the problem is being caused by a solenoid problem:

**CAUTION: Never apply voltage to the solenoids or solenoid block; doing so could damage them.**

If you remove the solenoid block from the TEHCM, you can control the solenoids with a solenoid driver or test machine. You can test the shift solenoid by applying 12 volts but never apply 12 volts to the pressure control solenoids.

For this test, you're going to apply 45 PSI of air pressure, without energizing the solenoids (figure 5). Use a plastic test plate to cover the fluid entry port, and check for air coming out of the exit ports.

Remember, these are variable bleed solenoids so they'll all leak a little air; even the normally low solenoids. The normally high solenoid will allow more air. With a little testing and playing around you'll quickly learn how they should function.

If you find a bad solenoid, you can replace the TEHCM, confident that you found the problem. Or you may be able to replace just the solenoid in question.

You may be able to find broken TEHCMs with bad connectors cheaply from your hard part suppliers. Sure, the connector's broken, but the solenoids may be okay to reuse. That way you can replace the individual solenoids instead of the TEHCM. And, since you're reusing the same TEHCM, you won't have to reprogram afterward.

These six-speed transmissions are quickly becoming one of the more common units to reach your shop. Learning how they operate and how to test them is the best way to make sure the future you're looking at will be a bright one.



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# IN FRONT OF THE FLYWHEEL



by Scott Shotton  
THE DRIVEABILITY GUYS



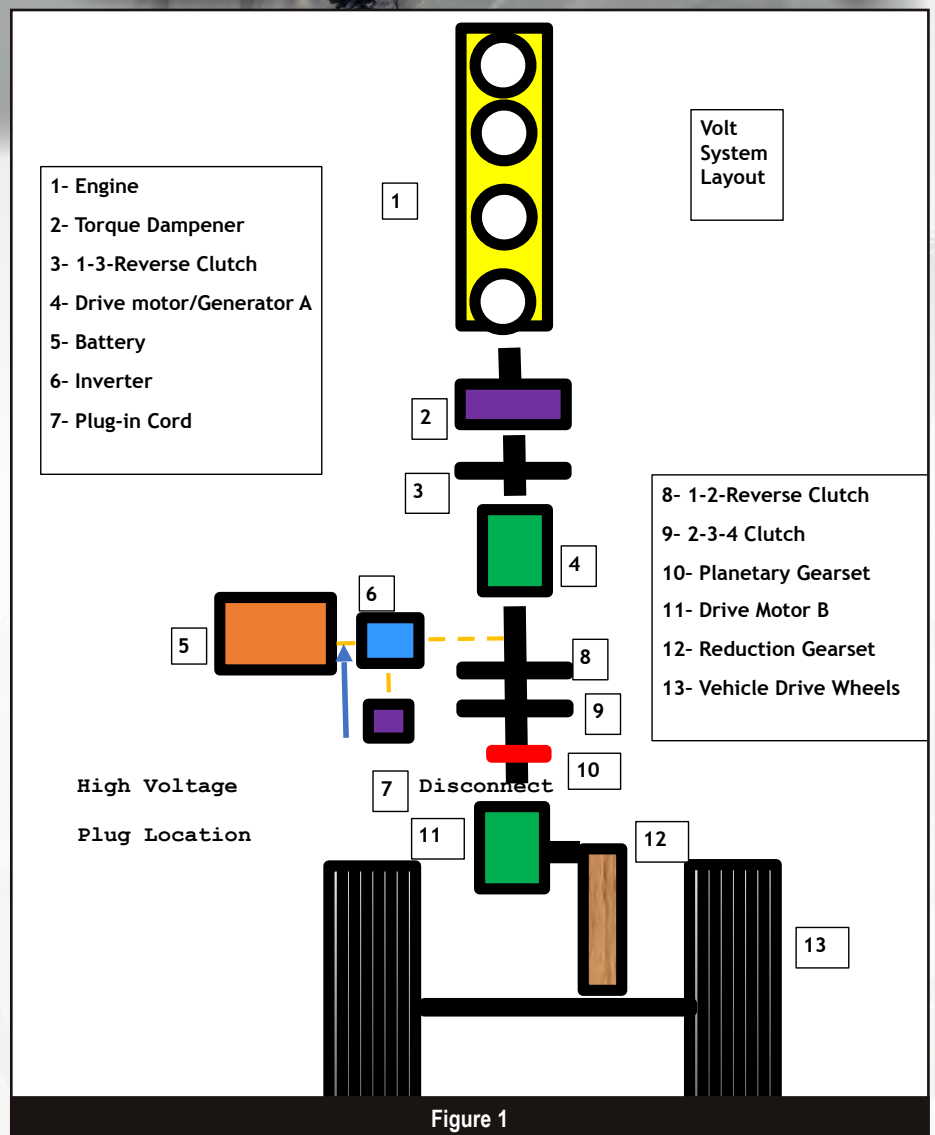
# Tackling a 4ET50 Hybrid

**M**any transmission technicians are hesitant to tackle hybrid and electric transmission repairs. But those repairs may not be as difficult as you might think.

As with all repairs, the first time you work on a specific unit, you'll want to be extremely careful not to make a mistake. With hybrid/electric applications, you also need to pay close attention to the safety aspects of the repair process.

GM uses the 4ET50 (RPO MKA) in the Chevrolet Volt and the 4ET55 (RPO MKD) in the Cadillac ELR. They switched to the 5ET50 (RPO MKV) hybrid/electric transmission for 2016-and-later Chevrolet Volt and Malibu applications.

The Volt equipped with the 4ET50/5ET50 is classified as an Extended Range Electrical Vehicle (EREV). This type of hybrid/electric vehicle uses a gas engine to help extend its driving range. The Volt uses electric drive motors mounted in the transmission. The gas engine charges the battery through one of the transmission drive/generator motors.



Yes, the vehicle and its systems are high tech, with multiple controllers; four, high-speed CAN bus communication systems; two DLC connectors; and three separate cooling systems. Keeping that in mind, GM has done everything possible to make diagnosis and repair very technician friendly. System diagnosis is supported by more DTCs than any other GM vehicle. Scan data support parameters are very complete and easy to use.

The transmission consists primarily of

- a torque dampener assembly
- a G-rotor main pump
- an electric auxiliary pump
- one planetary gearset
- two rotating clutch assemblies
- one stationary clutch assembly
- a valve body with TEHCM
- two, 360-volt, 3-phase AC electric drive motors/generators

Drive motor/generator A (1) is 55kW and drive motor B (2) is a 111kW unit. (Figure 1)

These systems have four modes of operation possible:

## System diagnosis is supported by more DTCs than any other GM vehicle.

- **Electric only (Motor B) Engine Off** — The 1-2-reverse clutch is applied (holds the planetary ring gear). Drive motor B drives the vehicle.
- **Electric only, Engine On** — Drive motor B drives the wheels, motor A charges the battery: the 1-2-reverse clutch holds the planetary ring gear while the 1-3-reverse clutch connects the transmission to the engine through motor/generator A.
- **Electric combined, (Motor A and Motor B) Engine Off**

— The 2-3-4 clutch is applied, connecting drive motor/generator A to the transmission planetary. This allows drive motors A and B to drive the vehicle.

- **Engine On combined; Motor B and Motor A drive the vehicle** — The 1-3-reverse and 2-3-4 clutches are applied. Drive motors A and B drive the vehicle while the engine charges the battery.

As in many other vehicles, the driver can select various driving modes by pressing a button on the driver information center (DIC). The driver can choose the preferred driving mode based on operating conditions. These modes include:

- **Normal** — The normal mode maximizes the battery charge and use mileage.
- **Sport** — The system releases more current during acceleration to make the vehicle more responsive to accelerator pedal input.



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## Bearing installer faces the numbered side of the bearing



Figure 2

- **Mountain** — The system maintains a reserve charge for climbing hills by running the engine to keep the battery charged.

Like other hybrid and electric drive vehicles, the Volt offers you the opportunity to expand the type of services you

offer and add to your bottom line. Shops are starting to pop up around the country specializing in hybrid and electric vehicle repairs. Few transmission shops are offering to service these vehicles, which may be a lost opportunity.

Remember, this type of vehicle has a transmission;

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it's just a little different than the transmissions you've serviced for years. Back in the early 90s, everyone was afraid to work on the new electronic transmissions. This is really no different. It's time to jump into hybrid/electric transmission service with both feet!

Let's look at a very common repair for the 4TE50/4ET55 transmissions. One of the common issues with this unit is a scraping noise whenever the drive wheels are turning. The noise is more apparent at low speeds and during regeneration or deceleration mode.

The noise is usually caused by a failed drive motor B support bearing. This repair doesn't require removing the transmission and it's fairly straightforward.(Figure 2)

### **Safety Considerations**

Before working on any electric or hybrid vehicle, you'll want to disable the electrical system. Remove all jewelry and watches and always use personal protective equipment such as safety glasses and high-voltage, class-0 insulated gloves, which are available from your local parts supplier or electrical supply warehouse. As always, refer to the factory manual for information regarding disabling the high voltage system.

Next, you'll want to disconnect the vehicle's 12-volt battery. Then disconnect the high voltage disconnect plug, located in the center console armrest area. Wait five minutes or more for the capacitors in the inverter to discharge. (Figure 3)

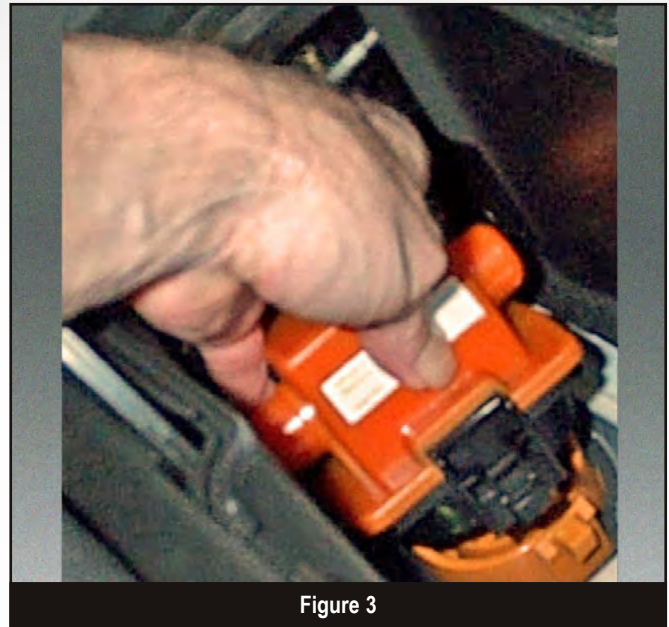


Figure 3

Check the resistance at high voltage terminals A and B as outlined in the factory service information. With the high voltage disconnect plug removed and stored in your toolbox, take some UL-approved electrical tape and cover the hole for the plug.

At this point, you'll need to disconnect the inverter electrical plug to isolate the inverter from the system. Measure the voltage at terminals A and B of the inverter

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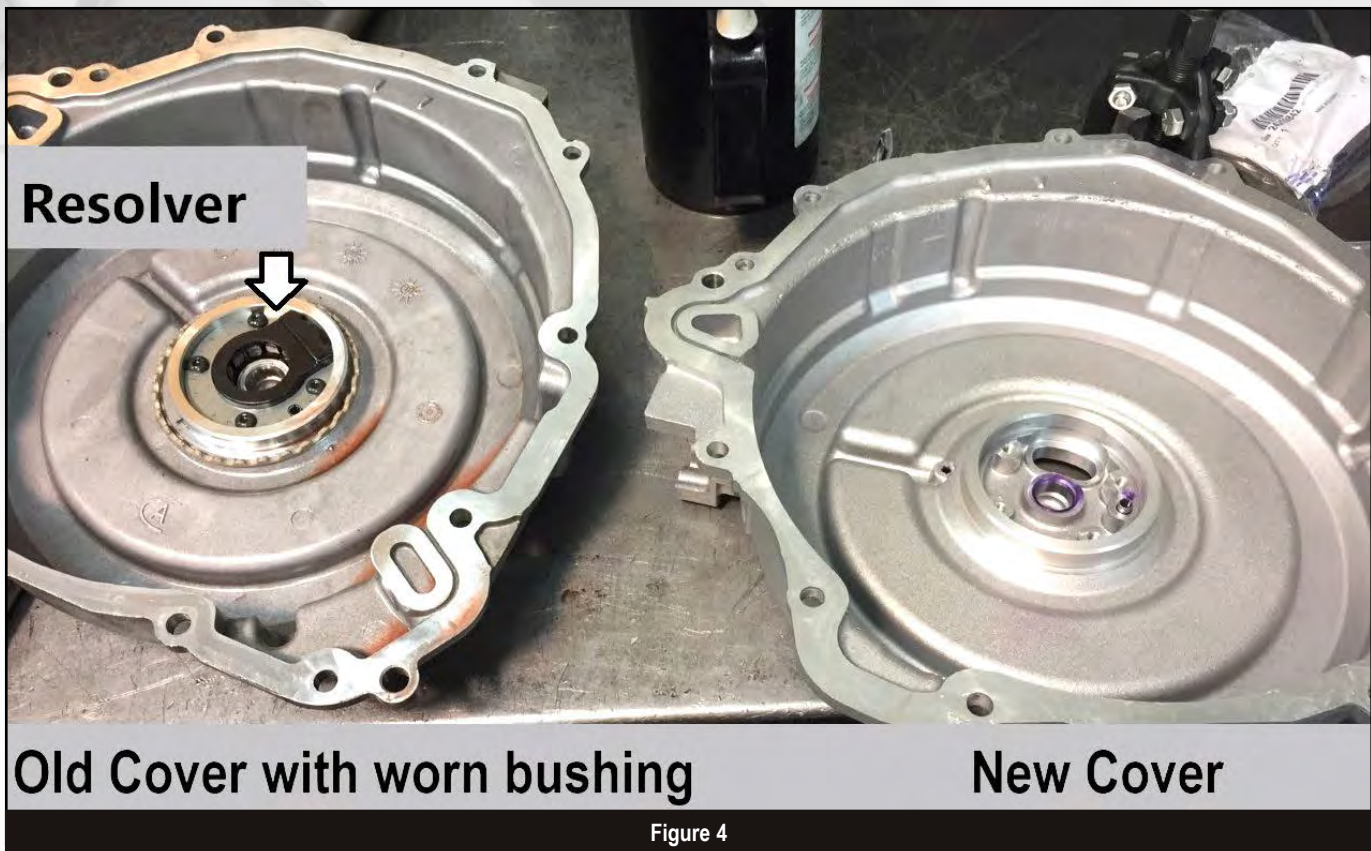


Figure 4

**Make sure to place the side of the bearing with the part number facing your bearing driver tool.**

harness as outlined in the shop manual. The voltage at each point should be less than 3 volts. As always, make sure you're wearing high-voltage, class-0 insulated gloves and following the shop manual steps while making the vehicle safe to work on.

### **Bearing Replacement**

Once you have the electrical system disabled, you'll need to remove the transmission side cover. With this application, you don't need to remove the axle shaft or any suspension parts to access the cover. Removing the side cover will expose the bearing, which is mounted to the rotor of drive motor B.

To remove the side cover you'll need to:

- Support the engine with a sling or engine support fixture.
- Remove the 3-phase cable brackets and reposition the cables as needed.
- Unhook the shift cable and bracket and move the cable out of the way.
- Mark the transmission mount position and remove the mount bolts.
- Remove the wheelwell liner.
- Lock the steering wheel in the straight-ahead position, and remove the steering intermediate shaft.
- Disconnect the stator/drive motor electrical connectors.
- Drain the transmission fluid.

- Disconnect the stabilizer link from the strut assembly.
- Remove or tilt the cradle.
- Remove the side cover.
- Use a narrow jaw puller and a bridge to remove the bearing from the rotor.
- Inspect the side cover bushing for evidence of damage. If the cover bushing, bearing mounting area, or resolver (stator position sensor) are damaged, you'll also need to replace the side cover, and replace or transfer the resolver from the old cover. (Figure 4)
- Install a new bearing onto the rotor using the appropriate tools. Make sure to place the side of the bearing with the part number facing your bearing driver tool. Drive the bearing into its bore until the bearing outer race is 0.95–1.2mm (0.037"–0.047") below the bearing bore. (Figure 5)

As you can see, the repair isn't difficult. If the transmission is contaminated with metal, you'll need to flush the cooler, just as you would any other transmission. Once the repair is complete, you'll need to:



When properly installed the bearing race will be .95-1.2mm below the bearing bore surface.

