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11-05-2017, 04:33 AM

Thread Starter

post #1 of 61

Uniblurb

Web Wheeler

**2004 WJ**

Join Date: Jan 2012

Location: Central

Posts: 9,795

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Jeep WJ Ground Write-up Info

The WJ electronics require good/clean grounds to avoid electronic failure or create havoc. The purpose of this thread is to pinpoint ground locations along with listing which components connect to each ground. In addition to insulated ground wires the flat ground straps will also be included.

Much of this 'ground' information was gathered from the 2004 WJ FSM (Factory Service Manual). Since just knowing the ground location isn't much help I went through hundreds of pages of wiring schematics to find which components connect to each ground. And wire color-coding is included with the ground wires when found.

The photos of the specific grounds are from my 04 4.7 Limited. In addition to the 4.7 left-hand-drive WJ's the 4.0 grounds will also be included but without photos. There was just too much info to include the right-hand-drive and diesel WJ's.

This is a work in progress and corrections or additions are gladly welcomed. Also since the WJ's (1999-2004 Grand Cherokee) cover 5 years the early year WJ's may have different grounding than the later years.

Tools and supplies needed for cleaning grounds.

- Wrenches and/or sockets for removing ground bolts/nuts.
- Pliers or vice-grips in case the eyelets are seized or turn.
- Rust cutter if the bolts/nuts are difficult to loosen/seized.
- Small wire brush, fine emery cloth or fine sandpaper.
- Dremel/rotary tool with wire wheel instead of above if available.
- Spray electronic cleaner preferred some use carb/brake cleaner.
- Dielectric grease or products like ox-gard. (optional)

Tips on removing and cleaning grounds:

- Most of the eyelets are solid stainless steel where they don't have a metal coating. But if you do run into eyelets with tin/zinc coatings don't remove the eyelet coatings and just rust/corrosion.
- I did not remove body paint from under inner fender/firewall mounted grounds since the eyelets have special teeth for going through paint. Reinstall eyelets in same position as removed.
- All upper engine compartment grounds have a 10mm headed bolt or nut. Exception is the large/tall ground stud to right of plenum and all bolt/nut head sizes are included on photos.
- Note: 'left' & 'right' are indicated as if you're sitting in the driver's seat and not looking at the front. Most everybody already knows this and only mentioning when working from the front.
- My upper body/engine grounds were all fairly good/clean but I

cleaned them anyhow. The grounds on the side of the engine block and underneath exhaust were fairly corroded externally due to being in the salt/rust belt.

Ground numbering:

There are approximately 13 ground locations listed and they're designated by a 'G' followed by a 3-digit number. Many flat ground straps are not even included in the ground location list but I'll try to include what has been found.

Numeric order will not always be followed in this write-up to group some area grounds together. I've typed in text for electrical components grounded on most diagrams and photos.

I realize I'm way too wordy, sorry, and most ground info can be gathered from the photos & diagrams. Component info is under the ground number/heading anyhow as well as on photos or diagrams.

Below is a chart for on ground numbers with locations. Since the exact locations are unclear additional info in blue text has been added.

GROUNDS

GROUND NUMBER	LOCATION
G100 (4.0L and Diesel)	Near Starter
G100 (4.7L)	Near Intake Plenum
G101	Near Battery (Right inner fender, far forward)
G102	Right Side of Engine (To rear of motor mount, 4.7)
G103	Right Side of Engine (To rear of motor mount, 4.0 & 4.7)
G104 (4.0L)	Right Rear of Engine (Near filler tube)
G104 (4.7L)	Left Side of Engine (To rear of motor mount on 04 4.7)
G105	Right Side of Engine (only found for diesel)
G106	Left Side of Engine Compartment (Left inner fender)
G107	Left Side of Engine Compartment (Left inner fender)
G108	Near Power Distribution Center (Right inner fender)
G200	Near Airbag Control Module (Left side cabin console)
G201	Near Airbag Control Module (Left side cabin console)
G300	Near Right Front Seat (Right side of passenger seat)
G301	Near Left Front Seat (Left side of drivers seat)

() = Additional info

U101

The individual grounds are below with images following the description.

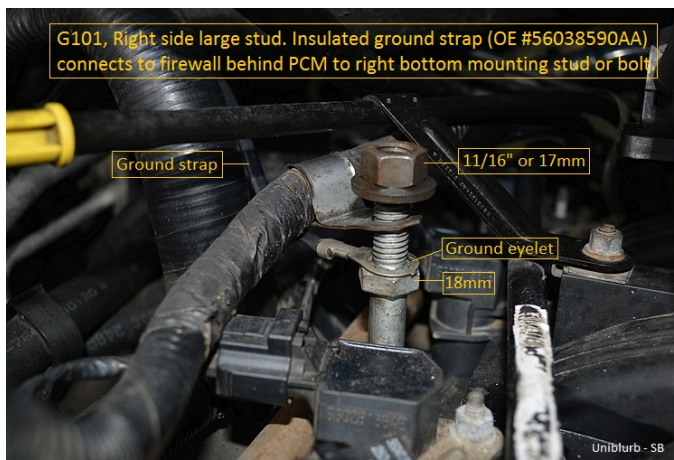
G100. Near starter (4.0). No info found and a photo would help.

