Craftsmanship

Do you remember the smart kid in class, the one who always seemed to have all the answers? Every time the teacher asked the class a question, the smart kid would be the first one to raise his hand. Naturally, the teacher didn't want to call on the smart kid all the time, so other students were chosen to answer questions too.

We've got a similar situation here at the Tech Tips page. Mike Craft, shop foreman and technician at Andy's Toyota/Honda in Portsmouth Ohio, started sending us Tech Tips some time during 1990 or 1991, and he hasn't let up since. We chose one of his tips for Runner Up honors in our Tech Tip of the Year competition for 1991. After that, we took Mike out of circulation for a while. It seemed only fair to give the other 70,000 of you a chance to get your tech tips into print.

Even though we explained that we weren't going to be able to print what he sent us, Mike kept right on sending in useful tips on Hondas and Toyotas each month. This continued until February 1993. By then I had a stack of Mike's tips that were taking up space on my desk. It seemed a shame to see them go to waste, so we printed several of his tips in that issue.

Since then, Mike has continued to mail in his Tech Tips at his usual pace (at least one or two a month). It's been exactly three years since we last published any of Mike's tips, so once again a corner of my desk is occupied by a large stack of Tech Tip cards with a rubber band around it. Each card has Mike Craft's name on it. We've divided the tips by manufacturer. Where possible, we've also tried to keep tips that apply to a single model grouped together. Without further introduction, here are the latest selections from Mike.

—By Karl Seyfert
TOYOTA TIPS

ROD IMPERSONATOR

A Toyota Camry equipped with a 3SFE or 5SFE engine that is making a rod-like knocking noise may not have a bad rod bearing. Remove the alternator/air conditioning compressor belt. If the noise is gone, remove the A/C compressor and compressor clutch.

Inspect the A/C compressor. If the snout of the compressor is worn or the clutch fits the snout loosely, you’ve found your knocking noise. Replace the compressor to correct the problem.

LOOSE BOLT

Be sure to check the reverse shaft lock bolt on 1985 and later front wheel drive Toyota five-speed transmissions (Camry, Celica, Corolla). This bolt is located an inch or two away from the front plug. The bolt can loosen or fall out, causing symptoms like these:

• Hard to shift out of reverse.
• Noise in other gears.
• Loss of fluid.
• Differential whine.

I check these bolts during maintenance work and find a lot of them are loose.

CAMRY EFI RELAYS

There are a lot of things that will cause a 1987-91 Toyota Camry to be hard to start after sitting overnight or for four or five hours. These may include the cold start injector and/or the injector thermo-time switch, but on a few cars I’ve also had problems with the EFI main relay in the underhood fuse box.

This is a four prong relay that doesn’t always go completely dead. If it does, you’ll have a no-start that will be much easier to diagnose. More often than not, the EFI relay just gets weak and twitchy, causing intermittent problems. If you can get the car to act up, try substituting another “known good” four-prong relay from the fuse panel to see if the problem disappears. If the problem is corrected, replace the EFI relay.

BLOWN FUSES

I have found several causes for a blown GAUGE fuse on 1987-91 Toyota Camrys. This little fuse controls a lot of different electrical consumers. Look for problems in the following areas:

• The driver’s side wiring harness located in the door jam. The rubber sleeve between the door and the door frame will be in good condition, but the wires can break and short out inside the sleeve.
• Check for broken wires in the back up light wiring harness that is attached to the rear trunk hinge.
• Battery acid may short out the neutral switch at the transmission on automatic transmission-equipped models.
• An intermittent short in the blower motor.

Any problems with this fuse will also cause no power window operation and no seat belt operation.

STILL MORE FUSES

Most older Camry models (1984-91) run the tail lights and brake lights through a bulb failure relay. On first series Camrys, it’s located in the right rear fender area (trunk). On second series Camrys, the relay is located on the left rear. This relay is also used on front-drive Celica models and can be found in the left rear quarter area, in front of the rear seat. When this relay goes bad, you can lose the brake lights or tail lights.

Remove the bulb failure relay and pop it open. If you can see a burnt circuit track or a burnt fuse link, you may be able to fix the relay (a new relay costs $125-130 retail). I’ve had a pretty good success rate with the solder job. When you’re done, be sure to check and replace any defective bulbs. These may be the original cause of the bulb failure relay problem.

CROSSED WIRES

A 1986 Toyota Cressida was towed to my shop with a no-start condition after installation of a used engine. The previous shop had diagnosed it as a no-spark problem and had installed an assortment of distributors, coils, ignition modules, etc.

My testing seemed to indicate that I had a broken wire somewhere in the wiring harness. While back-probing at the computer, I had a lot of “no continuity” and “no ignition signal” readings. Very confusing.

When a 1986 Supra showed up, I had a working
model to examine for comparison purposes. It turns out that there are two connectors that are the same on 1985-87 Cressidas and 1984-87 Supras. The wire colors in the connectors match up better when the connectors are hooked up wrong than they do when they are hooked up right.
The connectors are located on the battery side of the engine. One connector is for the distributor and the other is for the injector pack resistors. The connectors are exactly the same and will easily hook up to one another the wrong way.

