



## Great Tips

Welcome to the 1997 *Import Service Tech Tips Special*. Here you will find a wide assortment of tech tips on a variety of import vehicles. As we have done in the past, we have divided your tips into eight basic sections. They are:

- Brakes
- Drivetrain
- Electrical
- Engine Mechanical
- Fuel and Emissions
- General
- Steering and Suspension
- Temperature Control

This year we've dispensed with a "mini table of contents" at the beginning of each section. This gave us room to fit more of your tips onto the pages that follow. If you're looking for a tip on a particular type of vehicle, turn to the beginning of the section and you won't have far to go from there. The sections are

arranged in alphabetical order, just like the list in the previous column.

Most of the tech tips we receive are only two or three sentences long. Some authors leave out their full names, or other critical pieces of information. The space we give you on the Tech Tip card is at least partially to blame for this situation. The cramped writing area forces you to write extra small and neat (or leave out every other word).

We can usually get the gist of what you're trying to say, but if you think your tip needs additional explanation or a photograph, don't be afraid to put everything in an envelope with a 32 cent stamp on it. This makes it that much easier to understand what you're trying to say, greatly enhances the usefulness of your tech tip, and also increases the likelihood of it getting published. The dedicated members of the "Tech Tip Translation Team" here at *Import Service* would certainly be grateful for your cooperation.



# Brakes

## ANTI-LOCK BRAKE FAILURE LIGHT

Here's a tip for 1988-89 Jaguar XJ40s that come in with the antilock brake failure light flashing. Check the over-voltage relay unit located in the trunk, above the left rear tire. Open the unit, then look for a relay on a circuit board. A cold solder joint is the cause of your problem. Re-solder the connection, and the problem should be solved.

Jason Mascow  
Enzo's Automotive  
Marietta, Georgia

## DUST COVER TROUBLE

If you've ever rebuilt a caliper and had trouble putting the dust cover on the piston, try this:

- Install the dust boot first.
- Slip the caliper piston over the dust boot, then inflate the boot by adding compressed air through the bleeder.
- Push the piston past the boot, into the caliper bore.

Jud Greig  
Jud's Auto  
Pittsburgh, Pennsylvania

## LEAK-FREE PARTS CHANGES

To help keep brake hose, caliper and wheel cylinder part changes leak-free, use a brake pedal depressor to hold the brake pedal slightly depressed before opening a hydraulic brake line.

The compensating ports in the master cylinder will close and brake fluid won't leak out of the system. The master cylinder and ABS unit won't get any air in them, so bleeding goes much faster. Pull the brake light fuse to prevent battery drain on long jobs.

John Kucab  
LC Garage  
Palatine, Illinois

## BRAKE BOOSTER TEST

To determine whether a power brake unit is good or bad, attach an electric air conditioning vacuum pump to the power brake unit.

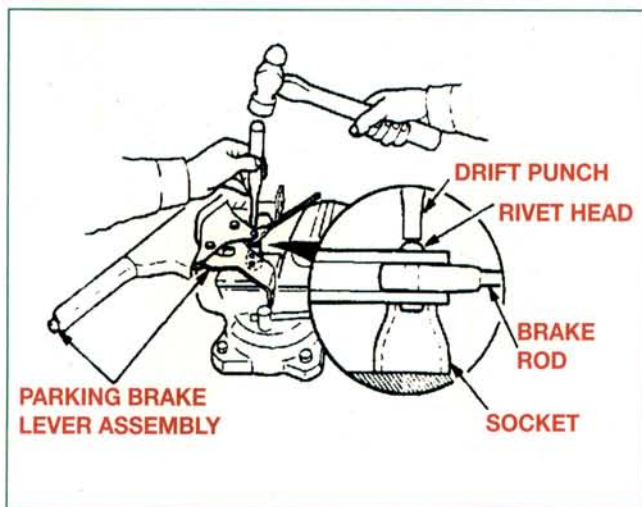
Attach a shop-made adapter, then use the low

side gauge of the A/C gauge manifold, or a separate gauge and hose. Watch how much vacuum the booster pulls and holds, while listening for leaks with a mechanic's stethoscope. An inline filter on your test rig will prevent contamination of the gauges and vacuum pump.

Earl Mathe  
Toyodat Auto  
Lemon Grove, California

## PREMATURE BRAKE WEAR

Some 1993-94 Honda Accord and Prelude models may experience premature rear brake shoe wear due to a binding parking brake handle. This condition does not allow the rear shoes to completely release and the red brake warning light may also remain on.



To repair this problem:

- Remove the center console, the parking brake rod from the equalizer, and the two bolts retaining the parking brake handle assembly.
- Remove the assembly from the vehicle and place it on its side.
- Place an 8 mm socket over the rivet, from the opposite side.
- Center a  $\frac{3}{16}$ -inch drift punch over the top of the rivet, then tap with a hammer (refer to figure).

This procedure will allow the parking brake handle to move more freely. After reinstalling the handle assembly, re-adjust the cable at the equalizer, verify that the parking brake is functioning properly, and that the red brake warning light is off when the handle is down.

Jeff Simonsen  
Brake Parts, Inc.  
McHenry, Illinois

## FROZEN CALIPER SLIDES

To remove frozen caliper slides on Honda rear disc brakes, use the special socket (HO-018) that is designed for Honda fuel filter banjo-bolt removal (it's the one with the two flats).

Put some penetrant under the rubber boot, then let it soak. With the caliper yolk in the vise, you can spin out the frozen caliper slider, using a helper to apply outward pressure with a forked tool.

Bill Sprentall  
Japanese auto  
Ann Arbor, Michigan

## ADJUSTER ACCESS

You've got a VW van with self-adjusting brakes. There's a ridge on the edge of the brake drum, which is preventing its removal. The self-adjuster is seized or difficult to back off. What do you do?

