C2 / C3 Troubleshooting

By Chris Petris

The most important tool to use when troubleshooting is a good memory or notes. If necessary, write down as much information as possible. This will help compile a troubleshooting notebook. A factory service manual is an invaluable tool when diagnosing problems. A road test is very important and notes should be taken then also. When road testing I take notes about when a problem occurs: hot engine, cold engine, or possibly after a hot restart. In the shop I try to get as much information as possible about any previous repairs and parts that were replaced. A simple audio test of the engine's performance is to listen to the engine cranking over and note any irregularities. A V-8 engine that has comparable compression on all cylinders has an even rhythm as it cranks over. If you hear what sounds like a rhythmic increase or uneven pulses during cranking, most likely a cylinder(s) has low compression, which may be caused by a burned valve or possibly a hole in a piston.

I would perform a crankcase pressure test. A crankcase pressure test consists of removing the PCV valve and breather tube on an engine that is at operating temperature. Watch for oil vapors coming out of the PCV valve port. If you have oil vapors coming out of the PCV valve port in pulses like a steam engine you have broken piston rings or possibly a broken piston. A light amount of smoke (blow by) without rhythmic pulses is normal on high mileage engines. If I find either excessive blow by or uneven cranking I do a compression test first, then a cylinder leakage test. The most important thing is to have good engine compression with minimal blow-by before proceeding.

Compression Testing

When compression testing be sure to hold the throttle and choke wide open and remove all spark plugs before testing. Lower than usual compression readings that are even will not typically make an engine run rough. Cylinders that vary more than 25 PSI when performing compression testing can make an engine run rough. Cylinder pressure testing is accomplished with a supply of compressed air. First the valve cover should be removed and the valve adjustment backed off on the cylinder being tested. Now compressed air is introduced into the cylinder with an air-hold. Listen for air leaking at the carburetor for an intake valve leak and tailpipe for an exhaust valve leak. If you hear air leaking in the crankcase you have broken piston rings or a hole in a piston.

Vacuum Testing

The next check should be engine vacuum. A good vacuum gauge that has not been banged around in your toolbox can be very helpful in diagnosing engine performance. It is not a good idea to abuse a vacuum gauge because it will not be accurate. An expensive unit will not tolerate abuse either. Please refer to the chart provided (Figure 1.1) for vacuum gauge diagnosis. A vacuum gauge can also help locate an unexplained power loss. The vacuum gauge will check for a clogged exhaust system. A clogged exhaust system can be difficult to diagnose because it usually takes quite a while for it to cause a significant power loss that accumulates over time. The most reliable test of exhaust system backpressure is to remove the A.I.R. check on vehicles with an A.I.R. pump system. These are the valves on the top of the exhaust manifold. A 1-1/16" wrench is required for removal. Be sure to use a 7/8" wrench to hold the manifold tubes during removal. Sometimes a torch is required to heat the A.I.R. check valve during removal. An adapter can be put together to connect the vacuum gauge to the A.I.R. tube. Three pounds of exhaust system pressure is acceptable. Any pressure greater than three pounds indicates a clogged exhaust system. If you do not have an A.I.R. pump system the 9/16" nuts can be loosened at the exhaust flange to allow the pipes

to drop down. Then road test the vehicle. A vacuum gauge is useful for carburetor adjustment also. This will be discussed in the fuel system troubleshooting section.

Camshaft and Valve Spring Troubleshooting

If you have an unexplained miss at idle and under load there are two possible causes that can be difficult to find in some situations. A worn camshaft will cause a steady miss. A slightly worn camshaft lobe will possibly have only a minor tapping noise occur. As the camshaft lobe wears, power is reduced and a miss will be evident. Severely worn exhaust camshaft lobes will cause a rhythmic popping noise in the carburetor as the engine is accelerated. The exhaust valve does not open enough to allow the exhaust gases to escape, so they are released into the intake manifold. If an intake camshaft lobe is worn it will not allow fuel and air to be drawn into the cylinder, which will make the engine have a steady miss. From 1972-1981 worn camshaft lobes were a frequent occurrence on small block Chevrolet engines. A severely worn camshaft intake lobe usually gives a warning of impending disaster. If you have lifter that starts to tap and you adjust it and it requires adjustment again and again, this usually indicates that the camshaft lobe is wearing away. A compression test will show a slightly lower than normal reading if the intake camshaft lobe is worn badly.