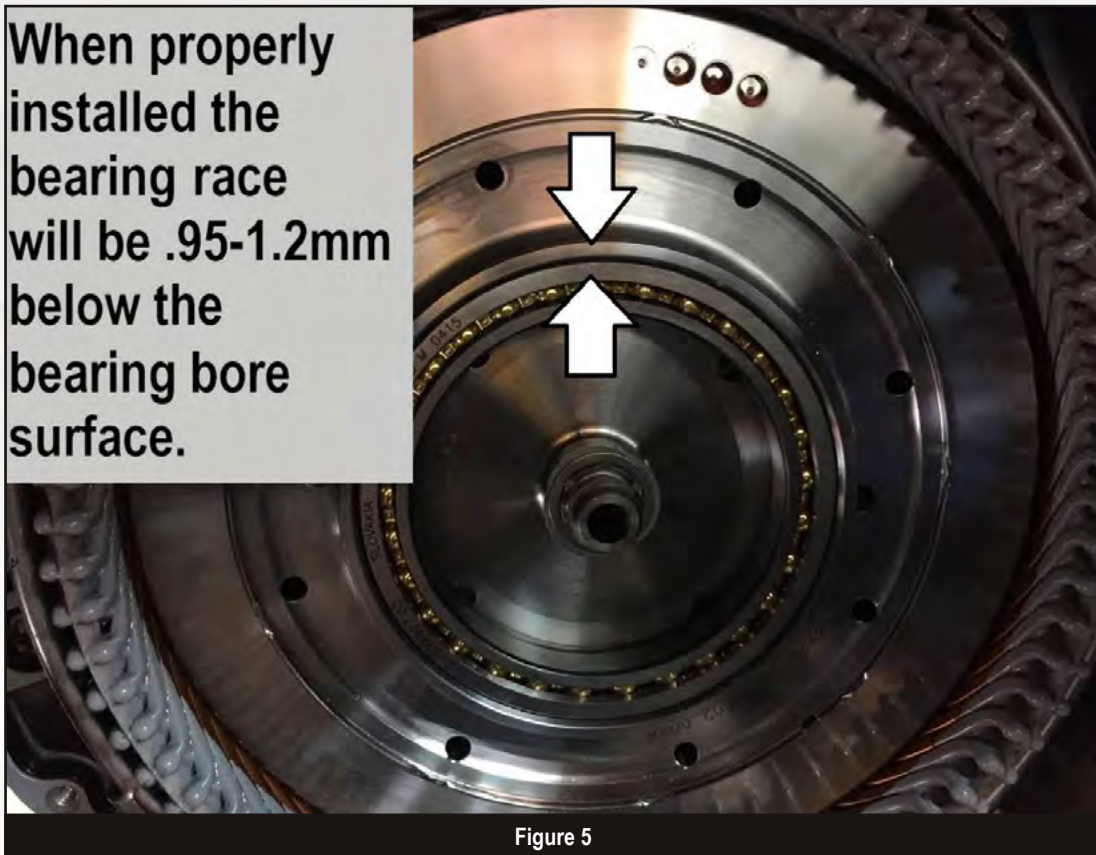


Figure 5

- Connect, install, and reposition the components you disturbed during disassembly
  - Refill the unit with Dexron VI fluid
  - Reinitialize the system
  - Clear the DTCs
- ...and reset the adapts prior to road testing.
- A lot of people would like the

hybrid and electric car market to disappear, but according to a 2017 AAA survey, “the demand for electric cars may be as robust as it is for pickup trucks.” This was based on a survey of 1,004 adults in February 16-19.

Reasons for interest in electric cars vary:

- 87%—concern for the environment
- 62% — lower long-term costs

- 52% — cutting-edge technology
- 29% — carpool lane access
- 12% — other

As you can see, this technology is likely to be around for quite some time. Maybe it’s time for you to make some money from these high-tech vehicles. Now’s the time to educate yourself on these systems and start advertising your services.



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- **62TE Reprogramming**
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## FORD

- **CFT**
  - Delayed Engagement After Overhaul, DTC 0868
- **Torqshift, 4R100, E4OD, 4R70W**
  - Wiring Issues
- **Torqshift**
  - Coast Clutch Drum Repair
  - Delayed Forward Engagements
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- **6F35**
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  - Reverse Engagement Issues
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  - Locks Up on Top of 2nd Gear
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## GENERAL MOTORS

- **4L60E, 4L80E**
  - Erratic Shifts, Possible P0730 Set
- **4L80E**
  - No Lock-Up Command
- **6T30/35/40/75, 8L45**
  - No Lock-Up Command
- **6T30/35/40/75, 8L45**
  - Hybrid Start/Stop Feature No Longer Operates After Repairs, No DTCs Set
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  - Generation 3 Oil Pump Update Change
- **6T40/45/50**
  - AWD Final Drive Failure Slipping/Damaged 3-5-R or 4-5-6 Clutch
- **6T70**
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- **6T70/75/80**
  - TCC Slip, Shudder, No Apply After Service
  - Gen 2 Valve Body Identification
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  - No Reverse Followed by No Forward or Reverse, GM and BMW Applications
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  - Transfer Case Shift Concerns Colorado and Canyon Applications
- **6L50**
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- **6L50/80/90**
  - No Reverse After Valve Body Replacement
- **6L80/90**
  - No 4th, 5th, 6th Gears, Possible DTC P0796
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  - Harsh Shifts
  - Delayed Engagement, Drops Out of Gear at Stop Signs
- **8L90**
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  - Introduction
- **JF011E**
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- **Nissan/Jatco CVT**
  - Applications
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  - Idle Neutral Control
  - G Sensors (Late Models)
  - G Sensors Calibration
  - Speed Sensor Function
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- **RE0F11/10A**
  - Range Sensors
- **RE0F10D/E/H/J**
  - Speed Sensor Locations
  - Fluid Temperature Sensor
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  - Speed Sensor Locations
- **RE0F11A, RE0F10D/E/H/J**
  - Primary Speed Sensors
  - Output Speed Sensors
  - Ratio Control (Stepper) Motor
  - External Lube Filter Replacement
  - Service Information
- **RE0F10D/E/H/J**
  - Input Speed Sensors
- **RE0F11A**
  - Speed Sensor Shims
  - Solenoid Identification and Function
  - Fluid Temperature Sensor
  - High Clutch Pressure Sensor/Switch
  - Case Connector
  - Pressure Sensors/Switches
  - Clutch Apply Chart w/ Ratio Change
  - Pressure Tap Locations
  - Secondary Bearing Failure
  - Broken Transmission Case
- **RE0F10A/B**
  - Solenoid Identification and Function
- **RE0F06A**
  - Solenoid Identification and Function
- **RE0F09A/B, RE0F08A**
  - Fluid Temperature Sensor
- **RE0F06A**
  - Fluid Temperature Sensor
- **RE0F10/09/08**
  - Pressure Sensors/Switches
- **RE0F10A**
  - Pressure Tap Locations
  - Service Information
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  - 2-3 Flare
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# 5 STEPS TO BOOST TECHNICIAN EFFICIENCY



by Thom Tschetter

**U**p Your Business is an exclusive *GEARS Magazine* feature in which I share stories, insights, and reflections about real business and life challenges.

When considering the *shop equipment* and *tools* theme of this issue of *GEARS*, don't ignore the importance of *management equipment* and tools as well.

This article focuses on five steps you can take to increase technician efficiency. Ironically, for the most part, these five steps have little to do with the skill or efficiency of the technicians themselves.

Instead, you'll have a more significant effect on performance by the things you do — or fail to do — relative to your team members. Often, your shop's processes, operational procedures, and policies negatively influence your techs' abilities to perform at a sustained high level of efficiency.

### What All Employees Want

What do top performing technicians have in common, besides the three core attributes: good attitudes, aptitudes, and abilities? *Authentic Manhood* answers this question in

one of their studies, titled "A Man and His Work." The study asserts that all employees want four primary things from their work:

1. Success — They want to master what they do and to receive recognition and respect for it.
2. Fair Compensation — Note the word is *fair*... not high pay, more money than the other guy, or some other similar catchphrase.
3. A Good Fit — Feeling comfortable and reasonably challenged in the job and enjoying the work environment, including the people.
4. Meaning — The feeling that their work matters... that it's purposeful and significant. For instance, auto techs don't just fix cars; they fix people by solving their transportation problems. They help parents get kids to school, workers get to their jobs, etc.

### Five Best Steps

So what are the five best steps to incorporate these four primary factors and boost your shop's efficiency, productivity, and billable hours?

1. **Establish a baseline of current performance levels for each tech and a composite for the entire**

**technical team.** The best way to do this is with a concept called *adjusted capacity*.

This is important because it's vital to track how productivity is trending. You need to determine your shop's current level of productivity as the starting point for measuring progress.

Your team's production capacity isn't necessarily the total number of hours your techs work per week. You'll need to adjust their actual capacity for a number of factors, resulting in the adjusted capacity, which could be more or less than the total hours worked.

Your shop's adjusted capacity is the number of hours of tech time that are actually available for the shop to sell and reasonably expect to produce per day, week, month, or year.

Here are the steps to calculate adjusted capacity for one technician for one week. Do this for each tech and then add them together to determine the shop's weekly combined adjusted capacity.

- Calculate the number of hours the tech is at work per week.
- Estimate how many of those

hours are actually available for doing work. Deduct:

- Structured lost time — breaks, lunch, paid holidays, paid sick days, paid vacations
- Process related lost time — time spent waiting for job assignments, time spent waiting for parts or ordering parts, time spent performing technical research or calling a tech hotline
- Underemployed lost time — doing non-billable work like cleaning the shop, running customers home, stocking parts inventory, or other things that waste the tech's ability to produce revenue that matches his skill value
- Non-revenue jobs — warranty repairs or fixing another technician's mistakes
- Technician efficiency — this can be an addition or deduction because it answers the question, "How long does it take this tech, on average, to perform a job compared to the time allowed (and hopefully billed) in the shop's labor guide? For instance, if he can do a 2-hour job in 1.5 hours, he has an efficiency factor of +33% (2 divided by 1.5 = 1.33). But if it took him 3 hours to do a 2 hour job, he has a 67% or a -33% efficiency factor (2 divided by 3 = 0.67). To maintain consistency and accuracy, always use the same labor guide because the guides vary.

While this might seem like a daunting task, it's actually quite simple. Once you've done it a few times, it'll go fairly quickly. The challenge is accuracy, because so much of the data is estimated or purely subjective.

There are easy-to-use time clock features available as add-ons to most shop management computer systems. One company I know of, ProfitBoost Software, offers this feature with their new Auto Shop Software package. These time-clock features automatically capture and calculate the precise data needed to determine a technician's adjusted capacity and the production team's adjusted capacity.

**2. Use adjusted capacity in setting production goals.** Since billed and produced hours are the best measure of a shop's efficiency, why not use adjusted capacity to measure the technical proficiency of the shop?

Set short-term targets related to improving adjusted capacity for each technician as well as a team target. Carefully determine the targets to make sure that achieving individual targets will result in meeting the shop's objectives and goals.

Employees typically perform better when trying to achieve a goal. But most of all, they need to understand how they can directly influence the achievement of the goal.

People like to play games that have winners and losers, or at least provide performance feedback. How

interesting would it be to play a game that conceals the results from you? Imagine bowling and only hearing the crash of the ball into the pins because the pins are concealed behind a curtain that drops down after the ball is on its way down the alley.

When it comes to technicians, their efforts are lost when the shop's focus is on sales dollars. They need to know that what they do matters and understand how improvements in their adjusted capacity translate into more billable hours and greater success for everyone, including the shop owner. After all, it's their production that drives billable hours, which, in turn, drives revenue.

**3. Provide rewards for meeting production goals.** Add small incremental bonuses when techs exceed their respective individual targets. Give production team bonuses when the team exceeds composite production targets.

Bonuses based on shop sales are lost on the tech team members. But they do understand hours produced and will respond favorably to bonuses based on that.

Consider posting the daily targets on a whiteboard in a prominent spot in the shop, and periodically throughout the day update their progress toward those targets. Provide week-to-date tallies daily. All of these things demonstrate that you're paying attention and that what they're doing matters.

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Again, automated time-clock features streamline this process. Imagine the impact of real time feedback when technicians are connected to the network with workstation laptops or tablets... they can receive progress reports and “virtual high fives” throughout the day.

Celebrate achievements. Acknowledge individual techs when they set new production records. Being noticed by the boss and getting high fives from peers is energizing for everyone.

When the production team sets a new record, it's time for pizza! Make it fun and exciting.

#### 4. Remove obstacles to productivity.

**Here are some common obstacles:**

- Assigning a job to the wrong technician — When you assign a job to the right tech, he or she has a better chance to beat the allotted book time, which increases technician efficiency. We refer to this as a “good fit.”
- Technicians waiting too long for the parts for their assigned job — This is a process problem you need to fix.
- Jobs hung up in the office waiting for customer authorizations — This is also a process problem, but this one is almost invisible because it doesn't directly affect the technicians' efficiency. It does affect adjusted capacity, though, because it's a bottleneck. Contemporary auto shop software systems can save time in this area with features like:
  - ✓ Streamlined check-in process that automatically populate the repair order with vehicle and customer information
  - ✓ VIN readers
  - ✓ Sending customers text messages with estimates and pictures of the damaged parts
  - ✓ Obtaining customers' authorizations by text
  - ✓ Ordering parts directly from the repair order
  - ✓ Online tech support
- Rushed diagnostics — when a tech isn't given sufficient time

for a thorough diagnosis, it can cost the shop in several ways. For example:

- ✓ Lost sales from overlooking needed repairs so they don't get sold
  - ✓ Misdiagnosis that leads to longer repair times, warranty repairs, and other types of comebacks
  - Doling out jobs too slowly, causing delays while the tech waits for his next job, or holding the next job back until the tech completes the job he's on. It's better to keep at least one job on the board ahead of the technician. That way he knows there's a job waiting. This eliminates the time-wasting situation of the work expanding to fill the time. Also, sometimes a tech can jump on the next job while another job is hung up for parts, authorizations, or technical research.
  - Make sure your shop software system includes an easy, accurate, and beneficial time-clock feature to help facilitate workflow, to boost your shop's efficiency, productivity, and billable hours.
- #### 5. Provide a first-class work environment.
- This shows that you care and respect your team members.
- Start with a climate-controlled shop area. It's been proven time and again that happy technicians are more productive. What could make a technician happier and more productive than working in an air-conditioned shop during the heat of the summer or a warm shop in the depth of winter?
  - Provide state-of-the-art equipment and diagnostic tools. The days of technicians providing 100% of their tools are long gone. Some equipment is simply too expensive and each technician doesn't need to own it... it's appropriately provided by the shop and shared by the production team. It's the shop's responsibility to supply the essential diagnostic tools, computers, and electronic equipment. You wouldn't expect your

service writer to provide your auto shop management software, would you?

- Let the team know that you care about them and want them to care about customers. Nurture a customer-centric service culture. Remind the techs that they don't just fix cars... they fix customers by solving their transportation problems.

## Closing Thoughts

These five steps to greater efficiency are most effective when they're accompanied by a company culture that truly cares about its employees. When employees are treated well, so are the customers they serve.

These processes are easier to implement with an up-to-date auto shop management software system that's easy to use, improves overall efficiency, and provides timely, accurate reports to share performance results with the repair shop team.

I'm amazed at how many shops are quick to buy the latest new tech tool, but still operate with antiquated processes and outdated computer systems. It's time to step up and recognize that you can enhance tech efficiency by using effective shop management tools.



### About the Author

*Thom Tschetter has served our industry for nearly four decades as a management and sales educator. He owned a chain of award-winning transmission centers in Washington State for over 25 years.*

*He calls on over 30 years of experience as a speaker, writer, business consultant, and certified arbitrator for topics for this feature column.*

*Thom is always eager to help you improve your business and your life. You can contact him by phone at (480) 773-3131 or e-mail to [coachthom@gmail.com](mailto:coachthom@gmail.com).*

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# ACRES of DIAMONDS

by Jim Cathcart

**F**ormer civil war officer and Baptist minister Russell H. Conwell was once asked to mentor seven young students who couldn't afford college tuition. This led to his delivery of 6,152 lectures in what became a worldwide tour and the creation of his famous book, "Acres of Diamonds." The funds generated by the book and his lectures allowed him to found Temple University, and has provided education for thousands of struggling youth.

The gist of Conwell's famous message is that you and I are currently surrounded by opportunity. We're sitting on our own acres of diamonds. But like the man in his story, we usually wander elsewhere in search of it.

Conwell would prove his concept by spending a few days in each city before his lectures, researching local opportunities. Then he'd fill his speeches with stories about opportunities here and now.

Attitudes toward opportunity are illustrated in the familiar "Opportunity is Nowhere," vs. "Opportunity is Now Here" statements. They use the same letters in the same order, but the space between "now" and "here" makes all the difference. Which statement describes the views in your shop?

People tend to embrace the attitudes around them. If the leader has a limited mindset — "all work and no play," "just do the job," "things are tough and then you die. Get over it" — then the team will be likewise uninspired.

But when someone takes the lead and starts each day with gratitude — "Look at this! Another beautiful opportunity to help people today!" — then people smile more often, find more meaning in their jobs, and discover opportunities that others don't notice.

In the "Acres" story, Conwell tells of a man in India named Ali Hafed. One day he welcomed a traveler to his home who told great stories of the wealth that came to those who discovered diamonds. The story so captivated Hafed that he sold his farm and traveled the world, desperately seeking to discover diamonds.

Then one day, the traveler returned to the farm and spoke to the new owner. He asked about a large decorative stone that the farmer had placed on the mantle above his fireplace. The farmer replied, "It's just an interesting stone that I placed there for decoration. There are lots of them all over the farm."

As it turns out, the stone was a diamond, but neither the farmer nor Ali Hafed knew what diamonds looked like in their rough state. Before they're cut, diamonds don't look like diamonds. The farm in the story referred to what we know today as the Golconda Diamond Mines.