Knock one of the wheel studs inward, to gain easy access to the brake self-adjuster.

Ken Shapiro  
Precision People's Car Repair  
Berkeley, California

## SLIDER SLEEVE SOLUTION

When compressing or removing caliper slider sleeves on Mazdas or other imports, hammering with a punch or socket seems to result in mushrooming, which forces the replacement of the caliper and sleeves.

Try a heavy application of lubricant, using a ball-joint press and a 10 or 11mm deep socket to push the sliders out.

Don B. Kerr  
Pat Goss Car World  
Seabrook, Maryland

## STUCK PHILLIPS HEAD

To remove a stuck Phillips head screw in a brake rotor or drum:

- Beat the screw head with a flat punch or a  $3/8$ -inch drive extension.
- Follow this by driving a large Phillips head screwdriver bit into the screw slots with a hammer.

This technique should work, although it may take a few tries.

M.C. Boyd  
Firestone  
Candler, North Carolina



# Drive- train

## GUIDE PIN REMOVAL

Removal of guide pins on flywheels before resurfacing can be a hard and frustrating job. I use valve grinding compound on the hard to remove pins. The compound gives the slide hammer pin removing tool the extra friction needed to pull the pin out.

The compound also works wonders on hard to remove Phillips head screws. It gives the screwdriver tip the extra friction to grip the screw for removal.

Bill Clark  
Engine Parts & Machine  
Hagerstown, Maryland

## DAMAGED TEETH

When working on different manual transmissions, I have found times when the various pullers I used would damage the hard teeth on some transmission gears. To protect the gears, I took a short piece of soft copper pipe and flattened it. Then I used the soft pipe as a protective



pad under the gear teeth or edge that the puller jaws might damage.

Gary Griffith  
Aamerco Transmission  
Greenwood, South Carolina

## BROKEN BRACKET

A Toyota truck came to our shop after a recent clutch job, with the complaint of a low clutch pedal. A thorough inspection revealed a broken clutch pedal bracket, under the dash, that didn't allow for proper travel of the clutch push rod. The bracket was the cause of the clutch problem—not a worn disc or weak pressure plate.

Robert Desmarais  
Cajon High Auto Shop  
San Bernardino, California

## DAMAGED WIRES

The overdrive wiring harness on Volvo auto transmissions (with console shift), can become lodged in the shift lever pivot bracket, which damages the wires. The result—no overdrive.

Repair the harness by sliding a small vacuum hose over the damaged wires before soldering the broken wires. The hose will insulate the solder splice, plus it will protect the harness from further damage and failure.

C.J. Essic  
Thomas Transmissions  
Winston-Salem, North Carolina

## NO DRIP TIP

When removing transmission cooler lines from radiators, keep the transmission fluid from leaking on your head by using surgical tubing to plug off the cooler lines.

Cut a three-inch piece of tubing and stick a short  $\frac{5}{16}$ -inch bolt in one end. Stick the open end over the oil cooler line. The tubing seals tightly on a wide range of sizes, from  $\frac{1}{4}$  to  $\frac{1}{2}$ -inch.

Scott Regelin  
The Radiator Doctor  
Sonora, California

## ERRATIC SHIFTING

This tip concerns erratic auto transmission shifting on 1991 and newer Toyota Previa Vans. Check for broken wire(s) at the TPS connector on the throttle body. This can be caused by vibration and

movement of the harness. Replacement wire ends are available through the Toyota parts system.

Kent Hilty  
LaRiche Toyota  
Findlay, Ohio

## INFERNAL SNAP RINGS

For removing stubborn outer CV joints with the internal (infernal!) snap ring that you need to hammer off, try this:

- Place the axle assembly in a vise with the outer CV joint facing downward.
- Gravity works in your favor by preloading the retaining clip against the outer joint, which greatly aids in its removal. (Works great on Audi 5000!)

Alan Tamura  
Asian/European, Ltd.  
Santa Clara, California

## EASY CLUTCH CABLE REPAIR

When you run into a Volkswagen that has a broken retainer on the inside firewall for the clutch cable, don't spend three to four hours removing the pedals, carpet, etc., to weld it back (possibly a dubious weld). Instead, try this:

- Buy a sleeve with the correct diameter that is an inch longer in length.
- Weld a washer of the same I.D. to one end of the sleeve.
- Drill two holes in the washer and attach it to the outside of the firewall.
- Insert the cable.

John Kole  
JK Vehicle Repair  
Bellingham, Washington

## ALFA ROMEO 164 CLUTCH

When performing a clutch R & R on an Alfa Romeo 164 (front wheel drive), the following time-saving tips might help. Follow the Factory Shop Manual procedures, with these exceptions:

- Instead of dropping the exhaust manifolds and headpipes for starter removal, take a 13 mm socket with a wobbly extension and remove the top bolt holding the starter to the bellhousing. The other two bolts holding the starter are very accessible. Then move the starter out of the way, still leaving it electrically connected (battery disconnected, of course).
- Disconnect the left and right hand half shafts. Remove the left hand shock/strut assembly, but leave the left hand tie rod end connected. Leave the left hand axle half shaft still intact. Move it convenient-

ly out of the way for the next step.

- Now, instead of pulling the gearbox out of the car, just pull the gearbox away from the engine and rest it on the subframe. Doing this, you will even have enough room to R & R the flywheel for resurfacing, and clean the gearbox with solvent.

I want to acknowledge Larry Ogle, Master Technician at Knauz of Lake Forest, Illinois, who passed this tip on to me.

Alan Promisco  
Italia Automobili  
Northbrook, Illinois

## PULL THE PILOT

When pulling pilot bearings or other thin wall bushings using a slide hammer, wedge a chisel or punch against the back of the slide hammer to keep the slide hammer from pulling out of the pilot bearing.