A broken valve spring can cause a steady miss also. Vacuum gauge readings will be erratic when the valve spring is broken badly. There will also be a very noticeable valve train noise when the valve spring is broken badly. If the valve spring is broken near the top coil of the spring, it will only make a minor effect on the vacuum gauge reading, and the engine will have a steady miss. During a compression test it may not affect the readings at all and make no excessive valve train noise. Therefore, if you have checked everything: ignition, fuel system, vacuum leaks, and still have a steady miss, take a close look for broken valve springs or worn camshaft lobes.

PCV System

PCV (Positive Crankcase Ventilation) valves are very important for proper engine performance. The PCV valve allows a pressure drop (vacuum) in the engine's crankcase; this helps piston rings seal. The engine oil stays cleaner because moisture and oil vapors are burned off. The PCV valve also acts as check valve under hard acceleration when engine vacuum is zero. This allows the crankcase ventilation tube that is connected to the air cleaner to draw a vacuum in the crankcase when the throttle is wide open. PCV valves are often neglected but they play an important role in engine drivability and engine life. An incorrect PCV valve can cause hesitation, poor idling, and stalling. Also keep in mind that the carburetor is setup for the PCV valve's calculated vacuum leak. The crankcase should never be totally closed- it will cause extreme oil usage and oil leaks! Use the O.E. equivalent PCV system or crankcase breathers to relieve pressure in the crankcase; **never disable the system.** Many times when valve covers are replaced oil usage starts because the PCV system was also modified. Beware of aftermarket valve covers that have no PCV or crankcase tube baffles. If the baffle is incorrect or missing, oil usage will be extreme! All the PCV components should be in good shape: rubber grommets soft and pliable, all hoses clean and sealing properly, and the crankcase filter in the air cleaner clean.

EGR System

The EGR (Exhaust Gas Recirculation) valve can be a source of lean misfire at float or light engine loads. Typically this misfire will be felt at 45 MPH cruise speeds. The early control systems were poorly designed which made most of them hard to live with. If you have a 1975-1981 car the EGR valve is most likely not functioning. The 1975-1981 cars had the EGR system removed or plugged because they caused hesitation and stalling. When EGR systems are disabled, the exhaust passages have a tendency to build up carbon, blocking EGR flow. If the EGR valve is stuck open the engine will not idle. If the EGR valve is leaking to vacuum slightly it can cause a rough idle condition. Tapping lightly on an EGR valve that is sticking will

sometimes free it up enough to close completely and allow a smooth idle. The EGR system should allow flow at cruise speeds or light acceleration, not at idle or hard acceleration. If you have a functioning EGR system and misfire is a problem you can purchase an aftermarket EGR valve which has changeable orifices to cut down on the amount of EGR flow. If a carburetor is not the correct application for an EGR equipped car, it can cause a lean misfire because it may not be flow rated for EGR. If the ignition distributor-timing curve is modified it can cause a lean misfire due to EGR flow. Early EGR equipped cars utilize a high amount of ignition timing advance. Spark knock can occur when the EGR system is inoperative.

Headlamp and Transmission Modulator Vacuum Leaks

1968-1981 cars can have a large vacuum leak from the headlight actuator vacuum system that will affect the idle. This is one of the first things that I check when I have car with a poor idle complaint. I remove the vacuum hose and plug the fitting temporarily then check engine performance. No matter how good the carburetor is it will not compensate for a large vacuum leak! I mentioned valve seals leaking earlier that would coat the spark plugs with whitish-flaky deposits and sometimes completely close the spark plug gap. These deposits can occur on 1963-1981 automatic-transmission equipped cars on the number eight spark plug only. The transmission vacuum modulator that controls shift timing could have a broken diaphragm allowing transmission fluid to be drawn into the engine. Usually these deposits are darker than valve seal deposits though. A minor vacuum modulator diaphragm leak will dirty the number eight plug slowly and only a minor transmission fluid loss occurs. A severe vacuum modulator diaphragm leak will create smoke out the tailpipe and noticeable transmission fluid loss. The number eight cylinder intake manifold runner is where the vacuum supply to the automatic transmission modulator is located. This number eight intake manifold runner also supplies the headlamp actuator system. Therefore, this vacuum supply can create a very rough idle if both systems were leaking. Many times the fitting that screws into the intake manifold is loose.