Here's what Wikipedia says about these mines: Out of 38 diamond mines of India, 23 were located in the Golconda Sultanate, making it the 'Diamond Capital' of the past. It was considered a point of pride by any ruler to be the owner of one of the Golconda Diamonds. The top

four pink diamonds of the world are from Golconda.

Where are your diamonds? Perhaps they're hidden among your employees who have untapped potential? Or dormant among your former customers who seldom hear from you anymore? Could they be waiting among your friends and colleagues who could refer business to you, and you to them? Is there a stash of diamonds in the added services that you could easily offer, or in the technology that you're barely using at all?

It's been proven that the most reliable source of good, future employees is the referrals to acquaintances of your current employees and customers. Have you looked for diamonds (talent) there? Do people know that you're always seeking talented people to join your team? Do your customers know that you consider them precious assets, and that you're eager to be of further service to them and their families, companies, and friends?

Maybe today would be a good day to start roaming your "farm" and looking for diamonds in their rough state. A bit of polishing and expert cutting might just produce a beautiful gem.



Jim Cathcart is a strategic advisor to ATRA and a valued contributor to *GEARS*. You can schedule him as a speaker or acquire his many books by simply visiting [Cathcart.com](http://Cathcart.com) or searching for "Jim Cathcart" online.



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# I'VE NEVER SEEN A HEARSE PULLING A U-HAUL

## Right! You Can't Take It With You!

**FACT:** I'm not an expert on transmissions. Never really saw one until I spoke at Expo a few years ago.

**FACT:** I *am* an expert on people. I've spent a lifetime creating programs, ideas, tips, skills, and techniques for people on the topics of sales, customer service, and communications.

So, when I got asked back to speak at this year's Expo, it was an honor and certainly a compliment. What it said to me was, "Gee, she may not know too much about transmissions or how to rebuild them, but she sure knows her stuff about people."

I'm also a small-business owner. They call folks like us *entrepreneurs*, and I'm damn proud to be one.

But no matter what they call us, we have a small business that we created, was handed down to us, or that we bought. It's ours. And we get to do pretty much what we want with our businesses.

There are pitfalls of course, but there are pitfalls in every business. So that doesn't scare me at all. I'd rather make less money and run my own business than have more business and do what someone wants me to do that I don't like to do. Does that make sense to you?

So I decided to make this article 'bulletproof,' if you will, for 'that day.'

That day when we say, "It's time." Be it time to retire, time to slow down, time to sell, or just *time*. Maybe just time to leave early.

While succession planning is critical in all small businesses, it's also critical to be sure the folks who stand by our sides — the staff we hired to do the work — are well-trained, so we can feel comfortable taking time off.

I'm always surprised when I hear that those plans aren't in place. And if those plans aren't in place, we, as small-business owners, worry a lot. And, of course, then we can't take that *time* we so need.

We worry what'll happen if we aren't in the shop every day. We worry if our customers will be treated the way we know they should be. We worry if we can take time off for a golf game, let alone a true vacation.

Well, let me help you remove some of that worry.

If you can get a plan in place, even a mini plan, you can play golf, you can take a vacation, you can relax a little more. You can have *time* because, as the title of the article says, "You can't take it with you."

What plan, Nancy? What do you mean?

I mean the feeling that we, as owners, are the only people that can do 'things.' That we're the only ones who know how to operate the shop. How to



by Nancy Friedman  
President, Telephone Doctor  
Customer Service Training

do *everything*. I'm sure you know the feeling.

We may know how to do it better, yes, but we need to be sure those we've hired, put into place, and who work with our customers, can do it at least *well*.

I'm betting one of the reasons you don't take time out for yourself isn't because you're worried the others aren't able to rebuild transmissions. Heck, that's what they're trained to do; it's what they get paid for.

Rather, it's because of how your employees might treat your customers. Because if you're a true entrepreneur, you worry about that part a lot.





So here goes: Put this checklist into place at your business. Make your folks accountable for the results. Have a meeting or get-together once a week to be sure they understand what you need and want. It doesn't need to be a long meeting; 15 to 20 minutes will be fine. If you do make it longer, feed them — that always helps.

Put these 6 ground rules into place, to be followed day in and day out by everyone. No exceptions! And, if you do, you'll have more time for *you*.

**FACT:** The best weapon for a small business against the *big guys* is customer service. It's that simple.

We'll pay more for better service! So, if you're a small-business owner who's looking for ways to improve, read on.

Adapting and putting these easy steps into place will make your day, and, more importantly, make the customer's day a better experience. Once you feel everyone on your staff is on board, you'll find yourself taking more time for you. Cause remember: You can't take it with you.

**1. People Before Paperwork** — When someone walks into your place of business or calls you while you're working on something, *drop everything for that person*. Remember, paper can wait; people shouldn't have to. We've all been abused when we go shopping and been ignored, and we know how that feels. Let's not abuse our own customers. Remember: People before paperwork.

## **2. Rushing Threatens Customers**

— Sure, you may understand something quickly, but rushing customers along will only make them feel intimidated and you won't see them coming back to you. Take it easy. Remember, speed isn't success! Trying to be “done” with a customer as quickly as possible feels rude and uncaring. Take your time with each contact.

**3. Company Jargon** — Not everyone is as familiar with transmissions as you are. Did you ever get a report from a company and not understand it? Some companies have jargon that makes the CIA wonder what's up.

Be very careful to avoid using your own company jargon with your customers. You and your employees may understand it very well, but the customer may not. And you'll only cause a lot of unnecessary confusion. Spell things out for your customers. Don't abbreviate. Remember, don't use military language on civilians.

## **4. Don't Be Too Busy to Be Nice**

— Hey, everyone's busy! That's what it's all about. Being busy doesn't give you *carte blanche* to be rude. Remember, you meet the same people going down as you do going up. They'll remember you. (What's worse than being busy? *Not* being busy.)

**5. “Uh-huh” Isn't “Thank You”; “There ya go” Isn't “You're Welcome”** — How often do you hear these slang phrases? We need

to remember “Thank you” and “You're welcome” are beautiful words. The customer can't hear them too often. But if you're telling your customers to “have a nice day,” please say it with meaning! I recently had a checkout clerk tell the *floor* to have a nice day. She wouldn't look at me. Make eye contact when you're saying something nice.

## **6. Be Friendly Before You Know Who It Is**

— There's a good lesson to be learned here. The Telephone Doctor motto is, smile *before* you know who it is. It'll earn you many classic customer service points. Customers need to know you want to work with them, no matter who they are. Remember, sometimes it's way too late to smile and be friendly after you know who it is.

I still don't know too much about transmissions or how to rebuild them. But I do know if you put these 6 principles into place, you'll have happy customers and you'll have time to play golf, semi-retire, or whatever you want to do.

Remember: They can go somewhere else to get their transmissions rebuilt. Don't make them go elsewhere for better service.



## Who Might Buy My Shop?

All business owners want to know, “What’s my business worth?” But different buyers will put different values on your shop:

- Family
- Employee
- Ambitious Rebuilder
- Competitor
- Investor
- Strategic Buyer

It’s because they want different things. Family, an employee, or a non-employee rebuilder all want to operate and build your business over time. Owning and being involved in growing the business appeals to them. The competitor may also want to own and grow your business, continuing in the current location or closing your location and merging your customers into their shop.

Both the investor and strategic buyer have different interests from the others. The investor and strategic buyer are keenly aware of the value of your current and potential cash flow. The first four probably don’t clearly understand cash flow. The investor is prepared for steady, incremental growth from profitable operations and eventual sale.

The strategic buyer sees some special potential in your operation that few others could take advantage of, but they believe they can achieve it. Maybe it’s the location, reputation, or

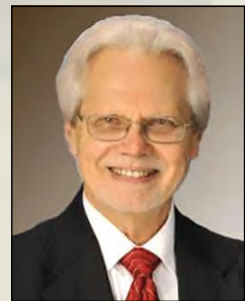
upcoming neighborhood changes that will suddenly make your shop busier and better.

The strategic buyer may be willing to pay much more than other types of buyers; well beyond the cash flow value. This is why Facebook, Amazon, Apple, and Google pay billions for firms just a few years old that currently lose money but could add dramatic value to their company in the future. Or they may want to keep that new company’s technology away from a competing giant.

If you have an excellent shop, a terrific staff, and experience selling businesses, then strategic or investment buyers could be the best new partners to grow your venture further and then transfer ownership.

If yours isn’t an extraordinary shop, then you should focus building value to fit one, and probably only one, of the other types of buyers: family, employees, an ambitious builder, or a competitor. Each type of buyer requires a different set of preparations and offers different benefits... and risks.

The more strategic you are in your business preparation, the better the result for both you and the buyer. Making your business ideally fit a particular buyer increases the business value to them, making it more appealing and smoother to transfer.



by John E. Anderson  
MS Management  
[smartexit@atra.com](mailto:smartexit@atra.com)

Identifying the best candidate, testing that person, and building the possibility takes time. The first candidate may not work out. It’s a delicate dance, exploring and testing while keeping your risk low and options open should insurmountable problems arise with one candidate or another.

There are two things you should do next: First, increase your commitment and dedication to operating the best damn shop you can by making sure you: a) please customers, b) practice delegating responsibility and authority to employees, and c) strive to make the shop clean, organized, and appealing.



Second, reread *Smart Exit — The Best Way Out*, in the April, 2017 issue of *GEARS*. In it, we ask three questions:

1. Do you have something to sell?
2. Can you prove it's worth buying?
3. Can you find someone who's interested?

Start with question 3 and make a list of possible candidates for each category: family, employees, rebuilders, and competitors. What do you have to sell that's especially appealing to each category or candidate (question 1)?

Describe which attributes of your shop are of greatest importance to each category or candidate. From that list, further define those attributes and how you could prove their value. Don't discount anyone because of some perceived shortcoming.

Don't let money or the lack of it write anyone off as a possible candidate. You should be able to find workarounds for nearly any shortcomings. For example:

**Family** — A nephew, niece, or best friend's relative is a mechanic and his wife is an accountant. Their goal is to end the long commute to the big-company job.

**Employee** — One or more trusted employee of 5+ years could be trained to operate, manage, and partner with you and then buy you out. You know and respect the employee and his or her family.

**Ambitious Rebuilder** — You've heard about a tech who's new in town. He talks a good game, has his own tools, and looks like he could have the management experience he's claiming; he has potential.

**Competitor** — Distinguish between direct local versus next-city

potential competitors. Are they a strong, single store, or a chain with horsepower? Like investors and strategic buyers, they may make a big offer to capture your attention and sweep you off your feet with their promises.

Beware of threats in the offering and selling process. Here are some possible situations:

**Shoppers and Due Diligence** — Tire kickers who take your time and dig in your mine to discover your gold.

High dollar offers typically have a due diligence clause that, if they discover the value is lower than they originally believed, their payment is significantly reduced until actual sales prove the higher value is valid. You receive this smaller payment upon closing.

These sales are structured such that you can earn the remainder only if they reach certain performance standards. But now they're operating your business and you're no longer in control.

Creating Your Toughest Competitor— you get what appears to be a great offer with a high dollar sale. In walks a knowledgeable industry expert (maybe with a team of accountants and analysts) to see behind your curtain and study your customer list, vendor pricing agreements, inventory, and history.

They get a complete picture of your operation, taste your secret sauce, and then invalidate the purchase agreement because of something they find. Not only have you invested a great deal of time focused on them instead of growing your business, but now they have information they can use against you.

Ultimately, your business value will be largely influenced by financial

reports substantiated with income tax returns. You'll augment these with a list of your tangible assets: equipment with their liquidation and replacement values, and inventory (useable current inventory, not obsolete or scrap parts).

These financial reports convert into ratios, such as current assets divided by current liabilities, accounts receivable divided by accounts payable, cash flow, return on equity, and many others.

Your sales, profits, and these ratios enable you and others to compare the value of your shop to others that sold recently or are currently on the market.

There are industry averages and benchmark targets shops strive to achieve. We recommend a certified valuation every three to ten years and then having your business value measured annually to be sure management is going in the right direction.

Valuation is an ongoing process. Determine what your business is worth and find "the best way out" to achieve your smart exit!



*John E. Anderson will be speaking at this year's Expo. John is a longtime business coach who helps business owners evaluate their businesses, adjust their operating practices, build a strategic plan and make a Smart Exit™.*

*In the coming issues, John will discuss some of the strategies he's developed. He'll show you how to turn your business around, so you can answer the three questions, and ultimately, find a smart exit that works for you.*

*Post your questions and observations on the ATRA Forum. A CEO Circle of shop owners is forming to discuss these topics leading up to the EXPO. Email ATRA for further information [smartexit@atra.com](mailto:smartexit@atra.com)*



## Aus-Tex Transmission Built on a Foundation of Clearly Defined Processes and Procedures

**A**us-Tex Transmission is in Round Rock, Texas, about 10 miles north of Austin. So why Aus-Tex, if it isn't in Austin? Because this is a new location; the old shop was in Austin. They moved to the new shop in October of 2016.

Okay, moving to a newer, larger shop isn't uncommon; a lot of shop owners move once their business outgrows the original location. But 10 miles is a long way to move... even in Texas (where, you know, everything's bigger). Generally, a move like that means starting over. Why so far?

Turns out the old shop was in a not-so-nice neighborhood, and it was affecting their business. "We had a really hard time getting people to come work there," says Aus-Tex owner Pepe Torres. "Good potential employees would be scheduled for an interview. They'd look at the shop, they couldn't find a parking spot, and they'd just keep going and never come back."

That's not a problem with their new shop: a build-to-suit property in



The crew of Aus-Tex Transmission, from left to right: Sabrina (Administrative Assistant), Ryan (Lead Diesel Technician), Charles (General Service Tech), Tere (Owner), Pepe (Owner), Noemi (Receptionist). In back: Alfredo (Owner's Son - Jr. Transmission Re-builder).

a nice neighborhood. The new shop is 10,600 square feet; about three times the size of the old building.

"We drew up the plans for the building we wanted — the offices, the waiting room, the transmission building room — and we signed a 5-year lease-to-buy contract. At the end of five years I have to buy the building."

The move also puts Pepe closer to home: "We're just seven minutes from home now," he explains. And that makes a lot of things easier for him and his wife, Teresa, who manages the shop's business and marketing operations.

The move wasn't easy for them. "There were many expenses and setting up the shop was very costly,"



Pepe and Tere Torres, Owners of Aus-Tex Transmission.

he says. But with hard work and some valuable business practices, Aus-Tex is starting to climb back and become successful again.

## AN EARLY START

“I came from very humble beginnings,” explains Pepe. “I grew up as a farm boy in Mexico. My parents moved here when I was a kid. They taught me to work hard and always respect others.

“I got into the auto repair business when I was 15 years old. My first real job was at Pep Boys as a ‘tire buster’; I was doing tires and oil changes. I had to lie about my age because I wasn’t 18 yet.

“They moved me up to ‘flag hour’ (flat rate) within a year, while I was still a minor. Then I took a job at a GM dealership for about four years.

“I became an ASE Master Technician when I was 22 years old. The only test I had a little problem with — but I still passed it! — was the transmission test. I’d never really been into a transmission before.

“I knew how to R&R a transmission and I’d had a 4L60 pump out



The Lone Star Flag proudly displayed at Aus-Tex Transmission.

when I worked for the dealer. But I didn’t really know what was going on inside. I passed the test based on simple logic.

“I got into the transmission work in 2004. I made one of the biggest mistakes of my life and bought a failed, bad-reputation, bad-reviewed transmission shop. That was how I got into transmissions full time. I

was misled, but was able to make the best out of a bad situation.”

So how was Pepe able to create a successful transmission business with almost no transmission experience? In the beginning he was self-taught and he learned a lot of what he needed by trial and error.

Then he found ATRA: “I learned about the ATRA seminars and I



Noemi assists Ryan in diagnostics.



Pepe in the build room.

started going to them. I started reading *GEARS* and reading on line, learning more and more about transmissions.

“The first time I went to an ATRA seminar, I barely had enough money for gas. I didn’t want to be late so I drove to Houston the night before and stayed in the parking lot ’cause I couldn’t afford a hotel. It was freezing; I had to start my car every few hours just to warm up.

“It was an experience I’ll never forget, but it was my first ATRA seminar and I loved it. I grasped as much information as I could. It was the first time I heard about ‘shift adapts.’

“I always sit at the front of the class, asking all the questions I can; whether it’s at a seminar or at Expo, it doesn’t matter. I’m always asking questions.”

## TRANSMISSIONS AND DIESEL REPAIRS

When Pepe bought Aus-Tex, it was a transmission-only shop. “When I first opened the shop I didn’t have a lot of experience in transmissions. So I knew I needed a backup plan: something else that was certain to bring in money.

“I started working on a couple diesel trucks, because no one in Austin wanted to work on them. I knew a bit

about Duramax from when I worked at the dealer.

“So I started working on diesels, and two years later I took the L2 ASE certification for advanced diesel performance. I actually learned from the test and I got really interested in them.

“I started telling people we do diesel work and I hung a sign that said ‘diesel specialist.’ We started getting in a lot more work. Today about 50% of our revenue is from diesel repair.” And, of course, their diesel work often leads to transmission repairs.