G100. Near intake plenum (4.7).

Conflicting info supplied by the FSM and needs verified.

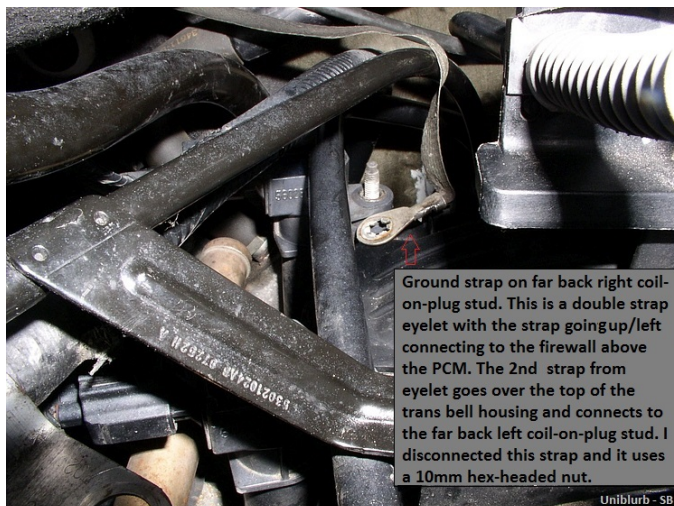
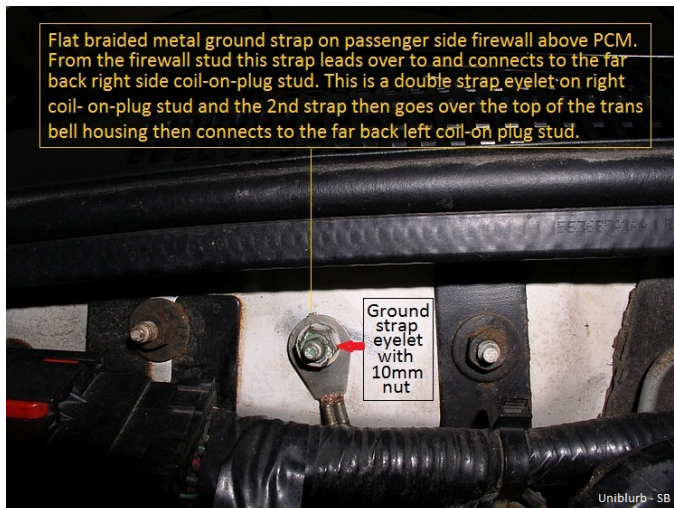
For now the large/tall stud to right of the intake/plenum will be designated as G100. This insulated ground strap is connected between the large stud to the backside of the PCM case on one of the left bolts/nuts. I thought this ground was attached to firewall behind PCM but it is not and just on the back of the PCM case.

The OE number is 56038590 for this strap but not sure if available. This is the only rubber insulated half-flat ground strap found. The air box on top of the plenum needs to be removed to clean this ground good.



Firewall ground to right/left rear coil-on-plug studs:

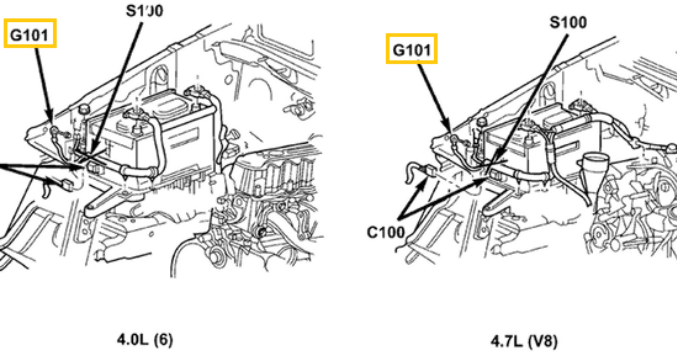
This flat braided metal ground strap connects to a firewall stud above PCM and goes to far back passenger side coil-on-plug stud/nut. This is a 'Y' strap eyelet on the right rear coil-on-plug stud. While one strap connects from the firewall the other strap goes over top of the transmission bell housing and connects to the rear far back driver's side coil-on-plug stud/nut. Again, air box on top of plenum needs removed to reach these far back grounds.



G101. Right inner fender, far forward (4.0 & 4.7)

Large black 6-gauge ground cable direct from battery negative terminal. Real poor design on my 04 since I couldn't back the bolt all the way out since the head was jammed against the PDC case. I cleaned the front/back of eyelet and bolt threads with small wire

brush with bolt tip still in place. I've noticed on other WJ's a hole further forward used for this ground which makes more sense since PDC wouldn't be in the way.



tjmaximus, 97Mule, LTopher and 3 others like this.