After-fire Troubleshooting

After-fire is a problem that occurs when combustion takes place in the exhaust system. This can be confusing to describe when you are experiencing this particular problem. After-fire can be caused by advanced ignition timing or cold air introduced into the exhaust system. The A.I.R. system has a diverter valve control system that controls flow. After-fire can be heard on deceleration if the A.I.R. pump is incorrectly pumping air into the exhaust system. The A.I.R. system should divert to atmosphere when the throttle is closed. This popping in the exhaust is often mistaken for backfiring. This condition is annoying and will increase exhaust system temperature. This after-fire condition causes drivability problems because the engine will run leaner than it should.

Fuel System Troubleshooting

Fuel system problems typically may feel like you are running out of fuel. The best solution is to check fuel pressure and volume before condemning a carburetor. High fuel pressure (above seven pounds) will cause as many problems as low fuel pressure! Vacuum gauges are also useful for checking fuel pump pressure on carbureted engines. A word of advice: if the fuel pressure is above ten pounds it will damage your vacuum gauge. The vacuum gauge can be connected to the fuel line at the carburetor or connected in line to allow fuel pressure testing under load. You should have two to three pounds of fuel pressure at idle and five pounds of fuel pressure at high engine speeds.

The Corvette fuel tank is slightly higher than the carburetor to allow fuel to be gravity-fed to the carburetor. The fuel tank position will allow idling and low speed performance even with a failed fuel pump. Since the fuel is gravity-fed on 1963-1981 cars it is very important to check the condition of your fuel hoses at the

fuel pump and fuel tank frequently! I make a habit of checking these fuel hoses at every oil change. *A leaking hose can empty your entire fuel tank overnight.* If you have a fuel pump failure be sure to check the engine oil for fuel contamination. 1963-1974 cars have fuel sending units at the bottom of the tank. These are more accessible but they will not stop flowing fuel until the fuel tank is empty.

A deteriorated fuel supply hose on 1975-1981 cars can cause a fuel starvation situation under high load conditions. The 1975-1981 fuel sending unit is at the top of the fuel tank, which can allow the fuel supply hoses to suck air. This is safer because a deteriorated suction fuel hose will suck air but fuel loss will be minimal. The 1975-1981 fuel hoses can be accessed and replaced by removing the fuel tank door. If a fuel-return hose is leaking on 1968-1981 cars it will run down the sides of the fuel tank and drop on the mufflers, so keep an eye on those hoses! Another common problem I have found is fuel starvation from a kinked fuel suction hose. It is almost impossible to make the bends that are necessary from the fuel line to fuel pump with bulk fuel hose. I always use the correct S-bend fuel hoses for suction and return at the fuel pump. I had a car that was towed in once that had a fuel tank replaced. It would run about five minutes then would not start. It was not getting any fuel. After checking the system I found that the fuel hoses were caught under the fuel tank retaining straps and pinched the fuel supply and return hoses shut. Beware when reinstalling fuel tanks on 1975-1981 cars.

Carburetor Troubleshooting

Check the carburetor accelerator pump for proper operation. If the accelerator pump is not working you can have a backfire under hard acceleration, a very difficult time starting your car after it cools down to ambient temperature, and severe hesitation when accelerating. A lean fuel condition can also cause backfiring on acceleration. Usually the backfiring is more severe under hard acceleration when the carburetor is lean due to fuel supply. Backfire is caused by combustion in the intake manifold. A simple trick to see if you have lean fuel condition at idle is to lay a shop towel across the carburetor air-horn. If the idle smoothes out and rpm increases, you have a lean fuel condition. If you have a long duration camshaft with low engine vacuum you may also notice a favorable change when the shop towel is placed on the air-horn. This is occurring because the idle fuel system is not capable of drawing enough fuel at low engine vacuum. The idle air bleed system can be modified to help this lean condition to some degree.

A high carburetor float level condition can cause stalling under hard cornering or braking. A very common condition is a sticking carburetor needle and seat valve that allows engine flooding. This occurs on vehicles that are driven infrequently. Once in a while a heavy carburetor float can occur. The carburetor float can get fuel soaked from being nicked or a fuel blend that is detrimental to the float material. A carburetor float that is just slightly heavier than normal will make an engine run rich and foul spark plugs. This can be identified by discoloration trails from fuel running down the side of your carburetor. Sometimes there will be fuel pooled up around the center intake manifold bolts when the carburetor float is heavy or the needle and seat are leaking. Be sure it is fuel, not motor oil. The oil can be forced up the bolt threads creating little pools around the bolts also. The best thing to do is to weigh the carburetor float when overhauling or replace the float assembly. Always remember to check and adjust float level as necessary during overhaul.

