TCRA and ATRA, A Strategic Alliance

Ford 6F50N Rebuilding Techniques
Mercedes 722.9 Preliminary Information
### PROBLEM
- Poor shift quality
- Delayed forward or no reverse
- Low TCC apply pressure
- TCC slip code, P0741
- Scratched OEM valve
- Converter apply issues
- No 4th gear
- No 2nd or 5th gear
- Converter apply issues
- High TCC slip RPM
- No TCC apply
- Code P1741
- Flare upshifts, Low EPC pressure
- TCC slips, P0741
- Loss of 3rd & 4th gear, Hot
- Erratic shifting
- Delayed engagement
- High or low line pressure
- Low baseline pressure
- Soft shifts
- Delayed reverse

### SOLUTION

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EPC &amp; Engagement Control Kit</td>
<td>37947-11K</td>
</tr>
<tr>
<td>2</td>
<td>TCC Regulator Valve Spring Kit</td>
<td>37947-46K</td>
</tr>
<tr>
<td>3</td>
<td>Standard TCC Regulator Valve</td>
<td>37947-38</td>
</tr>
<tr>
<td>4</td>
<td>Oversized Coast Clutch Valve Kit</td>
<td>37947-33K</td>
</tr>
<tr>
<td>5</td>
<td>TCC Regulator Sleeve Kit</td>
<td>37947-09K</td>
</tr>
<tr>
<td>6</td>
<td>TCC Modulator Valve Sleeve Kit</td>
<td>37947-07K</td>
</tr>
<tr>
<td>7</td>
<td>EPC &amp; TCC Relief Valve Kit</td>
<td>37947-40K</td>
</tr>
<tr>
<td>8</td>
<td>End Plug Kit</td>
<td>37947-13K</td>
</tr>
<tr>
<td>9</td>
<td>Pressure Regulator Sleeve Kit</td>
<td>37947-05K</td>
</tr>
<tr>
<td>10</td>
<td>“Elevated Pressure” Main PR Springs</td>
<td>56947-17</td>
</tr>
<tr>
<td>11</td>
<td>Boost Valve &amp; Sleeve Kits</td>
<td>37947-01K, 37947-03K</td>
</tr>
</tbody>
</table>

**Note:** Sonnax 37947-EZ contains many of these solutions in one easy-to-use kit. More information is available at [www.sonnax.com](http://www.sonnax.com).
TCRA and ATRA, A Strategic Alliance — by Joe Rivera and Bill Brayton

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Taking Advantage of Murphy’s Law: Answer the Phone All Day, Every Day — by Steve Bodofsky

Shop Profile: Santa Rosa Transmissions

SALES & MARKETING

38

44

46

48

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DEPARTMENTS

2
FROM THE CEO: Avoiding the Rat Hole — by Dennis Madden

52
ATRA News

57
Powertrain Industry News

61
Shoppers and Classified

68
List of Advertisers

TABLE OF CONTENTS

4
TCRA and ATRA, A Strategic Alliance
— by Joe Rivera and Bill Brayton

16
Ford 6F50N Rebuilding Techniques
— by Lance Wiggins

26
How Much? There’s More to It than You Think
— by Thom Tschetter

28
That Converter You Just Did!
— by Martin Brooks

30
Mercedes 722.9 Preliminary Information, Part 1
— by Mike Souza

36
Writing Your Operations Manual: How I Run My Business
— by Paul Mathewson

38
Keep Those Trannys Rolling: Chrysler’s New All-wheel Drive System
— by Pete Huscher

44
Fluid Matters: The Wrong ATF Can Ruin Your Rebuild
— by Mark Mustard

46
Taking Advantage of Murphy’s Law: Answer the Phone All Day, Every Day
— by Steve Bodofsky

48
Shop Profile: Santa Rosa Transmissions

On the Cover: Joe Rivera and Bill Brayton present TCRA and ATRA, A Strategic Alliance

Page 4
Advertising is critical for any business. If you want people to find you, you have to put your name out there. But some types of advertising are more effective than others. Put your money into the wrong type and you might as well be stuffing it down a rat hole.

That’s why we focused much of last year’s What’s Working study on consumer buying habits: What they look for in a repair shop and what kinds of advertising are most effective. Essentially we wanted to know how consumers choose a transmission repair shop.

One thing we learned was that consumers will usually ask for a recommendation from someone they trust when they have a transmission problem. The Yellow Pages ranked low from consumers who participated in the survey.

That’s why, when it comes to those ads, size really doesn’t matter: Shops with a single, 1/8th page ad often do better than shops with full page ads in several directories covering their region.

So what do consumers look for when choosing a repair shop? Local activities and community-based advertising provided the highest return. Things such as sponsoring a local sports team, membership in local service organizations, ads in local newsletters and school newspapers… activities that bring you — the shop owner — closer to the community and help generate trust among potential customers.

That may be easier said than done. Many of us have more of a technical mentality. If something is broken we want to fix it. The transmission flares on the 2-3 shift? A valve body modification or an oversized servo and the problem’s solved.

So when car counts are down, it’s only natural to want to fix it. And there are dozens of sales people out there just waiting to tell you where to spend your money to do that.

“Increase your ad budget,” they’ll tell you. “Go with a larger ad in the Yellow Pages.” Or “let us show you how our Pay-Per-Click internet marketing will drive more potential customers to your business.”

Sure, you can buy more or bigger ads, and maybe you’ll see a slight improvement here or there. But the vast majority of consumers are looking for a more personal connection; they’re looking for a shop they can trust. You’re not going to buy that trust with a larger phone book ad or web site banner.

That type of community-based involvement isn’t necessarily easy. Many of us aren’t comfortable in social situations. And these programs often don’t allow us to tackle the problem of bringing more cars in directly; they’re just about getting out there and mingling… becoming part of the community. But there’s little doubt that this type of “friend in the business” attitude is what builds trust, and puts more cars in your bays over the long haul.

Don’t be fooled by momentary changes in the business climate. For example, many shops today are experiencing a surge in business. It would be easy to attribute that increase to whatever advertising changes you made yesterday. Put up a new web site last week? It must be working, because more cars came in this week.

What you’re more likely looking at is an accident of timing. A lot of shops have been seeing more cars over the last few months partly because of economic considerations, and partly due to the winter, which has been severe for most of the country. The increase may have nothing to do with your new radio spot, larger Yellow Pages ad, or updates to your web site.

Does that mean you can’t measure your advertising response? No, it just means you should take those measurements with a grain of salt. A lot of different considerations factor into a consumer’s decision to choose your shop over another. That’s one of the benefits of the What’s Working study: It eliminates those momentary surges or ebbs in the market, and lets you discover what’s been working over the long term.

Advertising is a critical part of every business, and in bad times it’s even more important. But unless you track your leads and are able to determine the effectiveness of your programs over time, you can’t determine if a new advertising plan really works. And putting too much effort into that new web site or radio spot may keep you from focusing on those community-based activities that have proven successful, time after time.

Sure, those other ads are still important, and they must present the proper image for your shop. But don’t let them interfere with the ones that let you build trust from the people in your community. Otherwise you could wind up falling down that rat hole.
“I was extremely impressed with the precision of the end product.”

Randy Leptich
Hyranics Driveline Service, Inc.
Plano, Illinois

Randy says: “I have discovered a new respect for every clutch, steel and electronic component Raybestos produces. There is an incredible sense of pride and confidence everywhere within Raybestos. My congratulations to a fantastic company of dedicated folks who make the ‘Made in the USA’ label the most powerful on the planet.”

Electronic Components Benefits

• Sensors: Superior reliability and durability compared to off-shore and OE; eliminate limp mode comebacks
• Solenoids: Corrosion resistant and durable under the most severe operating conditions; reduce risk of solenoid failure
One of the acknowledged truths about any business is that certain alliances can improve your profitability. This is by no means a unique situation; it carries into just about every type of business. And nowhere is the need for a strategic alliance more evident than the synergy created between the transmission repair shop and the torque converter rebuilder. Close ties between these two businesses can reduce problems and comebacks, and improve profitability for both businesses.

Here’s an example of the benefits of one such alliance: The car is a late-model Honda. The transmission was burnt up, so the transmission shop rebuilt the transmission and installed a rebuilt torque converter.

Everything seemed fine for the first few weeks, but a month or two later the customer was back. The MIL was lit, and the computer had code P0740 in memory, indicating a slipping converter clutch.

So the transmission shop technician does what anyone would do: He checks the TCC operation. Sounds easy, doesn’t it? But nothing appears to be wrong. He clears the code and drives the car. The code doesn’t come back and the TCC seems to be working fine. His scan tool doesn’t provide all that much information, but he can feel the converter clutch working, so he returns the car to the customer.

Within a few weeks it’s back with the same P0740 code in memory.

So how does the transmission shop deal with this type of problem? Many would simply call their torque converter rebuilder and order a second converter. And, unfortunately, many of those shops would be seeing the car back again in a few weeks.

The smarter transmission shop technician recognizes the need to work...
with the converter rebuilder. He’d know that a TCC slip can have a number of possible causes, many of which wouldn’t be particularly obvious. And while the converter itself could cause this type of slip, there are also a number of transmission issues that could affect it too.

Let’s take a look at the different
conditions that can cause this specific problem, and look at them from both points of view: the transmission shop and the converter rebuilder.

The transmission technician’s point of view will be provided by Bill Brayton from the ATRA Technical Department; Joe Rivera from ProTorque offers the converter rebuilders point of view.

Honda Converter Clutch Slip: The Transmission Technician’s View
by Bill Brayton

There are several issues you need to consider when dealing with a P0740 TCC slip code on a Honda:

**Diagnosis** — If you happen to have a dedicated Honda scan tool, you can check the difference between engine RPM and the mainshaft RPM. When the converter clutch is fully engaged, the speeds should indicate no slip at all.

Unfortunately most scan tools won’t provide that level of information. If that’s the case, you’ll have to assume the computer is seeing some level of slip under certain conditions; you just won’t be able to check them directly.

**Valve Body** — You should have disassembled and cleaned the valve body during the rebuild, so hopefully there are no problems there. While it’d be nice to check the valve body again, that’s easier said than done on a Honda. Chances are you’re not going to want to recheck the valve body until you’ve decided to replace the torque converter, since both jobs will require removing the transmission from the vehicle.

If you do end up pulling the unit again, pay particular attention to the valves that control TCC operation. On 4-speed units and 5-speed Odyssey and Pilot vehicles, these are:

- Lockup Shift Valve
- Lockup Timing Valve
- Lockup Control Valve

On 5-speed Accord and CRV vehicles, you’ll only need to check these two valves:

- Lockup Shift Valve
- Lockup Control Valve

Figures 1 provides an exploded view of the valves that control TCC operation. Make sure these valves are clean and working freely. And check the end caps; these caps tend to loosen and leak. You can order special replacement end caps from Sonnax that include an O-ring to provide a more positive seal and eliminate end cap leaks.
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ATF — Improper transmission fluid can be a likely source of all types of transmission slips and chatters. The additives that alter Dexron for use in units requiring fluids with different friction characteristics work well, provided you begin with a quality base fill.

If you used Dexron and an additive and are now experiencing a slip or chatter, one of the first things you can try is to switch over to the factory fill; in this case, Honda fluid. It’s been known to correct TCC slips on a number of vehicles.

CPC Solenoids — Damaged or faulty solenoids are another likely source of a TCC slip. Start by checking the solenoid resistance and operation. Make sure the solenoid closes completely and flows freely when it’s supposed to.

If the unit was overheated or had severe metal contamination, you should replace the solenoids as a normal part of your rebuild procedure. Or if everything else checks out okay and code P0740 returns, replace the solenoids.

Here are the solenoids that control TCC operation:

- 4-Speed Units — CPC A and B
- 5-Speed Accord and CRV Vehicles — CPC A
- 5-Speed Odyssey and Pilot Vehicles — CPC C

Pump Gear to Converter Hub Seal — Honda units have an O-ring on the converter hub that seals the hub to the inner pump gear. Originally this was a black O-ring, with a diameter of 1.440” (figure 2). And this O-ring worked fine… when all the bushings and shafts were new.

But as the transmission components begin to wear, the original style O-ring no longer seals the converter charge oil properly. The problem is, there’s no one item that’s really worn enough to identify as being worn out; and replacing everything isn’t a cost-effective solution.

The better choice? Replace the original O-ring with the new, green O-ring (figure 3). The replacement O-ring is 1.550” in diameter — 0.110” larger than the original, so it provides a better seal, even with the combined wear from the older components.

Finally, once you’ve decided everything else is okay and you need to replace the torque converter, call your converter rebuilder. Explain the situation and let him know what you’ve done so far. That way the rebuilder knows what to look for, and will have a better idea of what he needs to do to help eliminate the TCC slip.

