

No Start, No Wait To Start....Bad Grounds! But also “How To Replace Ignition Switch and Remove Aftermarket Security System”

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It's been weeks not able to start truck. I've been here reading, and on the weekends applying what I've learned from TheDieselPlace 6.5L forum to my 1997 GMC K3500, which is now running. This write up give details of my repair in three sections

-Cleaning Battery Terminal and Grounds

-Remove Security System

-Changing Ignition Starter Switch



Figure 1. 97' GMC K3500 With “NO START”

Diagnosis

Starting with the diagnostic given in the DieselPlace's 6.5L Forum.

(<http://dieselplace.com/forum/showthread.php?p=675511&highlight=wts#post675511>)

1. Does the engine Turn over? **YES**

1a. Does the engine start? **NO**

1b. Do you have a Wait To Start Light & duration lit? **NO** see figure 2a. below



“No Start, No PCM power”

Figure 2a. Missing Dash Lights



“Starts, PCM powered”

Figure 2b. Shown with SES STS and WTS

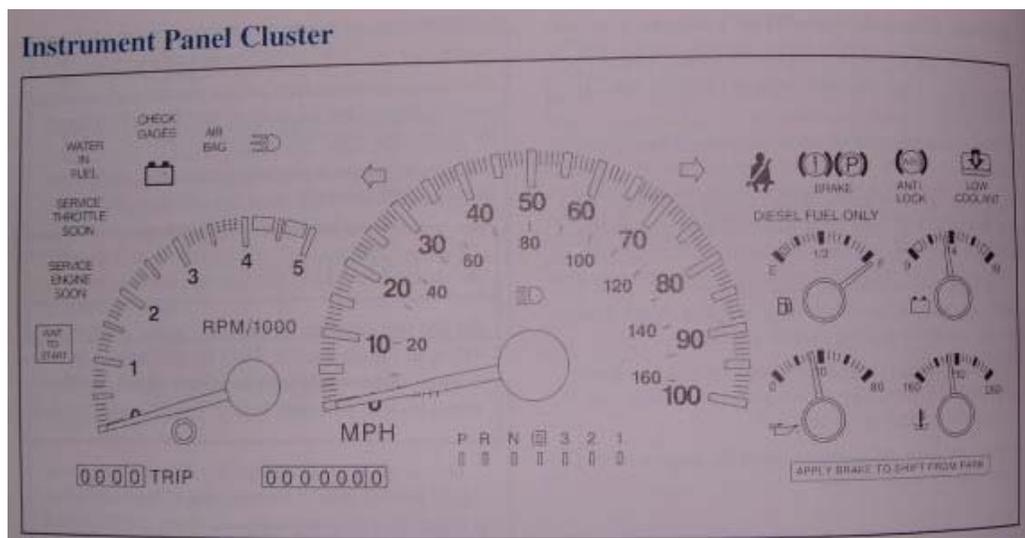


Figure 2c. Instrument Panel Cluster Indicator Light Locations

From here I was able to go to and determine that

-PCM and IGN fuses were good. There were **no blown fuses** in either cab or engine bay fuse panels.

-The engine coolant temperature (ECT) **sensors measured good**. These are RTDs and measured ~3.6k on a 65degF day. Reference table shows 3520ohms at 68F

°C	°F	OHMS
Temperature vs Resistance Values (Approximate)		
150	302	47
140	284	60
130	266	77
120	248	100
110	230	132
100	212	177
90	194	241
80	176	332
70	158	467
60	140	667
50	122	973
45	113	1188
40	104	1459
35	95	1802
30	86	2238
25	77	2796
20	68	3520
15	59	4450
10	50	5670
5	41	7280
0	32	9420
-5	23	12300
-10	14	16180
-15	5	21450
-20	-4	28680

Table 1. ECT Resistance Vs Temperature (from service manual)

Attempt to read codes only showed reader connection error. The code reader was not getting signal from PCM. It was clear that the power control module (PCM) was **NOT getting power (or gnd)** or had suddenly died completely.

1.) Clean Battery Terminal And Grounds

The battery terminal were cleaned first. They looked good from the outside, but showed significant corrosion BETWEEN the connectors.



Figure 3 Battery Cable Corrosion

The engine grounds were cleaned next. Figure 4. show ground to engine terminal which had to be replaced when it broke off.



Figure 4a. Auxiliary Ground To Engine



Figure 4b Cleaned And New Terminal

Rear engine passenger ground was cleaned next. The transmission check fill tube bracket is above it. Figure 5. shows this can be done without removing tube, but did require a “thin” open end wrench to fit between terminal and engine to keep from breaking ground ribbon off.