96 4.0 ZJ Laredo, 2004 4.7L WJ Limited, 96 4.0 XJ (son's)

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11-05-2017, 05:09 AM Thread Starter

post #2 of 61

Uniblurb
Web Wheeler
JeepForum Supporter

WJ ground write-up continued.

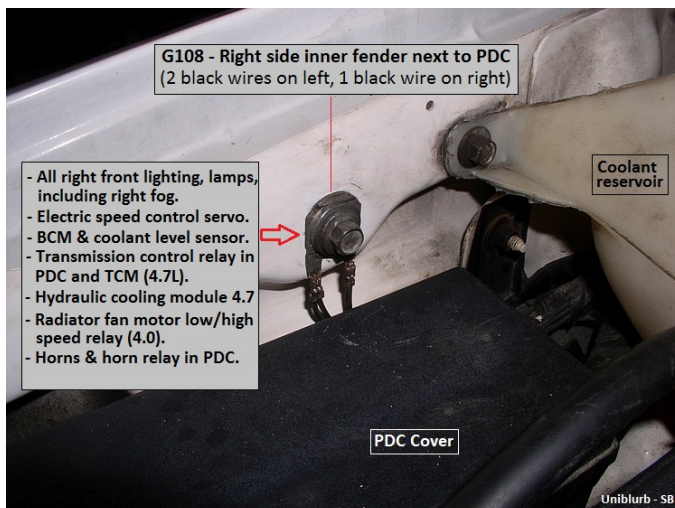
G108. Right side inner fender next to PDC. (3 bk wires, 2 eyelets)
All right front lighting/lamps including fog, electric speed control servo, BCM, coolant level sensor, trans control relay in PDC & TCM (4.7), hydraulic cooling module (4.7), radiator fan motor low/high speed relay (4.0), horns & horn relay in PDC,

2004 WJ ▾

Join Date: Jan 2012

Location: Central

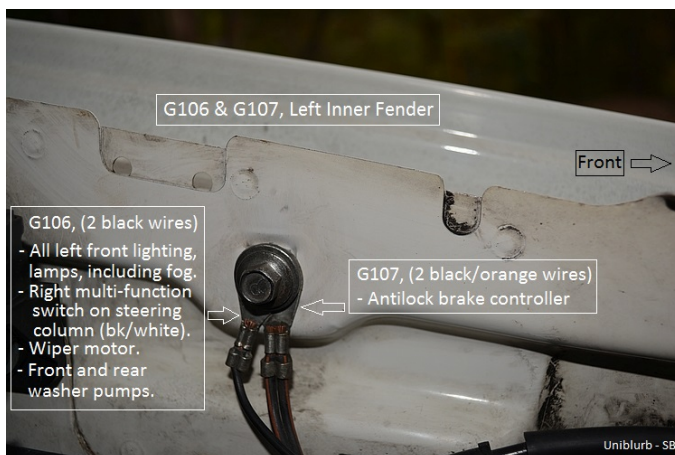
Posts: 9,795

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G106 & G107. Left inner fender with both connected by one bolt.

G106. All left front lighting/lamps including fog, right multi-function switch on steering column (black/white wire), wiper motor, front and rear washer pumps,

G107. Antilock brake controller (2 black/orange), only ground.



G102. (4.7) Right side engine block directly to rear of motor mount.

PCM ground (2 black/white) to #31 in C1 black PCM connector.

TCM to speed sensor, line pressure sensor (trans).

Data link connector.

G103. (4.7) Right side engine block to rear of G102 next to mount.

PCM ground (black/tan) to #32 in C1 black PCM connector.

(above PCM grounds are critical to be good/clean)

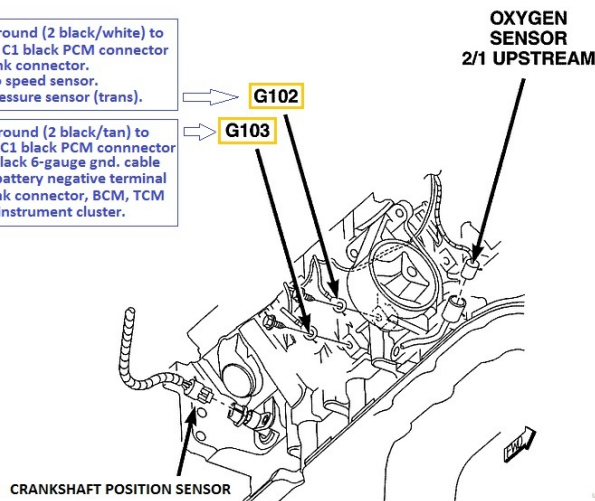
Black 6-gauge ground wire direct from battery negative terminal.