Honda Converter Clutch Slip: The Converter Rebuilder’s View

by Joe Rivera

There are a number of issues that can create a slipping problem in a Honda converter clutch:

- Clutch Material Compatibility — There are several different types of friction material available for the
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But in most cases, the plain paper clutch material won’t provide the necessary holding power, temperature capacity, or the proper coefficient of friction to work with a pulse width modulated converter clutch system. These units usually require a high carbon clutch material to perform properly.

Most Honda transaxles use a pulse width modulated control strategy for their converter clutches. These clutches have a certain level of slip built into their control strategy. So it’s important to use a converter clutch material with a high carbon content that can handle the additional heat being generated.

If you aren’t sure which type of clutch control system is used in the vehicle you’re dealing with, ask the transmission technician. He should be able to tell you just by checking the converter clutch solenoid resistance: PWM solenoids usually have a much lower resistance than the older, on-off solenoids.

Follow the Proper Bonding Process — The converter clutch material comes with the bonding adhesive already applied. Bonding the clutch to the piston involves a specific process of heat, pressure and time, which is provided by the clutch manufacturer.

That process isn’t a suggestion, and close enough just plain isn’t. It’s critical that you follow the bonding process to the second… to the pound… and to the degree. Each clutch manufacturer has its own requirements; always contact them for the specific specs and procedures for their bonding adhesive.

• Check the pressure on your bonding press to make sure it’s accurate, and adjust it if necessary. Consider adding a one-way check valve in the line feeding the piston to help maintain a constant apply pressure.
• Set a timer to make sure you’re following the bonding duration instructions; don’t guess about the time.
• Check the actual temperature applied to the clutch material with a digital pyrometer (figure 5); don’t just assume the adjustment dial is accurate. This is called bond line...
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temperature; it’s the temperature at which the adhesive begins to flow and bond to its contact surface. Most adhesives will reach their bond line temperature between 375ºF and 425ºF.

A few degrees too low… a few seconds too fast… a few pounds too little… and your clutch may not bond properly. This can allow the clutch to debond and fail during operation.

The temperature check is the difficult one to verify. First there’s the clutch piston: Many, such as the Honda, have a very complex construction, including various springs, rivets and other hardware (figure 6). This hardware acts as a heat sink, drawing heat away from the clutch facing. So even if your bonding fixture’s temperature is accurate, it’s possible the temperature will never get high enough to bond the facing to the clutch piston.

And some bonding fixtures don’t provide you with access to the clutch assembly during the bonding process, so you won’t be able to check the bond line temperature until you’re finished. In that case, check the clutch piston temperature immediately after you complete the bonding process. It should still be close to the recommended temperature for bonding.

You might want to test your bonding press beforehand using an old clutch piston. Install the piston assembly, and go through the bonding process. Then check the temperature immediately after releasing the pressure: If the clutch temperature is significantly lower than the manufacturer’s recommendation, adjust the temperature dial and try again. Keep performing this test until you’re sure your bonding press is bringing the clutch to bond line temperature. And recheck your press occasionally to make sure it’s working properly.

An alternate test would be to use a Tempilstik to mark the clutch piston and check the bond temperature (figure 7). Tempilstik is a paint stick that changes color when you exceed its rated temperature. There are dozens of Tempilstiks available in a wide range of temperatures, so you should be able to have one available for every clutch manufacturer’s temperature rating. Tempilstiks are available through MSC Industrial Supply Company, at www1.mscdirect.com.

**Check the Clutch Release Clearance** — The Honda converter clutch should have a clearance of about 0.015” to 0.035”. Any less and the clutch could drag; any more and the clutch may not apply all the way.

Here’s how to check the clutch clearance on the Honda converter:

1. Measure the height from the clutch release stop on the turbine hub to the bearing surface (figure 8).
2. Place the clutch into the front cover, and measure the height from the top of the clutch assembly (where it rides on the clutch release stop on the turbine) to the bearing surface (figure 9).
3. Subtract the first measurement from the second measurement.

So on the example unit, the first measurement was 0.770”; the second was 0.755”.

- 0.770”
- 0.755”
- 0.015”

• If the clearance is too low, you can machine the clutch mating surface to increase it.
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- If the clearance is too high, you can use a thicker clutch material.

Once you have the unit ready to assemble, you can check your clearance. To do so, you’ll need six shims: three 0.015” shims and three 0.035” shims.

Place the three thin shims on the clutch (figures 10A & 10B), and slide the converter assembly together. Then check the clutch; it should rotate freely. If it’s binding, even just a little, the converter clutch doesn’t have enough clearance.

Pull the unit back apart, and place the three thicker shims on the converter clutch. Then slide the assembly together again, and check the clutch. This time it should bind; if not, the converter clutch has too much clearance.

IMPORTANT: Remove the shims before welding the converter together!

Once you have the clearance adjusted properly, you’re ready to assemble the clutch. And you shouldn’t have any problems with its performance.

While there are a number of transmission issues that can create a converter clutch slip, there are also many ways to slip up in the converter rebuilding process. The key is to follow the procedures to the letter. If you do that, you can virtually eliminate those converter clutch slip codes on Honda transaxles.

Two different approaches to a single problem: While there are a number of transmission issues that can create a converter clutch slip, there are also many ways to slip up in the converter rebuilding process. The key is to follow the procedures to the letter, and maintain open lines of communication between the transmission rebuilder and the converter rebuilder. If you do that, you can virtually eliminate those converter clutch slip codes on Honda transaxles.
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For some rebuilders, every time they get a new unit in the shop — one they haven’t seen before — they end up with that feeling in the pit of their gut that asks, “What am I getting into?” Others look forward to the challenge; for them it’s, “This is going to be cool. I can’t wait!” Hopefully, you’re one of those guys who looks forward to something different, something new and exciting. For you, change is good!

In this issue of *Let’s Play Ball!* we’re going to cover how to get around purchasing the special tools for the 6F50N to remove and replace internal clutch piston retaining snap rings, take a look at the valve body, and see how to replace the ISS and OSS sensors.
Disassembly Tips

The first thing to remove from the unit is the valve body. The TCM is part of the valve body, along with the Transmission Range Sensor, the TSS and the OSS connectors (figure 1). Here’s how to remove the valve body from the transmission:

- Remove the connectors from the TCM.
- Remove the TCM from the unit (figure 2).
- Remove the valve body bolts from the valve body (figure 3).
- Remove the end cover and start disassembling the transmission.

Once you have the transmission torn down, it’s time to start working on the subassemblies.

Valve Body

The valve body has three main bodies and one cover plate (figure 4). To disassemble the valve body:

- Remove the cover plate and main body casting.
- Remove the separator plate to gain access to the checkballs (figure 5).

Once you have the transmission torn down, it’s time to start working on the subassemblies.

The valve body has three main bodies and one cover plate.
Ford 6F50N Rebuilding Techniques

The checkballs are steel (figure 6).

- Remove the valves, spring, and related parts (figures 7 and 8).

As usual there are some regulator valves you’ll need to pay close attention to in both the main and lower valve bodies. Refer to figures 7 and 8 for descriptions.

**Main Valve Body:**

#6 Pressure Regulator Valve
#7 Direct Clutch Regulator Valve
#8 Intermediate Regulator Valve
#9 TCC Regulator Valve
#10 Low/Reverse and Overdrive

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<table>
<thead>
<tr>
<th>Main Valve Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Manual Valve Assembly</td>
</tr>
<tr>
<td>2 Multiplex Shift Valve Assembly</td>
</tr>
<tr>
<td>3 Multiplex Manual Valve Assembly</td>
</tr>
<tr>
<td>4 TCC Control Valve Assembly</td>
</tr>
<tr>
<td>5 Isolator Valve Assembly</td>
</tr>
<tr>
<td>6 Pressure Regulator Valve Assembly</td>
</tr>
<tr>
<td>7 Direct Clutch Regulator Valve Assembly</td>
</tr>
<tr>
<td>8 Intermediate Clutch Regulator Valve Assembly</td>
</tr>
<tr>
<td>9 Torque Converter Clutch Regulator Valve Assembly</td>
</tr>
<tr>
<td>10 Low/Reverse and Overdrive Clutch Regulator Valve Assembly</td>
</tr>
</tbody>
</table>

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Figure 7
<table>
<thead>
<tr>
<th>WIT WHATEVER IT TAKES TRANSMISSION PARTS, INC</th>
</tr>
</thead>
<tbody>
<tr>
<td>800-940-0197 <a href="mailto:sales@wittrans.com">sales@wittrans.com</a></td>
</tr>
<tr>
<td>or buy online at <a href="http://www.wittrans.com">www.wittrans.com</a></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Automatic Transmission Parts</th>
<th>Standard Transmission Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Parts</td>
<td></td>
</tr>
<tr>
<td>• OE Manufacturer, Aftermarket New, Remanufactured, &amp; Used</td>
<td></td>
</tr>
<tr>
<td>• Clutch Drums</td>
<td>• Rebuilt Kits</td>
</tr>
<tr>
<td>• Shafts</td>
<td>• Bearing Kits with Syncro Rings</td>
</tr>
<tr>
<td>• Front Pumps</td>
<td>• Gasket Sets</td>
</tr>
<tr>
<td>• Valves Bodies</td>
<td>• Gears &amp; Shafts</td>
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<tr>
<td>• Complete Line of Miscellaneous parts</td>
<td>• Rebuilt Transmissions</td>
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<tr>
<td>Torque Converters</td>
<td>• Standards</td>
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<tr>
<td>• Complete line of CVC Remanufactured Converters</td>
<td>• Clutch Parts</td>
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<tr>
<td>Soft Parts</td>
<td>• Sach’s &amp; Valeo Clutch Kits (New)</td>
</tr>
<tr>
<td>• Master Kits</td>
<td>• Forks</td>
</tr>
<tr>
<td>• Banner Kits (Less Steels)</td>
<td>• Pilot Bushings &amp; Bearings</td>
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<tr>
<td>• Overhaul Kits</td>
<td>• Clutch Alignment Tools</td>
</tr>
<tr>
<td>• Paper/Rubber Kits</td>
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<td>• Filters &amp; Kits</td>
<td>• Transfer Case Parts</td>
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<td>• Frictions</td>
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<td>• Chains</td>
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<td>• Modulators</td>
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<td>• Washers</td>
<td>• Shop Supplies &amp; Tools</td>
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<td>• Bearings</td>
<td>• Additives</td>
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<tr>
<td>• Gaskets</td>
<td>• Assembly Lubricants</td>
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<tr>
<td>• Bands</td>
<td>• Builders Benches</td>
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<tr>
<td>• Flex Plates &amp; Flywheels</td>
<td>• Lifts</td>
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<td>• Speedo Gears</td>
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<td>• Mounts</td>
<td>• Tools &amp; Equipment</td>
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<td></td>
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<tr>
<td>• Transgo Shift Kits</td>
<td></td>
</tr>
</tbody>
</table>

**WHATEVER IT TAKES “BRINGING SERVICE OUT WEST”**
What are you really selling your customers? Performance? Reliability? Peace of mind? The truth is, when someone comes to you with a transmission problem, they want it fixed quickly and cost effectively with as few worries and hassles as possible. That’s exactly what Precision International, the worldwide leader in quality-tested domestic and foreign transmissions, delivers.

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Overdrive Drum

The overdrive drum assembly also contains the input shaft. This makes it difficult to remove the piston from the clutch drum. For now, the only place to get those special tools is from Ford/Rotunda. Since that can be both time-consuming and expensive, we decided to use parts from around the shop to imitate the special tools needed to disassemble and reassemble the 6F50N.

To remove the retaining snap ring from the OD clutch piston return spring assembly (figure 9), you can use:

- an A4LD/5R55E rear ring gear (for the low/reverse planet)
- a worn out OD clutch hub/shaft from a 4T60E
- a large deep socket
- a suitable press

Here’s how to build your OD snap ring removal tool:

- Use a cutting wheel to cut large slots out of the 4th clutch hub/shaft.
- Place the ring gear on the clutch retainer.
- Slide the 4th clutch hub down onto the ring gear (figure 10).
- Use the deep socket as an extension of the hub to be pressed down to remove the ring (figures 11 and 12).

Direct Drum

To remove and install the direct clutch piston return spring without breaking the tab, we used:

- a low/reverse piston from an AW50-42LE or a 4L30E reverse clutch piston.
Ford 6F50N Rebuilding Techniques

- a bar or 12” long, 3/8” extension.

The 4L30E reverse piston will have to be modified with a cutting wheel to provide access to the snap ring, but it’s the correct diameter to fit the direct clutch piston. Or you can just use the AW50-42LE low/reverse piston (figure 13).