Another area to check carefully is the fuel inlet line for leaks. A loose fuel line will create a fire hazard! The 1-1/16" filter housing nut must be held when removing the 5/8" fuel line. There is also another concern with fuel loading the crankcase; if the carburetor needle and seat is leaking it can completely fill the crankcase. This is a very dangerous situation!

Fuel Line and Filter Maintenance

If a fuel line has been cut off to install an aftermarket carburetor many times burrs are left on the fuel line which can cut tiny pieces out of the newly installed rubber hose. These tiny pieces of rubber will not allow the new carburetor's needle and seat to close properly if there is no fuel inlet filter. Or, if enough rubber pieces are removed and washed into the carburetor a power loss can occur. Today most aftermarket carburetors have filters in their fuel inlet to keep debris off the carburetor's needle and seat but it can become plugged causing a power loss. The safe way to install an aftermarket carburetor is to fabricate a new fuel line with 5/16" or 3/8" steel tubing as necessary. This way your O.E. fuel line can be put away for safe keeping in the event you would like to put your original carburetor back on. If you decide on cutting your O.E. fuel line it is a good idea to de-burr the freshly cut end and then use a flaring tool to put a bump in the tube. This will prevent the rubber fuel hose from coming off. The rubber fuel hose should have a hose clamp that will not dig into the rubber hose. If you put a bump in the fuel line you do not have to crank down on the rubber hose to prevent fuel leaks. Be sure to blow out the fuel line after cutting and possible flaring of the fuel line. If you decide to connect your carburetor with rubber fuel hose make it as short as possible and check it frequently if you have a car that has been stored regularly and there has been no fuel additives put in the fuel tank to stabilize the fuel. Rust will occur which can be very fine particles that most fuel filters will not stop. All 1963-1981 Corvettes have a fuel strainer in the fuel tank that can be replaced after removing the fuel level sending unit. The fuel strainer is part number 5651702, available from your GM dealer. On cars that have debris in the fuel tank I drain the fuel tank, blow out the fuel lines, and install a new fuel strainer. I also install an in-line fuel filter before the fuel pump to stop the minute rust particles that pass through the fuel strainer. If your fuel tank has even small amounts of debris it can hang open a fuel pump check valve, which will stop a fuel pump from pumping fuel. The fuel filter can be installed in the rubber hose between the fuel sending unit and the fuel line that runs forward to the fuel pump on 1963-1974 cars. On 1975-1981 cars I install a fuel filter in the S-rubber hose between the fuel line that runs along the passenger side frame rail before the control arm and the fuel pump. I always use a 3/8" steel bodied fuel filter to allow maximum protection from heat and road debris from damaging the filter. I have removed many glass tube style fuel filters and installed steel bodied fuel filters. The glass tube style filters may look neat but they allow debris to pass through their filter media and can be broken easily. Do not forget to check the fuel filter many times. It typically is forgotten when diagnosing a fuel delivery problem. Remember: a remanufactured or new carburetor will not work correctly with contaminated fuel!

Holley Carburetor Troubleshooting

Holley carburetors are great at the racetrack but they just seem to be too finicky for everyday use. Holley carburetors are easily adjustable but unfortunately they seem to need frequent adjustments. I found that putting just a dab of silicone sealer on the idle mixture adjustment screws can save a lot of time. All of the idle adjustment screws seem to get loose even with a new seal on the idle mix screws. Loose mixture screws change idle quality- usually for the worst. Another simple maintenance tip to preserve a good idle with a Holley carburetor is to spray the primary booster venturi area with carburetor cleaner while the engine is running. The idle air bleed orifices are in the booster venturies and they seem to attract dirt quite easily. If they get plugged up or restricted the idle will be erratic or nonexistent. If you spray a little carburetor cleaner on the idle air bleed orifices each time you change your oil the orifices will stay clean and the idle quality will remain the same. Holley carburetors are notorious for blown power valves when a backfire occurs. The power valve uses engine vacuum to control fuel. When a backfire occurs it can tear the power valve diaphragm, which allows engine vacuum to draw fuel out of the float bowl. This condition can be severe enough that the engine may not start due to fouled spark plugs. There is a kit available that uses a check valve to prevent power valve damage when a backfire occurs on Holley carburetors. When adjusting Holley carburetors always start with float level then idle mixture. When adjusting float level on the primary side of carburetor accelerate the engine a few times to draw the fuel level down slightly this will give you a

better idea of float level. When adjusting float level on the secondary side you must open the secondary throttle shaft to allow fuel to be drawn out of the fuel bowl. Fuel is not drawn from the secondary fuel bowl until the secondary throttle shaft is opened.