One thing he’s discovered is that a lot of those transmissions behind diesel engines are being torn up because the vehicle’s owner installed a “tuner” to alter the engine’s power curve. But that additional power can quickly destroy a transmission that would have been fine behind a factory-tuned diesel engine.

That experience is why Pepe will be at this year’s Expo, to present a program for the technical track, tentatively titled *Blame It on the Tuner*. In it, he’ll discuss what he’s learned about building transmissions that can keep up with that additional power. “It’s my way of giving back to the Association,” he says.

Aus-Tex handles all transmission repairs in house. The only thing they

avoid repairing themselves are transfer cases. “I don’t like messing with transfer cases myself because I always end up spending too much on parts,” explains Pepe.

“Even if I have to sell a transfer case for just about my cost, I’m not going to build it; I’ll sell a reman transfer case every time.”

## PROCESSES AND PROCEDURES

The importance of creating a business model built on specific processes and procedures should be a familiar one to regular *GEARS* readers. And at Aus-Tex, those processes and procedures have become nearly an art form.

According to Pepe, every employee has a checklist of procedures to follow for every job he or she does. And they have to initial each step to verify that they’ve performed them.

“The transmission rebuilder helper has a list that says ‘wash the case in the parts washer,’ ‘clean the pan,’ ‘make sure the magnet’s there.’ He knows exactly what’s expected of him, and he knows he’s responsible for doing each step properly,” says Pepe.

And not just the technicians; even the service advisors have a checklists to follow. “The services writers’ checklist says they have to greet the

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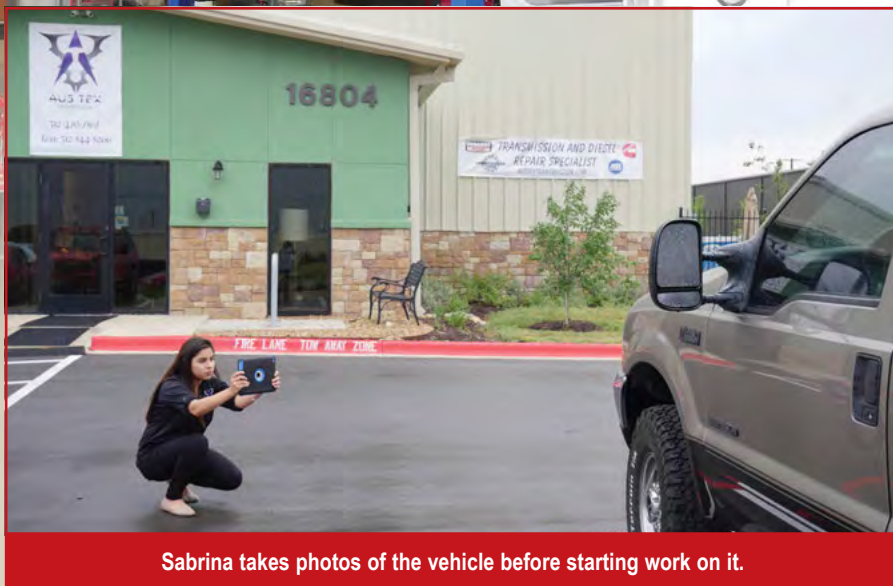
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Charles works on another important checkmark on his checklist, keeping the shop clean.



Sabrina takes photos of the vehicle before starting work on it.

customer and they have to have a conversation with the customer that has nothing to do with their cars,” explains Pepe. “It can be about the weather or how their kids are doing.” Something to help build a personal relationship with them.

“Then they have to log the vehicle in, record the customer’s original complaint, and determine how the customer’s going to get home or to work... whether they need a ride or have transportation planned.

“Part of logging the vehicle involves taking pictures of the car. We take a picture from every corner, to record any dents or scratches, so there aren’t any questions about whether they were there before the car came in. And they take a picture of the odometer or hour meter.”

And all of those photos are kept in the shop’s files, just in case a problem comes up later on.

“They also have to dispatch the job to the right technician and prepare

estimates for me or Teresa to call the customer.”

“So everyone has a list of procedures to follow and initial. And it’s worked real well for us; we’ve perfected it over the years, and we keep adding and modifying the checklist about every year.”

The checklist is also a terrific help for training new employees. “New employees don’t know what to do. You give them a list and they know what’s expected of them.”

Of course, not everyone follows procedures exactly as they’ve been listed. That can lead to problems for the shop and the employee. “People who don’t like to follow directions often skip steps... and that’s when mistakes happen.

“If there’s a mistake, we go back to the checklist and ask, ‘Why didn’t you follow the steps? You’ve made this mistake three times; you’ve skipped this step three times.’ And that provides us with documentation

when we have to let someone go for not following procedures.

“Yeah, we have some employee turnover, but you can’t afford to have people who aren’t doing the job right when you’re offering a 3-year, 100,000-mile warranty.” And, thanks to those checklists, everyone in the shop knows what it means to do the job right.

## NEW EMPLOYEES

While many successful shops have a number of longtime employees, Aus-Tex is mostly staffed by new people. That’s because Pepe doesn’t believe in keeping an employee who won’t conform to his business model. He wants people who’ll do a good job and who’ll follow his procedures. If they can’t do that, he’ll send them packing.

“We open at eight o’clock; that’s when customers start coming in,” explains Pepe. “I need my guys here to road test cars or take customers home. If they can’t meet my requirements, I don’t want them here.”

Fair enough, but a lot of shops deal with employees who maybe aren’t exactly what they were hoping for. They have to, because they just can’t find qualified help to replace





Alfredo at the work bench.



Tere focuses on her administrative duties.

them. Where does Pepe find new technicians?

“I’ll put ads on social media, Craig’s List, and even Monster.com, and let people know I’m looking. I’ll ask them to send me a text message; that shows me that they have at least some familiarity with computers.

“Once I get a few people interested, I’ll run online checks. I’ll check their social media pages to see what they post. If they show me something having to do with car repair, I know they have some pride in what they do; they’ll get an interview.”


Pepe also has a page on his web site — AusTexTransmission.com — for people who’d like to work there. “We get people who fill out the online application. We’ll go through those applications and run a basic background check to see if the applicant might be a good fit. If so, I’ll give him an interview.”

Pepe’s always on the lookout for a strong candidate: “I’ll be talking to someone at a diner or at a store, and we’ll make a connection. If they seem interesting, I’ll look into them further.

“I also build relationships with technicians in other shops — the guy I hired to handle a reflash or something like that. They get to know me and, one day, when they’re looking to move on, they’ll contact me.”

According to Pepe, looking for new talent is a full-time job. It isn’t something you can do just when you have an opening. You have to keep an eye out all the time or a terrific employee might slip through your fingers.

It must be working, because even with a recent move, Aus-Tex Transmission is well staffed and doing great. We look forward to hearing from him at this year’s Expo.



# TECH TIPS

From our toolbox to yours!

5

## How to Fix Bad Converter Clearance - Part 3: Ford Clearance

Converter clearance is a crucial part of any installation, but what is the perfect amount? 1/8” to 3/16”. This is the critical measurement you should verify on every install.

**Q: What do you do when the converter clearance is too tight?**

**A:** This usually means the torque converter is not properly installed into the transmission. Similarly to adjusting GM clearance as talked about in Part 2, rotate the converter while applying an inward pressure and supporting the pilot hub. This will allow the two sets of splines and the pump lugs to align properly. Normally, you will feel two “clunks” as the converter aligns.

**Q: What do I do if the converter is too loose, i.e. more than 3/16” clearance?**

**A:** This usually causes a no-move condition as the pump gear has broken. This is a very common situation on E4OD, 4R100, & 5R110W units. But Ford uses studs. So, what should you use? Same as with a GM unit, start by double checking the flex-plate to see if it was bent or has lost its “flex”. Just like any other spring, a flex-plate can lose its tension and move, causing too much clearance – and more than the 1/8” to 3/16” that is critical. Once you have determined that the flex-plate is good, double-check the converter clearance. Still too much? Use one grade 8 flat-washer per converter stud to reduce the total clearance. Place the flat-washer on the stud base making sure it fits not only the stud but the base of the stud flat against the stud-pad. This usually is the solution to set the converter clearance to approximately 1/8 inch.

**Stay tuned next month for more on this topic in Part 4 - Chrysler & Import Converter Clearance.**

**Gary S. Carne, Brad Laskowski, & Mark Kidder**

ETE REMAN Tech Team

# Shop Equipment and Tools Showcase

**W**hat makes your job possible? Your unique skill set? Sure. But what about the tools and equipment you use every day? Without the inventiveness and utility of the tool manufacturers, you might find yourself struggling to put those cars back on the road.

Here's a showcase for some of the most valuable tools and equipment designed to help you tackle the unique challenges you face every day.

Some are new; others have been around for awhile. But most could be considered a "must have" for a professional transmission technician.

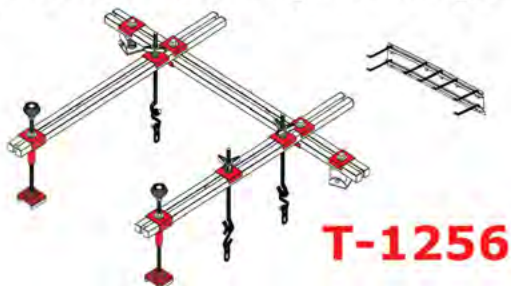
In this issue of *GEARS*, we salute the manufacturers and distributors who work tirelessly to provide the tools and equipment that keeps you working at your best, and keeps our industry profitable.

## **A & Reds Ultimate Engine Hanger**

The Ultimate Engine Hanger is made with twin steel beams no need to worry, its strong enough. Needle bearings makes handles work easy, fully adjustable, hinged shock towers, full ball bearing front feet and wall hanger for easy storage. This is the right tool for your shop.

A & Reds Transmission Parts 800-835-1007.

### **The Ultimate Engine Hanger**



## **Adapt-A-Case Stainless Steel Teflon Ring Installers and Resizers**

Teflon Ring Tools (T-1618SAC)-4R70 Direct Drum and (T-2142SAC)-4R70 (Input) Shaft. Adapt-A-Case has many different specialty tools that are all manufactured in Grand Rapids, MI. Check out our full line of products and distributors at [www.adaptacase.com](http://www.adaptacase.com).



# Shop Equipment and Tools

## **Adapt-A-Case Alignment Tools**

Alignment Tools (T-0159AC)-5R55N/S/W Converter/Mid-Plate Alignment Tool, (T-46664AC)-6L50/80/90 Pump Alignment Tool and (T-7867AC)-Universal Pump Clamp Tool not compatible with 6L80. Check out Adapt-A-Case's full line of products and distributors at [www.adaptacase.com](http://www.adaptacase.com).



## **Adapt-A-Case Dodge RWD Differential Carrier Bearing Adjuster T-78925AC**

This tool makes it easy to adjust the ring and pinion on a Dodge 7.25, 8.25 and 9.25 rear end.

Simply use set screws on tool to lock on to your long extension. Works on both sides.

Adapt-A-Case has many different specialty tools that are all manufactured in Grand Rapids, MI. Check out our full line of products and distributors at [www.adaptacase.com](http://www.adaptacase.com).



## **EZ-Driver, Arizona Transmission Machine**

Here is the Universal bearing installation system as used in ATRA's webinar training series. From Packards to Porsche to Moto Guzzi to Goldwings the EZ-Driver handles all light to medium duty applications for bearing installation. Kit includes 28 interchangeable force distributors, 21 for tapered roller bearings and 7 ball bearings force distributors (flat) Tubes come in 3-6-9 inch lengths and has a connector for using 2 tubes for added length. Use with press or hammer and comes in a carrying cases. Special offer is trade show price need to call or e-mail.

Arizona Transmission Machine Inc. Call (602) 992-2961 Michael Tilley, President. [mtilleyathome@aol.com](mailto:mtilleyathome@aol.com). [www.ez-driver.com](http://www.ez-driver.com)



## **HT-VBT Deluxe - Valve body testing unit, Cottingham Engineering LTD**

The ultimately advanced tool for Valve Body testing - introduced with the aim to improve the general quality of Transmission rebuilding for its users and exclude turn-ins after the repair services.

HT-VBT Deluxe emulates the work of a transmission unit and runs a series of tests checking performance of a malfunctioning Valve Body at various gears and pressure input. The system makes a graphic that is compared to the one taken from an original new Valve Body of the same model. This comparison makes it possible for Valve Body Rebuilders to determine the exact source of the problems with the Valve Body under rebuilding.

Cottingham Engineering LTD  
Kettering, UK NN16 8TD  
Tel.: +44 1536 511123,  
[sales@hydratest.co.uk](mailto:sales@hydratest.co.uk)



## **HT-50L model 2 - Solenoid testing unit, Cottingham Engineering LTD**

The Solenoid Testing machine is used for checking the condition of solenoids of various automatic transmission manufacturers. It is supported by a number of various solenoid test blocks - making it possible to run tests for the majority of most popular makes on the present-day market. The unit is powered by a special version of a most advanced HTC-K Controller (used in the Valve Body testing machines) adopted for solenoid testing.

Cottingham Engineering LTD  
Kettering, UK NN16 8TD  
Tel.: +44 1536 511123,  
[sales@hydratest.co.uk](mailto:sales@hydratest.co.uk)



# Shop Equipment and Tools

## HT2000 - Circuit Integrity Leak Test Machine, Cottingham Engineering LTD

This portable unit allows Automatic Transmission Rebuilding specialists to test the hydraulic integrity of the individual gearbox components. To identify Transmission Leaks a test plate is attached to the transmission. Then using the flow meter, the operator performs a test to indicate the amount of leakage at the piston or servo seals. With that, a pass/fail condition can be determined. It is an efficient and easy-to-use tool implemented to save AT rebuilders' time and funds.

Cottingham Engineering LTD  
Kettering, UK NN16 8TD  
Tel.: +44 1536 511123,  
sales@hydratest.co.uk



## WS 2.0 - Torque Converter 2-Gun Welding Stand with MIG and TIG, Cottingham Engineering LTD

This Welding Stand is a part of our new complete Torque Converter rebuilding line Hydra-Torque. The unit has dual chuck system for precise Torque Converter alignment during the welding process - so you will have maximum precision as the result. Maximum diameter of the welded Converters is 460 mm, which will cover all civil vehicles and some of heavy duty converters too. The welding process is automated (8 points + circular welding), you will just need to do manual positioning of the welding torch - which is very convenient and effective.

Cottingham Engineering LTD  
Kettering, UK NN16 8TD  
Tel.: +44 1536 511123,  
sales@hydratest.co.uk



## Automotive Power Pusher®

The Automotive Power Pusher® is a battery-powered, heavy-duty, multi-use device designed to move immobilized vehicles more efficiently and help reduce the risk of injury. It is able to push or pull almost anything on wheels and can move inoperable vehicles with only two people, instead of five or six that are normally required to move them.