Figure 5a. Rear Engine Ground



Figure 5b BEFORE Tightening

Frame ground was cleaned next. Figure 6. shows top of frame with engine and fender ribbon grounds go. The rubber fender splash shield was taken off to get at and find ground.



Figure 5. Right Front Frame Ground

Result: all lights are working and the truck started right up! See as shown in figure 2b. Water In fuel was on but not on during 2nd key when photo was taken.

Cleaning and or Replacing Grounds fixed the problem! That really did it, but because I had changed the ignition switch first, the aftermarket security system needed to be reconnected OR removed.

-2.) Remove Security System (from previous owner aftermarket security system)

The security system, where keypad controlled a relay tied into main +12V (red) and ign (pnk) wire on the ignition switch, was cut out when the new ignition switch was installed. That left the ignition disabled due to break in both ignition feed wires (pink).

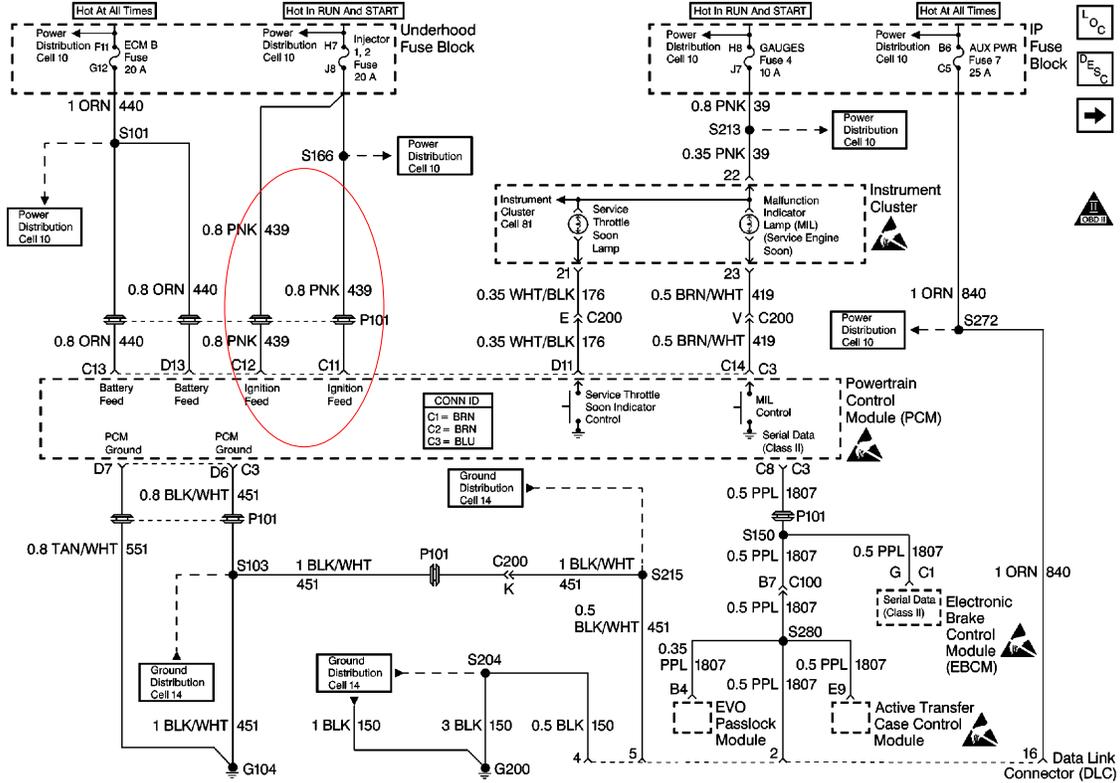


Figure 6. Ignition Schematic (Add Kill Switch Where Shown)

This was obvious once the glove compartment door was removed and PCM wires inspected. Connecting the two ignition feed wires (pink) restored the circuit completely removing ignition kill. You *could* reverse this to add a manual kill switch.



Figure 7a. Security Keypad



Figure 7b. Ignition Kill Removed
(C-clamp on button to keep light off)

BEFORE cleaning grounds I decided to change the ignition switch. At the time, I figured this *had to* be the problem. I found changing ignition switch easier than it was to find, clean, and repair all the grounds! But this didn't fix the problem (it actually caused another problem with security system). Switch cost \$120 and I like having a NEW one in there given the contact design and significance this switch plays in the whole circuit. I also knew that some day my 2 year old was going to push the right combination of buttons on the keypad to activate security, and I wasn't completely sure how to *enter* the code, which is written on visor.

-3.) Changing Ignition Starter Switch

Changing the Ignition switch (figure 8 and 9b) required the removal of the bottom steering wheel cover, as shown in Figure 9a.