Carburetor Choke Maintenance and Troubleshooting

You can upgrade your Edelbrock or Holley to an electric choke for faster starting and quick warm-ups without flooding or extended high idle. One problem that occurred frequently was clogged exhaust crossover passages on early cars with inoperative exhaust heat risers. Clogged exhaust crossover passages would prevent heat from building up quickly or at all which would allow the choke to stay on for extended intervals which would shorten engine life. Many times the fast idle would be adjusted very low or off completely because the choke would stay on preventing complete fast idle release. So if the fast idle is not working you think that the choke is off when it is on creating a rich fuel mixture. An extremely rich fuel system will wash the oil off the piston rings and cylinder walls wearing them prematurely. A problem area I have found is incorrect gasket and heat shield installation on early cars. All the early cars used exhaust heat to warm up the carburetor to promote better cold driveability. If the heat shield is installed incorrectly the carburetor can be distorted or possibly a fire hazard. Always check carefully the carburetor's base gasket for correct fit. On all applications I prefer a thick carburetor base gasket to help prevent fuel boiling in the float bowl.

Carburetor Adjustment

Once the carburetor is installed and the engine is up to operating temperature (Holley carburetors float level adjusted first) choke fully opened the fuel mixture can be adjusted. (During carburetor overhaul the idle mixture screws should be adjusted approximately 2 and 1/2 turns out from their seat- this should allow the engine to run). Take care when seating the idle mixture screws; just a light touch against the seat is all that is necessary. Counterclockwise will richen the mixture clockwise leans the mixture. (Some Holley carburetors are opposite in their adjustments). If you are using a vacuum gauge to set the idle fuel mixture you will be trying to obtain the highest vacuum with a smooth idle. Many times I find the idle mixture screws about to fall out! After four turns out with the idle mixture screws, if you still have a lean fuel condition there is a problem. Typically if everything is right 3 to 3 and 1/2 turns out is correct with Carter and Rochester carburetors. Holley carburetors usually are too rich if the fuel mixture screws are out more than 2 turns. If you set the carburetor too rich it may seem like it is idling smooth in the driveway but after driving it may load up and stall or be sluggish on acceleration. I run the fuel mixture needles in until the idle speed drops slightly then back it out ¼ turn. A good test is to remove the headlamp vacuum supply hose from the intake manifold. If the engine idles changes over 100 RPM, the idle mixture is too rich or too lean. If it is too rich the idle will speed up, too lean it will slow down.

Ignition System Troubleshooting

A steady miss may also indicate an ignition problem or a fouled spark plug. If the miss occurs primarily when the engine is cold you may have an open circuit in a plug wire. If you have a miss when accelerating it indicates that there is a secondary circuit (plug wire, distributor cap, or rotor) that has an open circuit.

Primary ignition failure feels like you shut off the ignition. The engine will stop for a second and come right back on. This can be caused by a poor connection at the firewall bulkhead connector on 1963-1967 cars. If you have an unexplained stalling or loss of power try moving the firewall bulkhead connector while the engine is running; if it quits you found the problem.

Many cars that come into my shop have the plug wires routed incorrectly. It can be difficult to install the plug wires under the motor mounts and route them in the lower block shielding on the 1963-1982 cars but it is worth the extra time necessary. If the 1963-1982 car valve covers are not pouring oil on the plug wires they will last quite a long time when installed in the correct location with proper plug wire retainers. A word of caution: I have seen some people remove the plug wire boot so they can route the plug wire under the motor mount this can damage the wire and terminal connection. This can cause a misfire if the boot is not removed carefully, which can make troubleshooting difficult. Over the years I have used many brands of plug wires I always use Moroso for performance applications and A/C Delco for everyday use. These particular brands of custom fit plug wires fit well and are very reliable. Remember though, there is no plug wire that will sit directly on a hot exhaust manifold without misfiring.