Place the drum in the press with the bar or extension across the piston to push the piston down evenly (figure 14).

CAUTION — Only press the direct clutch cylinder down far enough to get the snap ring out of its groove. Pressing the cylinder down too far can break the tab and the cylinder.

Intermediate Drum

To remove and install the intermediate clutch retaining snap ring, use:
- an E40D/4R100 sun shell or RESR05A sun shell (cut two slots opposite each other).
- a bar to use in the press.

Use a cutting wheel or a torch (much faster) to cut large notches out of the sun shell (figure 15). These slots will provide access to the snap ring. The slots shouldn’t be any wider than 4”; any larger and the return springs may distort as you compress the spring.

Simply install the shell over the return spring assembly and use a press or equivalent to press the shell down far enough to reach the snap ring (figure 16).
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Reverse Drum

By far this is the easiest drum assembly to get into. To remove or install the reverse clutch return spring, all you’ll need is a pair of C-clamp vice grips.

- Start one end of the retaining snap into the groove.
- An inch or two away from the end of the snap ring you started installing, use the C clamp to compress the return spring (figure 17).
- Use a screwdriver with a twisting motion to secure the snap ring in place.
- Move around the end cover until the retaining ring is completely seated in the groove (figure 18).

TSS and OSS Replacement

You can replace the Turbine Shaft Speed sensor (TSS) and Output Shaft Speed sensor (OSS) with the transmission in the vehicle (figure 19). But it’s much easier to replace the TSS than the OSS. The TSS is located under the valve body (figure 20). To replace the
TSS, remove the TCM and valve body, then replace the TSS assembly.

The OSS requires a little more effort; the OSS is located in the end cover (figure 21) and connects to the valve body. This means the wiring runs inside the transmission and snakes its way back to the valve body (figure 22). To replace the OSS:

- Remove the pan.
- Disconnect the harness.
- Unbolt the OSS and remove it.

Reinstalling the OSS is a bit different. You’ll need to run a metal snake or heavy gauge wire through the end cover and the case, and then attach the OSS connector to the snake and pull it through (figure 23).

As for the rest of the rebuild, well, it’s still just a transmission… no problems there! And that’s the game!
How Much? There’s More to It than You Think

Most of us think of marketing as sales and advertising. Marketing is really much broader than that. Advertising is only one aspect of marketing, and it has just one purpose – the creation of leads. Advertising is not to create sales...it creates sales opportunities - leads.

Before you invest a ton of money in advertising, are you sure you’re converting the leads your advertising is generating? In the automotive repair business, most leads come to us over the phone; so it’s imperative to use the best telephone procedures available.

Even the worst telephone procedures will get appointments. If that wasn’t true, some of you would have been out of business years ago. With that in mind, don’t read this article with the attitude that what you’re doing is working. I’m not arguing that point; I’m just asking you to be open to the possibility that you can improve on what you’re doing.

Whether using a memorized telephone script or just “winging it”, price shoppers can strike fear in the seasoned professional. Over the years, some of the best trainers in the industry have taught us techniques and scripts to avoid quoting prices over the phone.

It’s been said time and again that customers ask “How much?” only because they don’t know what else to ask. I don’t buy into that theory. In fact, I think it’s a silly belief. They ask because they want to know the price and frankly, the sooner the better. What reasonable person wouldn’t be worried about the price?

For years I have pondered the price shopper dilemma. I’ve come to the conclusion that when a caller asks for a price, they are asking only part of the question. What they really want to know is, “What do I have to do to find out how much it will cost?”

Think about it. What would you say if a caller actually asked, “What do I have to do to find out how much it will cost to fix my transmission?” Does it make sense to ask a list of questions about the car, what it’s doing, how long it’s been doing it, etc? Even if you normally quote prices over the phone, would you answer the question by giving a price range or an estimate?

No...you would most likely tell them to bring the car in so you can check it and give them an estimate.

So next time, give this a try. Regardless of how the caller asks for a price, pretend they asked, “What do I have to do to find out how much it will cost to fix my transmission?” Now, just answer that question and invite them in so you can check the car and give them an estimate. Here is a simple script that really works well.

1. “Thank you for calling Certified Transmission, how may I help you?”
2. When they ask for a price, you say, “A price? – you bet; would you rather bring it in now or later today so we can check it and give you an estimate?”
3. If they ask again, say, “I’ll be happy to give you a price as soon as we’ve checked your car. For your benefit, there’s no charge for the check, it only takes about 20 minutes, and we’ll even do it while you wait. Is today good for you, or would tomorrow be better?”
4. When they agree to an appointment, get their name, number, vehicle details, and don’t forget to give them directions to your shop.

Believe it or not, this simple technique works. I don’t blame you if you’re skeptical, but I know it works. Plus it’s so short and simple that anyone in your shop can do it.

Next month I’ll expand more on this telephone procedure and share some of the best telephone finesse techniques, ever. Until then, give it a try...the nicest thing about this script is that you haven’t risked a thing. If the caller balks, you can still fall back and use your current technique. But as you practice, you’ll find that you won’t have to go back to the old procedure as often.

By the way, if you want a little coaching on this or anything related to sales and marketing, feel free to send me an email or give me a phone call. My email is Thom@CertifiedTransmission.com and my phone number is 800-544-7520 ext 173.
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Freeway Transmission ...........................................Salt Lake City, UT .........................................800-354-5920
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Norfolk Transmission and Muffler ..............................North-Central Nebraska ...............................800-234-8726
RMP .................................................................Philadelphia, PA Metro .................................800-257-7418
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The converter was from a ZF 5HP19 with a captive clutch, fitted to an Audi AWD. We’d overhauled the converter about a month before and now my customer, who was a transmission rebuilder about 350 miles away, claimed the converter shuddered during the regulation phase. As always, my first question was, “What fluid are you using?”

“Dexron 3,” he replied.

So naturally I suggested that he switch to either the factory fill or an equivalent. He did so and reported that the shudder was gone.

About three weeks later he called again to tell me the converter was shuddering again. I decided I needed to get the unit back and check it. There was no evidence of any problem, so I suggested he check the transmission carefully. We reassembled the converter with new lining and extra care on the clearances. He installed it and reported that the shudder was once again gone.

About a month later he called to tell me that his customer was once again complaining of a shudder. He tried another valve body and was now sure it was the converter. He suggested that perhaps he should send the converter to another rebuilder, because it appeared we weren’t having any luck, and the competitor assured him that he would be able to fix the problem. I was reluctant to allow this as he’s a good customer. So after asking around and hearing that often the fault could only be cured with a factory converter, I offered to obtain a factory unit for him.

The factory unit arrived and was fitted; vehicle drove well with no shudder. About another month goes by and the customer is back once again with the same complaint. I was out of ideas; the only way that I could help was to look at the car. That’s no problem for us, since we’re also a transmission shop.
The car arrived and sure enough, it had one of the worst shudders I’ve ever felt. We checked the obvious external causes such as engine codes, etc., and then removed the pan. This is where it got interesting: The technician noticed the fluid had a strange look to it. Not pink or discoloured, but “just doesn’t look right.”

At the last TCRA seminar there was a brief mention of testing for water using a drip coffee maker with a paper filter (Figure 1). A drop of the fluid hit the hot plate and it sizzled: a sure sign of water (Figure 2 and 3).

Then we had a professional test performed. It revealed the fluid had 2% water contamination. It turned out that the radiator was leaking coolant into the fluid; not a lot, just enough to change the frictional characteristic of the fluid. Of course each time the fluid was changed the problem was gone until the contamination reached the critical level again.

We rebuilt the converter once again, with new converter clutch lining. And the transmission was rebuilt again using new clutches, and the car’s radiator replaced. Several months have passed without any further problems.

The moral of the story? Think outside the box, don’t take anything for granted, and remember this quick and easy test for water in the ATF. Just put a drop on the hotplate of your coffee maker: If it sizzles and spits, it’s likely contaminated with water; if it just smokes the fluid is okay.

Remember: the fluid can look good and still be contaminated. And this test won’t identify all types of contamination. It’s possible to have a coolant leak that won’t show up with this “quick and dirty” test. I strongly recommend that you invest in a commercially available test kit to check for coolant contamination.

Of course the best part of this whole story is that I retained my customer and was paid for all the converters and the transmission job... as well as a radiator!

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The Mercedes 722.9 transmission has been around since the later part of 2004, but there still isn’t a lot written about it. The 722.9 can be found in these Mercedes vehicles:

2004-06 – SL500

2005-up – CL500, E500, S430, 500, SLK350, 55 AMG

2006-up – C230, 280, 350, CLK350, CLS500, E350, E63 AMG, R350, 500, SLK280


That’s a lot of vehicles! This 5th generation transmission is the first 7-speed automatic produced by Mercedes Benz. The Mercedes designation for this transmission is New Automatic Gearbox 2 (NAG2) or 7G–Tronic. Along with seven forward speeds this unit also has two reverse gears ratios (similar to the 722.6) depending on whether it’s in Sport or Comfort mode.

Shift Strategy

Shift strategy improvements include:

- Computer reaction time is 0.1 second shorter.
- Downshifts are shortened by up to 0.2 seconds.
- Coasting downshifts are shortened by 0.4/2.5 seconds.
- 37-47 MPH acceleration times are shortened by 23-28% (model dependent).
- Fuel consumption is reduced by up to 4%.
- Noise levels are reduced due to lower engine speed in 5th, 6th and 7th gear at constant vehicle speed.
- Flexible adaptation to vehicle and engine.
- Earlier upshifts and later downshifts
- Reverse gear 2 (2.231:1)

The transmission will start in first gear if any of these conditions apply:

- 1st gear is selected manually.
- ¾-throttle to full-throttle acceleration from start.
- Cold engine temperature (pre-catalytic warmup).

Emergency Function or Limp-Home Mode

There are a variety of failsafe modes:

- If a solenoid doesn’t work the affected gear is blocked. For example: if solenoid Y3/8y7 or the B3 clutch is defective, you won’t have 1st, 7th or reverse in S mode.
- If a hydraulic fault prevents a gear from engaging, the previous gear will remain applied.
- If the computer defaults to limp mode while driving, it’ll turn all solenoids off.
### Table 1

<table>
<thead>
<tr>
<th>Shift Member</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>BR</th>
<th>K1</th>
<th>K2</th>
<th>K3</th>
</tr>
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<tbody>
<tr>
<td>Gear 1</td>
<td>4.377</td>
<td>C=Max / P=0</td>
<td>X / C=V / P=V</td>
<td>X / C=V / P=V</td>
<td>C=0 / P=0</td>
<td>C=Max / P=0</td>
<td>X / C=V / P=V</td>
</tr>
<tr>
<td>Gear 2</td>
<td>2.959</td>
<td>X / C=V / P=V</td>
<td>X / C=V / P=V</td>
<td>C=0 / P=0</td>
<td>C=Max / P=0</td>
<td>X / C=V / P=V</td>
<td>C=Max / P=0</td>
</tr>
<tr>
<td>Gear 3</td>
<td>1.921</td>
<td>C=Max / P=0</td>
<td>X / C=V / P=V</td>
<td>C=0 / P=0</td>
<td>C=Max / P=0</td>
<td>X / C=V / P=V</td>
<td>C=Max / P=0</td>
</tr>
<tr>
<td>Gear 4</td>
<td>1.368</td>
<td>C=Max / P=0</td>
<td>X / C=V / P=V</td>
<td>C=0 / P=0</td>
<td>X / C=V / P=V</td>
<td>C=Max / P=0</td>
<td>C=Max / P=0</td>
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<tr>
<td>Gear 5</td>
<td>1</td>
<td>C=Max / P=0</td>
<td>C=0 / P=0</td>
<td>C=0 / P=0</td>
<td>C=Max / P=0</td>
<td>X / C=V / P=V</td>
<td>C=Max / P=0</td>
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<tr>
<td>Gear 6</td>
<td>0.82</td>
<td>X / C=V / P=V</td>
<td>X / C=V / P=V</td>
<td>C=0 / P=0</td>
<td>X / C=V / P=V</td>
<td>X / C=V / P=V</td>
<td>X / C=V / P=V</td>
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<tr>
<td>Gear 7</td>
<td>0.728</td>
<td>C=Max / P=0</td>
<td>C=0 / P=0</td>
<td>X / C=V / P=V</td>
<td>C=0 / P=0</td>
<td>X / C=V / P=V</td>
<td>C=0 / P=0</td>
</tr>
</tbody>
</table>

**N (1)**

1. C=Max / P=0
2. X / C=V / P=V
3. C=0 / P=0
4. X / C=V / P=V
5. C=Max / P=0
6. X / C=V / P=V
7. C=0 / P=0
8. X / C=V / P=V

**R (1)**

1. C=Max / P=0
2. X / C=V / P=V
3. C=0 / P=0
4. X / C=V / P=V
5. C=Max / P=0
6. X / C=V / P=V
7. C=0 / P=0
8. X / C=V / P=V

**R (2)**

1. C=Max / P=0
2. X / C=V / P=V
3. C=0 / P=0
4. X / C=V / P=V
5. C=Max / P=0
6. X / C=V / P=V
7. C=0 / P=0
8. X / C=V / P=V

### Figure 1

Solenoids that are normally open will allow full pressure to selected clutches and the transmission will be in 6th gear. After shifting to park, oil pressure from K2 solenoid is redirected to the B2/BR solenoid by emergency operation valves, and the transmission will be in 6th gear.
will now provide reverse, and 2\textsuperscript{nd} gear with the selector in drive (figure 1).

