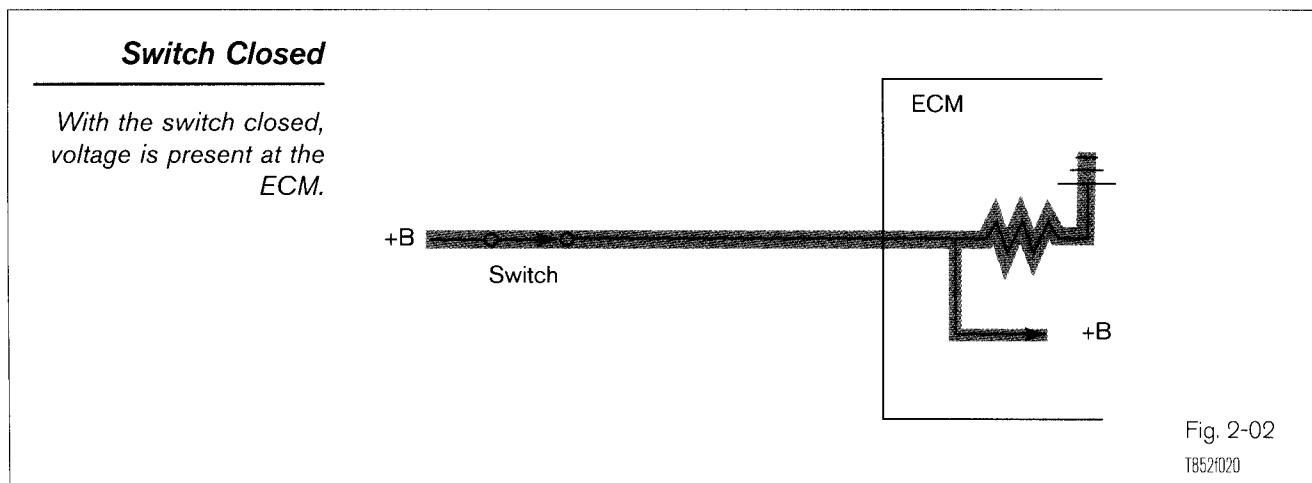
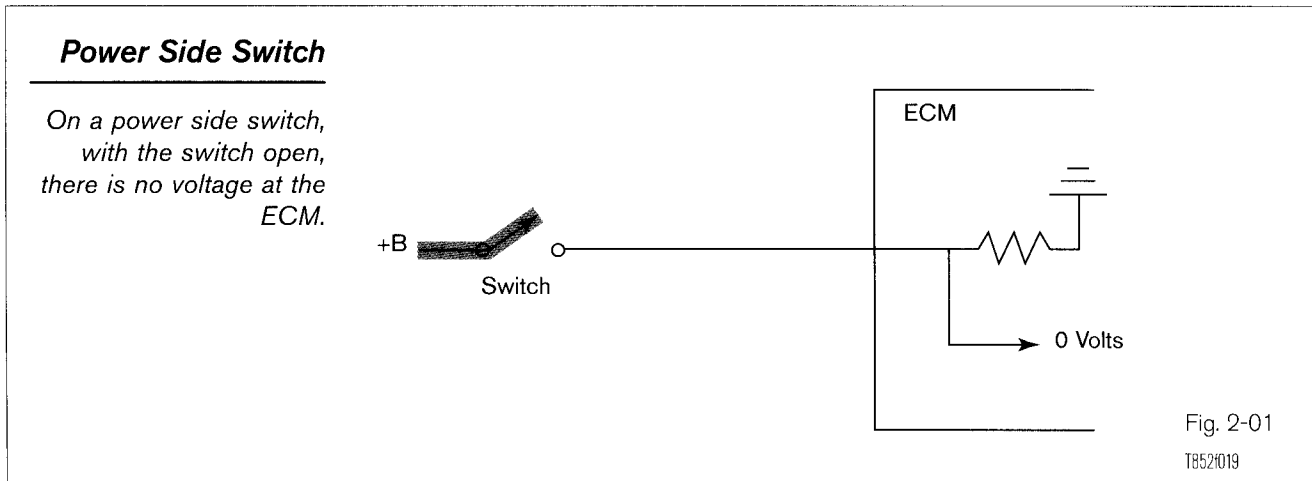


Position/Mode Sensors and Switches

For many components, it is important that the ECM know the position and/or mode of the component. A switch is used as a sensor to indicate a position or mode. The switch may be on the supply side or the ground side of a circuit.



