



Batch or Sequential Fire

Determining whether your 4-cylinder car is equipped with Batch-Fire or Sequential fuel injection.

The PowerCard is available for both sequential and batch-fired fuel injection systems. They are not interchangeable, therefore you must know which system you have before ordering a PowerCard. Batch-fire PowerCard part numbers are 982-000 (blue) and 982-001 (red), Sequential are 982-002 (blue) and 982-003 (red).

Please note: The PowerCard is a fuel-adder only and does not take away fuel. In addition, it can only add fuel up to the maximum flow rate for the injectors that it is connected to.

Brief definitions:

Batch-fire: Injectors are wired together in pairs ("batches") and triggered in pairs (i.e. Cylinders 1&4 together and Cylinders 2&3 together).

Sequential: Each injector is wired independently with a unique ground, and triggered independently.

Fuel Injectors: Supplied a constant ~12V+ when ignition is ON and triggered via grounding.

If you are unsure about your fuel injection system's arrangement and your manual does not tell you, please follow these steps to determine if your vehicle has batch-fire or sequential fuel injection.

Inspection: Examine the engine wiring harness at the injectors. All of the injectors will share a common supply of 12V+ power, however, the ground wires will be separate. On a 2-group batch-fire car, there will be two ground wires which will connect to two injectors each (i.e. Cylinders 1&4 and Cylinders 2&3). On a sequential-fire car, each injector will have its own, separate, ground wire.

If you cannot tell which system you are running by *Inspection*, you will need to test the circuitry with a multimeter or test light.

a. Find ground by using voltage. The way to discern ground is to find the 12V+ lead, then you know the other is in fact ground. To find 12V+, first remove the four injector connectors from the fuel injectors. Turn the ignition to ON position. Ground one of the multimeter or test light leads to the chassis, then sample each of the injector wires to check for 12V+ power. You now know which lead is GROUND, so make a note of the wire colors (i.e. yellow with black stripe) for the GROUND wire lead at each of the four injector connectors. Now, turn the ignition back to OFF.

Now that you have found ground, you may be able to discern if you have batch-fire or sequential fuel injection by inspection. Check the wire color at each injector connector. On a batch-fire system, each pair of cylinders making up a "batch" will share the same color ground lead wire going to the ECU, whereas sequential systems use unique ground wires. If you cannot determine via inspection, you will need to use a multimeter.

b. Determine by continuity. With the ignition OFF, use a Multimeter to check for continuity between the GROUNDS of the injectors (try Cylinders 1&4 or 2&3 first). If you find that the cylinders are grouped into pairs (with each pair sharing a common injector ground), then you will need to use the Batch-Fire PowerCard. If each injector has a unique ground,

use the Sequential-Fire PowerCard. If you find that all injectors share a common ground, then neither the Batch-Fire nor the Sequential versions of the PowerCard will work properly for you.