Just switching the connectors around allowed the engine to fire right up. I couldn’t really blame the engine swap guys. The connectors didn’t even look right when they were hooked up right.

POOR HEAT

If you have a 7ME or 7MGTE-equipped Toyota Cressida or Supra that is suffering from erratic heater output, don’t forget to check the head gasket. I’ve seen several of these cars that seemed to have a problem with the automatic climate control and the engine never warmed up.

Possible symptoms of a head gasket problem include:
• The temperature gauge may move erratically, but remain stable at highway speeds.
• Coolant may leak into the cylinders while the engine is off, causing fouled spark plugs and a “cold-only miss.”
• Unlike most badly-blown head gaskets you’re likely to see, there probably won’t be any extra smoke out of the tailpipe once the engine starts.
• The head gasket most often leaks at the rear, so the rear cylinders and combustion chambers will be shiny-clean when the head is removed.

OIL LEAKS

When checking for oil leaks on Toyota Supra and Cressida models equipped with 7ME and 7MGE engines, the center gasket over the spark plugs is a prime suspect. Remove the spark plug wires. If the wires have oil on them, the gasket has become hard and is leaking around the plugs.

The gasket is held down by Allen head bolts that go directly into the oil galley of the head. This gasket is often overlooked when the valve cover gasket is replaced.

A/C INOPERATIVE

An inoperative air conditioning system on 1992 and later Toyota Paseo and Tercel models, accompanied by a blinking A/C light on the dash, is usually caused by a broken wire in the wiring harness.
The wiring runs over the right side of the radiator, leading down to the A/C compressor speed sensor. The wire colors are pink with a pink or blue tracer. The wire's plastic cover will not be broken, however, checking with a continuity tester will show an internal break in the wire.

FLAGGED OXYGEN SENSOR

I recently repaired a 1987 Toyota Tercel that was hesitating and jerking during acceleration. This model has a variable venturi carburetor and is loaded with vacuum hoses, vacuum switches, and various other vacuum bleed switches. Since this was the most complicated system on the engine, I falsely assumed that it was to blame and wasted a lot of time trying to prove my assumption.
The cause of the driveability symptoms was a faulty oxygen sensor.
The oxygen sensor “went crazy” during certain acceleration loads and sent a lot of false information to an already lean carburetor. A new oxygen sensor cured the problem.
VALVE ADJUSTMENTS

If you have just adjusted the valves on a 1985-91 Toyota truck and the engine is now hard to start, misses, has a rough idle or no-start problem; pull the valve cover off and make sure that a loose timing chain hasn't allowed the camshaft to jump a notch or two during the valve adjustment.

Loose chains are fairly common on these engines. You may hear a rattling noise that sounds like loose valves when the chain gets loose. The 22R and 22RE engines are valve-benders, so be sure to check the chain closely during your valve adjustment. We have seen them continue to run after jumping time, but why take chances? If the chain is loose, replace the chain, guides, and tensioner to be safe.

CARBURETOR GROUNDS

A rough idle or no idle on older carbureted Toyota Corolla and Chevy Nova models (1984-87) may be caused by a poor ground. Check the ground bolt on the back of the block near the oil filter before you overhaul the carburetor. The wire attached to this bolt provides the ground for the idle solenoids and will give you an erratic idle if it is loose or corroded. This wire is very easy to knock off during an oil and filter service.

Most techs know enough to check for 12 volts at the solenoids but these carbs also need a ground to function properly.

BLOWN ENGINE FUSE

I recently repaired a Toyota truck that was intermittently blowing the ENGINE fuse. A previous tech had replaced the alternator, ignition switch, etc., all to no avail. After tracing the circuits controlled by the ENGINE fuse, we found an intermittent short to ground in the back-up light harness.

The wiring harness runs under the truck, then over the top of the transmission on its way to the back-up light switch in the transmission. The harness was rubbing against the transmission and was intermittently grounding to the case. After checking some other wiring diagrams, I found that two and four wheel drive Toyota trucks from 1985-89 route their back-up light wiring in this fashion.

LEAKING BOWL

A leaking fuel bowl may cause starting problems on carbureted 1984-89 Toyota trucks. The carburetor may develop a small crack which allows the fuel to leak out of the carburetor and into the intake manifold, where it evaporates.

When it's time to start the engine, the carburetor will be "out of gas" until the fuel pump can pump enough fuel to refill the fuel bowl. This causes the starting problem.

The only real cure that I've found for this problem is to replace the carburetor.

NO-START TRUCK

A no-start condition on a fuel injected 1985-90 two or four wheel drive Toyota truck may be caused by corrosion damage to the EFI main relay. Remove the right kick panel, then check for water damage at the relay terminals. The EFI control unit is also located in this area and may also be water damaged. This is a good place to start looking for intermittent problems too.

If the relay terminals and EFI control unit look good, check for continuity between the relay and the air flow meter. There are contacts inside the air flow meter which must be closed to activate the relay, so a continuity break will also cause a no-start.

