Cruiser's Renix Tips

Revised 12-28-2014

· Instructions have been written *
· Photos included with instructions **

Created by Cruiser54

1. Ground Refreshing

The Renix era XJs and MJs were built with an under-engineered grounding system for the engine/transmission electronics. One problem in particular involves the multiple ground connection at the engine dipstick tube stud. A poor ground here can cause a multitude of driveabililty issues, wasted time, and wasted money replacing unnecessary components.

The components grounding at the dipstick tube stud are:

Distributor Sync Sensor, TCU main ground, TCU "Shift Point Logic", Ignition control Module, Injectors, ECU main ground which other engine sensors ground through, Oxygen sensor, Knock Sensor, Cruise

Control, and Transmission Sync signal. All extremely important stuff.

The factory was aware of the issues with this ground point and addressed it by suggesting the following:

Remove the nut holding the wire terminals to the stud. Verify that the stud is indeed tightened securely into the block.

Scrape any and all paint from the stud's mounting surface where the wires will attach. Must be clean, shiny and free of any oil, grease, or paint.

Inspect the wire terminals. Check to see that none of the terminals are crimped over wire insulation instead of bare wire.

Be sure the crimps are tight. It wouldn't hurt to re-crimp them just as a matter of course. Sand and polish the wire terminals until clean and shiny on both sides. Reinstall all the wires to the stud and tighten the nut down securely.

While you're in that general area, locate the battery negative cable which is fastened to the engine block just forward of the dipstick stud. Remove the bolt, scrape the block to bare metal, clean and polish the cable terminal, and reattach securely.

Another area where the grounding system on Renix era Jeeps was lacking is the engine to chassis ground. There is a braided cable from the back of the cylinder head that also attaches to the driver's side of the firewall. This cable is undersized for it's intended use and subject to corrosion and poor connections at each end.

First off, remove the cable end from the firewall using a 15mm wrench or socket. Scrape the paint off down to bare metal and clean the wire terminal. Reattach securely.

Remove the other end of the cable from the rear of the head using a 3'4" socket. Clean all the oil, paint and crud from the stud. Clean the wire terminal of the cable and reattach securely.

A suggestion regarding the braided cable:
I prefer to add a #4 Gauge cable from the firewall to a bolt on the rear of the intake manifold, either to a heat shield bolt or fuel rail bolt. A cable about 18" long with a 3/8" lug on each end works great and you can get one at any parts store already made up. Napa has them as part number 781116.

A further improvement to the grounding system can be made using a #4 cable, about 10" long with 3/8" terminals at each end. Attach one end of this cable to the negative battery bolt and the other end under the closest 10mm headed bolt on the radiator support just forward of the battery. Napa part number 781115.

For those of us with Comanches, it's very important to remove the driver's side tail lamp assembly to access the ground for the fuel pump. Remove the screw holding the black ground wire. Scrape the paint from the body and corrosion from the wire terminal. Reattach securely.

If you want to upgrade your grounds and battery cables in general, contact Jon at www.kelleyswip.com. He makes an incredible cable upgrade for a very reasonable price.

Revised 12-04-2012

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2. C101 Connector Refreshing

The C101 connector on 1987 and 1988 Renix Jeeps was a source of electrical resistance when the vehicles were new. So much so that the factory eliminated this connector in the 1989 and 1990 models. The factory recommended cleaning this connector to insure the proper voltage and ground signals between the ECU and the fuel injection sensors. We can only imagine how this connector has become a larger source of voltage loss and increased resistance over a period of almost 25 years. The C101 connector needs to be cleaned at least once in the lifetime of your vehicle. Chances are it's never been done before.

Almost every critical signal between the engine sensors, injectors, ECU, and some to the TCU, travel this path through the C101 connector.

That said, the cleaning described below is a real MUST DO right off the bat. But, I strongly advocate eliminating the C101 at some point by following the procedure with photos in Post 27. Soldering skills are required and it takes about an hour.

The C101 connector is located on the driver's side firewall above and behind the brake booster. It is held together with a single bolt in it's center. To get the connectors apart, simply remove the ¼" bolt and pull the halves apart. You will find the connector is packed with a black tar like substance which has hardened over time.
Take a pocket screwdriver or the like and scrape out all the tar crap you can. Follow up by spraying out both connector halves with brake cleaner and then swabbing out the remainder of the tar. Repeat this procedure until the tar is totally removed. This may require 3 or more repetitions. Wipe out the connectors after spraying with a soft cloth.

If you have a small pick or dental tool, tweak the female connectors on the one side so they grab the pins on the opposite side a bit tighter before bolting both halves back together.

Revised 05-03-2014

3. Connector and relay/receptacle refreshing

I suggest unplugging EVERY electrical connection in the engine bay you can find, whether engine related or not, and spraying it out with a good electronics cleaner, visually inspecting the terminals making sure they haven't retracted into the plastic holder, and then plugging it back together. There's a critical 10-pin connector for the front lighting system located in front of the air cleaner and behind the left headlight assembly. Don't miss that one. Also be sure that the connectors to the ballast resistor mounted near the air cleaner housing are clean and tight.

ALL of the relays should be removed, the terminals wire-brushed until shiny, and the receptacles sprayed out with contact cleaner. Then plug them back in. I do this on every Renix Jeep I purchase or work on for someone else.

Revised 07/23/2012

4. Coil/ICM contacts

The contacts between the coil and the ICU on your Renix Jeep can become corroded and loose causing a complete or intermittent no-start condition. I recommend the following procedure as a maintenance precaution to insure this is eliminated as a possible cause now and in the future.

The coil is attached to the ICU by two T20 Torx bolts. Remove these two bolts and lift the coil up off the ICU. You will see 2 pins and 2 sets of contacts. Clean both the pins and springy contact pieces with a good electronics cleaner and some fine sandpaper. Squeeze the springy contacts closer together with some needlenose pliers. Bolt the coil back on to the ICU. While you're right there, unplug the connectors from the ICU and inspect the pins in the harness connector. Make sure
the pins are not retracted into the connector. Spray out the connector and the receptacle of the ICU with the same good electronics cleaner you used earlier. I feel this procedure should be performed at least once in the lifetime of a Renix Jeep.

Revised 04-04-2013

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5. Checking sensor grounds

This sensor ground circuit affects the CTS, TPS, IAT, MAP, ECU and diagnostic connector grounds. It's very important and not something to overlook in diagnosing your Renix Jeep as it is common for the harnesses to have poor crimps causing poor grounds. If any or all of the sensors do not have a good ground, the signal the ECU receives from these sensors is inaccurate.

Set your meter to measure Ohms. Be sure the key is in the OFF position. Using the positive (red) lead of your ohmmeter, probe the B terminal of the flat 3 wire connector of the TPS . The letters are embossed on the connector itself. Touch the black lead of your meter to the negative battery post. Wiggle the wiring harness where it runs parallel to the valve cover and also near the MAP sensor mounted on the firewall. If you have an 87 or 88 with the C101 connector mounted on the firewall above the brake booster, wiggle it, too.