Bill Gully  
Wills Toyota  
Twin Falls, Idaho

## GEAR EATING TRANSMISSIONS

**Automatic transmissions in Nissan Sentras have a bad habit of eating up their governor drive gears. If the transmission fails to shift out of first gear and other transmission vital signs are good (fluid, color, smell, and level): check the plastic drive gear for obvious damage. It is easily replaced.**

Andy Alden  
B & J Auto Works  
College Station, Texas

## QUICK AND EASY

**Here's a quick and easy way to install outer CV joints onto the axle shaft:**

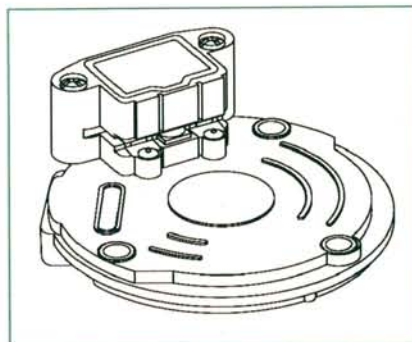
- First, install the boot strap and CV boot.
- Install a tie wrap over the c-clip.
- Tighten the tie wrap to compress the retaining clip into the axle groove.
- Trim off any excess tie wrap and discard.
- Align the CV joint until the CV joint touches the tie wrap.
- Give the CV joint a quick and firm tap with a rubber or brass hammer. The joint should pass over the retaining clip.
- Snip off the tie wrap, then continue tapping the CV joint until it seats the clip into the joint.
- Position the CV boot and retaining strap.

Mike Mikani  
Honolulu, Hawaii



# Electrical

## ERRATIC COLD ENGINE OPERATION



An erratic spark and fuel injection control condition on mid-eighties Nissan vehicles that goes away as the vehicle warms up may be caused by the presence of oil on the optical crank angle

assembly. These symptoms may occur on 1982-89 Nissan models equipped with 3.0 liter V6 engines, as well as 1984-87 Nissan models equipped with 1.6 liter four cylinder engines. They may also occur on vehicles from other manufacturers that are also equipped with optical crank angle sensors.

The oil in the crank angle sensor area is usually due to seepage past the upper distributor shaft seal. This oil coats the surface of the crank angle sensor optics, reducing the amount of light from the emitter. This creates an inconsistent switching signal, causing the erratic cold engine operation. The oil thins as the engine warms up, allowing a stronger emitter signal.

Short term servicing is as simple as removing the interrupter plate, then cleaning the emitter and collector using a swab and glass cleaner. Long term repairs should include servicing the distributor shaft bearings and seals.

The loss of signal may also be caused by internal cracking on the optical trigger assembly main board. In this situation, the vehicle will operate normally when first started, then become erratic as the engine warms. As the engine reaches normal operating temperature, the engine may smooth out. In this instance, cracks or cold solder joints on the crank angle sensor optical board are usually responsible. Replacement of the optical trigger assembly is the recommended service.

## ECHLIN ENGINE SYSTEMS

### THERE'S THE RUB

**If you have no fuel management and no ignition on a 1987 or newer V-6 Toyota pickup or 4-Runner, determine whether the EFI fuse located under the hood is blown. If it is, check the wiring harness**



**four inches from the diagnostic connector on the right inner fender.**

The wiring harness rubs through and shorts on the inner fender. (I have seen this on six vehicles so far.)

Jim Marcoz  
Lentz Auto  
Trafford, Pennsylvania

## NO LIGHTS

**Problem: No right side parking lights front and rear on 1984-89 Porsche 911 Carreras. The lights are fused separately, and the fuses and bulbs will test good. The problem can be quickly traced to a faulty diode located behind the headlight switch, that controls the right side parking lights only.**

Bill Germinario  
Bill's Auto  
Atlantic Highlands, New Jersey

## BLOWER MOTOR QUICK-CHECK

**A quick and easy check for a Toyota (and many other makes) heater blower motor circuit is to connect a test light across both terminals of the motor connector, then operate the blower motor switch (key ON).**

If the test light lights in all positions, you have basically checked the whole circuit (switch, relay, circuit breaker, fuse, resistor, ground). All that is left is the motor.

Jim Trook  
Cannon Toyota  
Scottsbluff, Nebraska

## ALTERNATOR SHORT CUT

**Here's a short cut for replacing an alternator in a fuel injected 1985-87 Honda Accord. Remove the air filter housing, then pull the alternator out through the opening. This will reduce a 2.2 hour job (Mitchell time) to 45 minutes.**

Howard Shimada  
Japanese Service Center II  
Sacramento, California

## RETRACTABLE LIGHTS

**Broken or shorted wires behind the headlights will cause blown fuses or inoperative headlights**

**on Hondas and other makes with retractable headlights.**

If you have a headlight that is out or a fuse that blows intermittently, check the wires to the light, behind the bulb. Where the wires flex is where you will find the short or open circuit. 1987-88 Hondas most commonly have this problem, but I have seen it on other makes as well.

S.J. Reeves  
Reeves Auto Service  
Carrolton, Georgia

## NOISE ABSORBER

**It's easy to pick up stray electrical noise when you are using an inductive tachometer (like the one on my smog machine).**

The RPM reading will usually be correct above idle, but the idle reading may be twice as high as the actual RPM. Hold the inductive pickup *and* its lead wire with your hand, then use your body to absorb the electrical noise. Watch out, though—they get hot!

Rob Robbins  
Atlantic Tire & Auto  
West Hollywood, California

## CLEANING TOOL

**An emery board makes a great cleaning tool for the female blade-type terminals found in the connectors at air mass meters, temperature sensors, etc.**

Use tin snips to cut the emery board into small strips approximately 3 mm wide. Work them between the terminal blades. Be sure to gently retention the terminals when you are done. Use dielectric grease to stop corrosion. **Note:** Heavily corroded connectors should be replaced.