- The Automotive Power Pusher® is the most efficient tool a service department or fleet can employ, not just an extra piece of equipment, it's a working member of the team requiring little maintenance
- It increases productivity and reduces direct labor cost on non-profitable activities, getting the job done in less time with less people
- The Automotive Power Pusher® is ready when you are with its built-in battery charger – plug into a 115V outlet when the unit is not in use
- The Automotive Power Pusher® is durable, mobile, fits through most standard doorways and is easily stored

Power Pusher, Division of Nu-Star, Inc.  
Julie Hicks, 952-445-8295; jhicks@nustarinc.com



## Rostra Precision Controls

### Honda/ Acura Pressure Switch Reference Guide

Rostra Precision Controls presents a Reference Guide covering nearly the full line of Honda/ Acura pressure switches, both late and early models. Rostra's Honda/ Acura pressure switches combined, are compatible with over twenty different applications. This guide includes the following information: Location of Switch, Application, Year, Trans Codes, Suppliers Cross Industry Reference Numbers, and OE #. Our Honda/ Acura Pressure Switches are designed to be exact OE replacements, and are 100% tested to guarantee proper operation. Rostra products come with a 12,000 mile/ 12-month warranty. The Reference Guide is available to download at [RostraTransmission.com](http://RostraTransmission.com). Contact Brian Sandlin for any questions or inquiries at [bsandlin@Rostra.com](mailto:bsandlin@Rostra.com)

Year	Model	Location	Application	Year	Model	Location	Application
1998	Accord	Engine	Pressure	1998	Accord	Engine	Pressure
1999	Accord	Engine	Pressure	1999	Accord	Engine	Pressure
2000	Accord	Engine	Pressure	2000	Accord	Engine	Pressure
2001	Accord	Engine	Pressure	2001	Accord	Engine	Pressure
2002	Accord	Engine	Pressure	2002	Accord	Engine	Pressure
2003	Accord	Engine	Pressure	2003	Accord	Engine	Pressure
2004	Accord	Engine	Pressure	2004	Accord	Engine	Pressure
2005	Accord	Engine	Pressure	2005	Accord	Engine	Pressure
2006	Accord	Engine	Pressure	2006	Accord	Engine	Pressure
2007	Accord	Engine	Pressure	2007	Accord	Engine	Pressure
2008	Accord	Engine	Pressure	2008	Accord	Engine	Pressure
2009	Accord	Engine	Pressure	2009	Accord	Engine	Pressure
2010	Accord	Engine	Pressure	2010	Accord	Engine	Pressure
2011	Accord	Engine	Pressure	2011	Accord	Engine	Pressure
2012	Accord	Engine	Pressure	2012	Accord	Engine	Pressure
2013	Accord	Engine	Pressure	2013	Accord	Engine	Pressure
2014	Accord	Engine	Pressure	2014	Accord	Engine	Pressure
2015	Accord	Engine	Pressure	2015	Accord	Engine	Pressure
2016	Accord	Engine	Pressure	2016	Accord	Engine	Pressure
2017	Accord	Engine	Pressure	2017	Accord	Engine	Pressure

## Sonnax Vacuum Test Stand Kit, Essential Equipment for Proper Vacuum Testing

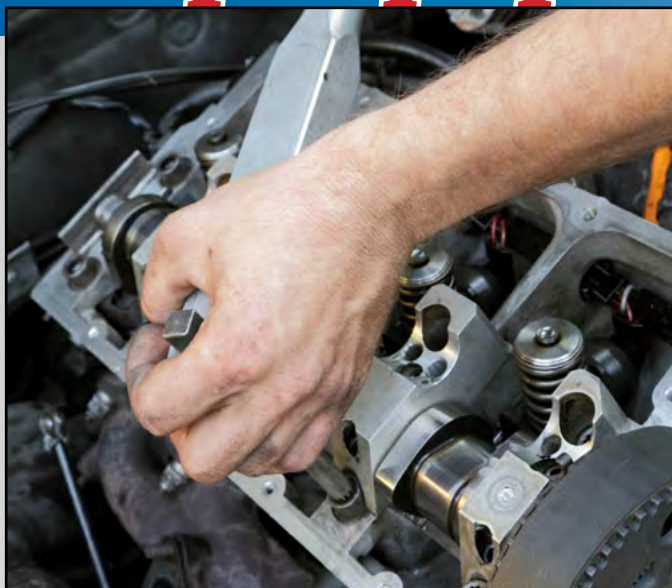
Vacuum testing is an efficient, cost-effective way to accurately evaluate valve/bore wear and confirm repairs, but you need the proper equipment for reliable results. Sonnax vacuum test stand kit VACTEST-01K takes the hassle out of building and calibrating a homemade kit, allowing you to start successfully diagnosing problem valve bodies quickly and easily. Each high-quality kit includes a test stand, accessories and easy-to-follow instructions to start your next rebuild right.

Visit [www.sonnax.com](http://www.sonnax.com) for details. • 800-843-2600  
• 802-463-9722

Sonnax is an Employee-Owned Company.



# Shop Equipment and Tools



## **Sonnax Valve Body Reaming Fixture, Get Consistent, Reliable, High-Quality Results**

The patented VB-FIX is a self-aligning fixture that provides an external, rigid pilot bore for the reamer and guide pin, allowing the fixture to be used on multiple valve bodies and valve bores. Only the VB-FIX process allows you to accurately locate the original bore centerline and then securely hold the reamer, ensuring that the reamed bore will remain on that centerline. Concentricity through the entire length of the bore is critical to correct valve fit and function.

The VB-FIX is for use only with special Sonnax parts and tools which service a specific bore in a certain valve body.

Visit [www.sonnax.com](http://www.sonnax.com) for details.

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Sonnax is an Employee-Owned Company



## **SuperFlow's Transmission Shift Consoles**

SuperFlow's Axiline and Hicklin transmission shift consoles help remanufacturers test and control transmissions for a variety of needs. These standalone controllers are not limited to dynamometer testing meaning technicians can diagnose transmissions before they are ever removed from customer vehicles. The SuperShifter platform of electronic transmission controls are handheld diagnostic devices that test shift function and solenoid performance with the transmission in the vehicle, on a bench or on a dyno and are available for most light and medium duty transmissions. The Hicklin heavy duty shift consoles are designed for service centers who need the ability to control and test HD transmissions, flash transmission control modules, code CIN numbers and perform diagnostics on the TCM under test. Visit [www.superflow.com](http://www.superflow.com) or call 888.442.5546 for more information.



## **SuperFlow's Transmission Dynamometers**

SuperFlow's Axiline and Hicklin transmission test stands cover the complete range of light-duty, medium-duty, heavy-duty and cross drive transmissions on the market today. With solutions for everything from passenger cars to the M1 tank and features like mechatronic shift controls, no-hassle precision alignment tooling and the available WinDyn Data Acquisition and Control system for fully automated tests and reports, SuperFlow transmission dynos are the only choice of the top transmission remanufacturers worldwide. SuperFlow's custom engineering team has developed and installed more than 30 cross drive transmission dynamometers, AC regenerative transmission test stands and a variety of custom transmission and gear box test stands for customers worldwide.

Visit [www.superflow.com](http://www.superflow.com) or call 888.442.5546 for more information.



## **SuperFlow's Valve Body & Solenoid Test Stands**

SuperFlow's line of valve body and solenoid testers offer transmission remanufacturers unmatched features like the WinDyn CAN Control mechatronic test option and fully automated testing to eliminate operator induced errors. The Axiline VBT-8000 and SolX Pro test stands accommodate more transmission applications than the next closest competitors combined and cover the range of light, medium, heavy and extreme duty transmissions like the X-1100. Plus, in the rare event you have an application that we don't, we'll develop it at your request. Don't chance your quality reputation with whoever remanufactures your valve bodies, put Axiline test stands in your shop and take control of your quality and bottom line. Visit [www.superflow.com](http://www.superflow.com) or call 888.442.5546 for more information.



## **Torque Converter Rebuilding Systems (TCRS)**

Torque Converter Rebuilding Systems (TCRS®) from SuperFlow® are the choice of converter rebuilders worldwide for one reason, quality. The TCRS® system has been proven on millions of torque converters and is in use at the big three automakers Ford®, General Motors® and Daimler Chrysler®. TCRS® sets the industry standard for precision alignment and is the only system available with all the tools to do the job right, with repeatability and precision within .001 of an inch. TCRS® representatives will not only help you select the correct equipment for your rebuilding goals, but also consult on the floor plan and staffing needs to make money rebuilding your own converters. If you're purchasing six or more converters a day from an outside source an in-house converter rebuilding program from TCRS® will save you money. Visit [www.SuperFlow.com](http://www.SuperFlow.com) or call 888.442.5546 for more information.



# Shop Equipment and Tools

## Accumulator Buddy®

Superior Accumulator Buddy® SUPERIOR SOLUTIONS Problem Solver The Accumulator Buddy® is a set of three brushes that work in bores ranging from 1 to 2 inches to remove light scratches, small burrs and bore glazing, leaving a clean polished bore for sealing. The long STAINLESS STEEL shaft allows you to use them with the transmission in or out of the vehicle, and the brushes fit into any type of drill. The Accumulator Buddy® polishes bores in seconds, saving time compared with the use of polishing pads. Great time saver ! Ask for it by name!

Superior Transmission Parts Inc.

Go to [www.superiortransmission.com](http://www.superiortransmission.com) to view products or email us from the contacts section.



## Bench Buddy® Bore Cleaning Brushes

Superior Bench Buddy® SUPERIOR SOLUTIONS Problem Solver:

Impregnated with a special super fine abrasive, Bench Buddy(R) brushes easily remove small burrs and polish the inside of a valve bore with virtually no enlargement of the bore diameter itself. Each Bench Buddy(R) kit features 4 different sized brushes.\* Improves the surface finish of a bore by up to 50%\* Restore smooth valve operation in seconds\* Services bores from 1/4" to 1". Ask for your Bench Buddy® by name, it's the mechanics best friend!

Superior Transmission Parts Inc.

Go to [www.superiortransmission.com](http://www.superiortransmission.com) to view products or email us from the contacts section.



## K0100 Supertuff 6F35 / 6T40 / 6T30 Drivers Side Axle Bushing Replacement Kit

Our New K0100 includes a high-quality, 3-piece tool set designed for quick removal of the worn bushing and an indexed re-installation of the SuperTuff bushing. The two-sided driver head allows the user to install an included seal made of better-than-OEM materials. Kit includes (5) axle seals and (5) SuperTuff Teflon bushings. Re-order Kit K099 for bushing and seal reloads ( one seal / one bushing per K099 ). The durable SuperTuff Teflon coated bushing from Superior Transmission Parts Inc. virtually eliminates premature wear and the resulting leak at the axle seal. The new SuperTuff bushing is 23% wider than original to offer more support, Teflon coated for durability and engineered with a lube window that allows more oil in to provide better lubrication.

Except no imitation, if it's not stamped stp-10000 on the bushing its not the original... Ask for your supertuff k0100 by name! and tell your distributor "I want my Superior" and "I want it now!"

For more on the K0100 or the K099 refill go to [www.superiortransmission.com](http://www.superiortransmission.com) to view products or email us from the contacts section.



## K0110 Honda Large Collar/ Bearing Removal Tool

SUPERIOR'S HONDA/ACURA 5 Speed LARGE TYPE Bearing and Sleeve Remover Tool Problem Solvers, the K0110, is designed to safely and easily remove the secondary shaft bearing and oil collar without damaging the bearing, collar or bell housing. If you work on Honda or Acura transmission, this is a must have tool for your workstation or toolbox. With the Superior K0110 Honda/Acura Large Collar Puller Kit you can remove the bearing and collar in just under 5 minutes!

Go to:

[www.superiortransmission.com](http://www.superiortransmission.com)

Click on contact us and send us an email or hit the link find a distributor near you.



## K0135 Honda Small Collar/ Bearing Removal Tool

SUPERIOR'S HONDA/ACURA 5 Speed SMALL TYPE Bearing and Sleeve Remover Tool Problem Solvers, the K0135, is designed to safely and easily remove the secondary shaft bearing and oil collar without damaging the bearing, collar or bell housing. If you work on Honda or Acura transmission, this is a must have tool for your workstation or toolbox. With the Superior K0135 Honda/Acura Small Collar Puller Kit you can remove the bearing and collar in just under 5 minutes!

Go to:

[www.superiortransmission.com](http://www.superiortransmission.com)

Click on contact us and send us an email or hit the link find a distributor near you.



# Shop Equipment and Tools

## Sussex Auto Parts CVT Tool Kits

Sussex Auto Parts are stockists of complete tool kits for a range of CVT transmissions, including MINI CVT, VW 01J, Mercedes 722.8, and Jatco JF010E and JF011E.

Our large inventory of specialist tools also covers Aisin, DSG, 0AM, DCT, and ZF. From hand tools to diagnostic equipment, we have got you covered.

Why not contact our friendly, experienced team for pricing and advice. SUSSEX Auto Parts. You can reach us on (814)838-4888 Erie, PA or at our Head Office on 0044 1323 848886.

Email: [info@sussexautos.com](mailto:info@sussexautos.com)



## Teckpak-Fitzall T-0154-M Mini Slide Hammer

This Slide Hammer, from Teckpak-Fitzall, is perfect for those hard to get to areas. The hex shaped design of the shaft allows the weight to be used to turn the shaft. This tool also has 3/8" threads on one end and 10mm threads on the other.

The T-0154-M weighs in at just under 2 lbs & 11 inches long. Request the best... Ask for genuine Teckpak-Fitzall. 1-800-527-2544. [www.teckpak-fitzall.com](http://www.teckpak-fitzall.com)



## Teckpak-Fitzall KT3507 Yoke Seal Installation Kit

FREE Tool, when you buy a six pack of Teckpak-Fitzall's specially designed yoke seals.

The tool attaches to any 3/8" socket extension and allows you to insert one of a 350, 375, 700-R4, C4, AOD & AODE... just to name a few.

The seals are designed to grab the inside of the yoke for a tight, secure fit that will stop driveshaft yoke leakage forever.

The kit contains (6) Yoke Seals and (1) Free Installation Tool. Part# KT3507

Request the best... Ask for genuine Teckpak-Fitzall

1-800-527-2544

[www.teckpak-fitzall.com](http://www.teckpak-fitzall.com)



## Teckpak-Fitzall PRNDL Switch Removal Tool T4T65-326

Save Your PRNDL Switch. Use this 3/8" slide-hammer attachment with the Teckpak-Fitzall mini 3/8" "hex-shafted" slide hammer to remove those stubborn "Nail Head" type pins. Simply "insert, Twist & Pull" and the pin is removed without damaging the switch. Fits almost all "Nail Head" type pins, such as those found in 4T65E, 6T70E, 6T75E, 6F40/45/50/55 ... just to name a few.

PRNDL Switch  
Tool part# T4T65-326,  
Mini-Slide Hammer part#  
T-0154-M

Request the best...  
Ask for genuine Teckpak-Fitzall. 1-800-527-2544.  
[www.teckpak-fitzall.com](http://www.teckpak-fitzall.com)



## Teckpak-Fitzall GM Transmission Dowel PIN Repair Kit T350-301

Repair dowel pin hole wear in hard to find Chevrolet transmission cases. Repair the case by sleeving the worn dowel pin hole with Teckpak-Fitzall's repair kit. The precision boring fixture allows perfect alignment of the steel sleeve in minutes.

This kit includes: (1) Alignment Tool, (1) Alignment Pin, (1) 11/16" Drill Bit, (2) Mounting Nuts and (6) Repair Sleeves. Part# T350-301. Extra Repair Sleeves (part# SM-134) are available.

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Ask for genuine Teckpak-Fitzall. 1-800-527-2544.  
[www.teckpak-fitzall.com](http://www.teckpak-fitzall.com)



# Shop Equipment and Tools

## **Teckpak-Fitzall Chrysler FWD Carrier Bearing Remover & Installer T604-306**

The "10-Minute Solution". Easy, inexpensive solution, from Teckpak-Fitzall, for customers with older, less expensive vehicles, as well as a more efficient way of providing service to your late-model customers.

Provides an opportunity to expand your customer base in both directions. This tool allows you to remove or install a carrier bearing in most FWD Chrysler transmissions (in the vehicle or on the bench). 604 (41TE/41AE), A670, A470, A413 & A404... just to name a few. Part T604-306.

Request the best... Ask for genuine Teckpak-Fitzall. 1-800-527-2544. [www.teckpak-fitzall.com](http://www.teckpak-fitzall.com)



## **Teckpak-Fitzall Ford Shift Linkage Pin Removal Tool #TK-56-RTD**

This tool, from Teckpak-Fitzall, removes material from around the shift lever pin to allow the pin to be easily removed. Works on A4LD, 4R44, 4R55, 5R55, AODE, AOD, 4R70W & 4R100 transmissions... just to name a few.

The TK-56-RTD also includes samples of Teckpak's Shift Lever Pins, uniquely designed with a head for easy removal.

Available in both 3mm (part# P56-PIN3) and 1/8" (part# P56-PIN18) sizes.

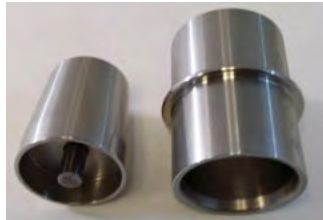
Request the best... Ask for genuine Teckpak-Fitzall. 1-800-527-2544. [www.teckpak-fitzall.com](http://www.teckpak-fitzall.com)



## **Trans-Tool T-2003-M GM Ford Teflon Ring Installer Kit and T-3074-90-M Teflon Ring Installer-Resizer**

T-2003-M GM Ford Teflon Ring Installer Kit GM Applications 6T40-E/6T45E 6T70E/6T75E Ford Applications 6F35/6F50N/6F55N Competitive Model Adapt-A-Case # T-46624-SAC User Price \$199.00. Distributor Price \$139.30  
T-3074-90-M Teflon Ring Installer-Resizer GM Applications 6L80/6L90 User Price \$195.00. Distributor Price \$136.50.

Call your Local Distributor/Mobile Tool Dealer or Trans Tool for more information. 800-531-5978 or visit [www.atec-trans-tool.com](http://www.atec-trans-tool.com)



## **Trans-Tool TRANS TOOL T-0012-TP The TransPorter**

FINALLY AVAILABLE AGAIN! The TransPorter is the only fluid evacuator and installer on the market. Removes and installs fluids through the pressurized container, complete with hose and adapter for transmission pan. Improved pressurized cap for easy pressure release after use.