You want to see as close to 0 ohms of resistance as possible. And when wiggling the harnesses/connectors the resistance value should stay low. If there is a variance in the values when wiggling the wires, you have a poor crimp/connection in the wiring harness or a poor ground at the engine dipstick tube stud. On 87 and 88 models, you could have a poor connection at the C101 connector as well. Refreshing of the dipstick tube connection is covered in tip #1, and the sensor upgrade is covered in Tip #6. On 87,88 models, you could have a poor connection at the c101 connector as well
See tip #2 and Tip #27

Revised 11/01/2014

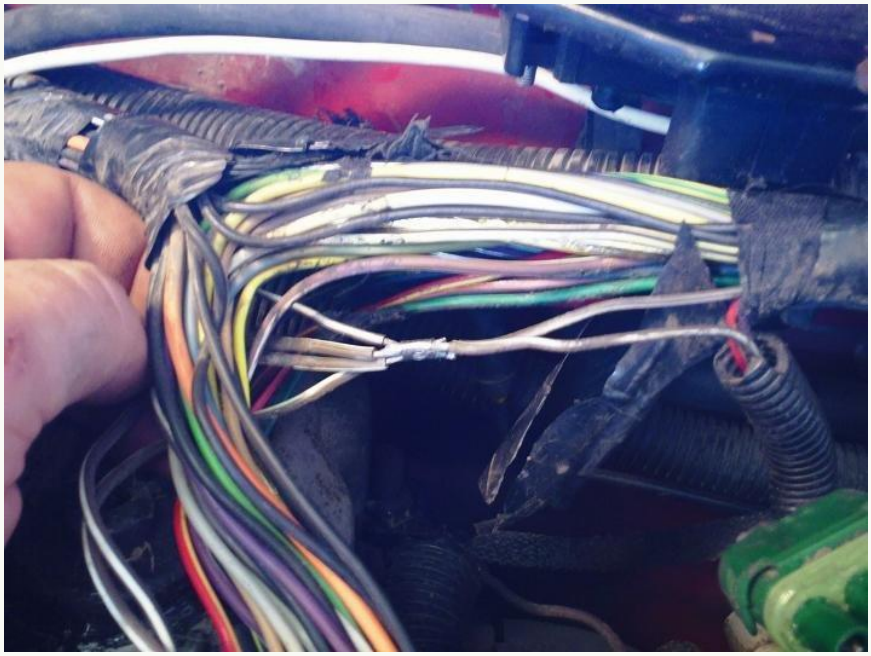
6. Sensor ground upgrade

Find your Intake Air Temp sensor. It's the sensor just to the rear of the throttle body, has 2 wires, and screws into the intake manifold. Where it's connector plugs into the harness you will see that one of the wires on the harness side is brown with a white stripe. Follow the brown with white stripe wire back into the harness. You'll have to open up the split-loom plastic sheathing to follow it. It will come to a splice with 2 other brown with white wires with duct tape over them. They're from the TPS and the CTS. The 3 wires will be spliced to a single wire headed toward the C101 connector if you have an 87 or 88. If you have an 89 or 90, you do not have the C101 bulkhead connector.

Now go to the MAP sensor. Follow the brown with white wire into the harness from there. You will find a splice with 2 more brown with white wires with duct tape over them. At the splice you will find the 3 wires connected to a single brown with white wire going toward the C101, or just along the firewall towards the engine if you have an 89 or 90. Along with the MAP sensor that you traced, they are the ECU sensor ground port and the diagnostic connector on the passenger inner fender.

You now have 2 sets of 3 brown with white wires, one near the firewall and one near the engine. Cut the splices out of each set of wires eliminating not only the crappy factory splices, but also the single wire between them. Bring both sets of 3 wires together. Solder the 2 sets of wires together and insulate them properly with tape or shrink tubing.

Zip-tie up your new sensor loom to allow for engine movement. I prefer to cover it with some new split-loom or wrap it neatly with electrical tape when done.



7. CPS testing and adjusting

Renix CPSs have to put out a strong enough signal to the ECU so that it will provide spark.
Most tests for the CPS suggest checking it for an ohms value. This is unreliable and can cause some wasted time and aggravation in your diagnosis of a no-start issue as the CPS will test good when in fact it is bad. The problem with the ohms test is you can have the correct amount of resistance through the CPS but it isn't generating enough voltage to trigger the ECU to provide spark.

Unplug the harness connector from the CPS. Using your voltmeter set on AC volts and probing both wires in the connector going to the CPS, crank the engine over. It won't start with the CPS disconnected. You should get a reading of .5 AC volts. If you are down in the .35 AC volts range or lower on your meter reading, you can have intermittent crank/no-start conditions from your Renix Jeep. Some NEW CPSs (from the big box parts stores) have registered only .2 AC volts while reading the proper resistance!! That's a definite no-start condition. Best to buy your CPS from Napa or the dealer.

Sometimes on a manual transmission equipped Renix Jeep there is an accumulation of debris on the tip of the CPS. It's worn off clutch material and since the CPS is a magnet, the metal sticks to the tip of the CPS causing a reduced voltage signal. You MAY get by with cleaning the tip of the CPS off.

A little trick for increasing the output of your CPS is to drill out the upper mounting hole to 3/8" from the stock 5/16", or slot it so the CPS bracket rests on the bell housing when pushed down. Then, when mounting it, hold the CPS down as close to the flywheel as you can while tightening the bolts.

