

Testing and Repairing OBD1 ECU Injector Drivers

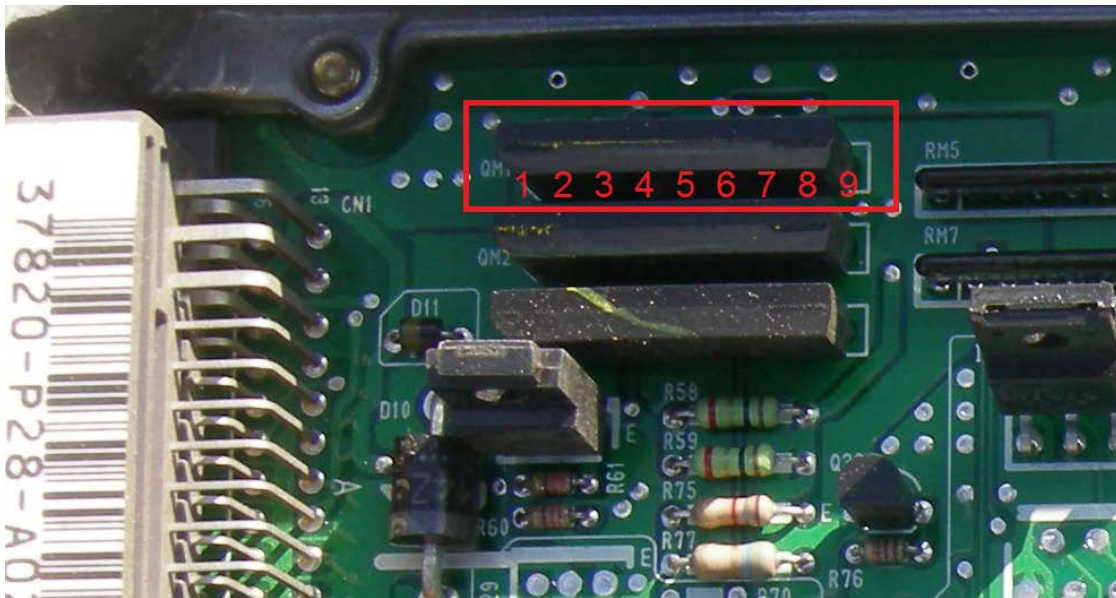
Tools:

Multimeter with ohms, diode continuity (voltage drop) and pF capacitance functions

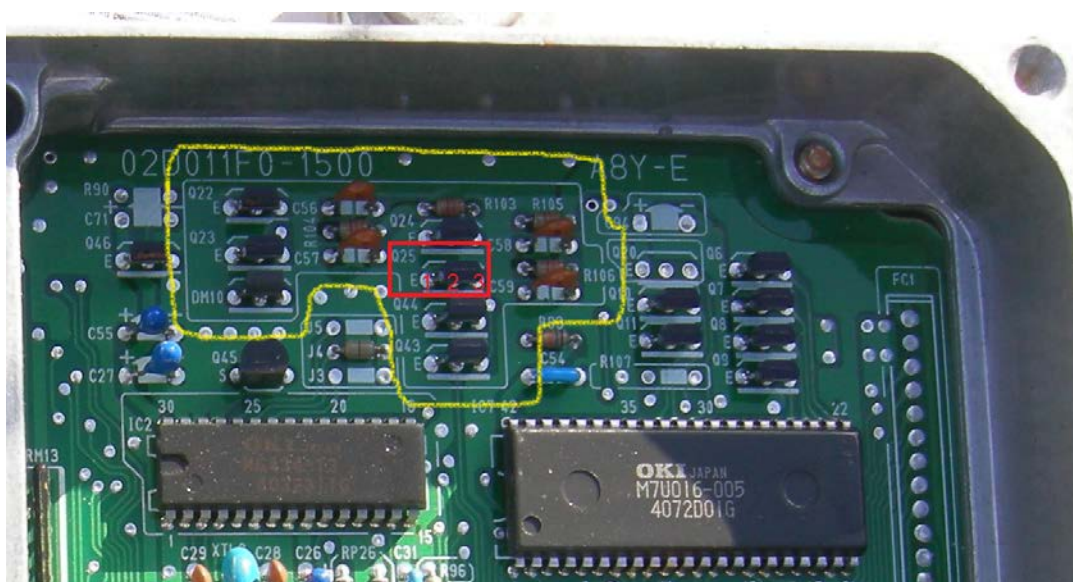
De-soldering station and soldering iron for repairs