Call your Local Distributor/Mobile Tool Dealer or Trans Tool for more information. 800-531-5978 or visit: [www.atec-trans-tool.com](http://www.atec-trans-tool.com)



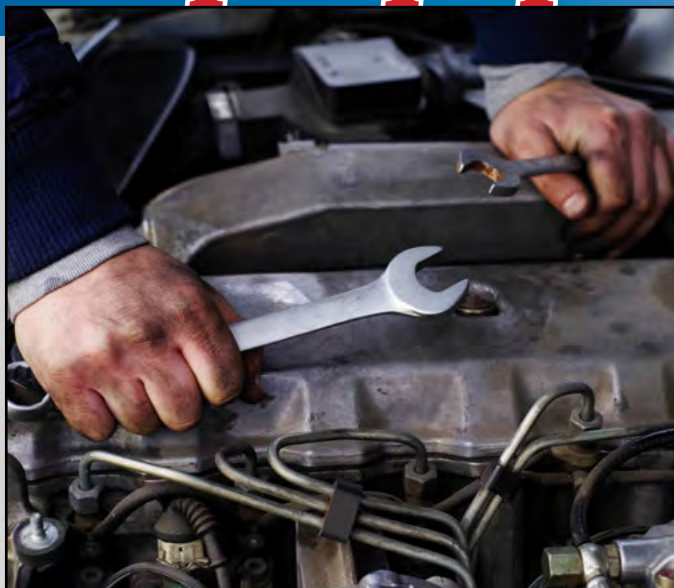
## **Transtar RAP Kit (Remote Assisted Programming)**

The RAP Kit, manufactured by DrewTech and available exclusively from Transtar, allows you to program and flash a vehicle right from your shop! No additional tools, software, or expensive subscriptions are required. Everything you need to program a vehicle is right in the convenient RAP Kit box. The RAP Kit includes a tablet, the vehicle interface, an OBD-II connector, and a 4G dongle. All you need to do is plug in, make a phone call, and let Transtar do the rest! The RAP Kit is absolutely free – you pay only for each programming event. The only requirement is for you to use the kit two or more times a month. Programming a vehicle has never been this easy. For more information, or to obtain a RAP Kit for your shop, go to [Transtar1.com/RAP-info](http://Transtar1.com/RAP-info). The RAP Kit – exclusively from Transtar.





# Shop Equipment and Tools



## **Transtar 1000-Pound (1/2-Ton) Air/Hydraulic, Telescopic Transmission Jack**

This ½-ton transmission jack from Sunex is available from Transtar (Transtar part number T7796). The Sunex 7796 1000-pound air/hydraulic transmission jack is used for removing and installing transmissions and transfer cases on all vehicle types supported by lifts. This 2-stage jack has an air operated first stage and a manual hand pump second stage, allowing very precise alignment of the transmission. A foot activated pump pedal allows you to raise the ram hands free. The side-to-side fore and aft tilt knobs with quick adjusting ratcheting fingers and large saddle can accommodate virtually any transmission shape or size. A nylon strap tie down conveniently secures the load to the saddle for added safety and the overload valve prevents the jack from being used beyond its rated capacity. A foot activated release pedal also provides a slow controlled lowering of the load. Wide base legs with swivel caster provide stability and easy maneuverability even under load with two locking casters to prevent jack from moving. Transtar carries a complete line of transmission jacks from Sunex. For more information, visit [Transtar1.com/tools](http://Transtar1.com/tools)



## **Transtar Air/Hydraulic Jack**

The Sunex 1-Ton heavy duty transmission jack, available from Transtar, can accommodate a wide range of transmission sizes (Transtar Part Number 7798). The air over hydraulic system allows for fast and easy use when connected to an air compressor and the fast rise foot pump lifts the load when air is not available. There are two methods of release: A fast-drop foot pedal for quickly lowering saddle without a load, and a fine tune hand dial to set the speed while being used to match the weight of the load. The wide base keeps the jack stable even with an uneven load. The redesigned ram is equipped with a large heavy-duty saddle and long extendable fingers to handle more types of transmissions. The upgraded 2" wide strength non-marring tension straps in the place of traditional ratchet straps or chain makes work holding and positioning adjustments safer, faster and easier. Transtar carries a comprehensive line of transmission and shop tools – ask your sales rep for details or visit [Transtar1.com/tools](http://Transtar1.com/tools).



## **Transtar Pilot Bearing Puller**

The Sunex Pilot Bearing Puller is designed to remove worn-out pilot bearings and stubborn, stuck flywheel pilot bearings, especially in cramped spaces where a slide hammer puller just isn't practical. With a jaw spread of 1" to 1-1/2" and a reach of ¾", this puller can be used on most models with the engine in chassis. This puller is made from chromoly steel, is built to last, and is available from Transtar - guaranteed with the SUNEXpress Lifetime Warranty. (Transtar Part Number 3916) For Transtar's comprehensive tool offering, visit [Transtar1.com/tools](http://Transtar1.com/tools).



## **Transtar CUDA 50-Gallon Parts Washer**

The 50-Gallon Parts Washer, manufactured by Cuda, is now available from Transtar (Transtar Part Number T2848). The Cuda 2848 is front-loading and features a turntable diameter of 28-inches, working height of 48-inches, and load capacity of 1,000 lbs. The 2848 is the largest front load parts washer to offer a single-phase model; the 5 HP pump pushes 110 GPM which is more than double every other parts washer in the single-phase category, and the series also offer 4 models in the three-phase category. The turntables are located knee high, control panels chest high and a curved, recessed entry that allows for easy loading and unloading of extra-large parts. The easy access debris screen prevents foreign objects and small parts from falling into the sump, and the sump cover permits quick and easy cleaning of the parts washer. The automatic low water shut off enhances safety and protects the heating element by automatically turning the unit off if the water level drops too low. Built-in wheels allow the parts washer to be moved easily about the shop. Ask your Transtar sales rep for details or visit [Transtar1.com/tools](http://Transtar1.com/tools).



## **Transtar Cuda Front-Load Automatic Parts Washer**

The Cuda 2840 is available from Transtar and is the second largest parts washer of all front-loading washers. This unit (Transtar Part Number T2840) features a load capacity of 1,000 pounds, a working height of 40", and a 28" turntable diameter. It also has a 3 HP seal-less vertical pump, and produces 50 GPM at 45PSI. The front access screen is a patented product that provides a filter for the wash solution. This allows the spray nozzle to spray clearly and effectively, and also provides a screen for small parts that may have been washed through the cleaning chamber by accident. The control panel has simple controls for heater, turntable and wash cycle operation, plus low water shut off indicator. The parts washer is equipped with a 6kW heater. For more information, visit [Transtar1.com/tools](http://Transtar1.com/tools). Order your Cuda Parts Washer from Transtar today.



# Shop Equipment and Tools

## **WIT Arbor Press**

WIT now carries a ratcheting arbor press with a 8" x 18" base for use in your shops repair operations. Please contact Whatever It Takes for any of your Transmission supply needs 800-940-0197.



## **WIT CVT Press Plate**

Whatever It Takes now carries a CVT Press plate to work with their Arbor Press to aid in the teardown and assembly of your cvt transmission rebuilds. Please contact WIT for any of your Transmission tool needs 800-940-0197.



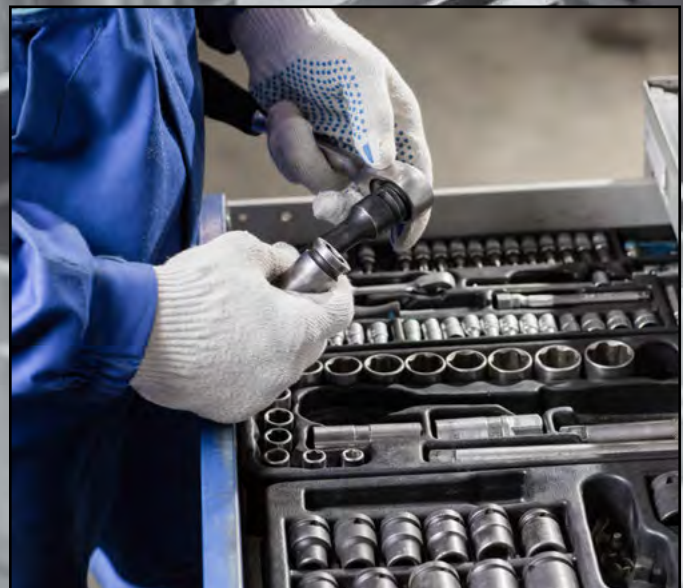
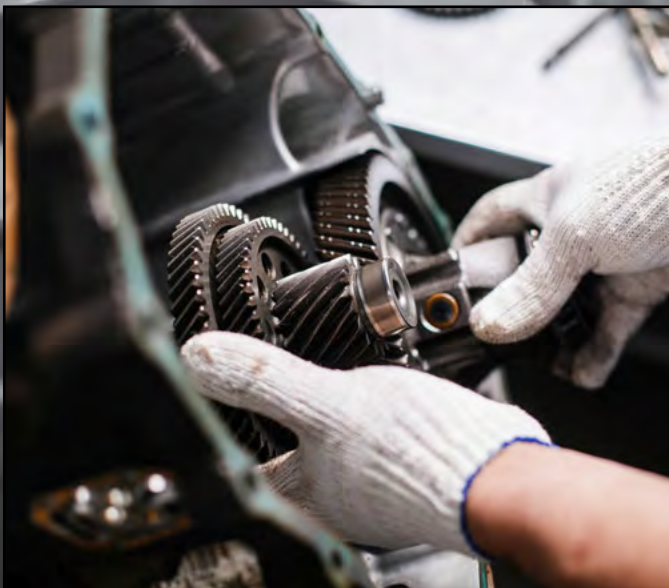
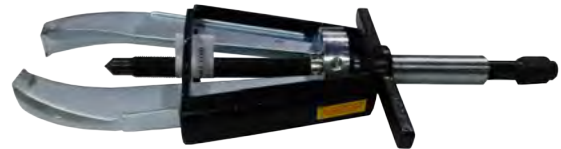
## **WIT Adapt-A-Case CVT Puller Tool Set (Part # T-CVTAC)**

WIT now carries the Adapt-A-Case CVT Puller Tool Set (Part # T-CVTAC). This tool comes complete with all pieces needed to spread the variators on Ford, Nissan, and Saturn CVT transmissions) Please contact Whatever It Takes for any of your Transmission tool needs 800-940-0197.



## **WIT transmission Bearing Puller for use on CVT's (Part # TJ-1)**

Whatever It Takes now carries a transmission Bearing Puller for use on CVT's (Part # TJ-1). This is a 2 jaw puller with a 9 1/4" REACH and a 2 3/4" TO 14 3/4" SPREAD RANGE. Please contact WIT for any of your CVT transmission Needs 800-940-0197.



# OCTOBER 19 - 22

# PARIS LAS VEGAS



**Powertrain**  
**expo** 2017



*hosted by* **GEARS**  
FOR THE TRANSMISSION REBUILDING INDUSTRY

[www.powertrainexpo.com](http://www.powertrainexpo.com)

# Schedule At A Glance

**THURSDAY  
OCTOBER 19**

**7am - 5pm Attendee Registration**

- 7:30am - 9am **8L90 Service, Updates and Repairs** - *Steve Garrett*
- 9:10am - 10:40am **FCA 8 and 9 Speed Automatic Transmission Update** - *Alan McAvoy*
- 10:50am - 12:20pm **Restoring Functional Reliability** - *Dean Mason*
- 1:50pm - 3:20pm **Introducing the 9T50 Transaxle** - *James Rokitski*
- 3:40pm - 5:10pm **Using Scopes to Streamline Diagnosis: Part 1** - *Scott Shotton*
- 5:20pm - 6:50pm **CVT Workshop** - *Robert Bateman & Mike Souza*
- 9am - 4pm **Selling Boldly** - *Alex Goldfayn*

**FRIDAY  
OCTOBER 20**

**7am - 5pm Attendee Registration**

- 7:30am - 9am **Using Scopes to Streamline Diagnosis: Part 2** - *Eric Ziegler*
- 9:10am - 10:30am **Introducing the 845RFE** - *Bill Brayton*
- 10:30am - 11:50pm **Helping the Rubber Meet the Road** - *Keith Clark*
- 8:30am - 10am **From Mindset to Mission** - *Dennis Madden & Rodger Bland*
- 10:15am - 11:45am **Building Decision-Makers!** - *Maylan Newton*
- 12pm - 2pm ATRA Luncheon** - *sponsored by Raybestos*
- 2pm - 7pm Trade Show**
- 4pm - 6pm ATRA Chapter President's Meeting**
- 7pm - 9pm Transtar Cocktail Reception**

**SATURDAY  
OCTOBER 21**

**8am - 5pm Attendee Registration**

- 8:30am - 10am **Tips and Tricks from the Builders Bench** - *John Parmenter*
- 10:10am - 11:40am **Converter Control** - *Bob Warnke*
- 2:10pm - 3:40pm **Introducing the ZF 8HP Hybrid** - *Dirk Fuchs*
- 3:50pm - 5:20pm **Blame It On the Tuner** - *Pepe Torres*
- 8:30am - 10am **Transmissions 101: Scan Tool 101** - *Jarad Warren*
- 10:10am - 11:40am **Transmissions 101: ATF Today; Surviving in an OE Drive Market** - *Pat Burrow*
- 2:10pm - 3:40pm **Transmissions 101: Series Circuit Essentials You Should Know** - *Dan Marinucci*
- 3:50pm - 5:20pm **Transmissions 101: R&R 101** - *John Parmenter*
- 9am - 10:30am **Gain Control of Your Business by Letting Go** - *MaryAnn Croce*
- 10:45am - 12:15pm **Would You/Could You Take a Vacation? How Valuable Are You, Really?** - *Nancy Friedman*
- 12pm - 5pm Trade Show**
- 3pm - 4pm ATRA Longtimer's Meeting**

**SUNDAY  
OCTOBER 22**

- 9am - 10:30am **Hydraulics 101** - *Bill Brayton*
- 10:40am - 12:10pm **Toyota, Lexus U881E and GM AF50 8 Speed Automatic** - *Mike Brown*
- 9am - 12pm **Smart Exit Workshop** - *John Anderson*

# THURSDAY, OCTOBER 19 GOLF TOURNAMENT 8AM



produced by



# EVENTS AT A GLANCE

## FRIDAY, OCTOBER 20 ATRA LUNCHEON 12PM



sponsored by **Raybestos**  
POWERTRAIN

## FRIDAY, OCTOBER 20 COCKTAIL RECEPTION 7PM



hosted by



# SLEEPING ROOMS



3655 S Las Vegas Blvd  
Las Vegas, NV 89109  
(877) 603-4389

Room Rate: \$179\*

Cut-off Date: 9/25/2017

\*A Daily Resort fee of \$29  
will be charged.



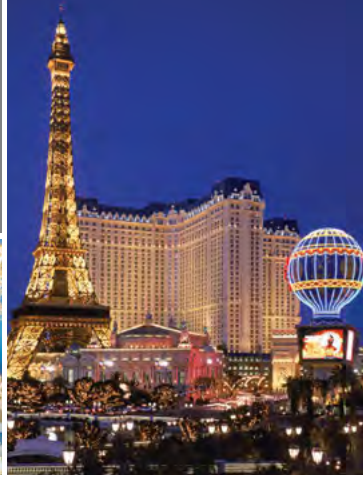
3645 S Las Vegas Blvd  
Las Vegas, NV 89109  
(877) 603-4389

Room Rate: \$119\*

Cut-off Date: 9/25/2017

\*A Daily Resort fee of \$29  
will be charged.

**THURSDAY  
OCTOBER 19**



## **TECHNICAL TRACK**



**7:30am - 9:00am**

### **8L90 Service, Updates and Repairs**

***Presented by Steve Garrett***

In this seminar, we'll focus on 8L90 operation, repair and updates for the 8L90 transmission, paying particular attention to

the TCM/valve body flow rate calibration process, as well as common product issues for this unit. And we'll take a closer look at how to interpret scan data for diagnostic purposes.



**9:10am - 10:40am**

### **FCA 8 and 9 Speed Automatic Transmission Update**

***Presented by Alan McAvoy***

FIAT Chrysler Automobiles (FCA) now offers the 9-speed 948TE automatic transaxle in the latest FWD and AWD Chrysler and Jeep vehicles, including the new Chrysler Pacifica, Jeep Compass, and FIAT 500X Crossover. The 8-speed 845RE and 8HP series are now available in all Jeep RWD and 4WD models, Dodge Challenger, Charger, and Durango, the Chrysler 300, and all Ram 1500 trucks. We'll discuss current service procedures and the latest updates, along with the use of FIAT's latest scan tool software: wiTECH 2.0.

**10:50am - 12:20pm**

### **Restoring Functional Reliability**

***Presented by Dean Mason***

Take an in-depth look at broken, malfunctioning, or compromised systems, with an eye toward the fundamentals of functional reliability and dependable design.



**1:50pm - 3:20pm**

### **Introducing the 9T50 Transaxle**

***Presented by James Rokitski***

You'll get a general overview of the major components in this new transaxle and discover unique operating features and diagnostic procedures that you'll find indispensable in the shop.





**3:40pm - 5:10pm**

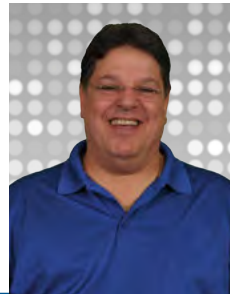
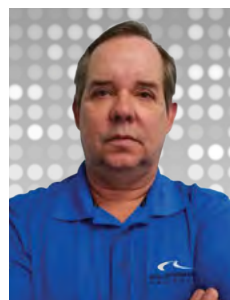
**Using Scopes to Streamline Diagnosis: Pt. 1**  
*Presented by Scott Shotton*

Learn how to use an oscilloscope to diagnose electrical faults accurately. We'll examine actual case studies to illustrate proper scope use, with emphasis on the advantages of an oscilloscope over other tools. Part I of this seminar will focus on speed and position sensors, including testing the actual sensors and using their signals for other diagnoses.