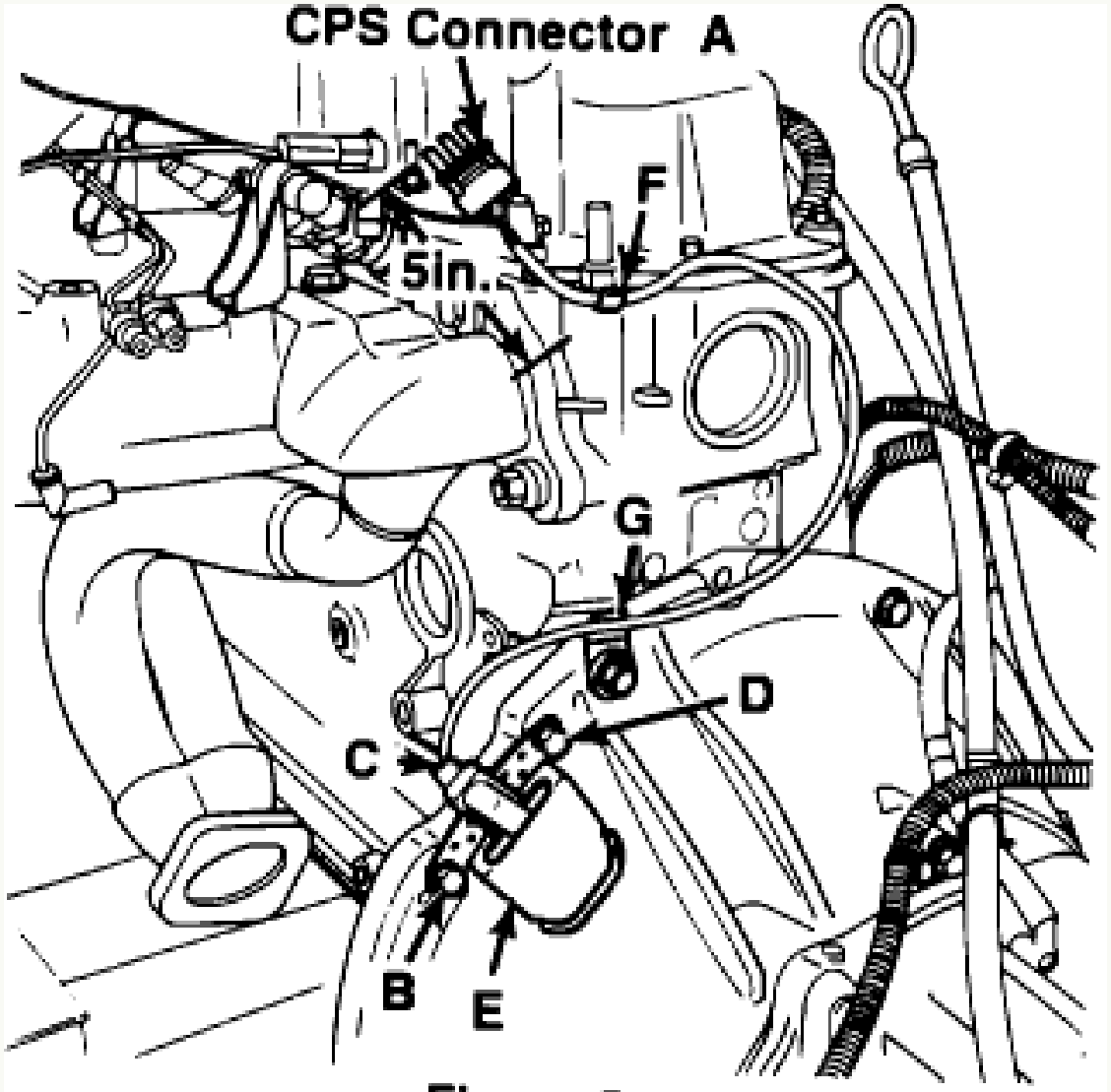

CPS Connector A
F
5in.
G
D
C
B
E

Figure 2


Renix CPS with
upper mounting hole
drilled to 3/8"

8. TPS testing and adjusting

Before attempting to adjust your TPS, there are two things that need to be done:

1) Be sure the throttle body has been recently cleaned. It's especially important that the edges of the throttle butterfly are free of any carbon build-up. and...

2) With the Key OFF, and using the positive (red) lead of your ohmmeter, set on the lowest scale, probe the B terminal of the flat 3 wire connector of the TPS. The letters are embossed on the connector itself. Touch the black lead of your meter to the negative battery post. Wiggle the wiring harness where it parallels the valve cover and also over near the MAP sensor on the firewall. If you see more than 1 ohm of resistance, or fluctuation in your ohms reading, some modifications to the sensor ground harness will be necessary. The harness repair must be performed before proceeding. I can provide an instruction sheet for that if needed.

TPS ADJUSTMENT FOR ENGINE ISSUES

Both RENIX manual and automatic transmission equipped XJs and MJs have a flat three-wire connector to the TPS which provides data input to the ECU. The three wires in the connector are clearly embossed with the letters A, B, and C.

Wire "A" is positive. Wire "B" is ground. DO NOT UNPLUG THE CONNECTORS !! Key ON, measure voltage from "A" positive to "B" ground by back-probing the connectors. Note the voltage reading--this is your REFERENCE voltage. Key ON, back-probe the connector at wires "B" and "C". Measure the voltage. This is your OUTPUT voltage. Your OUTPUT voltage needs to be seventeen percent of your REFERENCE voltage. For example: 4.82 volts X .17=.82 volts. Loosen both T-20 Torx screws attaching the TPS to the throttle body and rotate the TPS until you have achieved your desired output voltage. Tighten the screws carefully while watching to see that your output voltage
remains where it is supposed to be. If you can't achieve the correct output voltage, replace the TPS and start over.

Sometimes, after adjusting your TPS the way outlined above, you may experience a high idle upon starting. If that happens, shut the engine off and reconnect your probes to B and C. Start the engine and while watching your meter, turn the TPS clockwise until the idle drops to normal and then rotate it back counterclockwise to your desired output voltage.

TPS ADJUSTMENT FOR AUTOMATIC TRANSMISSION ISSUES

RENIX automatic transmission equipped XJs and MJs have a TPS with two connectors. There is a flat three-wire connector, same as the manual transmission vehicles have, and it is tested the same as outlined above—FOR ALL ENGINE MANAGEMENT RELATED ISSUES.

However, the automatic TPS also has a square four-wire connector, clearly embossed with the letters A,B,C, and D. It only uses three wires and provides information to the Transmission Control Module. THIS SQUARE FOUR WIRE CONNECTOR IS USED FOR TRANSMISSION/SHIFTING RELATED ISSUES ONLY. First off, DO NOT UNPLUG THE CONNECTORS !! Key ON, measure voltage between "A" positive and "D" ground by back-probing the connector. Note the voltage. This is your REFERENCE voltage. Back-probe the connector at wires "B" and "D". Measure the voltage. This is your OUTPUT voltage. Your OUTPUT voltage needs to be eighty-three percent of your REFERENCE voltage. For example 4.8 volts X .83=3.98 volts. Adjust the TPS until you have achieved this percentage. If you can't, replace the TPS and start over. So, if you have an automatic equipped XJ your TPS has two sides--one side feeds the ECU, and the other side feeds the TCU.

For those with a MANUAL TRANSMISSION--the TPS for the manual transmission XJs is stupid expensive.

You can substitute the automatic transmission TPS which is reasonably priced. The square 4 wire connector is just not used.

Revised 12-15-2013

9. ECU connector refreshing

Many times when other fixes have failed, it becomes necessary to eliminate the ECU to harness connections as a cause.

This requires removing the ECU. Up under the dash, to the right of the steering column is the ECU. It is held in by three 10mm headed bolts to a bracket.

It's most easily removed using a ratcheting wrench but a socket will work. Once you get the ECU down, unplug the two harness connectors from it. Visually inspect the connectors and pins.
Using a good quality electronics cleaner, liberally spray both of the harness ends and the ECU pin area. Now, take a small pick or a dental tool and go to the harness connectors. Using the tool, tweak each female receptacle in the harness plugs so they will grasp the ECU pins more tightly.
Plug the harnesses back on to the ECU and reinstall it. I usually only use two of the bolts because the third is a bear.

