

# Tomco Techtips

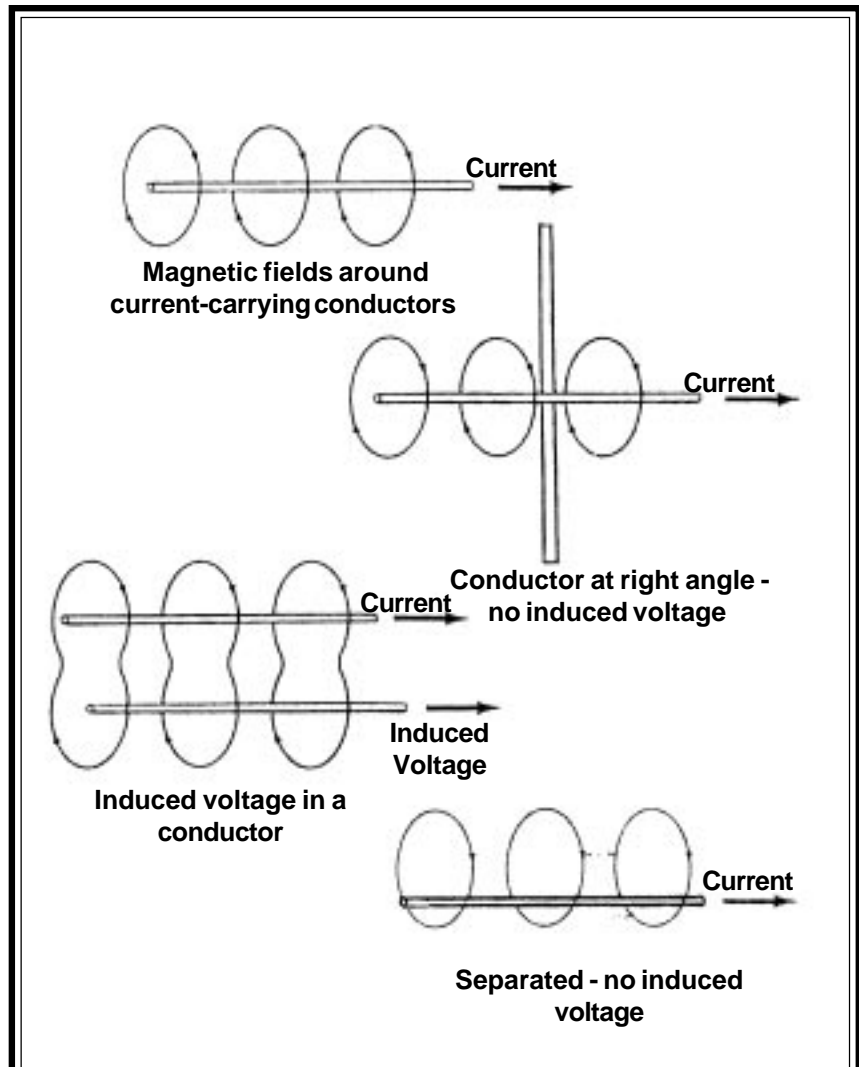
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ISSUE 10

## Stalling - Stumbling Engine

All vehicles with computer engine control systems can have various engine problems caused by a computer wiring harness being too close to starter, ignition or other engine wires. The harness should be five inches or more from all such high current or high voltage conductors. If the harness must cross a conductor, it should be at right angles.

This condition that causes this to occur is called "Faraday's Law of Induction" which states: "A magnetic force field that changes in time will develop a voltage in any conductor placed in the field, so that it cuts magnetic lines, a voltage will be induced across the conductor." This induced voltage occurs when the wires are parallel to each other because the conductor is cutting the magnetic lines of force. When the conductor is at right angles the magnetic lines are not being cut and no voltage is induced.



*Above: Figures describing "Faraday's Law of Induction" and how it applies to automobiles.*

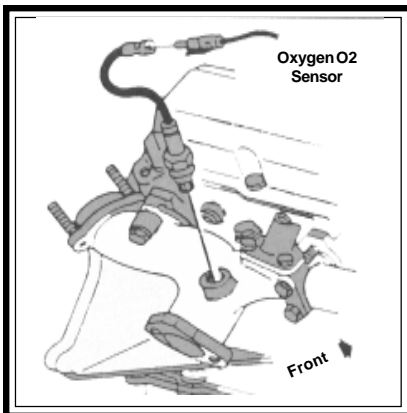
## O<sub>2</sub> Sensor Contamination

A hard to remove oxygen sensor may come out easier with rust penetrating oil, WD 40 and the like. Tests show that many penetrants not only loosen oxygen sensors, but also poison them.

Oxygen sensors are sensitive to "poisoning" if liquid of any type (that leaves a residue) penetrates the inner platinized surface of the zirconia cell (the heart of the zirconia type assembly).

Many oils and penetrates will burn off the outside of the zirconia cell when subjected to the high temperatures in the exhaust system. Replacement or voltage output testing with a digital voltmeter are the good answers.

A nonoperational oxygen sensor can cause expensive replacement and repairs - such as towing bills, burned up catalytic converters and excessive gasoline consumption.



## The "Backward" Oxygen Sensor

We had an '82 3.8L carbureted Buick in our shop with a complaint of a bad oxygen sensor. This O<sub>2</sub> sensor is located in the exhaust manifold just below the valve cover. The car had gone through three O<sub>2</sub> sensors within two months. Each time the "check engine" light came on, the O<sub>2</sub> sensor was producing a very low voltage: when "rich" it produced less than 150 millivolts, when "lean" it produced 800 millivolts negative.

Testing of the oxygen sensor showed no indication of oil, anti-freeze or leaded fuel present. Any of these will ruin any O<sub>2</sub> sensor.