**Electronic Control Components**

Here’s a diagram of the components that make up the electronic control system (figure 2):

- Transmission Control Module (Y3/8n4) (flash capable)
- Working Pressure Control Solenoid (Y3/8y1) (line/normally open)
- K1 Clutch Solenoid (Y3/8y2) (normally closed)
- K2 Clutch Solenoid (Y3/8y3) (normally open)
- K3 Clutch Solenoid (Y3/8y4) (normally open)
- B1 Brake Clutch Solenoid (Y3/8y5) (normally open)
- B2 Brake Clutch Solenoid (Y3/8y6) (normally closed)
- B3 Brake Clutch Solenoid (Y3/8y7) (normally closed)
- Torque Converter Lockup Solenoid (Y3/8y8) (normally closed)

Normally Closed: high current, high pressure; no current, no pressure.
Normally Open: no current, high pressure; high current, low pressure.
Normally open solenoids are used for limp mode with no current to the transmission.

**Two Oil Floats**

- Oil Control Float 1 (31)
- Oil Control Float 2 (32)

**Fluid Level Float Function 2**

The extended length of the transmission (41mm) allows oil to slosh forward during hard stops. To prevent oil foaming from gears running in fluid, Mercedes added a front float.

**Three Speed Sensors**

These components are built into the valve body assembly (figure 3):

- Turbine RPM Sensor (Y3/8n1) (Front)
- Internal RPM Sensor (Y3/8n2) (Center)
- Output RPM Sensor (Y3/8n3) (Rear / Hall Effect)
- Selection Range Sensor (Y3/8s1)
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Range Sensor Function

The Y3/8s1 range sensor is built into the ECM ribbon cable, and can’t be replaced individually. It’s a Permanent Magnetic Linear Contactless Displacement (PLCD) sensor; it has a permanent magnet mounted to the manual valve, which changes the magnetic field and output voltage as you move the selector. If the sensor signal doesn’t register properly with the computer, it’ll put the system into limp mode.

Speed Sensor Function

The 722.9 uses three speed sensors to monitor transmission operation (figure 4):
1. The front speed sensor (Y3/8n1) monitors turbine speed (input shaft / small ring gear).
2. The center speed sensor (Y3/8n2) monitors the Ravigneaux carrier speed (ring gear of rear planet).
3. The rear speed sensor (Y3/8n3) monitors the park pawl gear (exciter ring/2 Hall Effect).

The magnets for these sensors are molded in a plastic ring and secured inside nonferrous flanges.

Transmission Fluid Temperature

The transmission fluid temperature sensor is built into the TCM, and isn’t replaceable separately.

Clutch Components

The 722.9 uses four brakes and three clutch packs to provide seven forward gear ranges and two reverse ranges.
- 4 Multi-Disc Brakes
- 3 Multi-Disc Clutches
- No Sprag

Gear ratios are achieved with one Ravigneaux and two simple planetary assemblies shown in figure 5. Unlike the Lepelletier geartrain, the 722.9 geartrain has the sun gear fixed to the K1 clutch assembly, located in the front of the unit (figure 6). The Ravigneaux planetary assembly is also located in the front section of the transmission (figure 7). There are two simple planets located toward the back of the transmission, one in front of the other (figure 8).

Fluid Type

The 722.9 uses a newly-developed, suggested-use-only transmission fluid, referred to as ATF 3353 (figure 9). It promises a higher friction consistency, thermal stability, and temperature rating. ATF 3353 can also be used on previous model 722.3/.4/.5/.6 transmissions. This special ATF is available from Shell & Fuchs Europe oil suppliers in 1 liter bottles under Mercedes Benz part number A001 989 45 03 10.

No scheduled maintenance is required for the 722.9 (fill for life).

In the next issue we’ll go into sequential shifting, powerflow, and some unusual features associated with the Mercedes 722.9.
K1 Clutch Assembly

Ravigneaux Planetary Gears

Planetary Assembly

Figure 6

Figure 7

Figure 8

Figure 9
Writing Your Operations Manual

How I Run My Business

In the last edition of GEARs, we began to discuss how you could put an operations manual together that you could hand over to someone who had to replace you. In the closing paragraph I told you I’d make it easy for you create your manual. I can do that because I’ve already done one for our shop, so the organization of such a manual is already done. I’ll provide a template for you, but you’ll need to fill in the details.

This may surprise you, but you’re already doing this. For example, every time you plan to be absent from the shop you write notes to your employees. If you’re going to be away for less than a day you probably leave post-it notes for anyone who has to make a decision for you until you get back. If you’re going on vacation, the post-it notes aren’t adequate, so you write some things to remember about “how we do things here.”

But what if you’re going away, never to return? In that case, what you’re going to write is a homespun, amateur operations manual, and it’s just an extension of the same thing you’ve been doing when you left notes for your staff.

So we’re talking about a collection of your thoughts built around one simple theme: “How I Run My Business.” And remember, it’s about YOUR business… not anybody else’s. That means that you’ll explain not just what you do at your shop but why you do it that way. You won’t be around to explain anything later, so you have to do it now. So let’s get started.

Getting Started

I’d suggest you use a student notebook or a loose-leaf binder for your notes. Keep it handy to jot something down whenever you think of something relevant to your way of doing business. The notebook needs to have at least 70 pages. Put a heading on the first page that reads “What is a transmission shop?” Leave two blank pages and put a heading on the next that reads “Why am I in the transmission business?” Two more blank pages before you write “What I know about my competitors.”

Keep going: Leave two blank pages, then write sections for each of these headings:

- Where is our shop, what does it look like, how is it equipped?
- What factors have led to our success in sales?
- The future of my business, if I could have it my way.
- The trade associations, colleges, AAA, etc., that think we’re cool.
- How a typical trans job gets processed through our shop.
- Who works here and what I expect from each of them.
- How we price our work for different kinds of jobs.
- The minimum standards I insist on for work done here.
- How we warrant our work.
- The forms and computer systems we use.
- Advertising I like, and advertising I don’t like.
- How we generate business from outside sales.
- Who we buy from, who we don’t, and why.
- The legal stuff: incorporation papers, leases, contracts, tax documents.

- How the shop gets cleaned and equipment maintained.

Stuff to Write Down

Believe it or not, you’re now organized to write your own, personalized operations manual. It’ll reveal your acquired wisdom that’s given rise to the success of your business. You don’t have to write an English essay on each of the 18 topics listed; you just have to make notes, comments and observations. At this point it doesn’t have to be presentable. The various pages are just for you to collect data that you’ll assemble later.

Start writing. I suggest you start with an easy one first like “Who we buy from, who we don’t, and why.” List all the suppliers you use, including parts, shop supplies, ATF, waste disposal, towing, tools, maintenance services, uniforms and the like. Now explain why you choose them and avoid others. That explanation reveals your real life experiences with each and justifies your choices.

Go into detail as you write your notes. For example, “parts” may need to be broken down into soft parts, hard parts, cores, torque converters, manual trans parts, reman assemblies, cutouts, etc.

Under “hard parts” you’ll probably have strong feelings about rejecting sales pitches from junk suppliers so you need to state that, and, at the same time, refer your successor to hard part suppliers you trust.

“Soft parts” suppliers are plentiful, but your experience with quality, pricing and delivery will dictate which ones to use and which to use only for back up.

Similarly, whose torque convert-
ers do you use and why? Do you R&R torque converters? How do you control core returns? For this section, just imagine you’re writing to a new Parts Manager you’ve hired to do all your parts purchasing; then imagine you’ll never speak to him again — this is your only communication!

Writing Incidentally
A lot of these ideas will occur to you as you’re working. That’s when you need to grab the notebook and make an entry. If your notebook isn’t nearby, write your thoughts on a post-it note and stick it into the notebook later. Don’t worry about inserting things in the right spot on the page; just jot them down somewhere in the correct section marked “Who we buy from, who we don’t, and why.”

Okay, if you want to start on a couple of other easy ones, I suggest the next the topic to be “The minimum standards I insist on for work done here.” This subject surfaces every day when you’re selling your work and when you’re overseeing operations.

So, what does go into every automatic overhaul at your shop? Do you replace the EPC in every electronic unit? Do you use one particular manufacturer’s valve body updates in any or all rebuilds? Is the converter always replaced? Do you use rebuilt valve bodies for some units? When and why?

You need to use the same level of detail regarding manual transmission jobs, clutch jobs, differentials, transfer cases and anything else you work on. The object is to explain to a newcomer how you like everything done.

Warranty policy and procedure is another easy one for you to write about. So go to the section in your notebook called “How we warrant our work.” Describe the warranty provisions and the limits you offer for the various jobs you do.

Do you use the Golden Rule Warranty program? What unwritten procedures do you follow when a warranty is expired but you feel a moral obligation to “do something” for your customer? Now’s the time for those unwritten procedures to become written. Your successor is in the dark. He or she needs to know how you’d handle each situation.

Writing to The Ignorant
Remember, throughout this process you’re writing to someone who may be completely ignorant of how to run your transmission shop. Heaven forbid, but it may be your widow who’s offering your shop to a potential buyer who’s never worked in the transmission business before.

She can’t show him the ropes. Hopefully she can provide him with your operations manual that spells out how this profitable transmission shop works. And you’re the only one who can download your brain into a printed format.

Next Month and Beyond
As you can probably guess by now, the heading pages in your notebook will develop into a table of contents for your finished product. But that’s a long way off yet. You have a lot of notations to jot down under the 18 sections we discussed.

So work away at the easy ones. In the next issue of GEARS, we’ll start probing at the question of “Why am I in the transmission business?” You’ll need to think hard about that subject, but I’ll help you with that one, too.

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In our last issue of *Keep Those Trannys Rolling*, we took a brief look at what’s new in four-wheel drive systems and discussed Borg Warner’s Interactive Torque Management System (ITM 3e). In this issue, we’re going to take a closer look at the Interactive Torque Management System available in various models of the 2009 Chrysler 300, Dodge Magnum, and Dodge Charger.

These vehicles use an electronically-controlled transfer case, which eliminates the need for an electronically-controlled coupler at the rear differential as was used in other applications.

This new ITM 3e system is made up of two technologies: Active Transfer Case and Front Axle Disconnect (also known as FAD). The system uses a new design transfer case that automatically connects and disconnects the components that drive the front wheels. The all-wheel drive system operation is seamless. An indicator diagram is located between the tachometer and speedometer to show the driver which wheels are receiving power (figures 1 and 2).

**The Heart of the ITM 3e System**

The heart of the ITM 3e system is the Borg Warner 44-40 transfer case (figure 3). The Borg Warner 44-40 (BW44-40) transfer case allows torque to be applied variably to the front axle, and it has a fixed gear ratio. By allowing variable torque application between the front and rear axles, this all-wheel drive system can be driven on dry pavement without the typical driveline wind-up (crow hopping) that occurs with most four-wheel drive transfer cases.

Depending on conditions, the Drive Train Control Module (DTCM) will modulate the electronic clutch assembly within the transfer case (figure 4) to vary the amount of torque applied to the front axle, while continuing to deliver torque to the rear axle.

This BW44-40 transfer case uses
a special MOPAR transfer case lubricant (p/n 68049954AA). The BW44-40 transfer case contains an oil pump to circulate gear lube throughout the transfer case and provide clutch cooling. The Drive Train Control Module monitors the temperature of the transfer case with a temperature sensor and is capable of disengaging the all-wheel drive system if transfer case temperature exceeds recommended limits.

**Brains of the ITM 3e System**

The Drive Train Control Module (DTCM) is the brains of this ITM 3e all-wheel drive system. In the earlier versions (2007 and 2008), the AWD control module controlled the all-wheel drive system and the electronically-controlled coupler located in the rear differential.