Revised 07/11/12

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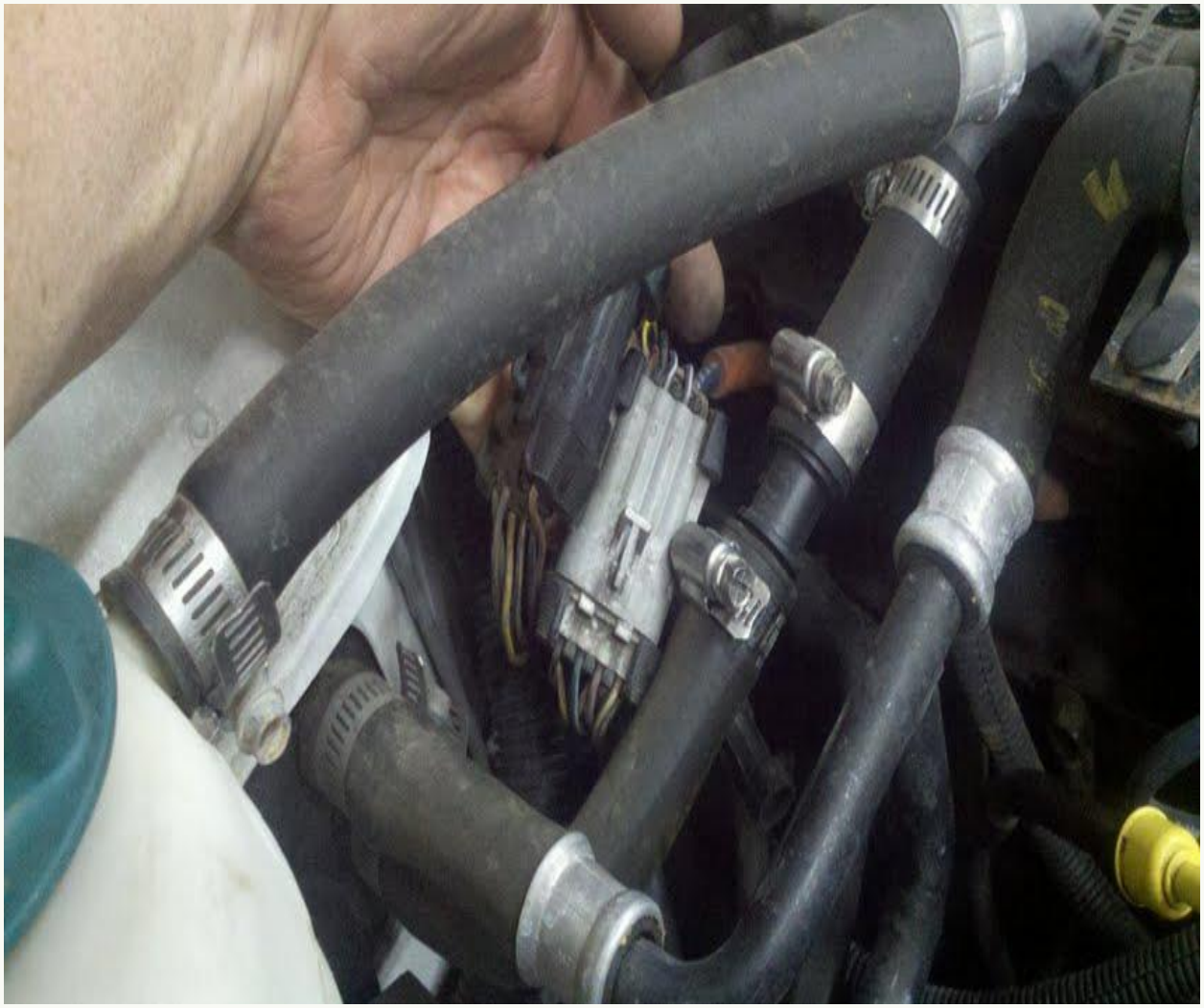
10. Trans plug connector refreshing

Over near the transmission dipstick tube are 2 rather large connectors. One is black and the other gray. These 2 connectors carry all the info between TPS, TCU, NSS, speed sensor, and transmission solenoids. Unplug each one, visually inspect for corrosion or bent pins, spray them out with electrical contact cleaner and plug them back in.

Additionally, if your Jeep is an 87 to 90 Renix, it's always a good idea to reach up under the glovebox area and unplug the connector to the TCU and spray it out along with the receptacle of the TCU. While you're there, find the fuse right in that area for the TCU. Remove it and spray out it's receptacle and clean any corrosion from the fuse.



Revised 9-10-2012

11. Throttle body and IAC cleaning

Courtesy of TJWalker:

The Idle Air Control (IAC) is mounted on the back of the throttle body (front for 87-90). The valve controls the idle speed of the engine by controlling the amount of air flowing through the air control passage. It consists of a stepper motor that moves a pintle shaped plunger in and out of the air control passage.

When the valve plunger is moved in, the air control passage flows more air which raises the idle speed. When the valve plunger is moved out, the air control passage flows less air which lowers the idle speed. Over time and miles, the IAC can get carboned up which can have an adverse affect on idle quality. Cleaning the IAC may restore proper function and is an easy procedure to perform and good preventive maintenance so it is never a bad idea.

Remove the air filter cover, associated hoses and the rubber boot that goes from the air filter cover to the throttle body.

Remove the IAC with a torx driver (2 bolts; one can be kind of hard to get to)

“Gently” wiggle out the IAC from the throttle body. Gasket on the IAC can be re-used if it is not damaged

Clean the IAC with a spray can of throttle body cleaner; inexpensive and available at any place that sells auto parts.

Throttle body cleaner is recommended rather than carburetor cleaner as it is less harsh, safe for throttle body coatings and is best for this task. Use cleaner, a rag and a toothbrush and or Q-Tips. Be gentle; don’t twist or pull on the pintle that protrudes from the IAC as it is fragile and you could damage it.

Thoroughly spray clean and flush where the IAC seats in the throttle body with the same spray cleaner.

It is also a good idea to clean the entire throttle body itself, the butterfly valve inside of the throttle body and all associated linkage as long as you have things disassembled.

12. Setting your 4.0 to #1 TDC

With #1 spark plug removed, turn the engine over clockwise using the 3/4" front crankshaft bolt. You will see the degree marks on your front cover. Mark the 0 with chalk or white-out.You will see the timing mark on the balancer. Mark it with chalk or white-out. While turning the engine over, put your finger/thumb over #1 spark plug hole. As the mark on the balancer approaches the marks on the front cover, if you are coming up on #1 TDC, pressure in the cylinder will push on your finger. If there's no pressure, you're at #6 TDC and need to crank the engine over until you see the marks coming together and you get pressure. Set the mark on the balancer to the 0 mark on the front cover.

13. Renix distributor indexing

Remove the distributor cap and cut a "window" into the side of the distributor cap at the #1 spark plug wire post . The "window" should be large enough to allow easy visual inspection of the position of the distributor rotor at the #1 spark plug wire post. Reinstall the distributor cap.

Install a ¾” wrench or socket onto the vibration damper retaining bolt. Rotate the engine in a clockwise direction until the #1 cylinder is at top dead center. Align the timing mark on the vibration damper with the "0" degree mark on the front cover timing scale. The tip of the distributor rotor should be near the #1 spark plug wire post.

Disconnect the distributor electrical connection. Remove the distributor hold down clamp, hold down bolt and distributor.
Remove the distributor cap and rotor.

Place the distributor housing upside down in a soft jaw vise. Scribe a line 1/2 inch from the end of the distributor locating tab. Cut the distributor locating tab at the scribed line with a saw.

Remove any burrs and metal filings from the distributor. Reinstall rotor.

If necessary, using a flat blade screwdriver, turn the oil pump gear drive shaft until the slot is slightly past the 11 o'clock position. The oil pump gear drive shaft is accessible through the distributor mounting bore in the engine block.

Visually align the modified locating tab area of the distributor housing with the hold down clamp bolt hole.

Turn the rotor to the 4 o'clock position. Lower the distributor into the engine block until it seats. The rotor should now be very close to the 5 o'clock position.