Figure 8 New Ignition Starter Switch



Figure 9a Bottom Cover



Figure 9b Ignition Switch

Then removing the top cover required loosening of two external torx screws, a socket set I did not have. Improvising, Figure 10 shows how a 5/32" ¼ drive socket worked in place of the "right tool".



Figure 10a Torx Screw and 5/32" Socket



Figure 10b Removing Torx Screw

Removing the top cover required removal of key cylinder as shown in figure 10. This was strait forward, but you do have to know this -the key has to be turned to START before latch can be depressed. When released to RUN, the cylinder will "pop" out. This procedure is shown with cover removed for detail in Figure 11.



Figure 10a Allen Wrench Under Cover



Figure 10b Key Cylinder Popped Out

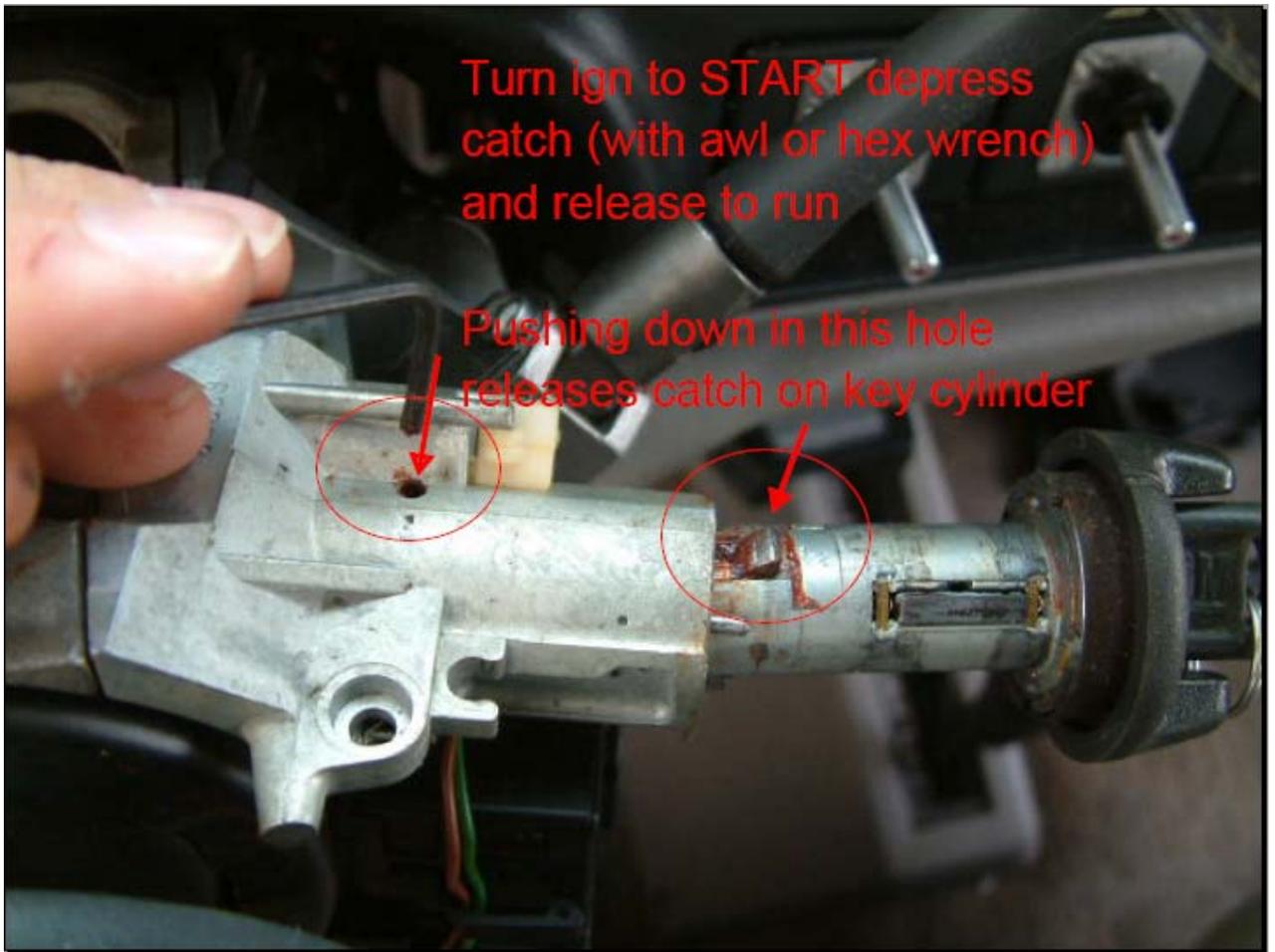


Figure 11. Key Cylinder Release (Shown With Top Cover Removed)

The top cover can now be taken off. The ignition switch is secured with even smaller torx screws. Again instead of getting the right tool I was able to use a #6 Hex head socket cap screw in a pair of vise grips. This setup is shown in figure 12.