In the 2009 ITM 3e system, the electronically controlled coupler was eliminated, and the AWD module has been replaced with a Drive Train Control Module. The Drive Train Control Module controls the electronic transfer case, providing seamless all-wheel drive operation when needed. The DTCM communicates with the PCM, TCM and ABS control module over the CAN-C system and uses inputs from each of these systems to control the all-wheel drive system (figure 5).

**Diagnosing the ITM 3e System**

Diagnosing the new ITM 3e all-wheel drive system is pretty straightforward. Simply connect your scan tool to the DLC connector and check for codes in the PCM, TCM and ABS control module. Document all codes received from each of these modules.

Before starting your diagnosis, correct any codes in the other modules. PCM, TCM and ABS problems can interfere with the all-wheel drive system operation. After all the codes have been corrected in the other modules, access the Drive Train Control Module and retrieve any codes in memory. Here are the codes you might find in the Drive Train Control Module, and what those codes indicate:

- **C1078** — Tire revolution range performance. Indicates the DTCM has received a message from the ABS control module indicating an out of range tire revolution. Check the ABS control system for wheel speed sensor codes. Repair as needed.
- **C1456** — AWD clutch power control circuit low. Indicates the DTCM has detected low voltage in the AWD clutch power circuit. Check battery or system voltage. Check DTCM power and grounds. Check AWD clutch circuit. Repair as needed.
- **C1457** — AWD clutch power control circuit high. Indicates the DTCM has detected high voltage in the AWD clutch power feed circuit. Check battery or system voltage. Check DTCM power and grounds. Check AWD clutch circuit. Repair as needed.
- **C145D** — AWD clutch power/return control circuit open. Indicates the DTCM has detected an open circuit in the AWD clutch power or ground circuit. Check AWD clutch control circuit. Repair as needed.
- **C1464** — Front axle disconnect control circuit low. Indicates the DTCM has detected low voltage in the front axle disconnect circuit. Check DTCM power and grounds. Check front axle disconnect circuit. Repair as needed.
- **C1465** — Front axle disconnect control circuit high. Indicates the DTCM has detected high voltage in the front axle disconnect circuit. Check DTCM power and grounds. Check front axle disconnect circuit. Repair as needed.
- **C1477** — Transfer case clutch
over temperature. Indicates the DTCM has received a signal from the transfer case temperature sensor indicating the transfer case fluid is too hot. Check the transfer case temperature sensor circuit, wiring and connections. Check transfer case lube circuit.

C147A — Transfer case temperature sensor high. Indicates the DTCM has detected an abnormally high voltage in the transfer case temperature sensor circuit. Check temperature sensor circuit, wiring and connections. Check transfer case temperature sensor. Repair as needed.

C147B — Front axle disconnect circuit sensor performance. Indicates the DTCM has detected a performance problem in the front axle disconnect sensor circuit. Check front axle disconnect sensor circuit, wiring and connections. Repair as needed.

C147C — Front axle disconnect power supply circuit low. Indicates the DTCM has detected low voltage in the front axle disconnect power circuit. Check DTCM power and grounds. Check front axle disconnect power circuit, wiring and connections. Repair as needed.

C147D — Front axle disconnect power supply circuit high. Indicates the DTCM has detected high voltage in
the front axle disconnect power circuit. Check DTCM power and grounds. Check front axle disconnect power circuit, wiring and connections. Repair as needed.

C2100 — Battery voltage low. Indicates the DTCM has detected low voltage to the DTCM. Check battery or system voltage. Check charging system. Check DTCM power and grounds. Repair as needed.

C2101 — Battery voltage high. Indicates the DTCM has detected high voltage to the DTCM. Check battery or system voltage. Check charging system. Check DTCM power and grounds. Repair as needed.

C2112 — Sensor supply voltage circuit high. Indicates the DTCM has detected high voltage on the transfer case sensor circuit. Check DTCM power and grounds. Check sensor circuit, wiring and connections. Repair as needed.

C2201 — Internal controller failure. Indicates the DTCM has detected an internal failure. Check DTCM power and grounds. If code returns, replace DTCM.


U0100 — Lost communication with ECM/PCM. Indicates the DTCM has lost communication with the ECM/PCM. Check communication with other modules. If communication with all other modules is possible, check ECM/PCM power and grounds. Check ECM/PCM CAN C circuits, wiring and connections. Repair as needed. Possible ECM/PCM failure.

U0101 — Lost communication with TCM. Indicates the DTCM has lost communication with the TCM. Check communication with other modules. If communication with all other modules is possible, check TCM power and grounds. Check TCM CAN C buss circuit, wiring and connections. Repair as needed. Possible TCM failure.

U0121 — Lost communication with ABS. Indicates the DTCM has lost communication with the ABS control module. Check communication with other modules. If communication with all other modules is possible,
with FCM/TIPM. Indicates the DTCM has lost communication with the FCM/TIPM. Check communication with other modules. If communication with all other modules is possible, check FCM/TIPM power and grounds. Check FCM/TIPM CAN C buss circuit, wiring and connection. Repair as needed. Possible FCM/TIPM failure.

U0212 — Lost communication with SCM. Indicates the DTCM has lost communication with the SCM. Check communication with other modules. If communication with all other modules is possible, check SCM power and grounds. Check SCM CAN C buss circuit, wiring and connections. Repair as needed. Possible SCM failure.

U0401 — Implausible data from ECM/PCM. Indicates the DTCM has received data from the ECM/PCM that doesn’t match conditions or is out of range. Check data in ECM/PCM.

U0402 — Implausible data from TCM. Indicates the DTCM has received data from the TCM that doesn’t match conditions or is out of range. Check data in TCM.

U0415 — Implausible data from ABS. Indicates the DTCM has received data from the ABS control module that doesn’t match conditions or is out of range. Check data in ABS module.

U0429 — Implausible data from SCM. Indicates the DTCM has received data from the SCM that doesn’t match conditions or is out of range. Check data in SCM.

U0431 — Implausible data from FCM/TIPM. Indicates the DTCM has received data from the FCM/TIPM that doesn’t match conditions or is out of range. Check data in FCM/TIPM.

Refer to the appropriate service manual for your specific vehicle’s diagnostic routines.

Well, there you have it: a closer look at Chrysler’s new ITM 3e All-Wheel Drive System. With a basic understanding of how Chrysler’s new ITM 3e All-Wheel Drive System operates and a quick look at the diagnostic routines available, you should have no problem keeping those trannys rolling.
check ABS control module power and grounds. Check ABS CAN C buss circuit wiring and connections. Repair as needed. Possible ABS module failure.

U0141 — Lost communication

Figure 5: Drive Train Control Module (DTCM) wiring schematic
You’ve just completed a rebuild on a late model ZF. You replaced all the clutches and seals, and installed a rebuilt converter. You put the unit back into the car and fill it to the correct level. Once you have everything buttoned up, it’s time for a test drive.

It doesn’t take long to notice the problem: a chatter when the converter clutch applies. Everything else seems fine… sort of. Well, maybe the clutch applies are a little firm, but not so severe that the customer will notice. But there’s no way you can deliver the car with this TCC chatter. You’re going to have to pull the transmission back out and replace the converter… again!

Wait… don’t blame the torque converter or the converter clutch just yet. They may not be causing the chatter. But then, if the converter’s okay, why is the clutch chattering?

How about the fluid?

Once upon a time, automatic transmission fluid came in two different flavors: Type A and Type F. Type F went into Fords that used bronze clutch facings, and everything else took Type A. So remembering which one you needed for which transmission wasn’t all that difficult.

That was over a quarter century ago. Today there are hundreds of different units on the road, and dozens of different oils made to address their individual performance characteristics. Some of those oils cost a bundle: as much as $45 a quart!

Between all the different types of fluid and their extreme costs, there’s no way any shop can keep a reasonable selection in stock. So many shops try to save by using Dexron in every transmission. When used with a friction modifier, many transmissions work just fine with Dexron.

But some transmissions aren’t so forgiving. In some cases the type of clutch material you used won’t apply smoothly with Dexron, even though it worked fine in another transmission. In others, no amount of coaxing or modifiers will overcome the differences between Dexron and the factory fill. ZF units are a good example of a transmission that’s usually a lot happier with the manufacturer’s brand of ATF.

So how can you be sure which units will accept Dexron and which won’t? Start by following the recommendations in the application guides from Lubeguard and Life, available online at the ATRA Tech Center, under the Quick Reference link.

These guides provide the information to help you avoid most compatibility problems with the ATF. But if you run into a converter clutch chatter, suspect the fluid before replacing the converter a second time. Replace the fluid with a factory fill and try again. If the chatter goes away, you know that this is one unit that just won’t get cozy with Dexron.

Of course, you can improve your rebuild’s durability and shift quality with one of the additive packages from Lubeguard or Life, even when used with the factory fill.

Just remember, if the converter clutch chatters, make sure you aren’t fighting a fluid compatibility problem before you start replacing the converter… for a second time.
Today's complex electronic transmissions require precise and accurate control, like the control provided by BorgWarner quality transmission solenoids. Our solenoids are engineered to exacting specifications, improving fuel economy and reducing emissions.

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Murphy’s Law tells us that “anything that can go wrong probably will.” And time and time again, Murphy has been proven right. In fact, today there are dozens of corollaries to Murphy’s Law, including:

• An open-faced sandwich will always fall peanut butter-side down (directly proportional to the cost of the carpet, and inversely proportional to the carpet’s age).
• Your kids (or pets) will always get sick after the doctor’s office has closed (usually Christmas Eve, after 6 pm).
• A car will always break down at the most inconvenient moment, and during the most inconvenient conditions. Like when you’re out for the evening and stuck on a long stretch of road, miles from home. And of course it’ll be at 9 pm or later… long after every shop has closed for the day.

And most importantly, a car will always break down at the most inopportune moment, and during the most inconvenient conditions. Like when you’re out for the evening and stuck on a long stretch of road, miles from home. And of course it’ll be at 9 pm or later… long after every shop has closed for the day.

But a customer who’s stuck in that situation won’t let a little thing like logic get in the way. He’s going to try calling your shop anyway, in the unlikely prospect of finding someone there to help him out of his jam.

Wouldn’t it be great if you were there to answer his call, and help him in his time of need? Simply answering the phone at that late hour will dramatically increase your chances of getting that job, and dozens of jobs like his that leave the customer stranded at all hours of the night or weekend.

Sure it’d be nice to get that work, but who wants to sit at their shop 24 hours a day, 7 days a week, waiting for those late night calls? Fortunately you don’t have to, you can be available to answer the phone without being there, using two simple, 21st century solutions: call forwarding and a cell phone.

**Call Forwarding**

Call forwarding is a service from your phone company that’s available nearly everywhere across the country. If you have a bundled phone package, you may already have call forwarding included in your service plan; otherwise you may have to pay a small monthly fee to have it added to your shop phone. Call your phone service provider for details and to add call forwarding.

Once you have call forwarding on your shop phone, using it is simple. Here’s how Verizon’s call forwarding plan works; most others work in a similar manner:

• Pick up your phone receiver and press *72 (on some areas it’s 72#).
• When you hear the tone, enter the number you want the call forwarded to, including the area code.
• That phone will ring. Once you answer it, call forwarding is active.

So you can pick up additional work simply by picking up the phone 24/7.
all calls until you deactivate call forwarding when you get into the shop the next morning. To the customer it’ll be completely transparent; as far as he knows, you’re at the shop answering the phone.

To deactivate call forwarding the next morning, just hit *73 (73# in some areas). Once you hear two short tones, call forwarding is deactivated. The calls will come to the shop phone again.

**Dedicated Cell Phone**

Next you’ll want a dedicated cell phone for taking shop calls. Why a dedicated phone instead of simply using your regular cell phone or home phone? For one thing, since it’s a dedicated phone, you’ll know to answer whenever your shop phone is set for call forwarding. Such as when it rings at 2 am, or early on Sunday morning. And it’s a phone you’ll want to leave on all night.

Second, when the dedicated phone rings, it’s just like your shop phone; you’ll answer it the same way: “Thank you for calling Central Transmissions. My name is Jim. How can I help you?”

Sure, many of today’s cell phones also offer unique rings, depending on who’s calling. But a separate phone eliminates any question about who it is, or whether to answer or not. If it rings, it’s a shop call, and you’ll answer it that way. Period.

Finally, using a dedicated phone allows you to pass the phone around, and give everyone a chance to handle the late night calls. Let’s face it, some of those calls may come in at really inconvenient hours — that’s the whole idea of using call forwarding on your shop phone. So you aren’t going to be able to handle the calls yourself all the time. You’ll want to share the responsibility with others, so everyone has a chance to get a good night’s sleep or go out for the evening once in awhile. A dedicated phone makes it easier to share the job with other members of the shop.