Black/green: (Bus communications) data link connector, BCM, TCM (4.7), instrument cluster.

G102 - G103, (4.7), Right side engine block to rear of motor mount

PCM ground (2 black/white) to #31 in C1 black PCM connector
Data link connector.
TCM to speed sensor,
Line pressure sensor (trans).

PCM ground (2 black/tan) to #32 in C1 black PCM connector
Large black 6-gauge gnd. cable from battery negative terminal
Data link connector, BCM, TCM (4.7), instrument cluster.



G103. (4.0L) Right engine block to rear of motor mount.
(see components connected on diagram)

G104. (4.0L) Right rear of engine block.

This ground appears to be near the transmission dipstick tube and see below figure.

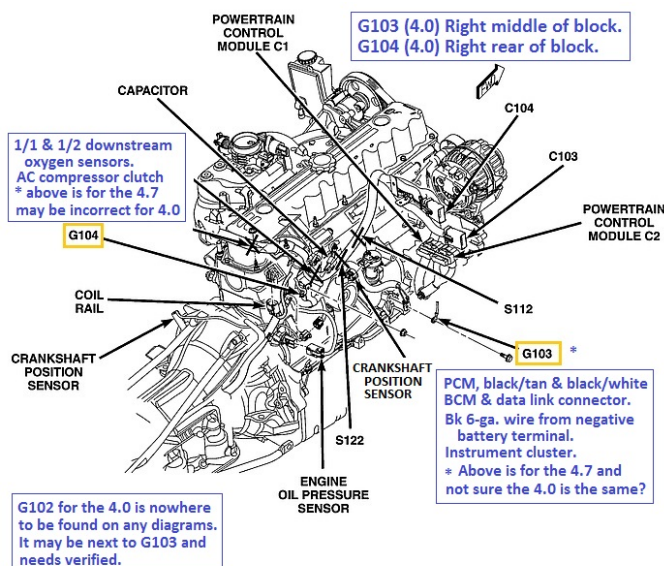


Fig. 15 ENGINE RIGHT REAR LHD 4.0 L

G104. (4.7L) Left side of engine block. (2 black wires, 1 eyelet)
A/C compressor clutch, 1/1 and 1/2 downstream oxygen sensors.

The below diagram shows this ground below the oil filter & oil pressure switch. This is incorrect on my 04 4.7. It's in the middle of the left side block, to rear of motor mount, and just 1" below one of the middle freeze-out plugs. Left body (not axle) needs to be jacked up to reach this ground from the underneath front.

**ENGINE OIL
PRESSURE
SWITCH**

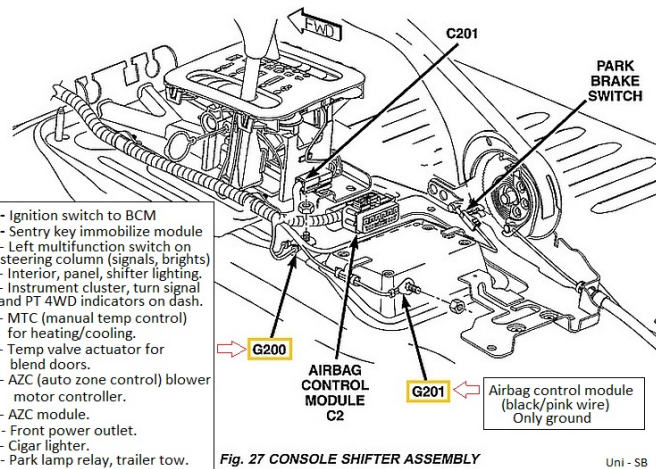
G104 (4.7) L. side engine block.
 - AC compressor clutch
 - 1/1 & 1/2 downstream
 oxygen sensors.

2 black wires, 1 eyelet
 * G104 is much further
 back on my 04 4.7. It's
 to rear of motor mount
 and 1" below middle
 freeze-out plugs.

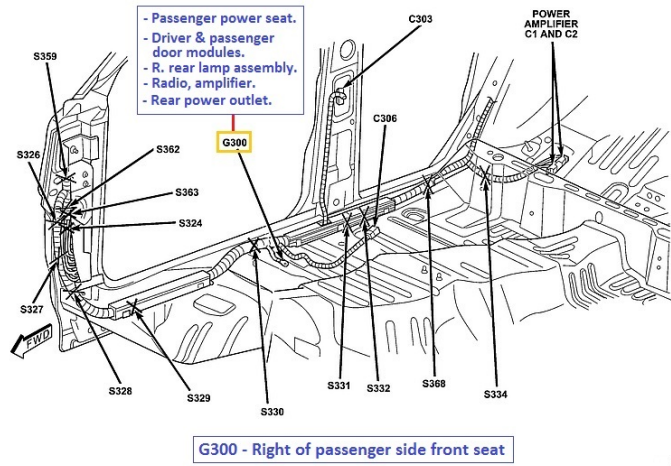
G104

G200. Cabin console left of shifter assembly.
 Ignition switch to BCM, sentry key immobilizer module, left multifunction switch on steering column (turn signals, hazards, bright lights), left/right heated seat switches, park lamp relay (trailer tow), interior lighting, shifter, panel lights, instrument cluster, turn indicators on dash, PT 4WD indicator, MTC (manual temp control, heating/cooling), temp valve actuator (MTC blend doors), AZC blower motor/controller, AZC module, front power outlet, cigar lighter.