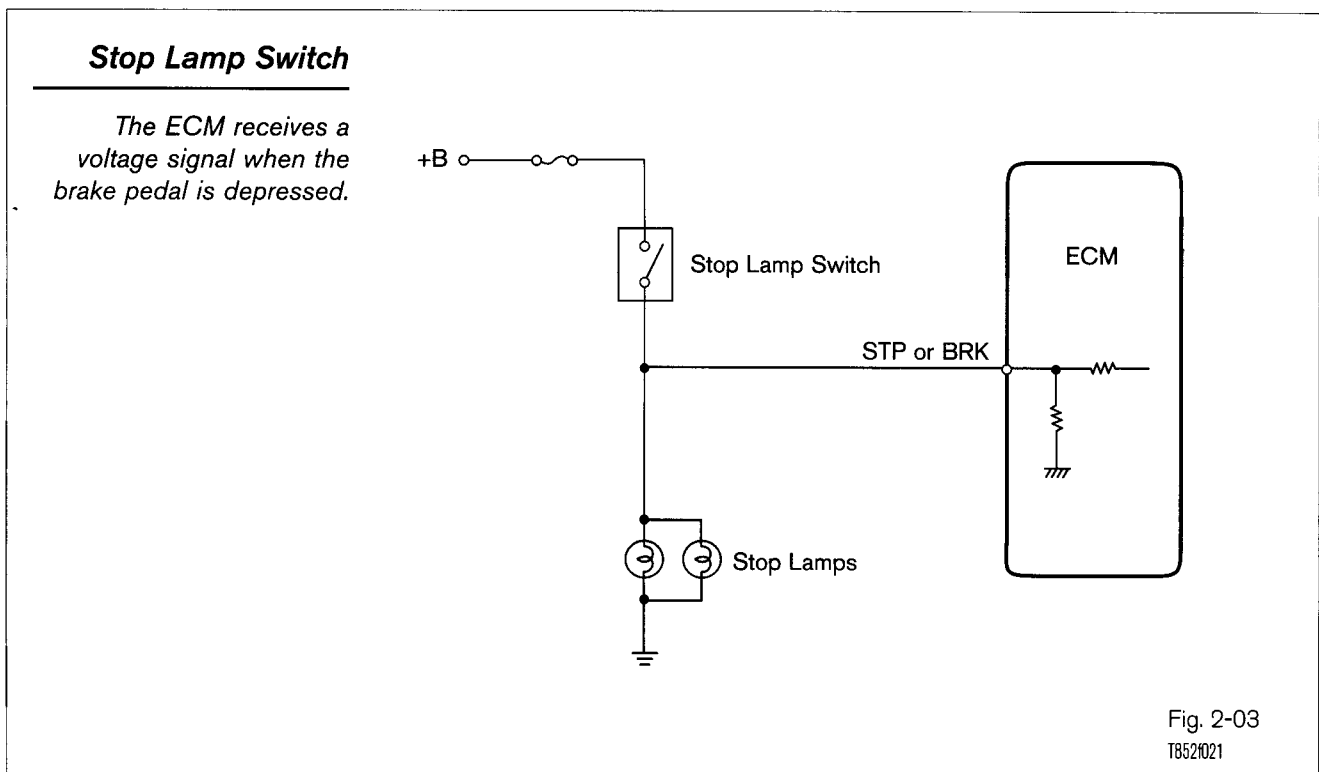
Power Side Switch Circuit

A power side switch is a switch located between the power supply and load. Sometimes the power side switch is called hot side switch because it is located on the hot side, that is, before the load, in a circuit. The Stop Lamp switch is a good example. When the brake pedal is depressed, the Stop Lamp switch closes sending battery voltage to the ECM. This signals the ECM that the vehicle is braking.

MODE SENSORS AND SWITCHES

The following switches act as switches for the ECM. Usually, they are supply side switches. Note in the figure(s) their location between the battery and ECM. Many switches that commonly use battery voltage as the source are:

- Ignition Switch.
- Park/Neutral Switch.
- Transfer Low Position Detection Switch.
- Transfer Neutral Position Detection Switch.
- Transfer 4V;D Detection Switch.



DVOM

A DVOM will measure 0 volts with the switch open.