**5:20pm - 6:50pm**

**CVT Workshop**  
*Presented by Robert Bateman & Mike Souza*

Seal Aftermarket Products Technical Advisers Robert Bateman and Mike Souza will tear down the Nissan RE0F11A CVT, demonstrate the disassembly and reassembly of the pulleys, and go over some of the technical aspects of the CVT. And we'll go over some similarities and differences with other Nissan and Jatco CVTs.



**MANAGEMENT TRACK**



*Thursday is now all day!*



**9:00am - 4:00pm**

**Selling Boldly**  
*Presented by Alex Goldfayn*

Join Alex Goldfayn, author of award-winning Revenue Growth Habit, and the upcoming Selling Boldly, for a powerful all-day session on (1) knowing how good you are, and (2) behaving - and selling! - boldly. This will be a memorable day full of high-impact learning, application, and fun. Alex will interview at least two customers of audience members on the phone live in the room, during the workshop. You leave knowing how to deal with damaging fear of losing the sale. You'll practice obtaining testimonials (with one of your actual customers!); asking for referrals; offering the customer more of what they can buy from you; and following up on quotes and proposals. We'll do live case studies, small group work, and have an altogether highly interactive, memorable, and hugely valuable day!



**FRIDAY  
OCTOBER 20**



## **TECHNICAL TRACK**



**7:30am - 9:00am**  
**Using Scopes to  
Streamline Diagnosis: Pt. 2**  
***Presented by Eric Ziegler***

Learn how to use an oscilloscope to diagnose electrical faults accurately. We'll use actual case studies to illustrate proper scope use, with emphasis on the advantages of an oscilloscope over other tools. Part II of this seminar will focus on making current and pressure measurements to help diagnose a variety of issues.

**9:10am - 10:30am**  
**Introducing the 845RFE**  
***Presented by Bill Brayton***

This 845RE introduction seminar will cover identification of the internal components and follow the power flow through the eight forward speeds for this popular, 8-speed Dodge/Chrysler, rear-wheel drive transmission. And we'll cover the principles of operation for this increasingly common unit.



**10:30am - 11:50am**  
**Helping the Rubber Meet  
the Road**  
***Presented by Keith Clark***

We'll take a close look at all-wheel drive systems in late-model American vehicles. You'll examine the components and control systems, and discover how they interact with other drivetrain control systems. And we'll cover important details for servicing, diagnosing, and repairing these systems.





# MANAGEMENT TRACK

**8:30am - 10:00am**

## **From Mindset to Mission**

***Presented by Dennis Madden & Rodger Bland***

Everything gets created twice: once in our minds and once in reality. Putting our thoughts into action seems like the most natural thing we could do, but nothing could be further from the truth!

What we think about we become – all day long. In order to change anything in our lives, it begins with our mindset. Rodger will offer ideas that help you clear the clutter in your mind and stay focused on the most important aspects of your business – and life!

From here, Dennis will help you develop a clear purpose and mission for your business. Whether you get this right or wrong will affect everyone in your company. Even large and well-known businesses have failed by getting this wrong.

Don't let your business be relegated to a simple "to-do list" or series of tasks.



**Team  
Development**

**10:15am - 11:45am**

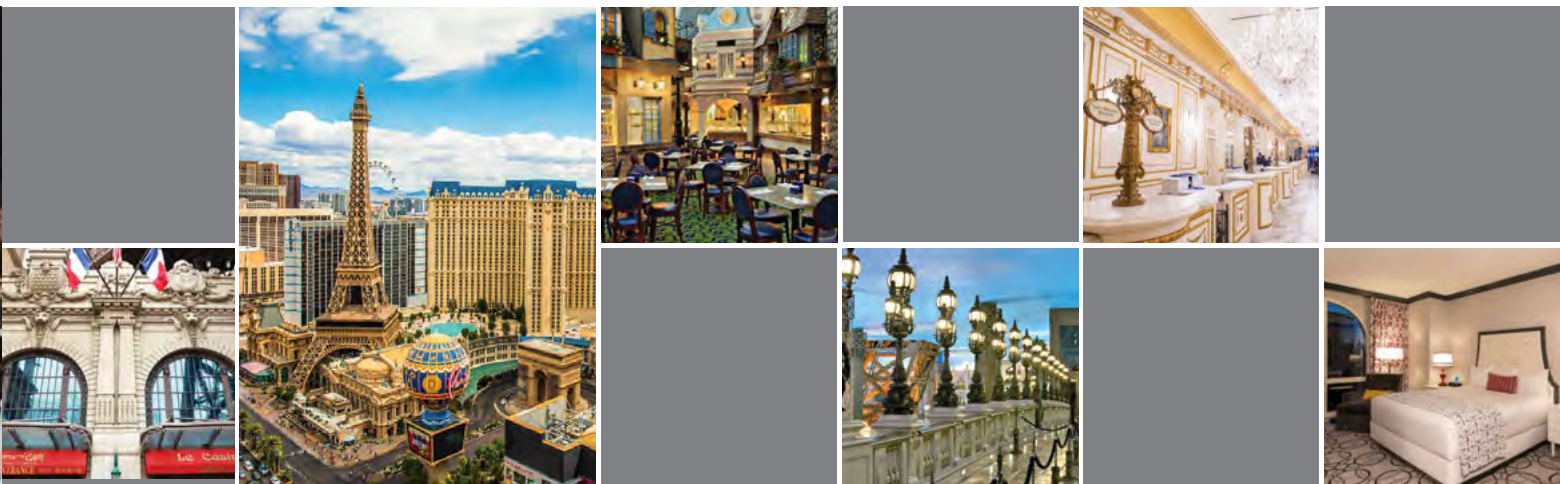
## **Building Decision-Makers!**

***Presented by Maylan Newton***

Ever wish your staff made better decisions? Or made a decision at all? Making decisions is a skill set that must be developed. Join us as we discover how to make ourselves and our staff better decision-makers! 6 tips to coach your staff on making better decisions.



**Vision**



# SATURDAY OCTOBER 21



## TECHNICAL TRACK

**8:30am - 10:00am**

### **Tips & Tricks from the Builders Bench**

***Presented by John Parmenter***

You'll get a firsthand look at real world issues for the latest transmissions you're seeing on the bench today. We'll cover how to diagnose today's vehicles, perform the

most current repairs, and discover what causes those conditions. And we'll take a close look at scan tool use and diagnostic aids, and their relationship to the fix. This is a must-attend show!



**2:10pm - 3:40pm**

### **Introduction of the ZF 8HP Hybrid**

***Presented by Dirk Fuchs***

Discover the difference between micro, mild, and full hybrid systems. In this program, we'll compare the ZF 8HP hybrid with the regular 8HP transmission. We'll examine what you need to know about the hybrid drive motor, the high voltage cables and connectors, and how to disconnect these systems safely before servicing.



**10:10am - 11:40am**

### **Converter Control**

***Presented by Bob Warnke***

Learn how to deal with the units your shop today. We'll revisit the existing units and take a closer look at how to deal with common problems that are often overlooked and hard to diagnose.



**3:50pm - 5:20pm**

### **Blame It On the Tuner**

***Presented by Pepe Torres***

It's easy to blame a transmission failure on a high-performance tuner. But, before you "blame it on the tuner," learn how to correct hydraulic problems that may be sabotaging your rebuilds. You'll discover how to combine high performance parts and tuners on 68RFE and 48RE transmissions.



*Back by popular demand!*

# TRANSMISSIONS

## 101

**"Back to Basics"  
Training by  
Industry Veteran  
Speakers!**



**8:30am - 10:00am**

### **Scan Tool 101**

***Presented by Jarad Warren***

Discover the ins and outs of performing a voltage drop test as part of computer system diagnosis. You'll learn how to interpret scan data to help you diagnose and repair problems on the latest vehicles

coming in to your shop.



**10:10am - 11:40am**

### **ATF Today; Surviving in an OE Driven Market**

***Presented by Pat Burrow***

With no industry-wide ATF standards (only individual OEM-required lubricants), it isn't easy to know what you're doing

when it comes to selecting transmission fluids. In this seminar, you'll learn how to separate the three types of automatic transmissions (CVT, DCT, and step automatic) by fluid type and function, paying special attention to the "equivalency" requirement when you aren't using the OE fluid.

**2:10pm - 3:40pm**

### **Series Circuit Essentials You Should Know**

***Presented by Dan Marinucci***

The series circuit is the essential, basic building block of the entire electrical system, so it's important to master fast, accurate methods for testing any series circuit. Discover the vital voltage checks — including the proper voltage drop procedure — for testing a circuit confidently. Even experienced technicians will benefit from this seminar.



**3:50pm - 5:20pm**

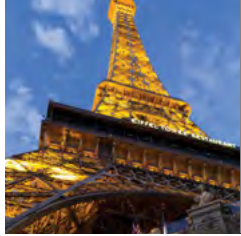
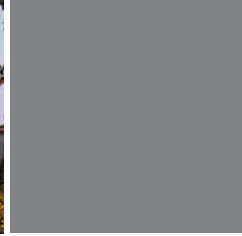
### **R&R 101**

***Presented by John Parmenter***

A comprehensive class covering everything today's R&R techs must know, from shop safety to key steps for removing the transmission efficiently and safely. This is an introductory course, designed specifically for beginners, students, and new employees.



**SATURDAY  
OCTOBER 21  
(cont'd)**



## MANAGEMENT TRACK



**9:00am - 10:30am**

### **Gain Control of Your Business by Letting Go**

***Presented by MaryAnn Croce***

Maryann Croce a fellow shop owner since 1999, will share her lessons learned and “aha” moments that took her business and relationship with her business partner and husband Tony, to the next level. “You don’t have to do it all, so stop trying to.” Focus on the activities that will move your business forward to have a business and life you love.



**10:45am - 12:15pm**

### **Would you/Could you - Take a Vacation? How Valuable Are You, Really?**

***Presented by Nancy Friedman***

How do you handle growth and change? What about bad news? Or other obstacles that come your way? Does “apathy” sound familiar? In this program, keynote speaker Nancy Friedman shares how to handle growth and change with grace, and uncovers the strategies behind these 7 leadership traits:

- Choose your attitude in advance
- Visualize Success
- Demonstrate Humor, Energy and Enthusiasm
- Resist Negative Tendencies
- Be a “Whatever It Takes Person”
- Embrace Change; Expect it and Accept It
- Be Grateful For What You Have





**SUNDAY  
OCTOBER 22**

## TECHNICAL TRACK



**9:00am - 10:30am**

### **Hydraulics 101**

***Presented by Bill Brayton***

Learn the principles of hydraulic systems, with a focus on the properties of the most common valves in the valve body. You'll discover how to read today's oil schematics, so you can isolate the valves

responsible for a function — or malfunction — and address it with a targeted modification that will offer the results you're looking for.

**10:40am - 12:10pm**

### **Toyota, Lexus U881E and GM AF50 8 Speed Automatic**

***Presented by Mike Brown***

Take a "first look" at the new Toyota U881E 8-speed and GM AF50, including solenoid and component function, pressure taps, and test procedures. Learn how to evaluate pressure and gear ratio. Covers transmission disassembly, clutch clearance, torque specifications, air checks, valve body break down, transmission fluid type and fill procedures, and computer relearn procedures.



## MANAGEMENT TRACK



**9:00am - 12:00pm**

### **Smart Exit Workshop**

***Presented by John Anderson***

Do you have something to sell? - Learn the four steps to making your Smart Exit.

What do you have to sell? - Evaluate your shop's management tools and machinery.

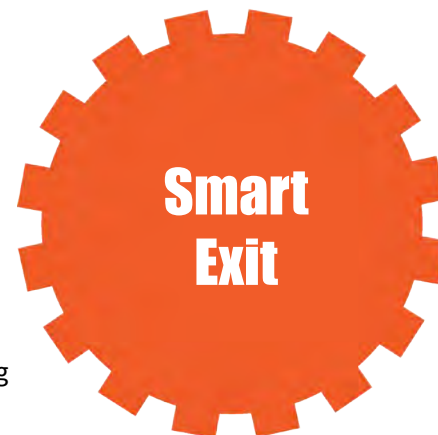
What's Your Shop Worth? - How are businesses valued.

Who might buy your shop? - Consider who are the best prospects.

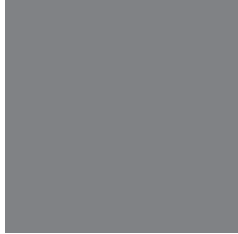
Can you increase the value of your shop? It would be foolish to sell a car without washing it, changing the oil and giving it a tune up, right? Make your shop sparkle!

Because there's many moving parts that change over time, it's best to have a written plan you can refer to, update and change as circumstances develop. Learn how to maintain your Smart Exit Strategic Plan.

Selling a business can be risky Not preparing to sell may be more risky Take the time to learn how and get expert help! Reduce your risk and increase your final gain. Make a Smart Exit!



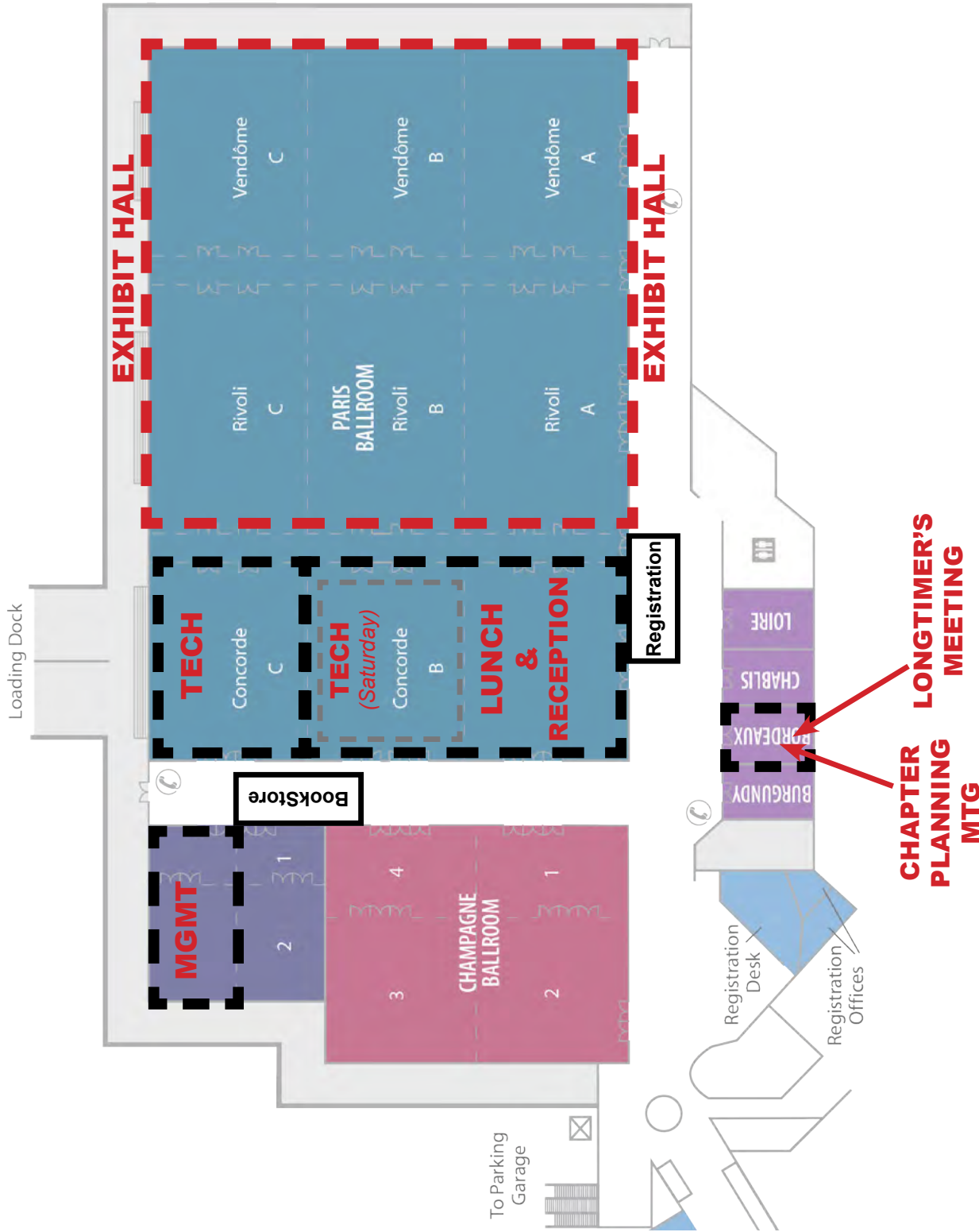
# ATRA EXHIBITORS *(as of 5/30/17)*



ACE/MCI Cores  
Adapt-A-Case  
Allomatic  
Alto Products Corp.  
ArmaKleen / Armex  
Ascension Engineering  
ATK and Parts, LLC  
Automotive Training Institute  
Autoshop Solutions, Inc.  
BAAN Powertrain Corp.  
BlueReach Automation & Control  
Berkeley Standard  
Capital Core Inc.  
Central Valve Bodies, LLC  
DACCO  
DCM Tech, Inc.  
Dieselsite, Inc.  
Dura-Bond  
EasyPay Finance  
ESi Seminars  
ETE Reman  
EVT Parts  
Exedy Friction Technics  
Ford Motor Company  
Freudenberg-NOK (TransTec)  
G-Cor Automotive Corp.  
GearSpeed  
Genuine GM Parts  
GFX Corp.  
G-TEC Inc.  
Hayden Automotive  
Hydra-Test/Cottingham Engineering  
Hot Flush, LLC  
Idemitsu Lubricants America Corp.  
JDS Worldwide Corp.  
KINERGO JSC  
KUHLE, Inc.  
Level Seven  
Lintex Auto Parts Co., LTD  
LUBEGARD®, A Stellar Automotive Group Co.  
McLeod Racing