HARD STARTING

A hard-start or no-start condition on 1985-87 fuel injected Toyota vehicles could be caused by a weak EFI relay. Check the fuel pressure and ignition switch first, then check the relay (it's located in the
fuse panel under the hood). A weak EFI relay will cause a weak or erratic power supply to the fuel system control unit, which also leads to weak or erratic fuel injector operation.

I keep an extra relay in my toolbox so that I can quickly substitute a relay when I’m having problems in this area. This cuts down on the time that I spend diagnosing intermittent problems.

SMOKED TRANSMISSION A LA CARTE

Heavy snows are particularly hard on Toyota front wheel drive transmissions. I had to tear down several Camry and Celica transmissions last winter due to hard engagement and shuddering problems. Cleaning the valve bodies did little to help these symptoms. On each of the transmissions I tore down, I found the front clutches were burnt or worn to nothing.

To repair this problem, R&R the transmission, remove the torque converter and front pump, then remove the input drum and clutch assembly. Flip it over and you should have burnt clutches to go. The clutches can be ordered separately.

After rebuilding the input clutch assembly, clean the valve body, install a new filter, and you’re back in business.

POOR A/C PERFORMANCE

Poor A/C performance and weird gauge readings may be caused by a clogged receiver/drier on all Toyota models. The receiver/drier is prone to partial blockage and/or oversaturation with moisture. If you have caught the problem in time, the compressor will probably be okay.

ACCORD DISTRIBUTORS

If you have a 1986-89 Honda Accord that won’t start and isn’t getting any fuel, always be sure to check for spark and the general health of the ignition system. The Accord’s fuel pump relay needs a spark pulse from the ignition distributor in order to turn on the fuel pump.

If there is no spark, there will be no fuel pump operation, even though the fuel pump is okay. The igniters frequently fail in these distributors and the bearings are also a weak link, so a rebuilt distributor is usually in order.

BLOWN A/C FUSES

A Toyota Supra or Cressida that blows the A/C fuse may not have a shorted A/C clutch assembly. I have removed the clutch on several of these models and found a shorted power wire at the top of the compressor. The wire was rubbing against the compressor and causing the blown fuses. You can repair the wire, reinstall the parts and you’re back in business without the need for a clutch or compressor replacement.

(continued on the next page)
HONDA TIPS

A/C INOP

If the A/C clutch circuit is inoperative on a 1990-93 Honda Accord, be careful about jumping wires at the A/C clutch relay. Any voltage applied to the Black/Red wire will result in a blown PCM.

The Black/Red wire grounds the clutch relay through the PCM. A better way to check this circuit is to ground the Black/Red wire at the pressure switch, then the A/C thermostat, and on down the ground circuit until you find your open circuit.

ACCORD ENGINE NOISES

We've been running into two new engine noises on 1990-92 Honda Accord. One is a growling noise at the front of the engine that is caused by a worn alternator bearing. The alternator can be disassembled and this bearing can be replaced separately.

The other noise is more of a rattling noise that seems to be coming from the master cylinder area. This noise is caused by the water pump, which is turned by the timing belt. We have been able to replace just the pump to correct the noise, but on higher mileage cars we also replace the timing belts at the same time.

ACCORD NO-START

Everybody knows by now that there have been some igniter problems on 1990-94 Honda Accord. But that no-start in your service bay could also be fuel-related.

Check the fuel pressure. If there is none or if it's low, don't be too quick to condemn the fuel pump. The EFI main relay may be to blame. The main relay controls power to the PCM and the fuel pump.

To remove the main relay, remove the cruise control relay first. It's located in the left upper dash. The two connector main relay is mounted on top. I have seen main relays, fuel pumps, or both fail. If the no-start only occurs after a hot soak, try heating the main relay with a hair dryer to see if it acts up.

PCV FAILURE

An often overlooked cause of rough idle, stalling, or no idle on 1986-89 Honda vehicles (especially Accords) is the PCV valve. The valve is located just in front of the carburetor, at the end of a U-shaped hose going into the intake manifold.

I have seen the spring fall out of the PCV valve and a very rough idle was the result (nobody seems to change the valve any more). Just pinch the PCV hose shut to see if the idle straightens out.

Another possible cause for idle problems is a clogged idle solenoid port. To clean the port, R&R the solenoid and blow out the port.

DRUM CENTERING

You've just finished replacing the rear brake shoes and turning the brake drums on a Honda Accord or Civic, and now you have a knocking or thumping noise in the rear when the brakes are applied. To eliminate the noise, you need to center the brake drums.

Install the brake drums and wheels, lightly tighten the lug nuts. Have a helper apply the brakes firmly, then tighten the rear lug nuts to 80-85 ft-lb. This centers the drum to the hub and it will work on other rear drum applications too.

LEAKING INJECTOR SEALS

Leaking injector seals may cause a hard hot restart problem on fuel injected 1986-89 Honda Accord LXi and Prelude models. The seals leak fuel when the engine is hot, causing the engine to lose fuel pressure. The drop in residual fuel pressure makes the vehicle difficult to restart. Because the fuel usually evaporates, it may be difficult to spot the leak. A visible leak may look like a leaking injector, but be sure to replace the seals first.