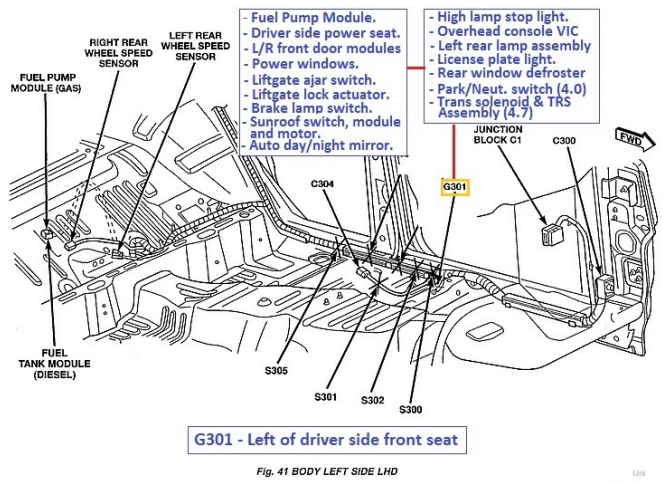
G201. Cabin console left of shifter assembly.
 Airbag control module (black/pink), only ground.



G300. Right of passenger side front seat.
 Black wire. Passenger power seat, driver & passenger door module, right rear lamp assembly, radio, amplifier, rear power outlet.



G301. Left of driver side front seat.
Black wire: Fuel pump module, driver's power seat, driver and passenger door module, power windows, liftgate ajar switch, liftgate lock actuator, rear wiper motor, brake lamp switch, overhead console VIC, left rear lamp assembly, high-lamp stop light, license plate light, rear window defroster, sunroof (switch, motor, module), park/neutral switch (4.0), Trans solenoid & TRS assembly (4.7), Auto day/night mirror.



tjmaximus, LTopher, Rottidog and 1 others like this.

96 4.0 ZJ Laredo, 2004 4.7L WJ Limited, 96 4.0 XJ (son's)

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11-05-2017, 05:24 AM

Thread Starter

post #3 of 61

Uniblurb
Web Wheeler
JeepForum Supporter

Exhaust ground, right side underbody at rear end of 'Y' pipe.
This is a double-strap eyelet with flat ground straps with a bolt connection to the body. One of the straps attaches to the closest stud on the exhaust clamp under the nut. The other strap from body connects to the exhaust hanger bracket lower bolt/nut which is connected to the rear of the transmission.

As can be seen in the 3 below photos my exhaust clamp ground

was worthless. Made a shorter ground out of the OE ground strap, used a narrower new ground strap to rear exhaust bracket stud, and installed a new 2.5" exhaust clamp.