Stu Rhodes  
SC Imports  
Cutchogue, New York

## CHECK FOR BREAKS

**If the tail light and dash lights are inoperative on a 1996 Camry, check for a break in the green wire with the red tracer between the tail light relay and the integration relay. This wiring is located under the dash, on the left side of the steering column.**

J. Mac Geissinger  
Lariche Toyota Subaru  
Findlay, Ohio

## MYSTERY STALL

**An incorrect pickup coil air gap may cause a mysterious stalling problem on 1984 and newer Camry models equipped with 2.0 liter 2S-E engines.**

The stalling may occur at low RPM, such as when shifting the vehicle into gear. If the pickup coil air gap is too wide, the primary circuit will shut down due to a weak pickup coil signal. The car will run fine at higher RPM, because the increased reluctor speed strengthens the signal. The spec is .008 to .016 inch. These gaps are critical and are often overlooked causes of mysterious driveability problems.

Steven H. (Buzzard) Gillard  
Sullivan Tire Company  
Plymouth, Massachusetts

## PARKING/BRAKE LIGHTS

**Single filament bulbs installed in place of dual filament bulbs may cause the front parking lights to come on when the brake pedal is depressed on Volkswagen Golf or Jetta models equipped with automatic headlights.**

Check to see if there are single filament bulbs in the rear brake and parking light sockets. Volkswagen Golfs and Jettas usually have dual filament parking and brake lamps. I have seen the same problem occur in several Japanese cars—usually when owners decided to install their own bulbs.

Chris Lagattuta  
New Dimensions  
Santa Clara, California

## WORN OUT MOUNT

**To give new life to a Volkswagen, Jetta, Rabbit, or Scirocco alternator with a worn mount:**

- remove the alternator,
- bore out the upper alternator mount,
- press in a bronze Rabbit valve guide,
- remount the alternator, and presto!

You will get another 50,000 miles out of the alternator. I've done this repair about 100 times and have never had a problem.

Andrew Marshall  
Comprehensive Auto  
Mesa, Arizona

## BUZZER ALERT

**As with any car, leaving the lights on in a 1988-**

**91 Civic can harm the battery. You can solve this problem by attaching a small (12 volt) peizo buzzer to the fuse box. Connect the positive lead to fuse #8 and the negative lead on fuse #17. When the ignition is off and the lights are in the ON position, the buzzer will sound.**

Joseph Pelleteri  
E. Rutherford, New Jersey

## MIXED-UP CONNECTORS

**Mercedes 260 and 300 E-series have two electrical connectors that are easily transposed. One goes to the electro-hydraulic actuator on the fuel distributor, and the other goes to a temperature switch on the cylinder head.**

Both are two pin connectors and come out of the harness at the same point, so they are easy to interchange accidentally. The car will still start and run, but will be very lean and run poorly.

Look for this problem if someone in the shop has just put a head on the car and cannot get it to run right. The wires to the actuator should be BRN/BLK and BLACK. The wires to the temperature switch may be BROWN or BLUE/GRY.

John Hege  
Old Salem Foreign Car  
Winston-Salem, North Carolina

## DAMAGED HARNESS

**A damaged wiring harness on a 240-series Volvo may cause all of the dash warning lights to come on intermittently.**

The wiring harness runs under the front of the engine. Leaking engine oil may cause the harness to deteriorate, then short out internally.

Another possible cause for these symptoms is worn alternator bushings. The worn brushes cause the alternator to charge intermittently.

Robert L. Smith  
Redline Auto  
Austin, Texas

## BIZARRE BEHAVIOR

**Have you ever spent hours tracking down an elusive driveability problem or a bizarre electrical problem, including a pin test of the entire system, only to find nothing wrong? To top it off, when you reassemble the vehicle, the symptom may have disappeared.**

Don't be too quick to blame a faulty connector for the phantom problem. In a lot of cases, it's just an



overloaded computer memory. Simply disconnecting the computer for several minutes has fixed dozens of vehicles for me. This has included everything from driveability problems to security alarms that went off by themselves.

Mike Fobes  
Sound Mitsubishi  
Benton, Washington

## **SUPER-SIZED MEMORY SAVER**

A simple and easy to use "memory saver" can be made from a lighter plug (Radio Shack® #270-021 for \$3.49), connected to a lantern battery (12 volt or two 6 volt batteries in series).

These batteries last longer than 9 volt radio batteries, and allow technicians to leave the door open while they are working, without draining the battery or losing the memory.

James D. Halderman  
Sinclair College  
Dayton, Ohio

## **MULTIPLE FUSE LOCATIONS**

Jaguar Series II and III XJ6 models use three fuses for the A/C clutch: a thermal fuse mounted close to the clutch; a fuse in the fuse box; and a third in-line fuse located under the removable panel on the passenger side of the console. If any one of these fuses is damaged, the A/C clutch will not engage.

Doug Friedman  
Performance Unlimited  
Tulsa, Oklahoma

## **SPOOKY WINDOWS**

If the windows are doing spooky things on a VW Passat,

**don't change the control module until you check the battery and charging system.**

The system uses momentary contact switches and the relays are in the module. The only way the module knows if the window is all the way down, is by the voltage spike that occurs when the window hits bottom. If the battery voltage drops below 12 volts, the voltage spike isn't strong enough to turn the relay off, so the module eventually burns up.

John Hege  
Old Salem Foreign Car  
Winston-Salem, North Carolina

## **FRACTURED JOINTS**

**Intermittent speaker or radio operation on Honda/Acura models, especially over bumps and potholes, may be caused by fractured solder joints (connector-to-PC board).**

Repair by opening the radio cover and reheating all the connector-to-printed circuit board solder joints. Fractures can be seen with a magnifying glass. This is a very common problem on 1991-92 Accords.