Reinstall the distributor cap with the cutout "window". Rotate the distributor housing until the trailing edge of the distributor rotor tip is just departing from the #1 spark plug wire post terminal.

Reinstall the distributor hold down clamp and bolt.. Reinspect the position of the rotor to the #1 spark plug wire post to insure that it has not moved.

Install the new distributor cap, reconnect the distributor electrical connections.

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14. Restoring throttle butterfly adjustment

Okay. Let's start from scratch. First off, that's not an idle adjustment screw. It's a throttle butterfly stop screw. It's purpose is to allow the butterfly to be as close to completely closed as it can be without binding or wearing into the throttle body.

It was never intended to be adjusted in the field. But, Uncle Bob didn't know that, did he?

Engine off. Back off the butterfly stop screw with a 3/32" allen wrench until the butterfly is completely closed. Now. turn the screw in until the FAINTEST movement of the butterfly opening is detected. This can be done more easily with the throttle body removed. If you remove the throttle body, be sure to replace the gasket underneath it after thoroughly cleaning the old one off.

15. Rear main seal diagnosis

I'd be looking up ABOVE first, and VERIFYING the source of the oil leak YOURSELF.

Everybody, who doesn't own or have to pay for or perform your vehicle repairs, loves to poke their noggin

UNDER the Jeep and come out bearing the false bad news that your RMS is leaking.

Many mechanics, friends, and good old Uncle Bob seem to enjoy telling you it's the rear main seal. Has a catastrophic ring to it, doesn't it?

A simple leak at the back of the valve cover or other source could produce the same symptoms. You don't need to be a mechanic to figure this out. If you have good eyesight and a dim flashlight, you're good to go on your own. Don't jump on the RMS/oil pan gasket bandwagon right off the bat.

Almost any oil leak on your 4.0 is gonna drip from the RMS area for two simple reasons:

First off, the engine sits nose-up and any oil will run back to the RMS area. Secondly, the RMS area is also the lowest point on the engine. Simple physics and the old plumber's adage apply here. "$#!& flows downhill".

Valve cover gasket, oil pressure sending unit, oil filter adapter seals and distributor gasket, in that order, have to be eliminated as possibilities first.

Revised 9-15-2012

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16. Vacuum test for exhaust restriction

Your vacuum gauge should come with an instruction booklet outlining the procedure. Hook the vacuum gauge up to a source on the intake manifold. Start the engine and note the vacuum reading. Usually 17 to 21 inches of vacuum. Throttle the engine up to 2,000 to 2,500 RPM for 20 seconds or so and the vacuum reading should stabilize to the same reading you got at idle. Let the throttle snap shut. The vacuum reading should shoot up about 5 inches of vacuum higher for a
second and then come quickly down to the original reading. If the vacuum reading stays high and comes down slowly with jerky needle movements, you have an exhaust restriction.

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17. HO engine into Renix

This swap is easier than some will lead you to believe, generally those who have never done it. Those of us who have done it, like myself, will share with you the things that need to be done for a successful swap. Just think of it as swapping in a long block.

The HO and Renix have some differences but none that can't be overcome very easily.
Any HO engine from an XJ or ZJ through 1999 can be used. One running change was that the rear of the head was no longer drilled and tapped for the temperature gauge sender beginning in the 96 model year. The sender can be relocated to the threaded hole in the thermostat housing taken from the HO engine. You'll have to extend the wire to that location. Some brave souls even drill and tap the HO head for the sender.

You will be using the intake and exhaust manifolds from your Renix, along with all your sensors and wiring. Since the intake ports of the HO are slightly different, you use the Renix gasket. Exhaust ports are identical. You will need to use your Renix distributor as it is different than the HO because they use different fuel management systems. The flywheel or flexplate from the Renix must be used so your CPS gets the correct signals. The valve cover from the Renix allows you to keep your CCV system intact and requires no modifications.

The HO block will have a plug in the coolant galley on the driver's side of the block, closest to the front, which needs to be removed so your Coolant Temp Sensor can be installed in it's place just as it is on the Renix. It requires a 5/16" square drive or a modified 3/8" drive that has been ground down to fit. Do this before installing the engine.

As for the knock sensor, which is located just above the oil pan on the driver's side of the engine about mid way, all the blocks I've seen are threaded for it. If not, I've heard they may be drilled but not tapped. Tap the hole if that's the case.

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18. Improving the instrument panel ground

The ground point for the complete instrument cluster on your XJ or MJ is located up under the driver's side dash. If you lay on your back and look up under there with a flashlight, without wearing a hat, you will see a black wire attached to a shiny piece of metal almost directly above the hood release knob. The screw will have either a ¼" or 5/16" head on it.

This ground point is responsible for handling the ground circuit for the following items: Dome lamps, Seatbelt and key warning, trans comfort switch, wiper switch, headlamp switch and delay module, fog lamp switch, cargo lamp switch, all instrument panel grounds and illumination, power windows and door locks, cruise control dump valve, and a few more things.

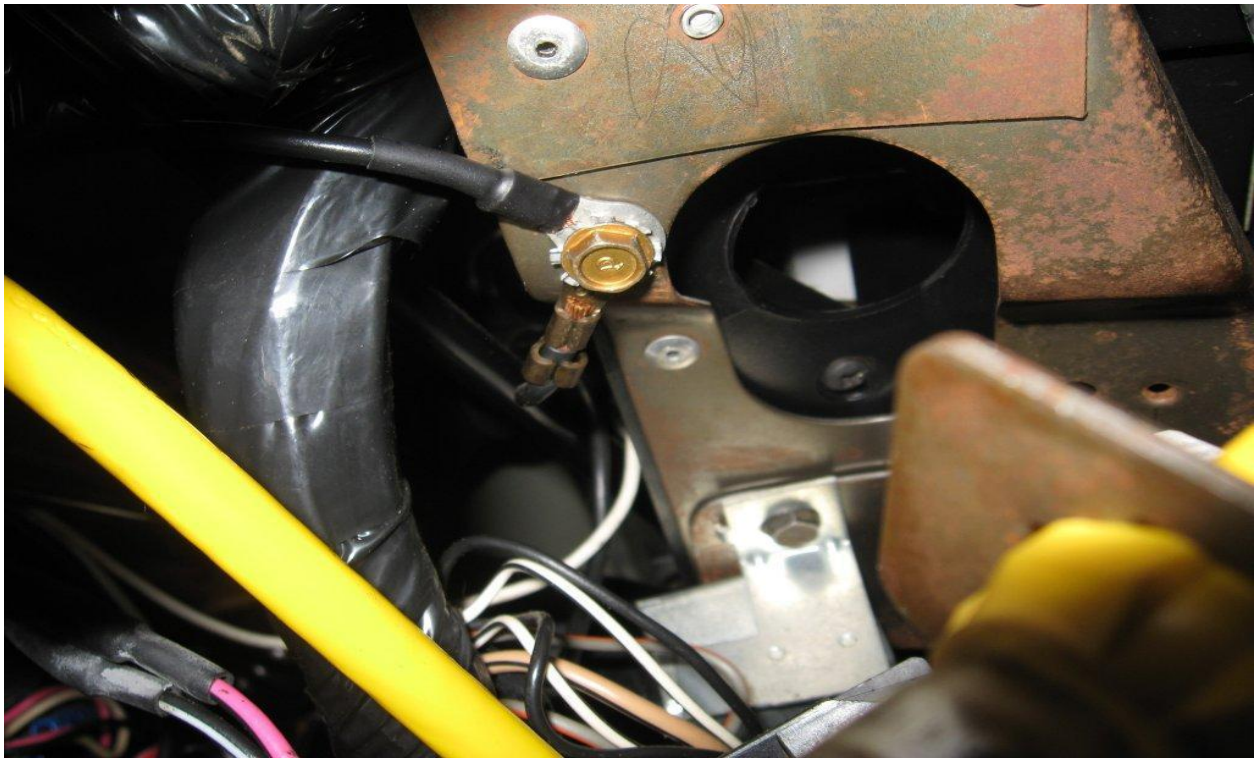
The problem is that where the ground point is located does not have a good contact with the chassis where the ground should be. The solution is simple.