2004 WJ ▾

Join Date: Jan 2012

Location: Central

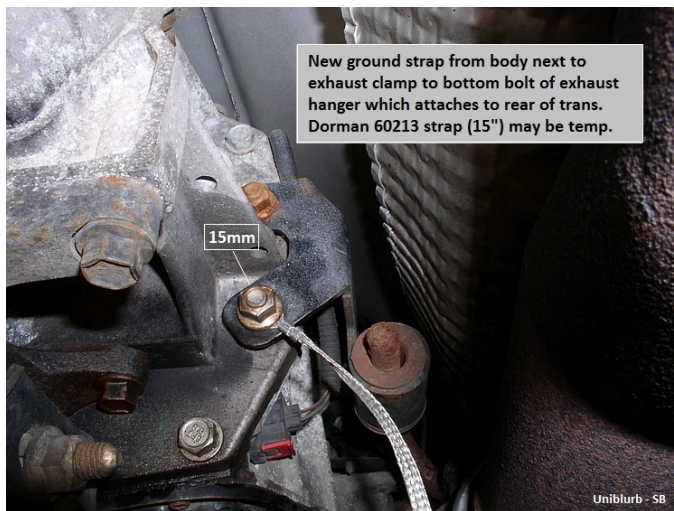
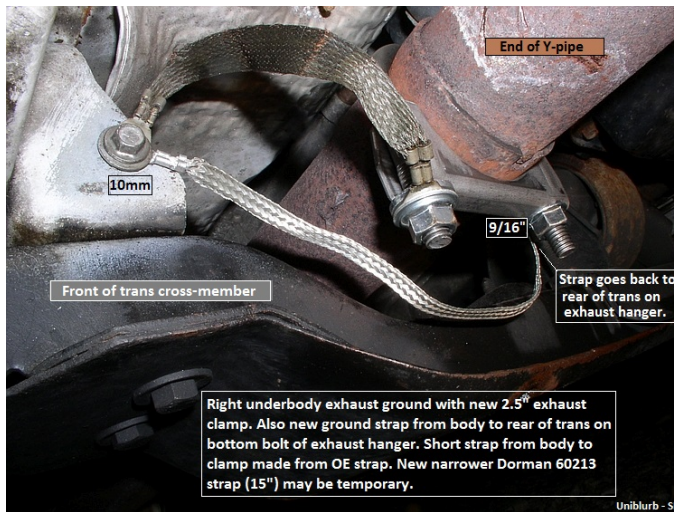
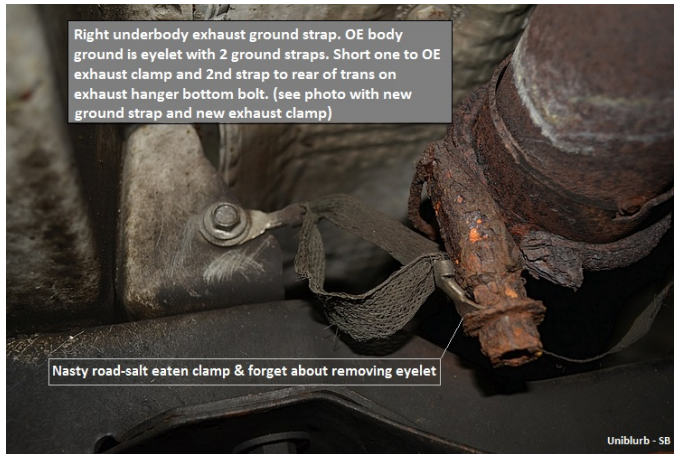
Posts: 9,795

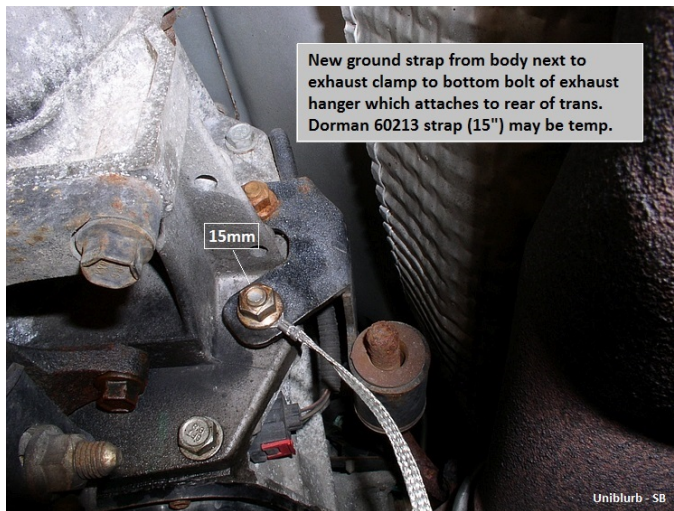
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End of ground descriptions and images.

Abbreviations:

AZC: Auto Zone Control (AC/heating system)
 BCM: Body Control Module
 PCM: Powertrain Control Module (computer)
 PDC: Power Distribution Center (fuse/relay box in engine compartment)
 TCM: Transmission Control Module (4.7)
 TRS: Transmission Range Sensor (4.7)
 VIC: Vehicle Information Center

I have not cleaned my engine block grounds yet and will be including more photos/info. Hope to tackle these real soon but wanted to get this write-up done for now.

Know I haven't covered all the grounds including those on the dash area and doors. Again, additional info, corrections, and photos are gladly accepted.

Sorry for the length but hope this WJ ground write-up helps.
 Good luck, Uni

Edit/addition: I finally cleaned my 04 4.7 WJ engine block grounds and thought I'd pass on some info/tips. The grounds were fairly rusted and needed cleaned. Luckily they weren't coated with oil which also makes for a poor ground.

Tools needed:

- Floor jack or regular jack with jack-stand(s).
 (with lift installed you may not need the above)
- Ratchet with 3" extension and 15mm socket.
- Small wire brush and various grits of emery cloth.
- Rotary tool if you have one with different tips.
 (I used my Dremel w/small wire wheel & barrel sander).
- Spray rust cutter, brake cleaner, electronic contact cleaner.
- Safety glasses are a must with rubber gloves optional.

First thing is disconnect the negative battery cable, set the parking brake, and block the rear tires. Then used a floor jack with wooden block on top and jacket it up on the right side far front unibody/frame just behind rear tie. Had it jacked up just until the right-side front tire was still touching the ground. Placed a jack-stand behind the floor jack which was also on the frame. Lifting up just the right-side body also created enough room to work on the left/driver's side block ground.