Dan Wheeler  
D&M Automotive  
Centereach, New York

## **BALANCE TEST**

Here's a quick way to perform a power balance test on vehicles equipped with DIS coil packs. If your scope doesn't have DIS adapters or you just want a quick check:

- Cut small (3-inch) pieces of windshield washer/vacuum line stock.
- Place them between the coil tower and the spark plug boot.
- Attach a test light to the vacuum line. You will short the cylinder spark to ground as long as





the test light is in place. This is also useful for isolating an engine noise to a particular cylinder.

• Don't disable the spark any longer than necessary. The unburned fuel pumped into the exhaust can damage the catalytic converter.

Devin Warner  
Auburn Crossroads Auto  
Marysville, California

## HONDA/ACURA/INTEGRA POWER DOOR LOCKS

**Power door locks on Honda and Acura models that are completely inoperative or intermittently inoperative may be caused by fractured solder joints inside the power window relay.**

The relay's output terminals are part of a printed circuit board that is located in the module mounted on the driver's door (behind the door panel).

This problem is very common on 1991-92 Accords.

Dan Wheeler  
D&M Automotive  
Centereach, New York

## SHARED FUSE

**On carbureted Hondas with electric fuel pumps, check the voltage regulator and associated wiring if the fuel pump blows the fuse intermittently.**

These components share a fuse. I've had to replace several for this problem.

Dan Rickert  
Almanor Import Repair  
Clear Creek, California

## A TRICKED CONTROL UNIT

**Lack of power can cause misleading trouble codes, which may lead you to believe the problem is more serious than it actually is.**

A bad coil wire and/or an ignition coil with a damaged terminal can trick the control unit into storing many different trouble codes. Several customers have come to our shop with a grocery list of parts they were told they needed to cure a coil and/or coil wire problem. Covering the basics and honesty still pay off.

James K. Overby, Jr.  
Ken's Repair  
Coon Rapids, Minnesota

## ROUGH RUNNING

**Remember, many early Mazda RX-7 models are equipped with ignition points, rather than electronic ignition. When working on rough running problems the cause may be one set of points that has closed up. This will disable either the leading or the trailing plugs on these cars, which will make them run very poorly.**

Santus Gore  
Spitzer Automotive  
Indianapolis, Indiana

## A MIND OF ITS OWN

**Intermittent electrical problems on a 1995 Nissan Pathfinder may be caused by the driver's door wiring harness. Symptoms include:**

- The driver's window (power windows) may open on its own after it's been closed.
- After locking the doors and setting the alarm, the car will disarm the alarm on its own after sitting for about an hour.

There is a junction in this harness where several ground wires are crimped together, but they may not be crimped tightly enough. You can either repair the crimp or replace the door harness.

Patrick Harvey  
Brown & Brown Nissan  
Tempe, Arizona

## CORRODED SPLICE

**A corroded connector may cause intermittent charging on 1987-92 Toyota Corolla sedans and station wagons.**

Most guys jump to the alternator first thing. I have seen this problem cause the charge warning light to go off and come back on intermittently. The problem is a bad splice six inches below the battery. The splice gets corroded, causing high resistance. Fix this and the charge light will go out and stay out (when it's supposed to).

Jason Morelli  
Day Toyota  
Monroeville, Pennsylvania

## PULL THE PLUG

**If you have ever experienced a driveability problem after a clutch replacement in a 1986-88 carbureted Honda Accord, check the "gang plug" connectors near the battery tray. While working under**

the hood, its very easy to snag one of these. This could affect the idle fuel cut circuit, which can cause a stall condition at idle or no idle. These symptoms could also be easily mistaken for a vacuum leak.

Steve Ferrier, Jeff Rhodes  
Kirkwood Auto center  
Wilmington, Delaware

## A QUICK VISUAL

Here is a quick visual check if you encounter a Camry with continuously running cooling fans (key ON). There is a small light grey double wire connector that can come loose, due to stretching of the harness to the battery positive terminal.

This will lift the ground to start both fans. It is a connector to the A/C high pressure switch located under the battery.

Benny Goss  
Benny's Mobile Auto Repair  
Atlanta, Georgia

## RUBBED THE WRONG WAY

If you have an early to mid 80's fuel injected rear wheel drive Toyota Celica that intermittently blows the fusible link in the main fuse box under the hood, check the wiring harness. It could be rubbed through in two places. I have seen them rub through on the edge of the battery tray, and also on the bottom of the air filter housing. If the fusible link that protects this circuit blows, the symptom will be no ignition spark due to no power to the coil.

John Rau  
Rising Sun Motors  
Beltsville, Maryland



# Engine Mechanical

## BELT REPLACEMENT

These tips may help you replace a timing belt on an early body style front wheel drive Nissan Maxima. Remove the hood shock from the lower side, then use a hood holder to give yourself more working room.

Also mark the cams with paint before removing

the old timing belt. We all know that one cam is always a little bit off! You'll go nuts trying to line up the timing marks.

Vincent Conigliaso  
Dr. Auto  
Glen Allen, Virginia

## LOW ON OIL

If a customer complains of high oil consumption on a 1990-93 Toyota Previa van, check the vehicle's oil level sensor. If it reads low oil, it will automatically pump oil from the oil reservoir tank into the engine. This may cause the engine to have too much oil in it. The extra oil may get burned off.

Double check the oil level using the dipstick located under the driver's seat. Previa owners tend to rely on the level in the oil reservoir because of its greater accessibility.