Mopar- FCA US LLC  
Motor Age Training  
Mustang Dynamometer  
NATPRO-National Transmission Products  
North American Powertrain Components (NAPC)  
Northland Transmission Inc.  
Omega Machine & Tool, Inc.  
Performance Products & Machining (PPM)  
PML, Inc.  
Portland Torque Products  
Power Pusher-Div. of Nu-Star, Inc.  
Precision International  
Precision of New Hampton, Inc.  
Raybestos Powertrain  
Ream Man Valve Bodies  
R.O. Writer Shop Management Software  
Rostra Precision Controls, Inc.  
Schaeffler Group USA, Inc.  
Seal Aftermarket Products  
Slauson Transmission Parts  
Sonnax Industries  
STK Transmission Parts Co., Ltd  
SuperFlow Technologies Group  
Superior Transmission Parts, Inc.  
Sussex Auto Parts, LTD  
Synchrony Financial  
TCS Performance Transmission Products  
Tenn-Tex Automotive  
TRANSBRITE / Allen Woods & Associates, Inc.  
TransGo  
Transmaxx, LLC  
Transmission Digest  
Transtar Industries, Inc.  
Wesco Automotive, LLC  
West Coast Standards  
Whatever It Takes Transmission Parts, Inc.  
YanTai HeXie Transmission Technology Co., Ltd  
Yie Kuang Enterprise Co., LTD  
ZF Services North America  
Zina Autoparts Co., LTD

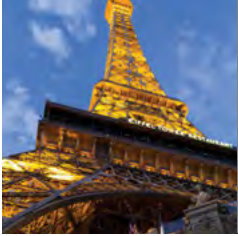
# EXPO LAYOUT



**CHAPTER  
PLANNING  
MTG**

**LONGTIMER'S  
MEETING**

# Registration Options



	<b>TRADE SHOW PASS</b> Friday-Saturday (Oct. 28 - 29)	<b>TECHNICAL CONFERENCE</b> Thursday-Sunday (Oct. 27 - 30)	<b>MANAGEMENT CONFERENCE</b> Thursday-Sunday (Oct. 27 - 30)	<b>COMPLETE CONFERENCE</b> Thursday-Sunday (Oct. 27 - 30)
Access to Technical Seminars		✓		✓
Access to Management Seminars			✓	✓
Expo Tech Manual		✓		✓
Expo Tech Program CD		✓		✓
Expo Management worksheets with leather binder			✓	✓
Expo Management Program CD			✓	✓
Coffee Breaks		✓	✓	✓
Friday Luncheon		✓	✓	✓
Friday Cocktail Reception		✓	✓	✓
Friday & Saturday Trade Show	✓	✓	✓	✓
Audio recordings of both the Technical & Management seminars				✓

**As low as \$20**

**As low as \$345**

**As low as \$345**

**As low as \$395**

*Best Value!*

## Thank you to our Sponsors!



**PRECISION**<sup>TM</sup>  
INTERNATIONAL







# Frequently Asked Questions

## Can I register at the door?

Yes. The following are the dates and times for On-Site Registration:

Thursday, October 19:	7am - 5pm
Friday, October 20:	7am - 5pm
Saturday, October 21:	8am - 5pm

## What are the hotel rates?

Hotel	Room Rate	Cut-off Date
Paris Hotel & Casino (877) 603-4389	\$179*	9/25/2017
Bally's Hotel & Casino* (877) 603-4389	\$119*	9/25/2017

*\*A Daily Resort fee of \$29 will be charged.*

## Does the hotel charge for parking?

Most hotels in Las Vegas now charge for self and valet parking. ATRA has negotiated to have our attendees' parking fees waived.

## Does ATRA make hotel reservations or is it included in the cost of registration?

All attendees make their own hotel accommodations directly with the Paris Hotel or the Bally's Hotel by calling (877) 603-4389. Mention ATRA to receive your discount room rate. Room reservations are not included with your conference registration.

## What are the registration cut-off dates for Expo?

The advanced purchase prices are good until 8/18/17. After that date, Standard Pricing will apply until 10/7/17. Any registrations made after 10/7/17 will need to be done on-site at the event.

## Will I receive a confirmation for my registration?

Your confirmation will automatically be emailed to the email address you provided immediately after your registration is processed. Please contact ATRA at (800) 428-8489 if you have not received your confirmation.

## Does my guest need to register?

Yes, everyone attending the seminars or trade show must have an official badge and registration - except children in strollers. Spouses and children of conference registrants may be eligible to receive free trade show access. Please call for details.

## Can I change one of my paid registrations from one person to another?

Yes, you can switch the name on one or more of your registrations before 10/7/17. Please call (800) 428-8489 with any changes you'd like to make. Any changes needing to be made after 10/7/17 will need to be done on-site at the event.

## What if I want to attend more than one seminar in a session?

Audio recordings of both the Technical and Management seminars will be available to all Complete Conference attendees after the Expo.

## 4 Easy Ways to Register

Call: (800) 428-8489 or (805) 604-2000

Online: [www.powertrainexpo.com](http://www.powertrainexpo.com)

Send Reg form by fax: (805) 988-6761

Send Reg form by mail: ATRA Powertrain Expo Registration  
2400 Latigo Ave  
Oxnard, CA 93030

## Registration Information

Enrollment is on a first-come, first-serve basis. Seating is limited by room size. Seminars start promptly at their scheduled time. Arrive early to be sure of good seating, and to meet with instructors and other seminar attendees. Recording is not permitted.

## What's Included

**Complete Conference:** admission to all technical & management seminars Thursday through Sunday, Friday Luncheon & Cocktail Reception, coffee breaks, Friday & Saturday ATRA Trade Show admission, Expo Technical Manual, Technical seminar program CD and Management worksheet materials. Audio recordings of both the Technical and Management seminars will be available to all Complete Conference attendees after the Expo.

**Technical or Management Conference:** admission to either the Technical or Management seminars Thursday through Sunday, Friday Luncheon & Cocktail Reception, coffee breaks, Friday & Saturday ATRA Trade Show admission, the Expo Technical Manual, Technical seminar program CD or Management worksheet materials.

**Trade Show:** admission to the ATRA trade show on Friday and Saturday.

## Cancellation Policy

All cancellation requests needing to be made after 10/1/17 will be subject to a \$50 cancellation fee.

# Registration Form

October 19- 22, 2017 • Las Vegas, NV



Company Name _____		ATRA Account Number _____	
Contact Person: (will receive all correspondence) _____			
Address _____			
City _____	State _____	Zip _____	
Country _____	Email Address _____		
Area Code Phone No. _____	Fax No. _____		
(     ) _____	(     ) _____		

**TO REGISTER: Call toll free 1-800-428-8489 or FAX this completed form to 805-988-6761**

<p><i>Badges will be issued from this list. Use a separate sheet for additional registrations. *</i></p> <p style="text-align: center;"><b>PLEASE PRINT CLEARLY</b></p> <p style="text-align: right;">TITLE: <input type="checkbox"/> Owner    <input type="checkbox"/> Manager  <input type="checkbox"/> Rebuilder   <input type="checkbox"/> Diagnostician  <input type="checkbox"/> Other _____</p> <p>NAME _____</p> <p style="text-align: right;">TITLE: <input type="checkbox"/> Owner    <input type="checkbox"/> Manager  <input type="checkbox"/> Rebuilder   <input type="checkbox"/> Diagnostician  <input type="checkbox"/> Other _____</p> <p>NAME _____</p> <p style="text-align: right;">TITLE: <input type="checkbox"/> Owner    <input type="checkbox"/> Manager  <input type="checkbox"/> Rebuilder   <input type="checkbox"/> Diagnostician  <input type="checkbox"/> Other _____</p> <p>NAME _____</p> <p style="text-align: right;">TITLE: <input type="checkbox"/> Owner    <input type="checkbox"/> Manager  <input type="checkbox"/> Rebuilder   <input type="checkbox"/> Diagnostician  <input type="checkbox"/> Other _____</p> <p>NAME _____</p> <p style="text-align: right;">TITLE: <input type="checkbox"/> Owner    <input type="checkbox"/> Manager  <input type="checkbox"/> Rebuilder   <input type="checkbox"/> Diagnostician  <input type="checkbox"/> Other _____</p> <p>NAME _____</p>	<p><b>CONFERENCES</b> <i>(Includes Luncheon &amp; Trade Show)</i></p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Complete Conference</th> <th>Technical</th> <th>Management</th> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Complete Conference	Technical	Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p><b>ADDITIONAL TICKETS</b></p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>Trade Show</th> <th>Lunch</th> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Trade Show	Lunch	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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REGISTRATION FEES	Qty	Advanced Purchase Before Aug. 19 <sup>th</sup>		Standard Pricing Aug. 19 <sup>th</sup> - Oct. 7 <sup>th</sup>		ALL ON-SITE	SUBTOTAL
		Member	Non Mem	Member	Non Mem		
Complete Conference Registrant*	_____	\$ 395	\$ 495	\$ 495	\$ 595	\$ 695	\$ _____
Technical or Management Conference*	_____	345	445	445	545	645	\$ _____
Trade Show	_____	20	20	20	20	30	\$ _____
Extra Luncheon Ticket <small>(Included with Complete, Tech &amp; Management Conferences)</small>	_____	50	50	50	50	65	\$ _____

**\*Conference Registrants may receive Trade Show Passes for spouse and/or children by contacting ATRA Registration at 1-800-428-8489.**

**TOTAL \$ \_\_\_\_\_**

I do **not** wish to receive any advertising or promotional material from Exhibitors.

**All cancellation requests made after 10/1/2017 are subject to a \$50 cancellation fee.**

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Check enclosed payable and mail to: **ATRA, 2400 Latigo Avenue, Oxnard, CA 93030** Check # \_\_\_\_\_

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GEARS does not endorse new products but makes this new information available to readers. If you have a new product, please email the press release information with applicable digital photo or drawing to [apena@atra.com](mailto:apena@atra.com) or send by mail to GEARS, 2400 Latigo Avenue, Oxnard, CA 93030.

## Sonnax Introduces New GM Manual Valve



GM 6L45 and 6L50 transmissions may not engage when shifted into forward or reverse, often because the narrow OE manual valve stem breaks into two pieces, forcing the car into neutral.

Sonnax standard-sized manual valve assembly 104740-24K overcomes this problem, and offers additional benefits including:

- Hardcoat anodized valve and aluminum link
- Larger stem diameter for added strength to prevent breaking
- Longer spool lengths for increased stability and leak prevention

Learn more at [www.sonnax.com](http://www.sonnax.com).

## Motorcraft: Quality Parts Solve Customer Concerns and Grow Business

Following the 2016 relaunch of Ford's Motorcraft parts brand — aimed at improving the customer experience through more competitive pricing and increased accessibility — Ford is sharing Motorcraft-driven success stories from technicians across the country.

“When it comes down to it, technicians need products that help them do business successfully,” said Marc Liskey, North America repair product planning maintenance and light repair manager. “We work to ensure Motorcraft products meet both customer and installer needs, and sharing the stories of how Motorcraft parts have helped technicians solve problems for customers or grow their business is a great way to illustrate the many ways in which Motorcraft is working to meet and exceed the needs of all customers.”

Ford called upon technicians nationwide for their input on how

Motorcraft has helped them meet or exceed a customer need or grow their businesses:

**Anthony Vigliarolo,**  
**Service Manager**  
*C&M Truck and Tire Repair Corp,*  
*Staten Island, NY*

“If we can trust Motorcraft for use in servicing emergency vehicles, we know we can trust it to perform for the rest of our hard-working fleets.”

**Kandy Kiehamer, Owner**  
*Lakeview Custom Coach, Oaklyn, NJ*

“Ten times out of ten, I will choose a Motorcraft part over an aftermarket part. Motorcraft parts are built to spec, so we avoid trouble with the parts over time.”

How have Motorcraft parts helped you build customers for life or improve your bottom line? Send them your story at [MCStory.com](http://MCStory.com).

## Ford Has a New CEO



Jim Hackett named as Ford Motor Company president and CEO, succeeding Mark Fields, who is retiring. Hackett, who will report to Executive Chairman Bill Ford, is recognized as a transformational business leader

Hackett led Steelcase Inc.'s turnaround to become the world's No. 1 office furniture maker, served as interim Athletic Director at University of Michigan and has led Ford Smart Mobility LLC since March 2016. He served on Ford's board from 2013 to 2016

Hackett, together with Bill Ford, will focus on three priorities: Sharpening operational execution, modernizing Ford's present business and transforming the company to meet tomorrow's challenges.

## JAMAR Releases Rugged Off Road Disc Brakes for VW Link Pin Front Ends



JAMAR's sophisticated and brutally rugged DB300VWLP is designed and manufactured for use with VW link pin front end assemblies. Intended for the serious off roader, these ultra rugged brake assemblies easily handle the abuse encountered in off road sports.

All components are made of the highest quality aircraft materials available. 100% Made in the USA. Suggested retail is \$838.50.

For complete details visit JAMAR at [www.jamarperformance.com](http://www.jamarperformance.com)

## Join the Training at automechanika: July 26-29, 2017



There's a demand among shop owners and the driving public to have well-educated technicians and repairers who understand the changing complexities of today's vehicles.

Automotive professionals have found big boosts to their careers by joining the free training at NACE Automechanika Chicago in the past. This year's program will take place from July 26 through 29.

We hope you'll take a few minutes right now and register. Look over the list of classes covering driveability issues, including:

- Glow Plug Diagnostic Strategies

- Mode \$06 — Fixing the No-Code Misfire
- In-Cylinder Pressure Transducer Diagnostics
- ...and much, much more.

Plus, when you use code NAPA2017, NAPA will cover all of your registration costs making your training free!

To register, visit <https://registration.n200.com/survey/01j7h7as2441z>

## **E-ZOIL Introduces Environmentally Friendly Hand Cleaner and Shop Wipes**



E-ZOIL, manufacturer of performance-enhancing fuel additives and cleaning solutions, has introduced Hardy Hands a new hand cleaner for professional technicians. Utilizing a high-performance formula with natural ingredients, Hardy Hands contains walnut shell scrubbers to quickly eliminate dirt and grime. The product contains six different lotions that leave hands soft and clean with a fresh citrus aroma.

E-ZOIL has also introduced, Hardy Wipes, a combined hand, tool and surface towel. The companion product utilizes the same high-performance formula in Hardy Hands to remove dirt, grime, grease, oil, tar and many other soils. The two-sided towel has an abrasive side to cut through soils and the smooth side is designed to wipe surfaces clean.

Hardy Hands is available from authorized E-ZOIL distributors in 3- and 18-ounce bottles and an 85-ounce jug. A dispenser for the jug is also available that is ideal for shop environments. Hardy Wipes are 9" x 12" and available in a 70-count container.

For more information on E-ZOIL, phone (716) 213-0106 or visit [www.ezoil.com](http://www.ezoil.com).

## **A Look Back at This Year's TCRA Meeting and Seminar Event**

Torque converter rebuilders from all across the country gathered in beautiful Ventura, CA for the 2017 TCRA meeting and seminar program this past April 21 and 22. As you might expect for SoCal, the weather was warm and sunny: a welcome respite for many of those in attendance who'd been fighting their way through the last remnants of winter.

This year's TCRA event took place at the Marriot Ventura Beach. Things began bright and early Friday morning with a visit to the Haas Automation plant, where they build some of the CNC machines used in many of today's torque converter rebuilding shops. Attendees got a first look at the latest equipment available for their shops, and were able to ask questions and discuss equipment issues with the folks who design and build them.

From there it was a short bus ride to ATRA's home office for a tour of the facilities and a catered luncheon hosted by ATRA. Then it was back to the hotel for a TCRA Member's meeting, followed by a reception, where

attendees got a chance to rub elbows and share their experiences with one another.

Saturday was a full day of seminars, presented by experts from all walks of the industry. GEARS Managing Editor Rodger Bland started things off with a short presentation about the history of the California missions and some interesting facts about the area they were visiting.

He was followed by industry experts covering a wide range of topics, from basic torque converter rebuilding techniques to diagnostic procedures and converter-related transmission issues.

After the seminars, Jim Naylor from the Ventura Raceway opened the raceway gates for all TCRA Members, to enjoy an evening of dirt track racing. Then, during intermission, Jim arranged a ride-along in one of the dirt-track cars for TCRA President Martin Brooks. "It was a blast!" said Martin.

Overall, it was a terrific event, with like-minded folks getting together to share stories and build relationships. And for many, it was an opportunity to take their businesses to a new level of professionalism.



**Bob Warnke of Sonnax provided one of several technical presentations.**



**TCRA Board Member, Raffi Pilajvian kept the meeting running smoothly.**



**A day of learning during TCRA's 2017 Annual Seminar at the Ventura Marriot Beach Resort.**

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