Without a doubt it's easiest to go straight in under the front to reach the 3 block grounds. You'll just have to switch sides with the axle pumpkin being in the way. Not much fun working on your back or side but only way I could reach these grounds.

I sprayed PB blaster on all 3 grounds and thought they'd be a bear to get off as rusty as they were. I actually used a 3/8" drive

breaker bar with short 15mm socket to break loose the right-rear G103 bolt and the left side G104 bolt. These ground bolts weren't all that tight and once broken loose a couple turns I could unscrew them with my fingers.

The G102 bolt right behind the right-side motor mount was a different story. You have to use a 3" extension to get on this bolt and it was real tight. Finally, when I was able to break it loose it came out hard all the way. It almost appeared it had a gray thread-locker on the bolt threads but don't believe they'd want to do this in creating a good ground.

The 3 double-wire eyelets, along with battery negative cable eyelet, are all solid stainless steel so they shouldn't be that hard to clean w/small wire brush and some fine emery cloth. But since there are 4 eyelets, and 3 engine block grounding surfaces, I cleaned everything up with my Dremel with small wire-wheel.

It turned out all I did on the block ground surfaces was polish the rust. It's difficult to reach up in there and some real course emery cloth wasn't taking the rust off easily. Finally I put a course barrel sander tip on my Dremel and that rust dust was flying everywhere! Since I was at an angle I had to pull the barrel sander drum further off the front of the rubber holder to have the edge of it sand. I'm sure you can do all this by hand if you're willing to use some 'elbow grease'.

Enough of my wordiness and below are photos with text, labels and explanations. Again, I used the ground wire color-coding I found and cross-referenced it to schematics to match. I'm going to have to change some of my previous text on the diagrams of G102 and G103 on the left-side engine block.

One surprising thing is all 4 wires on the G102 eyelet behind the right-side motor mount go directly to the TCM (Transmission Control Module). And again, make sure G103, to the rear of G102 is good/clean. There's 2 PCM ground wires on G103 and wouldn't doubt those replacing PCM's may be due to a bad ground. I for one had a bad PCM ground take out 2 PCM's and 2 crank sensors to boot on my other Jeep before I found out what the problem was.

Here's the photos, hope I can squeeze all this in, and good luck!

Attached Images

tjmaximus, cdplayer, LTopher and 6 others like this.

96 4.0 ZJ Laredo, 2004 4.7L WJ Limited, 96 4.0 XJ (son's)

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11-05-2017, 06:43 AM

post #4 of 61

jfclk33

Registered User

Join Date: Feb 2017

Posts: 51

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Just wanted to say thanks for taking the time to do this write-up. There have been times that I've looked for some of this info, and it's really nice to have it all in one place.

It looks like you put a lot of time and effort into this and I definitely appreciate it!

operator707 likes this.

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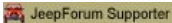
11-05-2017, 07:09 AM

post #5 of 61

ChrisHager

Administrator	Amazing. Added to the FAQ!
	Thanks for taking the time to do this!
	~Chris
	His: 2004 WJ - OME HD 'Kolak' Lift - To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.
	His: 1979 J-10 - 3" on 33s - To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.
	His: 2009 Expedition His: 1978 F250 Custom - To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.
	Hers: 2000 TJ Hers: 2010 Jetta
	To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.
	Quote: Originally Posted by Matt
	"You can't recycle tartar sauce."
	Quote: Originally Posted by steve_80
	Weird, I didn't realize you could use vomit as coolant.
	Quote Quick Reply

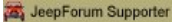







11-05-2017, 07:32 AM	post #6 of 61
GhostJeepWJ Web Wheeler 	AWESOME WRITE-UP BUD!! Will be referencing all this info in the very near future. I have a few that I know need to be replaced. And will go over and clean all the remaining grounds. But seriously, thanks for all the time and research you have into this!! Feel like we should pay you!!...lol
	@ ChrisHager maybe this should be "stickied"
	Edit** Chris is faster then me....lol
	<i>It's not the Destination so much as the Journey!!</i> - Cpt. Jack Sparrow
	2002 Grand Cherokee Overland 4.7 HO 2" IRO Spring Lift w/Bilstein 5100s 245/75/R17 Goodyear Armour Shield
	To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.
	Quote Quick Reply

11-05-2017, 09:37 AM	Thread Starter	post #7 of 61
Uniblurb Web Wheeler 	Thanks guys, appreciate it! Also thanks Chris for adding it to the FAQ's.	
	Luckily I'm an insomniac so worked on this during many wee hours. Lol. And it didn't help there was a huge thunderstorm while posting which thought for sure would take out my internet.	
	I'll add some more once I hit the block grounds.	
	PS. thanks Ghost for not posting until I was done. I saw you liked it after the 1st post out of 3! Ha!	
	operator707 likes this.	