Dennis Liongson  
LDL Auto & Speed Shop  
Fremont, California

## DON'T OVER-LUBE IT

A common mistake some mechanics make is putting "assembly lube" on bolts when they put an engine together. Then they twist off bolts because the assembly lube is too slick.

You may not get the proper torque reading until the bolt is overstretched. On bolts that require lubrication, always use motor oil, unless the manufacturer states otherwise.

Wayne R. Jenkins  
Mobile Mechanic  
Huntsville, Texas

## DON'T FORGET THE O-RING

On Toyota 20R-22R engines, the oil pump o-ring is often overlooked, especially when replacing the front main seal. Another area to explore for oil leaks in this section of the engine is the crank pulley. Replace or resleeve the pulley if there is a groove within the area that matches the oil seal.

Dennis Liongson  
LDL Auto & Speed Shop  
Fremont, California

## LOOSE PARTS

Some 1995-96 Mazda Proteges may die on the road, then refuse to restart. When checking the



vehicle, you will have spark, fuel, and air. However, the vehicle may turn over like it has no compression.

Remove the timing covers and check for a piece(s) of a rubber strip. A piece of rubber insulation from the bottom cover can fall off and get caught between the timing belt and the crank sprocket. This causes the timing belt to jump timing. The first vehicle I saw this on had 3,300 miles on it.

Brian Winkley  
Charlie's Motor Mall  
Windsor, Maine

## CRANKY BOLT

**Having a hard time getting the crank bolt out of an Audi 5000 five-cylinder engine? Try this:**

- There are two half-moon shaped openings in the bellhousing.
- When the crankshaft is turned to TDC, the holes line up with corresponding holes in the flywheel.
- Insert a  $\frac{3}{8}$ -inch extension, and you've locked the crankshaft at TDC.
- You should be able to break the crankshaft bolt loose with a breaker bar.

Chuck Boyce  
La Fox Imports  
South Elgin, Illinois

## SNEAK A PEAK

**An adjustable timing light can be used to verify proper camshaft belt timing if the camshaft cover has a sight hole.**

Run the engine with the timing light connected to the number 1 cylinder, and adjust the light until the TDC mark aligns with the crank pulley mark. Then check the camshaft mark using the timing light. If the belt timing is correct, the camshaft timing mark will be aligned just as the crankshaft reaches TDC.

Kent Anderson  
Anderson Automotive  
Kingsport, Tennessee

## YOU GET WHAT YOU PAY FOR

**No-name head gaskets for imports may not be properly centered over the cylinder bores. Any part of the head gasket that hangs over into the cylinder can cause a knocking noise that sounds like loose tappets. Check the gasket carefully before you install the head.**

Gary Walker  
Walker Brothers  
Roseburg, Oregon

## BEARING KNOCK

**On Volkswagen water cooled gas engines, a loud noise transmitted through the top end of the engine may be caused by a failed timing belt tensioner bearing. The noise may seem to be coming from the valvetrain or under the valve cover area.**

Use a stethoscope to pinpoint the noise, or a long screwdriver (holding the handle to your ear). The noise should be loudest under the top timing cover.

James Grafe  
Heidelberg, Pennsylvania

## CHECK BEFORE YOU CONDEMN

**The complaint is excessive oil consumption on a Volvo turbo. Check the oil separator box before condemning the turbo. There is no flame trap to clog up, but after 100K or so, this box can become restricted, causing oil to be drawn into the turbo and burned in the combustion chamber.**

Arthur H. Gilbert  
EuroStar Auto  
High Point, North Carolina

## EASY ACCESS

**When replacing a timing belt and water pump on Audi 90 models and some 5000 models equipped with 5 cylinder engines, I have found that removing the bumper cover is necessary to gain more access to the timing covers and pulleys. The minimal amount of work needed to remove the bumper cover allows more room and will save time in the long run.**

Todd A Vruyginck  
Alan Christian Motor Cars  
Holland, Michigan

## OIL IN THE COOLING SYSTEM

**Mercedes Benz 102 four cylinder and 103 six cylinder engines can get large amounts of oil in their cooling systems. High mileage cars with neglected cooling systems can develop electrolysis at the head gasket. This eats away the gasket and causes the problem.**

Repair, then replace the head gasket, and flush the cooling system.

Mike Siman  
Jim Earp Imports  
Omaha, Nebraska



# Fuel & Emissions

## FLOAT THE FLOAT

To check a used carburetor float for fuel absorption, place it in a container of gasoline (or other liquid), along with a new float of the same design. Even a slight difference in float density will show up. A fuel-saturated float will ride lower in the liquid than an unsaturated float.

This tip can be especially helpful when you are not sure of the cause of the carburetor problem, or the float design has been changed.

Dan Rickert  
Almanor Import Repair  
Westwood, California

## VOLVO NO-START

A no-start condition on a late model Volvo 760 may be caused by a bad fuel pump or injection relay. If the engine has no spark, check these relays, as they also control the ignition circuit.

Carlos Molina  
AM Foreign Motors  
Somerville, Massachusetts

## SUPER SNIFFER

Use the following procedure to check for CO in the crankcase using an exhaust gas analyzer:

- Pull out the PCV valve while watching the CO reading on the exhaust gas analyzer.
- If the CO level goes down, change the oil, then retest.
- If the CO level still drops when the PCV valve is removed, there is a combustion chamber bypass problem (probably worn rings).

Andy Berube  
Exxon Service  
Atlanta, Georgia

## CAR WASH BLUES

"My Beemer died and won't restart ever since I drove it through the car wash!"

1992 and later BMW 325 and 318 models (E36 body code) can drown their engine control modules if the hood cowl drain is even partially clogged. We have had success in reviving some wet control modules using the following technique:

- Remove the control module, then remove the

cover.