The services you require for this type of phone may be vastly different from those on your regular cell phone. You probably won’t need texting or internet access; but unlimited nights and weekends will probably be a benefit. There may be additional fees for taking forwarded calls on a cell phone; this can include long distance fees or additional minutes. Check ahead of time to make sure what they’ll be charging you, and adjust your service plan or provider to keep your costs as low as possible.

Remember that this is just an extension of your shop phone. You should answer it the same way you do the shop phone, in the same, professional manner. Sure, some of those calls will wake you out of a sound sleep, or interrupt your dinner. Try not to sound that way.

Do you use the ATRA Phone Procedure in your shop? You should, and you should have a Phone Procedure pad available at your home, as should everyone who takes a turn at answering the night and weekend calls. That way you won’t have to think about how you’re answering the phone, no matter what time of day it is. Contact the ATRA BookStore to order a Phone Pad starter kit or additional pads.

**24/7 Towing Service**

If someone calls you at 2 in the morning, chances are they’re stuck somewhere. If they were home, they’d probably wait until later to call. So you’ll have to send someone to get them… right now.

You’ll need to have a towing service available, offering dependable towing, 24 hours a day, 7 days a week. When a customer calls, **you’ll** take the information about where the car is and how to contact the customer. Then **you’ll** call the towing company and send them right out to pick up the car.

Never simply forward the call to the towing company, or ask the customer to call them directly; you want to remain in control of the customer and his car.

If you have a gated parking lot, give the tow truck driver a key to the lot, so he can bring the car right in and lock it in your secure parking area.

Some people will call the towing company directly when they have a problem. Work out a deal with them to bring potential customers directly to your shop, and you’ll pick up even more new customers.

Don’t forget to get a contact number to reach the customer the following morning. Make it a point to call the customer first thing when you get in, just to let him know you have his car, and to clarify any details about the problem. And let him know when you’ll be bringing the car in to check it out. That keeps the customer in the loop, and helps build his confidence in your shop.

**Market It**

Once you’ve committed to the idea of answering the phone at all hours of the day and night, don’t forget to let the world know. Add it to your Yellow Pages ad: Available 24/7, 365 Days a Year!

Remember, the customer who’s looking for a shop to call at 2 am doesn’t have a lot of confidence that he’s actually going to reach anyone. That simple statement on your ad will draw his eye, and you can be sure he’ll be calling your shop. All that’s left for you is to answer the phone.

Anything that can go wrong probably will… especially when it comes to your car. But you can turn Murphy into your greatest ally by taking customer calls 24/7, 365 days a year.
According to many shops from all across the country, car counts and profits have been abysmal for years. But through it all, Sam Burrage’s shop, Santa Rosa Transmissions, has managed to remain busy. What’s his secret? Where is he finding so much work when other shops are barely holding on?

“Probably the most important thing is having a good reputation,” explains Sam. “I don’t care how much you advertise; it won’t overcome a bad reputation. We have a great reputation here in town for being straightforward and honest and doing good work.”

Over the years Sam has worked on developing his reputation for honesty and providing quality work. “Always treat people as if your roles were reversed, and you were the one on the other side of the counter,” he says. “How would you want to be treated? Most people aren’t looking for something for free; they want an honest job at an honest price.”

It’s that attitude that’s helped build the reputation of this ATRA-Member repair shop as the shop for auto repair service in the Santa Rosa area.

Three Generations of Transmission Repair

That reputation didn’t happen overnight. It’s a legacy that spans three generations, beginning with Sam’s grandfather, William, who started fixing automatic transmissions back when they first began rolling off the Detroit assembly lines.

William taught the business to Sam’s father, Bill, and uncle, Ed. They went on to open B&E Transmissions in San Francisco, the shop where Sam got his feet wet in the transmission repair business.

After graduating high school, Sam went to a local college where he studied transmission technology. “It was a valuable experience because that’s where I learned the theory to support the rebuilding skills I learned in my father’s shop,” says Sam.

But while his introduction to the industry was from the technical side, today Sam no longer considers himself a technician. “I’m a businessman/entrepreneur with a strong technical background,” he says. “I have a skilled staff of diagnosticians and rebuilders who handle that end of the business.

“My technical background is a valuable resource, because it helps me understand what my technicians are dealing with on a daily basis… it helps me recognize when they need new equipment… it helps me hire better people because I can more easily identify a talented technician.

“But I owe my success today from learning to think like an entrepreneur and not like a mechanic,” concludes Sam. And a big part of that thinking involves the work he does in the community of Santa Rosa, building his reputation… and his business… each and every day.

Getting the Word Out

So how do potential customers find Santa Rosa Transmissions? What type of advertising brings in those customers? “A large part of our work comes in directly from referrals, or is backed up by referrals,” says Sam.

“Customers also come in because of our relationship with associations they’ve learned to trust, such as ATRA and AAA. People see those credentials
Never underestimate the value of the first impression: “Our shop is clean and neat, and there aren’t any junk cars in the parking lot.”

Never underestimate the value of the first impression: “Our shop is clean and neat, and there aren’t any junk cars in the parking lot. There are no dirty parts or oil stains on the floor as they walk into the office. We have a clean, friendly waiting area that creates a great first impression for new customers. Those first impressions are lasting impressions... they set the tone for the rest of your transaction.”

Community First

While Sam recognizes the need for advertising, he’s quick to point out that the most valuable resource for bringing customers is through community involvement.

For example, Sam is currently a board member for the local Automotive Service Council (ASC), where he regularly meets with other automotive service business owners. And he’s a member of the local Chamber of Commerce; a membership that allows him to meet with other local business owners and community members.

He’s also been a member of different “leads” groups, where members meet to share business leads and ideas with one another. And he’s sponsored a few Little League teams over the years.

Another way Sam works to give back to his community is by volunteering with a local hospice group, visiting and helping terminally ill patients. Many are living out their last days alone.

Sam doesn’t volunteer for any personal benefit: “I didn’t go into (hospice care) as a tool to improve my business; I don’t walk in wearing a Santa Rosa Transmissions shirt or even identify this as a marketing tool; I do it because it’s important to me.

“But when you’re involved with your community, people talk to you. They’ll ask, ‘Hey Sam, what do you do for a living?’ and that gets your name out there. You become their ‘friend in the business,’ and it eventually turns into new leads... and new customers. The additional business is a side-effect of being an active member in the community.”

Sam also lives right near his shop, in Rohnert Park — one town over from Santa Rosa. So it’s a common occurrence for him to run into his customers while at the supermarket, a restaurant, or taking his 10-year-old daughter Alyson or 5-year-old son Gavin to do business with members of their community; it’s about finding common ground,” says Sam.

Advertising His Shop

While Sam acknowledges the importance of word-of-mouth referrals and community involvement, he also recognizes the importance of maintaining an advertising presence. He still advertises in the Yellow Pages, and has a beautiful web site at www.SantaRosaTrans.com.

This year, based on some things Thom Tschetter mentioned at a recent Expo, Sam reduced his Yellow Pages ad presence. “I’ve always run big ads in the phone book, but this year I’ve decided to switch to a single listing. I’m
convinced that people go to the phone book to find someone they already know, not to get sold on a new shop.”

And no wonder: Those big ads in the Yellow Pages cost thousands of dollars every month; you have to fix a lot of cars just to pay for that ad.

Instead, Sam has put more effort into his web site. “Too many people get their new phone book and drop it right into the recycling bin. The business world is changing, and more people are turning to the internet when they’re trying to find a business.”

Santa Rosa’s web site offers potential customers a terrific view of their shop. It provides a brief overview of the company philosophy, introduces the staff, and explains the services they offer. There’s even an “Ask the Mechanic” page, where customers can mail their questions to be answered by a technician.

**Surrounding Himself with Talented People**

There’s little doubt that a key element in any successful business is to surround yourself with talented people. Sam is quick to acknowledge the contribution his employees make to Santa Rosa’s success.

Two of his employees are also family members: His uncles, Dennis Burkett and Rick Burrage, began working with Sam back when he first started out in his father’s shop. “These guys were my first teachers in the transmission business,” Sam says proudly. Both Dennis and Rick hold ASE and ATRA certifications.

Tom Brown and Aaron Nelson round out the Santa Rosa technical crew. Both are experienced technicians and both carry ASE certifications.

Tawnia Pometta is the office manager, and the newest member of the Santa Rosa staff. It’s her friendly voice that greets people who call for service or to check on their cars.

**More Than Just Transmissions**

Like many other transmission shop owners, Sam believes that the best way to remain profitable in today’s economy is to expand your services. These days he no longer even considers Santa Rosa to be just a transmission shop: “We’re
an auto repair shop that specializes in transmission repair,” he explains.

But making that transition wasn’t simply a matter of adding a few words to the sign out front. Sam is a big believer in training, and when he decided to expand the shop’s services, he made sure the shop was ready for it.

“I take my employees to Expo every year, and send them to the ATRA seminars when they come to town. And a couple of my employees are taking additional courses at the local community college.”

When will his staff have enough training? According to Sam, training isn’t a goal; it’s an ongoing journey… one that will continue as long as they keep making new cars. “The cars keep changing, and the technology changes with it. We need to keep up with those changes if we’re going to keep fixing them.”

While Santa Rosa is predominately a transmission repair shop, Sam isn’t ashamed to admit that he uses remans when necessary. “Last week I had four transmission jobs come in. We were able to rebuild two ourselves, but the only way I could be sure to get the rest out was to use remans for the other two.

“I’m okay with that; it’s about serving my customers. By using remans, I was able to take care of all of my customers in a timely manner. That’s important to them, and that makes it important to me.”

Sam also uses remans when a customer comes in from out of town. “It just makes good sense. They get a good warranty that’s covered anywhere in the country. They’re happy and that’s good for all of us.”

What would Sam consider to be the most valuable secret to his success? “The trick is getting past the walls of your business to become the guy people know from the community. Suddenly they can associate a person with the business name, instead of just a brick-and-mortar building with a sign out front. People want to do business with people, not just a name.”
Arguments against the Accelerated Retirement of Inefficient Vehicles Act

New legislation is being introduced that's designed to get older, less fuel efficient cars and trucks off the road; it's called the "Accelerated Retirement of Inefficient Vehicles Act." This legislation is being introduced by Senator Diane Feinstein (D-CA) and Representative Henry Waxman (D-CA). The idea is to pay people to scrap their older cars and use that money to help purchase newer cars. This could have a dramatic affect on the aftermarket repair industry. Several organizations, including ATRA, sent a joint letter to Speaker Nancy Pelosi, raising concerns on behalf of the aftermarket repair industry.

We urge you to contact your senators and representative and voice your concerns. If you'd like more information on this go to: http://www.sema.org/Main/ArticleDetail.aspx?contentID=61095

continued on page 53
Inefficient Vehicles Act continued

- Oligopolistic market operates the “greenmail” on improperly maintained less efficient vehicles, thus causing excessive demands for new vehicles, which are not necessarily more efficient than the vehicles they replace. These demands create broader vehicle demand programs, which lead to increased demand for new vehicles, further exacerbating the “greenmail” problem.

- Further programs driven by the availability of affordable transportation and related parts and services, such as service stations and parts suppliers, rely on the continued demand for new vehicles, which are not necessarily more efficient than the vehicles they replace, with the money provided by such programs.

- Further programs created with competing organizations such as the American Association of Automotive Manufacturers, the Congressionally-directed Military Order of the Purple Heart and the Federal Trade Commission are used to leverage programs to stimulate new vehicle sales.

- Manufacturing, service, and repair shops nationwide will suffer as the loss of older cars and parts they need to supply and service their customers. It will affect the supply and demand and distribution of new parts and other hard components.

- Available and competently staffed repair facilities, including automotive and home service locations, offer the same services.

- Further programs do not guarantee that a scrapped vehicle is replaced with a more fuel-efficient vehicle. In fact, many older vehicles are better for angle than the new ones.

- Our members are the companies that produce the new vehicles, which have a minimal impact on overall fuel economy.

- There are a number of options programs that demand for new vehicles, which has a minimal impact on overall fuel economy.

- The manufacturers and other associations should seek to provide tax incentives to purchase more electric and plug-in hybrid vehicles for new vehicles or those that are new, giving the manufacturer or the consumer a new vehicle.

- There are a number of options programs that demand for new vehicles, which have a minimal impact on overall fuel economy.

- It is critical for the industry to continue to provide the government with data on new vehicle fuel economy and other performance metrics. These data are used to support the industry's efforts to improve fuel economy and other performance metrics. We all support the continued progress.

- Thank you in advance for attention to this very critical matter. We look forward to further discussing this issue with you or your staff in the days and weeks to come.