Make up a jumper wire with #10 gauge wire about 10" long. On one end, crimp on a ¼" round wire terminal. On the other end, crimp on a 3/8" round wire terminal.

Remove the screw from the existing ground wire and attach the small terminal of your jumper so that the original wire and your new jumper share the same attaching point, one over the other. The best was to get to terminal screw is by dropping the lower dash panel.

Look above the driver's side plastic kick panel just forward of the top of the hood release knob. You will see an 8mm stud there. Attach the large terminal end there with a washer and nut over it tightened securely.

Special note for Comanche owners: Make your jumper wire 12" long and attach it on the driver's side kick panel close to the fusebox on the 8mm stud.



19. Headlight harness installation

It's an easy to install supplemental headlight harness.

From the factory, the voltage to the headlight bulbs travels from the battery, inside the cabin, to the headlamp switch, and then back out to the lamps via undersized wire. It's not uncommon to find only 10.5 volts at the lamps.

The supplemental harness is installed so that it provides battery voltage to the lamps and is just triggered by the factory wiring. The result is about 30% brighter headlamps and headlight switches that don't melt and burn out.

Absolutely plug and play. Remove grille and headlamp bulbs. I fed my harnesses from the passenger side starting between the battery and the back of the headlamp housing, over to the driver side. Plug the driver side bulb into the new harness. Attach the new harness's ground wire under one of the small bolts on the radiator support after scraping the paint off under it. Attach the harness to the existing harness behind the grille working toward the passenger side.

Plug the new harness plug into passenger headlamp. Plug original headlamp plug into receptacle on new harness. Attach the ground for the passenger side just like you did the driver side under a radiator support bolt. Attach relays with provided bracket on the passenger side inner fender. Connect power wires to battery.

Revised 12/10/2012

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20. 4WD shifting tips

Here's how the factory suggests you shift the transfer case and I've been doing this since these things

were new and I worked at the dealership. Quoted from the owner's manual.

"To engage, shift the transfer case lever from 2H to 4H while the vehicle is moving at any legal speed". I let off the gas, throw the lever, and then tap the gas and let off.

4L position: " To engage, slow the vehicle to 2-3 MPH , shift the transmission to Neutral, then shift the transfer lever to the right and pull firmly rearward to 4L".

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21. Renix EGR valve test

Valve Opening Test
1) With engine at normal operating temperature and at idle, rapidly open and close throttle. Open throttle sufficiently to obtain at least 1500 RPM. Movement should be noticed in EGR diaphragm.
2) If diaphragm does not move, probable causes are: faulty vacuum signal to EGR, defective EGR diaphragm or defective backpressure sensor diaphragm (if equipped), or leaks in vacuum lines or connections.

Valve Closing Test
1) With engine at normal operating temperature and at idle, manually depress EGR valve diaphragm. RPM should immediately drop, indicating that EGR valve is not leaking and had been properly cutting off exhaust gas flow at idle.
2) If there is no change in RPM and engine is idling properly, exhaust gases are not reaching combustion chamber. Check for plugged passage between EGR valve and intake manifold.
3) If engine idles poorly and RPM is not greatly affected by manually moving diaphragm up, EGR valve is not closing off exhaust gas flow. Check for carbon between pintle, leaking EGR valve gasket or bad EGR valve.

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22. Renix vacuum harnesses

Revised 12-28-2014
The vacuum harness that attaches to the front of the valve cover and includes the grommet/fitting, and is called the front harness, is Napa part number BK 715-1367, or Dorman 46003.

The vacuum harness that is closest to the air cleaner, EGR etc, and is called the rear harness, is Napa part number BK-715-1366.or Dorman 46004

The tube from the rear of the valve cover to the intake manifold is part number 715-1365.or Dorman 46005 and comes with the valve cover grommet.

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23. CPS timing advance mod

The sensor portion of the CPS needs to slide up the perforated bar towards the top of the engine.
Mark the perforated bar's top end with paint or marker.
Place the CPS in a vice, just not quite clamping the bar, the sensor resting on the vice jaws, with the top part protruding.
Place a bolt that fits tightly into the hole at the Top part of the bar.
With a hammer, tap the Top part of the bar and it will slide through the sensor portion of the CPS. Stop when the sensor portion is about 3/8" from the edge of the bolt hole.

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24. 4.0 Engine date codes

The date code is on the passenger side of the engine, on the block, just forward and up from the distributor on a machined flat surface.

The digits of the code identify:
1st Digit-The year (8 = 1998).
2nd & 3rd Digits-The month (01 - 12).
4th & 5th Digits-The engine type/fuel system/compression ratio (MX = A 4.0 Liter (242 CID) 8.7:1 compression ratio engine with a multi-point fuel injection system).
6th & 7th Digits-The day of engine build (01 - 31).

FOR EXAMPLE: Code * 801MX12 * identifies a 4.0 Liter (242 CID) engine with a multi-point fuel injection

system, 8.7:1 compression ratio and built on January 12, 1998.