- Spray the wet circuit components with a spray lubricant (like WD-40), then blow everything off with clean, dry compressed air at a sensible air pressure.
- Allow the control unit to dry in a warm area overnight, before reassembly.
- Reinstall the control unit, but don't forget to clean out the hood cowl drain first.

Ken Brown  
Quality Motors  
Laguna Niquel, California

## SURGING SENSATION

A surging sensation above 1500 RPM on a 1985 Mazda 626 may be caused by broken air injection reed valves. The broken reed valves allow exhaust to enter the carburetor through the air filter housing, rather than injecting fresh air into the exhaust system as intended. These symptoms can be easily mistaken for a carburetor or feedback circuit problem.

Steve Nix  
Nix Auto Service  
Woodland Hills, California

## NO START SUSPECT

If you are working on a late model Mazda or any Japanese model with a no-start, no-spark, no injector pulse complaint, check to see whether the CHECK ENGINE light is ON with the key ON, engine OFF.

If the CHECK ENGINE light isn't ON, try disconnecting the airflow meter. If the light comes on and the engine starts, you've found your problem—it's a shorted five volt reference signal in the airflow meter. I have seen this problem occur on several vehicles.

Ken Gutierrez  
Wakefield Battery and Electric  
Bronx, New York

## LOW FUEL FALSE ALARM

On older Mercedes-Benz diesel models (220D, 240D, 300D), I have found that the reserve warning lamp may light up, even though there is plenty of fuel in the fuel tank. Unscrewing the fuel filler cap releases a vacuum suction, and the complaint usually seems to occur after a long stretch of driving.

The cause of this problem can be found in the trunk. There you will find an expansion tank with two positive ventilation hoses (back to the main tank), and a negative hose (to the atmosphere).

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Inspection usually shows that one or all of these hoses are blocked or have been stopped up intentionally by a previous, well-intentioned technician or DIYer. Unblock the hoses and the low fuel light problem will disappear.

Stephen Blourg  
Avus 621  
Bronxville, New York

## **OUR BUDDIES, BUCK AND SURGE**

**A buck and surge condition after an air filter replacement on an older MX-6/Probe may be caused by a crack in the air intake hose. The torque of acceleration in first or second gear will cause the crack in the hose to open, allowing un-metered air to bypass the airflow meter.**

Scott Fulmer  
Ford & Bryant, Inc.  
Liverpool, New York

## **ONE MAN DIESEL FUEL INJECTION PUMP TIMING TEST**

**To test the fuel injection pump timing on Mercedes-Benz 616, 617.91 engines:**

- Remove the delivery valve assembly, then install the delivery valve holder with test overflow tube.
- Instead of pumping the hand pump like Mercedes suggests, remove any injector return line.
- Apply air pressure in the return line to pressurize the tank, then quickly reinstall the return line.
- Now rotate the engine, watching the test overflow tubes.

Mike Simon  
Jim Earp Imports  
Omaha, Nebraska

## **STICKING THROTTLE**

**We recently encountered a 1981 Subaru with a sticking throttle. After checking the throttle cable**

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adjustment and condition, we found that a dirty air filter was forcing the vacuum-operated secondary throttle plate to open. When I installed the same clogged filter on a 1986 Subaru, it caused the same symptoms. So it's possible that a clogged air filter cause the same symptoms on any vehicle equipped with a vacuum controlled secondary throttle plate.

Jamie Mann  
Import Auto Clinic  
Gray, Tennessee

## VOLVO NO-START

If you're working on a Volvo that will crank, but won't start, try disconnecting the mass airflow sensor wiring harness connector (with the engine OFF). If the engine will now start and idle, you can be about 99.9 percent sure that you have found the no-start problem.

Disconnecting the airflow sensor places the vehicle's engine management system in the fail-safe diagnostic mode. This mode allows the engine to start and run when some of its components are missing, or are sending very inaccurate signals back to the control unit.

Mike Hays  
Milford Car Works  
Milford, Connecticut

## MIXTURE HEATER FAILURE

On 1987 Nissan Pathfinder and Truck models, a cold hesitation may be caused by a failed mixture heater. The mixture heater is located below the throttle housing and should have a resistance of between 1-2 ohms. If it does not, replace the mixture heater.

Kenny Turner  
Superior Imports  
Melbourne, Kentucky



# General

## GET THE MOST OUT OF AEROSOLS

Ever get frustrated at aerosol cans that seem to be half-full and won't spray, or you can't get the can in the correct position to spray? Try using an 1/8-inch O.D. piece of plastic tubing. The type that comes with a mechanical oil pressure gauge works great.

Push the little tube that comes with the spray can into a piece of tubing about 12 inches long. There are two different sizes of spray can tubes. You may need to use a different size in each end so you can direct the spray and empty the can.

Douglass Kirchdorfer  
Douglass Auto & Body Repair  
Denver, Colorado

## KEEP ROCKER ARMS IN ORDER

Recycled cardboard egg cartons are a big help on cylinder head jobs. To keep rocker arms in the pro-per location and cut down on wasted time, insert the rocker arms, lifters, etc., into the individual bins in the egg carton. Mark the top of cartons to show the proper location of each part. This can also be used to store parts while keeping them free of dirt.

Richard Livingston  
Reliable Automotive  
Gary, Indiana

## THERMOSTAT HOLDER

It can be difficult to hold a thermostat in the proper position in the housing while starting the bolts. Try looping a rubber band through the thermostat, out the neck, and around a pencil.

The rubber band holds the thermostat in place until everything is in position. Then you can remove the pencil and the rubber band.