Correct plug wire routing can eliminate misfire and missing under load especially on hot engines. When installing the plug wires on the driver's side the number five and seven plug wires should not be routed parallel with each other. On High-Rnergy Ignition (HEI) system cars (1975-1980) an open circuit plug wire can also burn a hole in a rotor or distributor cap.

It is possible to install a new H.E.I. distributor cap and create an engine miss. Sometimes the ignition coil hold-down screws are not the correct length and will break through the distributor cap causing a short to ground. If you have an unexplained miss look carefully at the inside of the distributor cap for burn spots at each of the four ignition coil hold-down screw locations.

Distributor rotors can have a hole burnt through the plastic housing; this usually occurs when a plug wire is open. Plug wires that have 75,000 miles or more can be damaged easily when removing them for spark plug replacement. I found that twisting the plug wire boot before pulling on the plug wire and boot will allow easy removal and prevent terminal damage. Usually plug wires that have been tugged hard will cause an open circuit. I also noticed that if you look at the terminal inside the plug wire boot on plug wires that have had rough handling there will be black sooty deposits on the terminal. This is an indication that the plug wire has an open circuit that will be a problem very soon. If you use silicone dielectric grease when installing the plug wire boot you will promote better contact between the terminal and spark plug. It also makes spark plug wire removal easier in the future. Do not put more silicone dielectric grease than the size of a wooden match head at each plug wire connection. One other word of caution: if you do not feel or hear the plug wire terminal in the boot as it engages, the spark plug or distributor cap terminal may have a plug wire create higher resistance or possibly have it pop off the terminal.

It is a good idea to install a better distributor cap and rotor; they will stand a short to ground better and help prevent possible ignition module damage on HEI equipped cars. I prefer Accel or Standard Ignition's performance line distributor cap and rotor. Both of these manufacturers use brass contacts in their caps and rotors with heavy plastic components. Early points and condenser cars will perform better and reliability will be greatly improved when converted to electronic ignition. Pertronix has an electronic ignition conversion available that is very reliable. It requires no machining or cutting to install. The best part is you can use it in your tachometer drive distributor and the only external change is an additional wire on the positive side of the ignition coil and never change another set of points.

If you prefer the points and condenser system be sure that the condenser is tight and adjust them frequently. A loose or bad condenser can make your car almost impossible to drive, the engine will buck like a wild horse or make your engine start and stop without warning. Fouled spark plugs can make an engine hard or impossible to start. If you do not drive your car regularly fouled spark plugs are the norm. Fuel fouled spark plugs will also cause popping in the exhaust at idle. It is a good idea to drive your car at least long enough to open the choke fully.

With a high performance ignition coil spark plug gaps can be increased. This will possibly smooth a rough idle and will increase fuel economy. Do not increase your plug gap beyond .050" unless you have an ignition coil that has more than 50,000-volt output. Remember that with the increased secondary voltage distributor caps, rotors, and plug wires must be in top condition. When setting the spark plug gap on platinum tipped spark plugs do not pry between the center electrode and ground piece. The platinum tip can be broken and destroyed. Be careful when installing spark plugs if you hear even a minor pop noise the porcelain can be cracked that can cause an intermittent miss that is difficult to find. The best policy is to check the plug for cracks before proceeding. When installing spark plugs in aluminum cylinder heads Anti-seize or Never-seize should be put on the threads. A small dab of Anti-seize or Never-seize is all that is required excessive amounts will cause misfiring. Spark plugs tell a story: if they have whitish-flaky deposits your valve seals may be leaking. Sometimes they get so full of deposits the plug gap will be closed. This is a definite indication of valve guide seal leakage. Spark plugs that have black porcelain insulators are fuel fouled. This could indicate a weak ignition coil, but most likely it is a choke or carburetor problem. A spark plug diagnosis chart has been provided to determine condition of your spark plugs (Figure 1.2).

At the conclusion of this workshop, I hope that with careful observation you can spot a problem area and repair it with a little less aggravation. These observations have taken many years to acquire, along with an attitude that most problems are simple *if you go back to basics!*

See more at: http://tech.corvettecentral.com/2008/04/c2-c3-troubleshooting/#sthash.ShZnhMpq.dpuf