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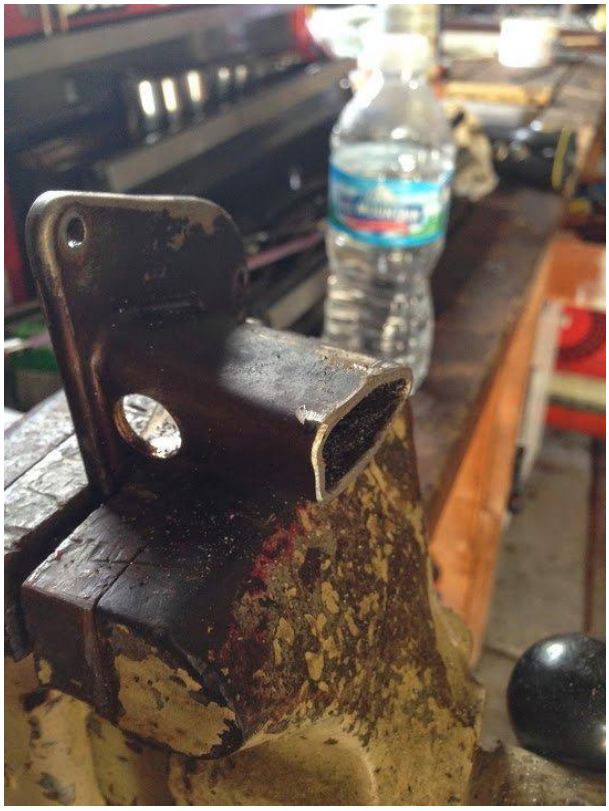
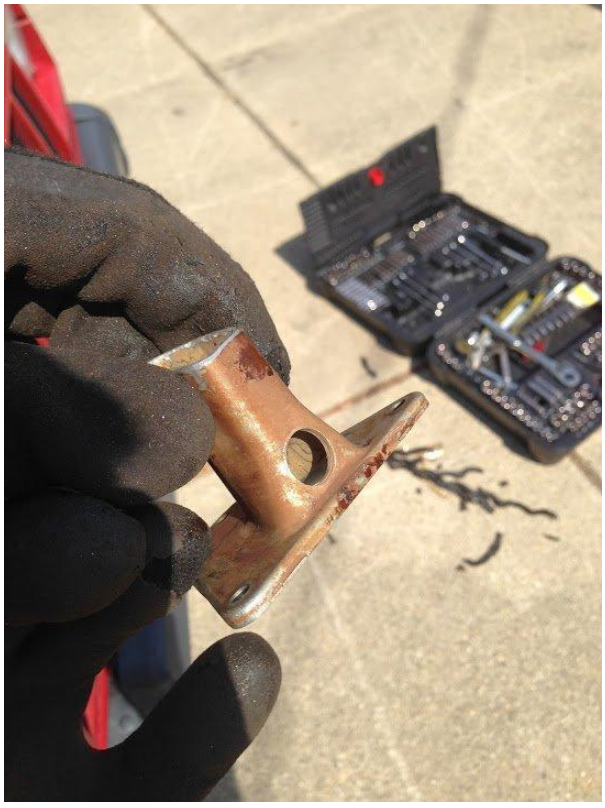
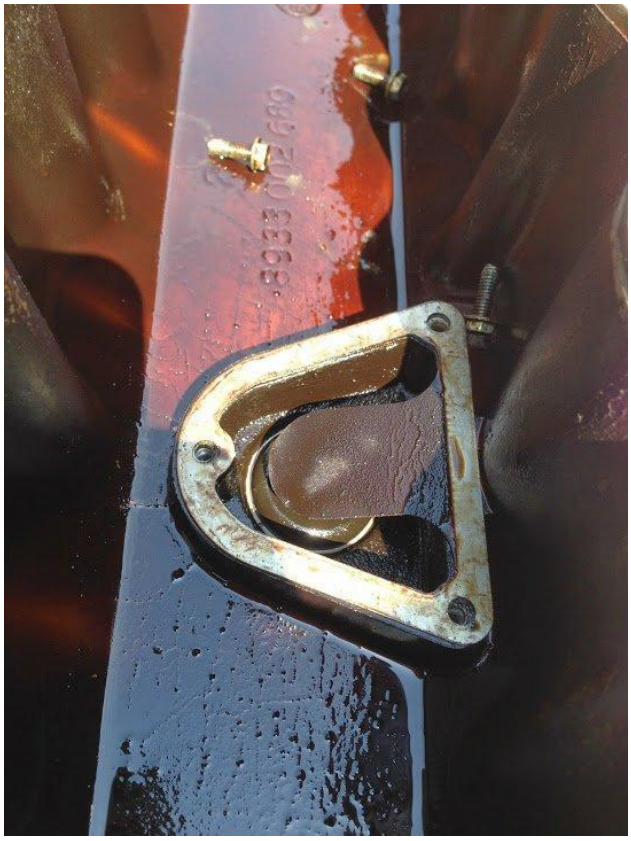
25. Valve cover mod

Most early and even later Renix 4.0s could be bothered by excessive oil in the air cleaner box. A fix from my old days as Service Manager at a Jeep dealership follows. Information was provided to me from a buddy at Jeep Tech during those days. I don't believe it ever came out in a Technical Service Bulletin.

Remove the valve cover and turn it over. Next, remove the fluted tubes that are now facing you by removing three screws on each. Chop 1 inch off each of them. Then, about a half inch up from the area where you just sawed them off, drill a half inch hole in the tubes so the holes will face the rear of the valve cover. Clean and de-burr/sand all rough edges nicely, clean with solvent, and reinstall. Don't be concerned about the chintzy gaskets that will probably crumble into oblivion when you remove the fluted tubes. They can go back together without gaskets.







26. Oil filler cap mod

We all get tired of the oil film/leak on top of our 4.0 Jeep aluminum valve covers. Many times the biggest culprit is the loose fitting oil filler cap. Here's a real easy fix:

Remove the plastic oil filler cap and wrestle the original rubber gasket from it using a small pick or screwdriver.
Make a duplicate of the gasket out of an old bicycle inner tube using scissors and a knife or razor blade.
Install the duplicate on the cap first, and then the original over top of it.
It will be a tight fit on the valve cover the first time, and may require some persuasion with a pair of pliers, but will get easier with time.

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27. C101 connector elimination

Unbolt the 2 halves of the C101 using a ¼" socket. On each half there is a plastic cover where the wires enter. They are removable but you'll probably end up busting them off. Lightly bolt the C101 back together, away from the firewall. Peel back the split-loom covering from the body side of the C101 connector down to where the harness splits and goes toward the firewall, pretty much below the MAP sensor. On the engine side, remove the split loom about the same distance. See first photo.

Now you can see from one side of the C101 to the other. Beginning at the top row, closest to the motor, be absolutely sure you cut the matching wires on each side of the connector off to about 1/2 inch. This will allow you to verify the original position of each wire color in case of mistakes or confusion. CUT AND SOLDER ONE PAIR AT A TIME. The wires may be wound a bit in their looms. See the first photo. Get them unwound neatly and do the following, ONE AT A TIME.