Douglass Kirchdorfer  
Douglass Auto & Body Repair  
Denver, Colorado

## HAND MADE STRAP WRENCH

**Holding a crankshaft pulley to remove the crankshaft bolt can be a difficult proposition on some vehicles. There's not enough room to work, and the wrong tools run the risk of damaging the pulley. I used the following technique to fabricate my own strap wrench for immobilizing the pulley while I loosen the bolt:**

- Find a piece of scrap steel pipe that is 12 inches long x 7/8-inch I.D. x 1 7/16-inch wide.
- Cut an old timing belt, then insert both ends through the pipe.
- Adjust the length of the timing belt to the size of pulley you want to remove from an accessory.

This tool works well both on or off the vehicle.

Talmadge R. Whigham  
Whigham's Auto Electric  
Thomaston, Georgia

## FROZEN LOCKS

**Having trouble with frozen locks on customer vehicles? Here's an easy way to melt the ice:**

- Take the shop hose used to remove exhaust outside, then hook it up to the shop truck or car.
- Point the hose at the frozen lock to use it like a large, gasoline powered hair dryer to thaw the locks or door mechanism.
- The same method works very well for thawing frozen fuel lines.

**A word of caution:** the hose gets very hot, and this procedure should not be tried in a closed shop! The exhaust isn't just hot, it can be poisonous, too.

S.J. Reeves  
Reeves Auto Service  
Carrollton, California

## CLEAN HANDS

**Common bleach and a small brush gets out those pesky dirt and grease stains imbedded in your finger crevices. Follow by washing with ordinary soap.**

J. Stoyer  
E Missions  
Swan Lake, New York



# Temperature Control

## ALL STOPPED UP

**I had a Volvo in the shop the other day with an intermittent overheating problem. The usual checks came out good, so I drained the cooling system and got ready to flush the system. Problem—the overflow bottle didn't drain.**

Seems someone had poured a can of Stop Leak® into the overflow bottle and completely sealed the hose to the radiator. With no cap on the radiator there was no way to know that the radiator was a half gallon low on coolant.

Dan Rickert  
Almanor Import Repair  
Clear Creek, California

## THERMOSTAT SHORTCUT

**Save time when flushing a cooling system. If replacement of a thermostat is part of your estimate, don't remove it before flushing. Take a large screwdriver and pry the thermostat open first.**

You can usually do it simply by removing the hose and working through the neck of the thermostat housing. This saves time spent on removing the thermostat when pressure flushing, when thermostat replacement will occur later anyway.

Scott Regelin  
The Radiator Doctor  
Sonora, California

## HOSE PROTECTOR

**Old heater and radiator hoses can serve a second function as protection for the new hoses:**

- When replacing heater hoses and radiator hoses, install the new hoses and cut the ends off old hoses.
- Slice the old hose like a curli-cue french fry.
- Wrap the old hose around the new hose to act as an insulator and protector.
- Secure the outer hose with wire ties.

J. Stoyer  
E Missions  
Swan Lake, New York

## RADIATOR PROTECTOR

**When working around an engine and doing things that might put you in contact with the radiator, tape a piece of cardboard on the backside of**

the radiator. It will help to protect both you and the radiator.

Jim Trook  
Cannon Toyota  
Scottsbluff, Nebraska

## CLIMATE CONTROL CULPRIT

**On Audi 5000 climate control systems with a poor or inoperative blower, the problem is usually not a component.**

If there is no power to the blower motor, check the multi-pin connector located behind the center console panel, next to the throttle pedal. This little connector was obviously not meant to carry so much current and is always melted! Bypass the connector, and the problem is solved!

Bernie Haggemacher  
Leonard's Foreign Car  
Northridge, California

## WEAK HEAT

**I recently had a 1988 Celica GT with a complaint of intermittent poor heater operation. The customer stated that the heat system would suddenly blow cold. When I got the problem to occur, I found that the heater control valve was in the cold position, while the temperature lever of the climate control was in the heat position.**

When the dealer informed me the cost of a new climate control head was around \$300, I decided to see if I could find a problem in the old head. When I removed the circuit board from the control head, I found several cracked solder joints at the section leading to the temperature lever.

After re-soldering and installing the unit, the repair was a success. I had a happy customer, with a bill of about \$70.

Charlie Russell  
Car Services, Inc.  
Norwell, Massachusetts



# Steering and Suspension

## VOLVO ALIGNMENT ALERT

If you are aligning a 1975-94 Volvo, check the angle of the ball joints carefully. I found a caster angle to be way out of specs and not adjustable, but the camber was okay.

The solution: the right and left side ball joints are interchangeable. You can put two right side ball joints on and have a two degree negative difference on the left side caster due to the offset.

I spent an hour looking for something that was bent, when the problem was that our do-it-yourselfer was sold two right side ball joints and in-stalled them with three bolts holding them in place.

Bill Restoff  
Dobbs Tire and Auto Centers  
Fairview Heights, Illinois

## BALL JOINT WEAR DETECTOR

**To determine ball joint wear on 1964-89 Porsche 911s, remove the 11 mm tension bar adjuster bolt. This relieves tension on the control arm and ball joint. Any tolerance build-up may now be easily detected.**

Jerome Passon  
J.P. Weeks  
Merriam, Kansas

## CHASING AN IMBALANCE

**Has this ever happened to you:**

- You're balancing a tire and the machine displays a value of one ounce.
- You install one ounce where the machine told you to, then re-spin the tire.
- Now the machine displays another .25 ounces.
- Instead of adding the .25 ounce weight, pull out the weight you already installed and shift back just one weight clip size.

The one ounce the machine told you to add in the first place was more than needed.

Creas Nwokeabia  
American Tire & Auto Repair  
Los Angeles, California

## PULLING BMW

**When faced with a BMW 3 series that pulls to one side and then another (usually the last direction steered), the problem is not the rack and pinion unit. Look for worn strut tower bearings.**

To avoid embarrassment, be sure to drive the vehicle before taking the customer's money for a wheel alignment.

Walter Razavi  
Razavi Service  
San Antonio, Texas