Mobile diagnostics and repair
M.C Wiring And Controls
ENERGIZING YOUR RIDE, ONE CONNECTION AT A TIME.

PATH TO REPAIR REPORT
Vehicle: 2012 GMC Terrain
Concern: No-crank condition, fuel pump inoperative, multiple BCM-controlled functions not responding
Prepared by: MC Wiring & Controls – Diagnostic Division
Date: 12-20-25

1. CUSTOMER COMPLAINT

- Vehicle initially presented with **fuel pump inoperative**.
- During evaluation, vehicle developed a **no-crank condition**.
- Additional symptoms noted by cycling active tests on each module:
  - Remote start inoperative
  - License plate lamps inoperative
  - Liftgate inoperative
  - Fuel pump command fails during scan tool active test
  - Starter relay does not activate during key crank or active test

2. VERIFIED SYMPTOMS

MCWC verified the following:

Starting System

- Starter motor **does crank** when the starter relay contacts are manually closed.
- With key turned to START, all systems drop out as expected (RAP release), but **starter relay never receives a control signal**.
- Scan tool live data shows **"Starter Command = Active"**, but the relay never energizes.
- Scan tool active test for starter relay returns **"Malfunction."**

Fuel System

- Fuel pump does not prime.
- Scan tool command to activate fuel pump returns **"Failure."**

Body Electrical

- License plate lamps do not respond to BCM command.
- Backup lamps do not respond.
- Liftgate does not respond.
- Remote start does not initiate a crank event.

3. RETURNING TROUBLE CODES (AFTER FULL CLEAR)

ECM

- P0452 – Fuel Tank Pressure Sensor Circuit Low
- P0013 – Exhaust Cam Position Actuator Control Circuit

BCM

- B2550 – Backup Lamp Control Circuit
- B3810 – Headlamp Washer Relay Circuit

HVAC

- B0248 – Airflow Control 3 Circuit
- B3761 – Airflow Control 3 Feedback Circuit

Interpretation:

These codes represent **multiple unrelated BCM-controlled outputs failing simultaneously**, not individual component failures.

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4. ADDITIONAL INFO: INCORRECT GROUND STRAP INSTALLATION

During inspection, it was mentioned that a **ground strap had previously been attached to the starter's B+ terminal**.

Why this matters:

- The starter B+ post is a **direct battery positive feed**.
- Connecting a ground strap to this point creates a **dead short event**.
- This type of electrical surge can damage:
  - BCM output drivers
  - BCM ground reference circuits
  - Internal fuse block bus bars
  - Low-side transistor arrays
  - Any module sharing that ground path

Relevance to current symptoms:

This type of surge is fully consistent with the vehicle's present condition, where **BCM logic is intact but BCM output circuits are non-functional**.

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5. ROOT CAUSE ANALYSIS

Based on verified symptoms, scan tool behavior, wiring diagrams, BCM pinout logic, and the incorrect ground strap installation:

The failure lies within the Body Control Module (BCM) output stage or its power/ground supply path.

Key Findings

1. ECM is healthy and reporting correct crank request logic.
2. Ignition switch is functioning correctly.
3. Starter motor and high-current relay path are functional.
4. Multiple BCM-controlled outputs fail simultaneously:
   - Starter relay control
   - Fuel pump enable
   - License plate lamps
   - Liftgate
   - Remote start
5. BCM reports "command active" but **does not physically drive any outputs**.
6. Active tests for BCM outputs consistently fail.
7. Prior incorrect wiring (ground strap on starter B+) is consistent with BCM output driver damage.

Conclusion

The BCM is **not providing ground or power to its output circuits**, which is required to energize the starter relay, fuel pump module, and other body functions.
This can only be caused by:

A) BCM Power Feed Failure

- Internal failure of the X50A fuse block
- Weak/open BCM battery feed
- Weak/open BCM ignition feed

B) BCM Ground Failure

- Poor connection at G103 or G105
- High resistance ground path

C) Internal BCM Output Driver Failure (Most Likely)

- BCM logic functions normally
- BCM CAN communication intact
- BCM sees crank request
- BCM cannot energize ANY outputs
- Prior electrical surge event supports this conclusion

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6. REQUIRED NEXT STEPS (35-Minute Verification Plan)

To finalize the diagnosis and confirm the exact failure point, MCWC will perform:

1. BCM Ground Load Test

- Test BCM grounds at X3-A1 and X3-A2 using a headlight bulb
- Confirms whether BCM can sink current

2. BCM Battery Feed Load Test

- Test BCM battery feeds at X1-A1 and X1-A2
- Confirms fuse block integrity and feed strength

3. BCM Ignition Feed Load Test

- Test BCM ignition feeds at X2-C1 and X2-C3
- Confirms BCM is receiving proper IGN voltage

4. Starter Relay Control Verification

- Backprobe BCM X1-B7
- Confirm whether BCM attempts to ground the starter relay coil

5. Fuel Pump Enable Verification

- Backprobe BCM X2-C5
- Confirm whether BCM attempts to wake the fuel pump module

6. Secondary Output Verification

- Test any other BCM output (backup lamps, plate lamps, liftgate)

7. EXPECTED OUTCOME

Based on all evidence, including the incorrect ground strap installation:

Option 1 — BCM Internal Failure (Most Likely)

- BCM PCB inspection.
- BCM programming / setup
- Post-repair verification of all outputs

Option 2 — Fuse Block (X50A) Internal Failure

- Replace underhood fuse block
- Transfer fuses/relays
- Verify BCM feeds restored

Option 3 — Ground Repair

- Restore G103/G105
- Clean, tighten, load-test

8. RECOMMENDATION

MCWC recommends completing the BCM feed/ground verification tests to confirm whether the BCM or the fuse block is the failed component.

Once confirmed, MCWC will provide:

- Final repair estimate
- Parts availability
- Programming requirements
- Turnaround time