Figure 12. #6 Socket Cap Head Screw In Vise Grips

A longer screw ~2" would have worked even better, to give more turning room as shown in Figure 13.

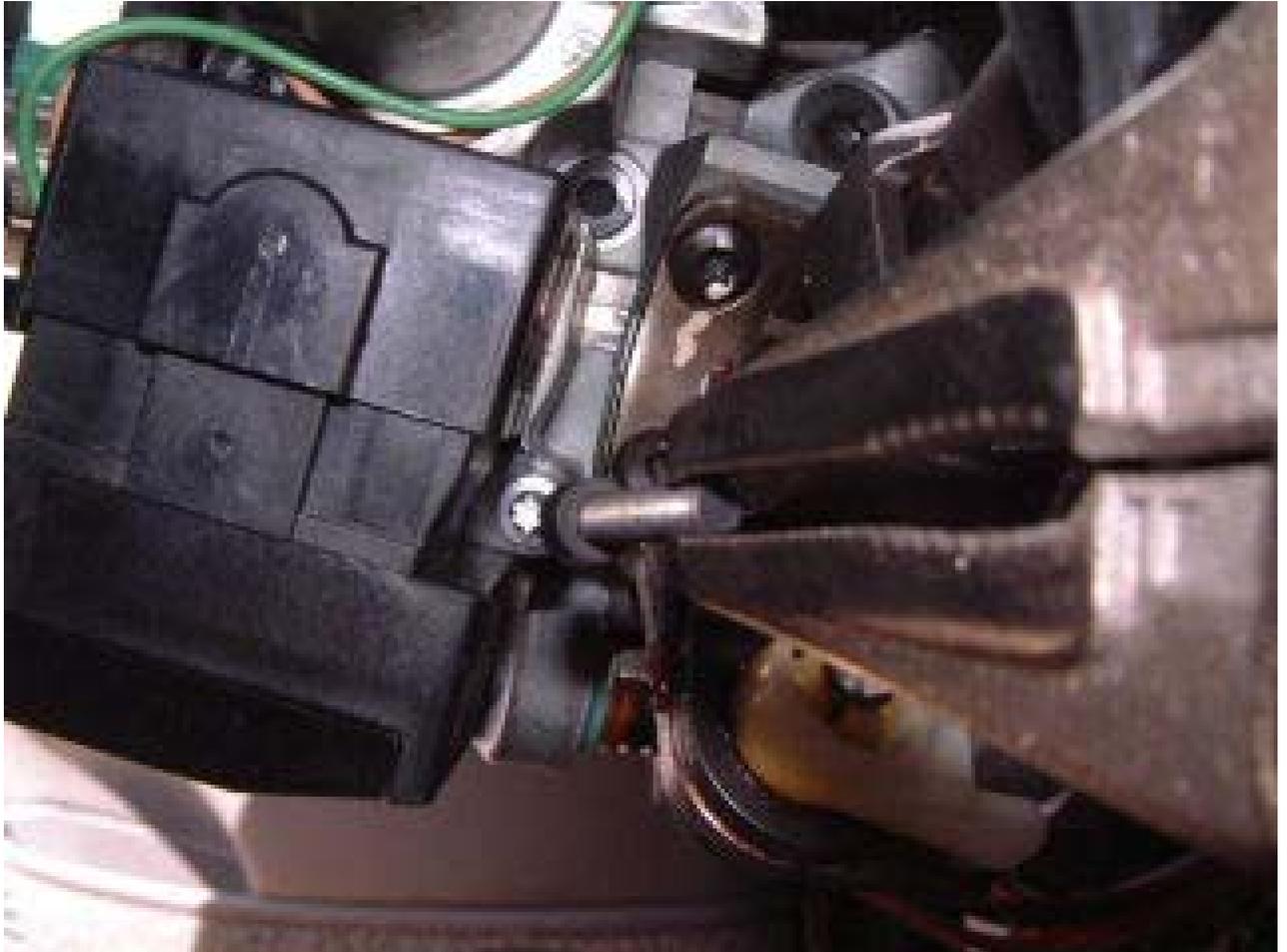


Figure 13. Ignition Switch Screw Removal

The harness connector screwed in and removing base made it easier. It seemed to require some care not to pull out the others connectors, but aside from that went right in. There was a small (2 wire) connector off main bundle, that I couldn't find. But by figured out it was just kind of glue up under steering column, so just pulling it got it down enough to use connector. Otherwise I was just going to cut and splice in the new one.

Many thanks to the Diesel Place's 6.5L moderators –**knkreb**, **-gmctd**, and **-Turbine Doc** and the advice from many others. Thank You!

-LCGarage