Sincerely,

Automotive Aftermarket Industry Association (AAIA)

April Long
301/574-0164

Automotive Engine Rebuilders Association (AERA)

Michael J. Coronin
202/331-7630

Automotive Parts Reconditioners Association (APRA)

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Specialty Equipment Market Association (SEMA)

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TIA Industry Association (TIA)

Pati Forrester
301/480-7280

Download a PDF version of this letter online at www.atra.com/gov
More IRS rulings for tool reimbursement

ATRA is aware of increasing pressure from the IRS for back taxes for shops that have participated in tool reimbursement plans. The IRS does not claim that the concept is illegal, but they have more clearly defined what is acceptable for a plan to be considered an "Accountable Plan". Last year the IRS issued a position paper detailing the three criteria needed for an accountable plan, and they've included several scenarios of existing tool plans that do not meet the criteria as samples. You can find the position paper at: http://www.irs.gov/businesses/article/0,,id=97388,00.html

If you are participating in a tool plan or have participated in a tool plan in the past we advise you to take a copy of the IRS position paper to your tax accountant for review.

www.irs.gov/businesses/article/0,,id=97388,00.html
Wayne's business received the first CSI report for 2009 from ATRA. The report shows the responses from his customers that submitted the CSI survey cards in the 4th quarter of 2008. These cards come directly to ATRA for analysis and the report helps ATRA members get a better understanding of their customers' satisfaction with their work. Russell Automotive Inc scored a 98% with this batch of cards and received a press release announcing this achievement to his local community.

Consumer Index Report

Congratulations Wayne!
New Golden Rule Warranty Logo

All members are now permitted to use the ATRA Member Logo. The original use of the logo was intended to be displayed by Rebuilder members only as they were participants in the Golden Rule Warranty Program. The problem was it wasn’t clearly written on the logo that that was the purpose.

With that in mind the need for a new logo especially for Rebuilder Members of the association was apparent. The new logo is completed and available for use by all Rebuilder Members of the ATRA.

All Rebuilder Members will now be able to use this logo in advertisements and for display on shop websites. In addition, within the shop finder search results on the www.atra.com website, Rebuilder members will now have the Golden Rule Warranty logo displayed next to their shop information as well.

ATRA is preparing to have the new logo available as a window sticker for purchase in the BookStore.

For use and guideline on the new Golden Rule Warranty Logo, please visit the ATRA website downloads area.

Workplace Safety

Although some workplace distractions and interruptions are unavoidable, many can be controlled or prevented. No matter what the distraction, your first concern should be to keep your mind and your focus on safety – your safety and that of others. Be aware of any distractions you may be causing and take responsibility for not interrupting others. Let your supervisor know about repeated and/or unsafe distractions.

Work interruptions are a distraction that can result in work errors or accidents. Before addressing or responding to another person, shut down or disengage any work tool.
Sun Capital Closes Crawfordsville Plant Raybestos Powertrain Unaffected

Sun Capital Partners announced that Friction Holdings LLC (“Friction Holdings”) intends to cease all operations on or about February 28, 2009. Friction Holdings has operations at Crawfordsville, IN and Greenwood, MS.

During 2008, the automotive and light duty truck industry has suffered historic slumps in sales, which left Sun Capital with no choice but to reorganize its plant operations and cease operations at Friction Holdings.

“Over the last year, we’ve experienced significant improvements in operating performance that all Friction Holdings employees should be proud of. Unfortunately, these improvements haven’t been adequate to offset the loss of a significant portion of our customer base,” said Daniel A. Gaston, President and CEO, Friction Holdings.

Raybestos Powertrain plant in Sullivan, Indiana will continue operations and look to expand its manufacturing capacity, to provide a seamless and ongoing supply of OE and OE equivalent parts for the aftermarket.

“We are a US manufacturer that will remain a US manufacturer for a long time to come. Our distributors can expect the same uninterrupted supply of Raybestos product that they’ve come to rely on with no change in service level,” said John Butz, President and CEO of Raybestos Powertrain.

Raybestos Powertrain will continue its strategic alliances with MEANS Industries, Filtertek, NTZ and others.

Raybestos Powertrain develops, manufactures and supplies OE and aftermarket component parts for use in an oil-immersed (wet) environment. To learn more, visit the Raybestos Powertrain web site at www.raybestospowertrain.com.

Transtar Industries Ranked World-Class in Customer Service

Transtar Industries, Inc. recently completed a survey with a random sampling of its customers. MarketVision Research, an independent research firm with over 25 years of research experience, conducted the survey. In support of Transtar’s customer-centric focus, this survey takes a third-party objective look at Transtar’s customer satisfaction.

“Keeping in touch with our customers is critical to our success,” states Tom DeMille, Vice President of Sales and Branch Operations. “We need to understand how our customers’ businesses and needs are changing so we can more effectively meet these needs.”

Overall, 97% of customers surveyed reported being satisfied or very satisfied with the service they receive from Transtar. According to MarketVision, this rating indicates that Transtar provides World-Class Customer Service to its customers.

“We truly appreciate our customers,” says Neil Sethi, Group Vice President, Transtar Distribution Group. “We desire to be our customers’ partner, not just their vendor. This survey shows that we are successful in this endeavor, even during these difficult economic times.”

“These scores reflect the hard work and dedication of our sales team, who put our customers first,” Sethi continues. “We’re proud of the exceptional service levels of our staff, and will use this information to build on the work we do well, as well as improve in the areas where customers say we can do a better job.”

Transtar Industries, Inc. is a worldwide manufacturer and distributor of transmission parts and services. For more information, visit the Transtar web site at www.transtar1.com.

TransTec Introduces New Ford 6F50, GM 6T70/75 Kit

In 2002 Ford and General Motors joined forces to design a new, compact, six-speed, front-wheel drive automatic transmission. Each company gave the unit its own designation and manufactures it in its own plant.

Ford has one designation, 6F50, while GM has two designations: the 6T70 for standard applications, and 6T75 for higher torque applications.

Corteco is pleased to announce the availability of TransTec® overhaul kits 2518, 2519, 2520 and 2521. Kits 2518 and 2519 will cover the 2007-up Ford 6F50; kits 2520 and 2521 will cover 2007-up GM 6T70 and 6T75 applications.

NTZ Micro Filtration Relocates to Expanded Facility

NTZ Micro Filtration has announced its relocation to Wixom, Michigan to expand its current operations. The new facility allows for onsite testing, product development, and logistical distribution.
POWER INDUSTRY NEWS

to provide a wider range of services to its North American customer base.

NTZ develops and manufactures micro filtration technologies for transmission, engine, and hydraulic systems in the automotive OEM and aftermarket. Applications include the Ford TorqShift® transmission micro filter, advanced transmission filtration development for dual clutch (DCT), continuously variable transmissions (CVT), industrial and heavy-duty engine filtration.

Headquartered in Rotterdam, The Netherlands, NTZ’s North American location in Wixom provides fluid contamination solutions to support the NAFTA region. The company also has a manufacturing facility in Oscoda, Michigan.

NTZ’s patented micro filter systems provide superior fluid cleanliness compared to that realized by standard filters. Ultra-fine filtration has several positive effects on fluid systems as a result of reduced contamination, including reduced failures and warranty claims, consistent performance levels, and improved durability.

NTZ’s new address is 28221 Beck Road, Bldg A-1, Wixom, Michigan 48393. Its new phone number is 248-449-8700, fax 248-449-8706. For more information, visit their web site at www.ntzfilter.com.

Sonnax Introduces New AW55-50SN, AF23/33 Kits

Sonnax is proud to announce the latest addition to its growing family of solutions for the AW55-50SN, AF23/33 transmissions. These units are found in selected 2001-up GM, Saturn, Saab, Volvo, Renault, Opel, and Nissan applications.

Eliminate the 3-2 neutral, harsh 3-2 coastdown shift, and 2-3 flare with the B-4 Release Valve Kit, Sonnax P/N 59947-26K. This upgrade kit includes a hard-coat anodized valve and an O-ringed aluminum end plug to prevent wear. A replacement spring is included to ensure proper calibration.

Installing this repair kit requires the F-59947-TL26 tool kit and the VBFIX holding fixture.

For more information on this or any of Sonnax’s line of repair kits, stop by the Sonnax web site at www.sonnax.com.

VBX Moves to Larger Facility

VBX-ValveBody Xpress is proud to announce that they’ve relocated to a new, larger standalone facility.

According to Tim LaCerra, president, “The move was necessary to serve our rapidly growing customer base and increasing global demand for our Guaranteed Remanufactured Valve Body Product Line.”

VBX is now located at 150 Mid-Atlantic Parkway in Paulsboro, New Jersey in a state-of-the-art, 32,000 square-foot facility.

Tim would like to sincerely thank all VBX Distributors, suppliers, industry supporters and his staff for not only making this move possible, but for also making a smooth transition from their old location.


North Coast Bearings Launches New Web Site

Distributors can now select, order and sell the entire line of differential and transmission rebuild kits, bearings and related drivetrain components from North Coast Bearings LLC (NCB) — online, anytime at the all-new www.northcoastbearings.com.

Along with NCB products, the new site features DT Components®, a premium line of transmission, differential and transfer case rebuild kits and components for truck applications distributed by North Coast through its strategic alliance with The Timken Company.

“This is the first time that the NCB and DT Components® product lines have been consolidated under a single web site, making it easier for distributors to meet virtually all of their drivetrain needs from a single distribution point,” said North Coast Bearings Vice President of Sales Ken Lark. “What’s more, the site includes links to our parent company, Bearing Technologies, with access to even more products.”

Detailed product information and application data is available in downloadable brochures, flyers and catalogs in pdf format from the “literature” section on the site. Included is the latest DT Components® product catalog, a 350-plus page guide covering virtually every popular vehicle on the road.

North Coast Bearings is a subsidiary of Bearing Technologies LLC, one of the world’s leading manufacturers and private labelers of wheel hub assemblies and clutch release, racing, repair and specialty industrial bearings.

For more information about North Coast Bearings’ new web site, please contact John Gross at Bearing Technologies LLC 440-930-7602, email jgross@brgtec.com or visit www.northcoastbearings.com.
SuperFlow Introduces New Premier Transmission Tester

SuperShifter, a revolutionary tester/controller that combines years of transmission testing experience and state-of-the-art electronics into an easy-to-operate, handheld diagnostic tool for today’s modern transmissions, is now available from SuperFlow Technologies Group.

The SuperFlow SuperShifter is designed for in-vehicle use and is a proven time- and money-saving tool for automotive professionals, enabling them to shift automatic transmissions in the same manner as the vehicle computer.

The SuperShifter automatically displays pressure and PRNDL switch status, temperature and speed sensor information. It displays solenoid names and impedances to help operators determine whether or not test results are within spec. It eliminates the need for an ohmmeter or pages of reference tables and data sheets. Plus, it works with dyno, valve body or solenoid testing equipment.

SuperFlow Technologies Group is a worldwide leader in the design and manufacture of Hicklin transmission dynamometers, Axiline transmission dynamometers and driveshaft service equipment, TCRS torque converter rebuilding systems, and SuperFlow high performance flowbenches, engine dynamometers, chassis dynamometers and transmission diagnostic equipment. For more information or technical consultation, call 888.442.5546 or visit them on line at www.superflow.com.

SuperFlow Introduces Program for Shops to Begin Driveline Repair

There are two types of driveline repair operations: Those who patiently outsource and wait for the repair work or replacements and pay… and those who build and balance their own drive-shafts, manage their own quality, schedule their own delivery and get paid!

Meet the SuperFlow Axiline SHAFTMASTER. This proven profit center is easy to operate, requires minimal investment, and produces “factory” welds every time for unmatched performance, because it’s the first and only machine that press welds, straightens, and balances all on one device…and it can be equipped with everything you need to do the job right, including specialized tooling to handle anything from PTO-powered tractors to high-performance off-road vehicles.

Also available: the Axiline Combination Lathe. Two lathes in one — Cut Off and Long Bed configurations — provide fast, safe removal of old welds, with tailstock and steady rest machining capability. Variable speed spindling range is 0-400 rpm.

The Axiline Press Welder — a great starter machine — lets you start now and balance later. It’s ideal for shops that already have build and balance stations, but want to add assembly and welding to keep up with demand.

SuperFlow Technologies Group is a worldwide leader in the design and manufacture of Hicklin transmission dynamometers, Axiline transmission dynamometers and driveshaft service equipment, TCRS torque converter rebuilding systems, and SuperFlow high performance flowbenches, engine dynamometers, chassis dynamometers and transmission diagnostic equipment. For more information or a technical consultation, call 888.442.5546, or log on to www.superflow.com.