Profile Gallery Classifieds My Jeeps	96 4.0 ZJ Laredo, 2004 4.7L WJ Limited, 96 4.0 XJ (son's) <i>To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.</i> <i>To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.</i> & <i>To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.</i> .
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11-05-2017, 10:24 AM

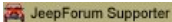
post #8 of 61

GhostJeepWJ Web Wheeler 	@ Uniblurb right on brotha! Was waiting til you finished. Once you get the rest up, have Chris delete all the comments between...lol Keep the informational stuff together. But again.....awesome job!!       
2002 WJ ▾ Join Date: Nov 2016 Location: Halls of Valhalla Posts: 2,239 Profile Gallery Classifieds My Jeeps Garage	<i>It's not the Destination so much as the Journey!!</i> - Cpt. Jack Sparrow 2002 Grand Cherokee Overland 4.7 HO 2" IRO Spring Lift w/Bilstein 5100s 245/75/R17 Goodyear Armour Shield <i>To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.</i>
	Quote Quick Reply

11-05-2017, 12:04 PM

Thread Starter

post #9 of 61

Uniblurb Web Wheeler 	Yeah Ghost, I probably shouldn't have crammed 8 photos w/info into the middle section in case I add the block ground photos I'm going to take where they belong. But with only 3 photos in the last section I can always do an edit at the end. Or may just move some of the last images/info in the 2nd section to the 3rd section. If it sounds like I'm burnt out from working on this most the night I am. 🍷
2004 WJ ▾ Join Date: Jan 2012 Location: Central Posts: 9,795 Profile Gallery Classifieds My Jeeps	96 4.0 ZJ Laredo, 2004 4.7L WJ Limited, 96 4.0 XJ (son's) <i>To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.</i> <i>To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.</i> & <i>To view links or images in signatures your post count must be 10 or greater. You currently have 0 posts.</i> .
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11-05-2017, 04:00 PM

post #10 of 61

Irivera1342 Registered User 2000 WJ ▾ Join Date: Aug 2014 Location: deer park Posts: 115 Profile Gallery Classifieds My Jeeps	awesome awesome awesome i am trying to find all those ground locations since i have that p1768 ground which keeps tripping my transmission into limp mode due to no ground wow i was tacking pictures of my other 2000 4.7 JGC and my friends to compare to see where i am missing a ground and this solves it in one location, hopefully this can be pinned or made into a "sticky": please mods keep this as a reference sticky lol
	Quote Quick Reply

post #11 of 61

Quick Reply

post #12 of 61

Quick Reply

post #13 of 61

Quick Reply

post #14 of 61

i think i possibly found the ground wire that actually goes to the socket #85 for the transmission relay, using UniBlurb awesome pictures and diagrams i was able to use another schematic to trace that wire from the harness all the way to where its is supposed to be bolt to the body, it appears that it was actually resting on the ground bolt and when i would drive or any jolt it would momentary disconnect thus possibly losing ground directly to the relay, if this is the case i can i further up on the harness connect it to another

Classifieds

My Jeeps

grounding point like the other stud on the driver side of the engine block pretty much in the same spot just higher on the engine ?

ground G104 to the socket via harness passed the C102 harness by the firewall it turns black and yellow but from the ground point thru the harness it starts out *** solid black

Attached Thumbnails

20171107_122645.jpg

20171107_122337.jpg

20171107_122456.jpg

20171107_122530.jpg

Attached Files

Relay and PCM schem..pdf (286.4 KB, 23 views)

Uniblurb likes this.

Quote

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11-07-2017, 07:32 PM

Thread Starter

post #15 of 61

Uniblurb

Web Wheeler

JeepForum Supporter

2004 WJ

Join Date: Jan 2012

Location: Central

Posts: 9,795

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My Jeeps

Good find Irivera and real nice photos! Is that G104 ground on your 2000 4.7 on the far back passenger side of the block rather than the left/driver's side block like my 04 4.7? If so I'll add that location info to the write-up.

I don't have the 2000 WJ FSM but have the 2001. It shows G104 for the 01 4.7 the same as mine, on the far forward side of driver's block under the oil filter adapter. And as I found it's actually mid-driver's side block on my 04 4.7.

Can't see why you can't run that broken ground wire from harness to the tall/large stud to left of the driver's side of the plenum. And there aren't any other grounds on that stud anyhow.

I was going to wait until I cleaned my G104 on driver's side block to post a photo of it. I couldn't get a very good photo of it a week ago since it's clear back in there but will post it anyhow. I'll likely jack up the driver's side body to get to it. Here's the not-so-good photo of it with bolt half-hidden in the shadow.

Attached Thumbnails

G104, Driver side of block 04, 4.7, 2017-10-31, 700x936.jpg

96 4.0 ZJ Laredo, 2004 4.7L WJ Limited, 96 4.0 XJ (son's)

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