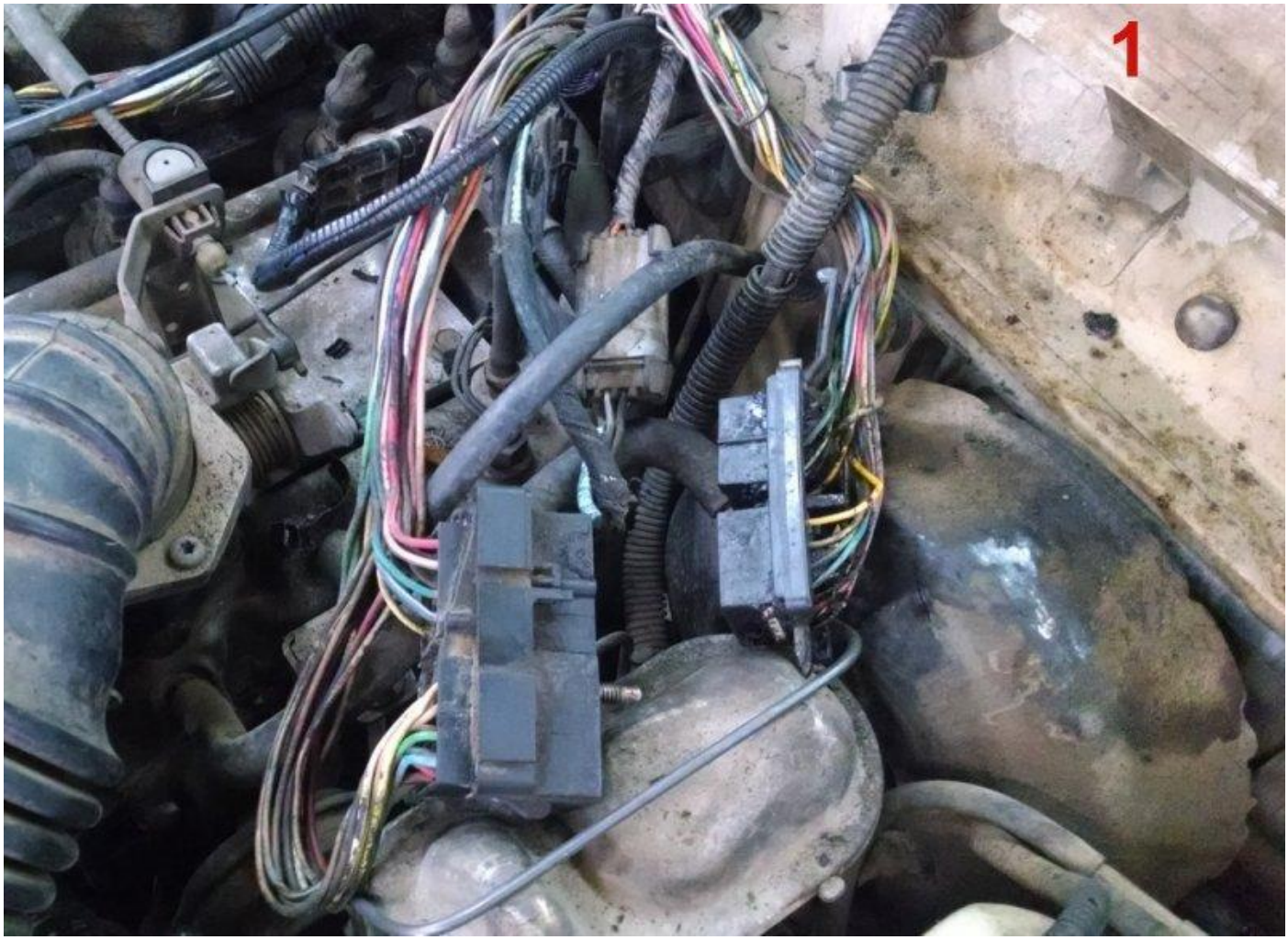
Slide your shrink tube over one wire. In a well ventilated area, solder the wires together and then slide the shrink tubing over the solder joint. Heat the shrink tubing so it seals your completed solder joint. Keep going until you've done all 22 or so connections.

Both sides of the C101 connection have a wire that is brown with white tracer. Follow each of these wires back until you come to a point where three wires are crimped together. See the second photo.

What you want to do here is cut the crappy factory crimp out of each set of three and bring both sets of three wires together and solder them together, using shrink tubing as well. All 6 wires. These particular wires will not end up in your normal C101 elimination loom. See the third photo.

After all the soldering and shrink tubing is done, bundle the wires together in a new piece of 3/4" split loom. Tape it up and secure it to the C101 connector's original bolt hole or somewhere else along the firewall so it will be protected. See the third photo.

Revised 03-06-14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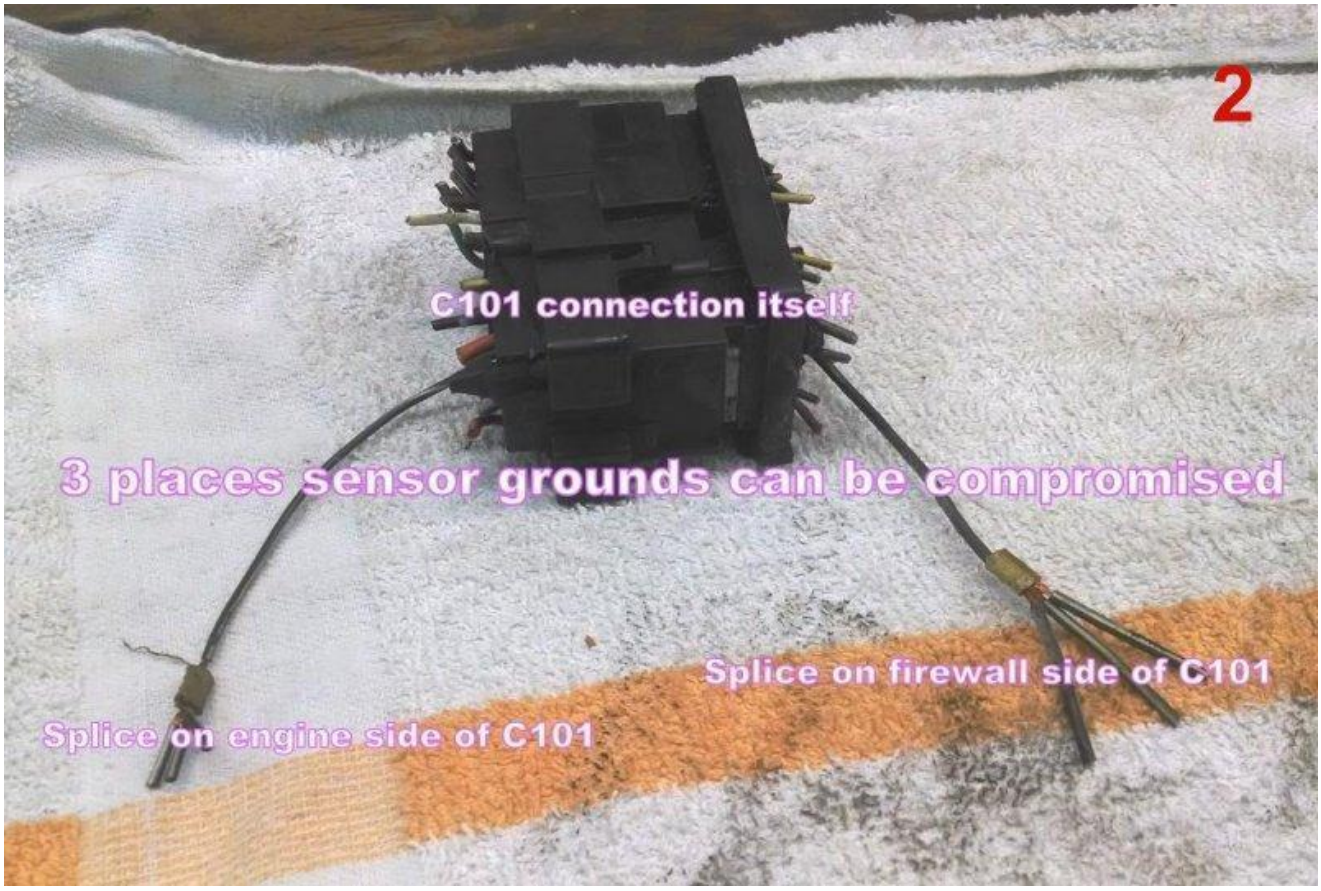
2
C101 connection itself
3 places sensor grounds can be compromised
Splice on firewall side of C101
Splice on engine side of C101


3
C101 eliminated
HERE
Sensor Ground Harness
HERE