When asked if anything else had been serviced lately on the car, the owner said the valve cover gasket had been replaced. We found a highly volatile clear silicone sealer had been used that was not designed for automotive use. High volatility silicone fumes are "poisonous" to O<sub>2</sub> sensors. The heat from the exhaust manifold caused the RTV silicone to release a gas that poisoned three oxygen sensors.

When the bad silicone valve cover sealer was replaced with a "high temp" nonvolatile RTV

silicone sealer, and a new O<sub>2</sub> sensor installed, the problem was corrected.

## Peugeot Fouled Plugs

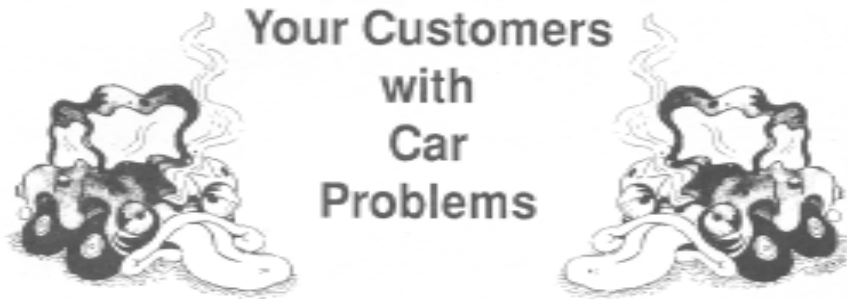
A 1989 405 Mil6 misfired when cold and sometimes would not start. Fouled spark plugs could be the problem. On checking, this was found to be the case. The car was used mostly for short trips around town and the plugs never heated up enough to burn off deposits. The solution is to install a hotter set of plugs.

***"IF IT JAMS, FORCE IT;  
IF IT BREAKS, IT NEEDED  
REPLACING ANYWAY."***

### Most Common Causes of Fuel Injection Problems

- Contamination
- Wiring and electrical system faults
- Fuel supply problems
- Failures in the sensing system
- Injector failures
- Control module failures

## The Right Questions to Ask



Automotive technicians have to diagnose problems very much like a doctor does. The right questions lead to right solutions.

Is the problem constant or intermittent?

Does it happen when the engine is hot or cold, or as the engine is warming up?

Does it occur right after startup or after driving a while? (How many miles?)

Does it occur at idle or at a certain road speed? (About what speed?)

If it happens at idle, is the transmission in gear or in Neutral?

If it happens at road speed, is it on acceleration, while cruising, or deceleration or while braking?

If it happens at road speed, is it on an upgrade, a level surface or a down-grade?

Does the problem occur in turns or while driving straight?

Was the beginning of the problem sudden or gradual? If sudden, was any work done on the car just before?

Does it happen with the air conditioning on or off?

If the car has power steering, does the problem occur with the steering wheel in the straight-ahead, partial or full-turn position?

What is the outside temperature when the trouble occurs?

Is the weather rainy, snowy, or dry?

Is the problem actually a die-out condition or does the engine just miss for a bit, then pick up again?



## Chrysler Fuel Injection

Fuel pressure on Chrysler fuel injection is critical.

The proper specs are:

- '84 & '85 TBI 36 P.S.I.
- '86 - '91 TBI 14.5 P.S.I.
- '84 - '92 Turbo PFI with no vacuum to the pressure regulator - engine off, key on - should be 55 P.S.I.

## Fuel Filters

High pressure fuel filters should be replaced on a time basis (one year) rather than mileage. Fuel is constantly being circulated regardless of speed or demand and their micron filtering size is smaller so they are contaminated sooner. High pressure fuel filters will definitely be a higher maintenance item than those for carburetors.

# Import Car Problems

## Decelerating Nissan & Subaru

Newer models of Nissan and Subaru, when in some deceleration modes, will experience a normal condition of electric fuel pump shutoff. This constant on-off cycling is causing failure to the control box, or "black box", and its connections. The box is actually being fed current through the oil pressure switch. So check that 1st if the "box" is suspected. If this is ok then check the black box.

## Clogged Map Sensor Lines

'83 to '87 Nissan Sentras, Pulsars and NXs have a tiny orifice in the hose leading to the MAP sensor nipple. This orifice tends to get stopped up. The solution is to cut out the plugged orifice and splice in a new one.

## Bad Alternator Diodes

A bad diode in the alternator will cause an AC signal. This "confuses" the ECM and affects operation.

It is a good idea to check the diodes before looking into sensors and other controls.

## Dusty TBI Systems

Import throttle body systems are very sensitive to dust and dirt. All ducts, hoses and air intakes have to be sealed air tight. These also allow leaks of unmetered air flow bypassing the airflow sensor due to cracks or gaps in the intake

system including the PCV valves and the O ring around the dip stick.

## 4 Wire TPS

Most import throttle position sensors (TPS) have a fourth wire. This wire lets the ECM know if the throttle is closed or open. It should be either 0 or 5 volts. If not working, adjust or replace part.

*"ANYONE UNABLE TO LEARN FROM PAST MISTAKES IS CONDEMNED TO REPEAT IT."*

# Alcohol/Gasoline Blends Can Cause Injector Failure

Injector failures are occurring as a result of alcohol/gasoline blends. The alcohol permeates the coil bobbin and dissolves the insulation. The above condition creates a reduction in injector coil resistance.

The diagnosis method can sometimes be confusing since most cars use a batch dump injector control system. The injector with the lowest resistance

will grab all the current and other injectors will not function. You will need to remove the connectors and measure the resistance of each coil separately for each injector to determine where the faulty one actually is.

Common misfire diagnosis procedures will indicate a faulty injector on the cylinder that is missing when in fact this injector is not at fault.