Testing Procedure:

- Remove both covers of the ECU, and with the plugs facing left identify region QM1 near the top left, occupied by a 9-pin black case which contains single-gate enhancement N-channel MOSFET transistors. The pins are numbered from left to right, 1 through 9.



- Also identify the region near the top right containing Q25 and R106 (1980 and 11f0 boards), where the injector section is outlined. Transistors are numbered from left to right, 1 through 3:



- Smell the board: if it smells fishy, or like burned plastic, or if there are any signs of charring in the mentioned areas, this is a surefire sign of damage. Also check around soldering vias for whiteness or separation, in which case you may want to just start with a fresh ECU.

Test the first injector (A1) circuit:

- Set the multimeter mode to diode and check voltage drop between the following leg sequences at QM1. For example: -1 +3 means negative probe on leg 1 and positive on leg 3, which you can access from the bottom of the board. Press firmly to make a good connection.

-1 +2 = 0.39v -1 +3 = 0v -1 +4 = 0.39v -1 +7 = 0.58v -2 +4 = 0.21v -3 +2 = 0.39v
 -3 +4 = 0.39v -7 +9 = 0.21v -8 +7 = 0.39v -8 +9 = 0.39v

If results vary outside of 0.1 volt or show no connection then the driver should be replaced, however these are obsolete and have to be pulled another Honda ECU.

Test transistor Q25 in the same manner (1980 and 11f0 boards):

-1 +3 = x -2 +1 = 0.88v -3 +1 = 1.3v

- If these results are not found, replace the component. I believe the part number for these is DTC144WSATP, or the DTC144ES “might” work, but I’ve never tried it. Otherwise just pull them from another ECU.

Test the resistance in Ohms at position R106 (1980 and 11f0 boards):

- It should read no higher than 3.3k. You can also de-solder and test the C59 capacitor for 100pF. It’s not common that the damage extends beyond the transistors, so if you do find these are bad, buy a new ECU.
- Each injector has drivers divided between QM1 and QM2. It is likely if QM1 is bad, QM2 is bad also, which can be tested the same way. This particular test on QM2 controls injector 3.
- The same strategy applies to the outlined region at the top right; if one transistor is bad, they’re probably all bad. Injector 3 uses Q23, C57, and R104.
- This guide does not cover testing for RM5. Although it is part of the circuit, QM1 and QM2 will completely fry before this node is damaged.

Repair Procedure:

- Carefully de-solder all the pins – the board is old, and it's very easy to burn the pads and traces off. I suggest no more than 40 watts, 30 is more ideal. Some pins may not de-solder all the way, in which case you can fill them back up with new solder and try again. If they still don't come loose, carefully crush or cut up the driver case with a tool of your choice (I use dykes), heat each pin from the top side and pull them out individually.
- Clean the area, use a fine wire or fiberglass brush and alcohol-free brake cleaner. Check for breaks in traces or pads – if they are damaged, there are several options for repair or you can take it to a repair shop. Or just buy a new ECU. I always check continuity across each node just to be sure. Insert the new component in the same direction, and solder away.
- The same process applies for the standalone transistors, although it's easier to just clip the heads and pull each leg individually.

Verification Procedure:

- The best conventional method is to bridge the injector clip with a 12v-rated LED and observe. Either it works or it doesn't, otherwise repeat the testing procedure and check continuity.
- I prefer using an engine simulator at a low speed. If the funds are available, I would highly recommend this, as it may help you weed out other potentially hidden ECU problems as well.

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