Superior Introduces New Bench Buddy™ and Accumulator Buddy™ Kits

Superior Transmission Parts has just introduced its new Bench Buddy™ and Accumulator Buddy™ kits. These specially designed wire brush kits are impregnated with a super fine abrasive to remove small burrs and polish the inside of valve and accumulator bores easily.

The Bench Buddy™ and Accumulator Buddy™ kits:
- Improve the surface finish of a bore by up to 50%
- Restore smooth valve operation in seconds
- Service bores from ¼” to 2”…and all with virtually no enlargement of the bore diameter.

With the Bench Buddy™ and Accumulator Buddy™ kits, you can reuse valve bodies and accumulator bores that may have been questionable in the past. No transmission bench should be without these exciting new tools from Superior.

And now, Superior has introduced a new 4F27E kit that includes new 1-2 and neutral/drive accumulator pistons and sealing rings, and comes with an Accumulator Buddy brush to smooth out case bores.

For more information about the Bench Buddy™ and Accumulator Buddy™ kits, call toll free, 1-800-451-
Superior Introduces New Shift Correction Package for 4R70E/W, 4R75E/W and AOD-E

Superior Transmission Parts is proud to announce it has updated item KAOD-E to fit all 4R70E/W, 4R75E/W and AOD-E transmissions, from 1992 through 2007. This kit will improve overall transmission performance while helping eliminate these common problems:

- 2nd roller clutch failure
- Soft or sloppy 3-4 shifts
- Slip-bang on takeoff
- Inadequate lube oil
- 3-4 band failure
- 3rd clutch failure
- Falls out of 4th gear when hot
- Converter shudder
- Soft or sloppy 1-2 shift
- Intermediate loss of 2-3 shift

We’ve also added a steel, non-stick solenoid regulator valve. All Superior products work as promised, so be like thousands of others that have made the shift to Superior Transmission Parts.

For more information, visit Superior’s web site at www.superiortransmission.com.

Aftermarket Controls Corp Names A. Mark Oakes VP of Operations

Aftermarket Controls Corporation (ACC), manufacturer of OEM and aftermarket automotive parts and accessories, has appointed A. Mark Oakes as Vice President of Operations.

In his new position, Oakes will be responsible for leading the company’s manufacturing and distribution operation in Laurinburg, North Carolina. He is a 25-year veteran of the automotive tier 1 and 2 supplier industry specializing in actuator, sensor, switch and electronic products.

Prior to joining ACC, Oakes was with Stoneridge, Inc where he served in various posts.

“We are pleased to have Mark join the ACC team. His strength as a leader of lean manufacturing and six-sigma disciplines, as well as demonstrated success in managing manufacturing transfer projects, will serve our strategic growth initiatives very well,” said Thomas P. Petrillo, President and CEO, ACC.

Oakes received his Bachelor of Science degree in Mechanical Engineering from Ohio State University. He currently resides in Southern Pines, North Carolina.

Aftermarket Controls Corporation (ACC) is parent company to Rostra Precision Controls, Inc., USA Switch and OEM Components, suppliers to the original equipment and aftermarket automotive industries. For more information, call 248.960.8500 or visit www.usaswitch.com.

Dye-Lite All-In-One dye is safe and easy to use. Just one bottle of dye per application is all you need! The dye is circulated through the vehicle’s fluid system, and will escape with the host fluid through the tiniest leak. When the system is scanned with a high-intensity Tracerline® UV lamp, the dye will glow, spotlighting the exact location of every leak. All-In-One is available in standard and concentrated formulas.

For more information about TP-3405CS Dye-Lite® All-In-One™ dye, call toll-free 1-800-641-1133. Outside the United States and Canada, call 516-333-1254, or visit their web site at www.tracerline.com.

Full Spectrum All-In-One™ Dye Pinpoints All Leaks in Oil-Based Fluid Systems

Tracer Products has developed a state-of-the-art fluorescent dye — TP-3405CS Dye-Lite® All-In-One™ dye — which greatly improves leak detection in all oil and oil-based fluid systems, including gasoline and diesel engine oil, gasoline, diesel fuel, automatic transmission fluid, power steering fluid, as well as hydraulic and lubrication fluids. This dye has proven to be 100% effective with all UV and blue light lamps.

TP-3405CS Dye-Lite All-In-One dye assures optimum leak detection because it actually contains two fluorescent dyes: One fluoresces best under UV and the other under blue light. Whatever type of inspection lamp is used, All-In-One dye will glow brilliantly and spotlight every leak — even a pinhole — in a system.
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GEARS March 2009

61
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<th>Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
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<td>7</td>
</tr>
<tr>
<td><a href="http://www.atiperformanceproducts.com">www.atiperformanceproducts.com</a></td>
<td></td>
</tr>
<tr>
<td>ATRA</td>
<td>31, 41 &amp; 43</td>
</tr>
<tr>
<td><a href="http://www.atra.com">www.atra.com</a></td>
<td></td>
</tr>
<tr>
<td>Borg-Warner Automotive</td>
<td>45</td>
</tr>
<tr>
<td>Certified Transmission</td>
<td>27</td>
</tr>
<tr>
<td><a href="http://www.certifiedtransmissions.com">www.certifiedtransmissions.com</a></td>
<td></td>
</tr>
<tr>
<td>EVT Parts</td>
<td>23</td>
</tr>
<tr>
<td><a href="http://www.evtparts.com">www.evtparts.com</a></td>
<td></td>
</tr>
<tr>
<td>First National Merchant Solutions</td>
<td>31</td>
</tr>
<tr>
<td><a href="http://www.fnms.com">www.fnms.com</a></td>
<td></td>
</tr>
<tr>
<td>Heffernan Group</td>
<td>37</td>
</tr>
<tr>
<td><a href="http://www.heffgroup.com">www.heffgroup.com</a></td>
<td></td>
</tr>
<tr>
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<td>IBC</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Life Automotive Products Inc.</td>
<td>17</td>
</tr>
<tr>
<td><a href="http://www.smartblend.com">www.smartblend.com</a></td>
<td></td>
</tr>
<tr>
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<td>OBC</td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Power Pusher By Nu-Star, Inc.</td>
<td>43</td>
</tr>
<tr>
<td><a href="http://www.powerpusher.com">www.powerpusher.com</a></td>
<td></td>
</tr>
<tr>
<td>Precision International</td>
<td>21</td>
</tr>
<tr>
<td><a href="http://www.transmissionkits.com">www.transmissionkits.com</a></td>
<td></td>
</tr>
<tr>
<td>Raybestos Powertrain</td>
<td>3</td>
</tr>
<tr>
<td><a href="http://www.raybestospowertrain.com">www.raybestospowertrain.com</a></td>
<td></td>
</tr>
<tr>
<td>Slauson Transmission Parts</td>
<td>41</td>
</tr>
<tr>
<td><a href="http://www.slauson.com">www.slauson.com</a></td>
<td></td>
</tr>
<tr>
<td>Sonnax Industries</td>
<td>IFC</td>
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<td><a href="http://www.sonnax.com">www.sonnax.com</a></td>
<td></td>
</tr>
<tr>
<td>SuperFlow Technologies Group</td>
<td>33</td>
</tr>
<tr>
<td><a href="http://www.superflow.com">www.superflow.com</a></td>
<td></td>
</tr>
<tr>
<td>Superior Transmission Parts</td>
<td>11</td>
</tr>
<tr>
<td><a href="http://www.superior-transmission.com">www.superior-transmission.com</a></td>
<td></td>
</tr>
<tr>
<td>Transmission Specialties</td>
<td>29</td>
</tr>
<tr>
<td><a href="http://www.transmission-specialties.com">www.transmission-specialties.com</a></td>
<td></td>
</tr>
<tr>
<td>Transtar Industries, Inc.</td>
<td>9</td>
</tr>
<tr>
<td><a href="http://www.transtarindustries.com">www.transtarindustries.com</a></td>
<td></td>
</tr>
<tr>
<td>TransTec By CORTECO</td>
<td>13</td>
</tr>
<tr>
<td><a href="http://www.transtec.com">www.transtec.com</a></td>
<td></td>
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<tr>
<td>Whatever It Takes Transmission Parts, Inc.</td>
<td>19</td>
</tr>
<tr>
<td><a href="http://www.wittrans.com">www.wittrans.com</a></td>
<td></td>
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<tr>
<td>ZF Sales and Service NA, LLC</td>
<td>15</td>
</tr>
<tr>
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<td></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Date</th>
<th>City, State</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/21/09</td>
<td>Houston, TX</td>
</tr>
<tr>
<td>3/21/09</td>
<td>St. Louis, MO</td>
</tr>
<tr>
<td>3/28/09</td>
<td>Boston, MA</td>
</tr>
<tr>
<td>4/4/09</td>
<td>Minneapolis, MN</td>
</tr>
<tr>
<td>4/18/09</td>
<td>Salt Lake City, UT</td>
</tr>
<tr>
<td>4/25/09</td>
<td>Fremont, CA</td>
</tr>
<tr>
<td>5/2/09</td>
<td>Toronto, ON</td>
</tr>
<tr>
<td>5/9/09</td>
<td>Denver, CO</td>
</tr>
<tr>
<td>5/30/09</td>
<td>Des Moines, IA</td>
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<tr>
<td>5/30/09</td>
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<td>6/13/09</td>
<td>Vancouver, BC</td>
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<td>Chicago, IL</td>
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<tr>
<td>10/17/09</td>
<td>New York, NY</td>
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Check ATRA.com for more dates and locations to come!
Available and ready when you need us.

- JASPER’s research allows us to correct problems in OEM design.
- Dedicated remanufacturing teams working on specific transmissions or transmission families assure trouble-free products.
- Dynamometer Testing - live-run testing of automatic transmissions simulates in-vehicle operation to assure trouble-free performance.
- Individual service from highly-trained professionals who provide insight into our products and ways to improve your profits through their sale.
- An available Premium Service Plan that adds even greater value for your customers.

3 Years/100,000 Miles

Full warranty disclosure available upon request.

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www.jasperengines.com

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Take your business the distance with products you and your customers can trust!

Real results from the LUBEGARD Love My Ride® Challenge

Call us toll free at (800) 333-LUBE to request your free reprint of this coverstory feature in Gears Magazine.

“I am impressed with LUBEGARD products: smoother operation, considerable increase in fuel economy (our trip computer shows 2-3 mpg increase), lower operating temperature, which is a huge plus living in the Arizona desert. We will now be adding LUBEGARD products to our other vehicles.”

Colter & Valerie Wright

“Approximately 10°F drop in operating temperature. Noticeable difference in vibration in steering wheel, less for sure. Transmission shifted smoother and converter clutch engagement was smoother. We have used LUBEGARD ATF Protectant for years, after the test, we will be offering all the LUBEGARD products to our customers with confidence.”

Nathan Wood

Kool-It Supreme Coolant Treatment

• Enhances heat transfer and reduces operating temperatures
• Extends coolant life up to 5 years
• Provides cooling system corrosion protection
• Protects all metals from electrolysis
• Prevents deposits which lead to overheating
• Reduces wet-sleeve cylinder cavitation erosion
• Works with all types of antifreeze, including DEX-COOL®

YOU WIN... Just 1 service a day for 1 year nets
$12,000
IN PROFIT!

YOUR CUSTOMERS WIN...
Before LUBEGARD
After using LUBEGARD
15.8mpg
16.8mpg

LUBEGARD BioTech Engine Oil Protectant

• Saves oil and fuel
• Reduces wear by up to 70%
• Reduces friction loss in the motor by up to 20%
• Provides outstanding cold start properties through polar behavior
• Improves oxidation stability (the main factor in oil aging)
• Lowers oil consumption (especially with long-life oils)
• Lowers the oil temperature
• Improves oil’s compressive strength
• Excellent for supercharged or high-performance engines (tuning)
• Audibly and significantly reduces the noises that arise through inner friction

YOU WIN... Just 1 service a day for 1 year nets
$8,500
IN PROFIT!

YOUR CUSTOMERS WIN...
Before LUBEGARD
After using LUBEGARD
14.5mpg
16.7mpg

* ROI may vary in your area. ROI based off of typical service price, typical cost of protectant & flush product, materials and labor. One year service total is based off of a 241 working day calendar.

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FEATURED ITEM
Yours FREE!
Let LUBEGARD help you inform your customers about the many benefits associated with ongoing preventive maintenance. Like this colorful and informative counter mat, yours free simply by calling!

ONLY LXE® Technology, with its unique Liquid Wax Ester Technology, can deliver these types of results.

LXE Technology, a direct synthetic replacement for sperm whale oil, has an inherent molecular structure that translates into fluid characteristics needed to not only fight oxidation, but prevent heat buildup, reduce friction, suspend factory add-packs and other very important functions. There is no other product that has such advanced lubricant technology!

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