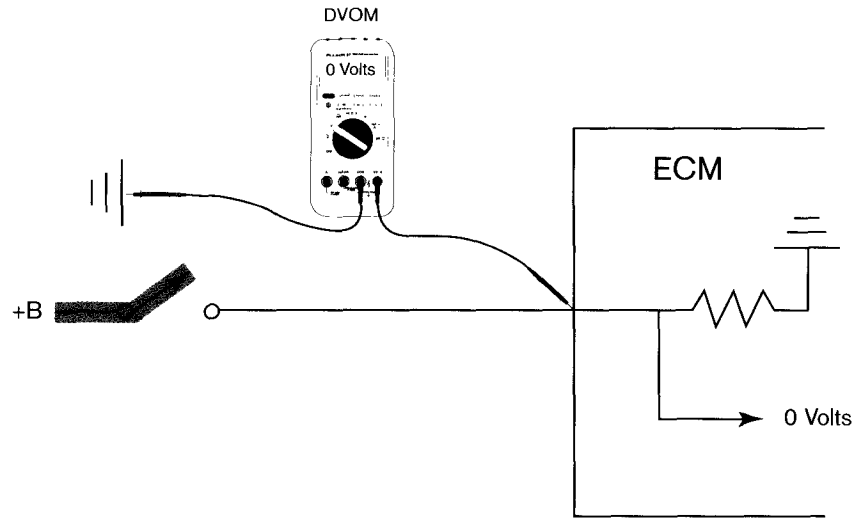


Fig. 2-04
T8521022

DVOM

Here the DVOM reads supply voltage when the switch closes. This indicates to the ECM a change has taken place. Using the DVOM confirms the circuit and switch are good.

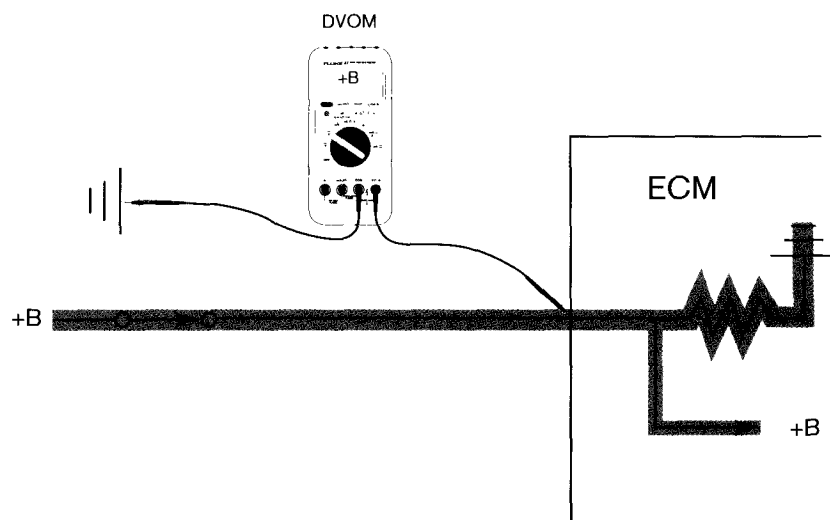
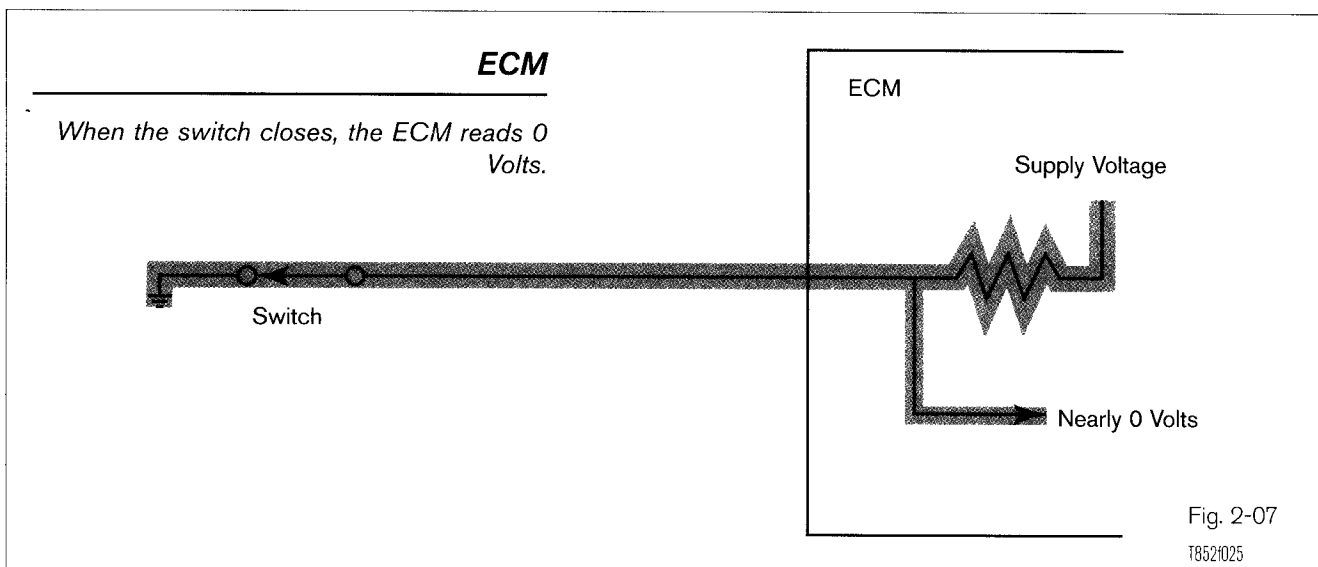
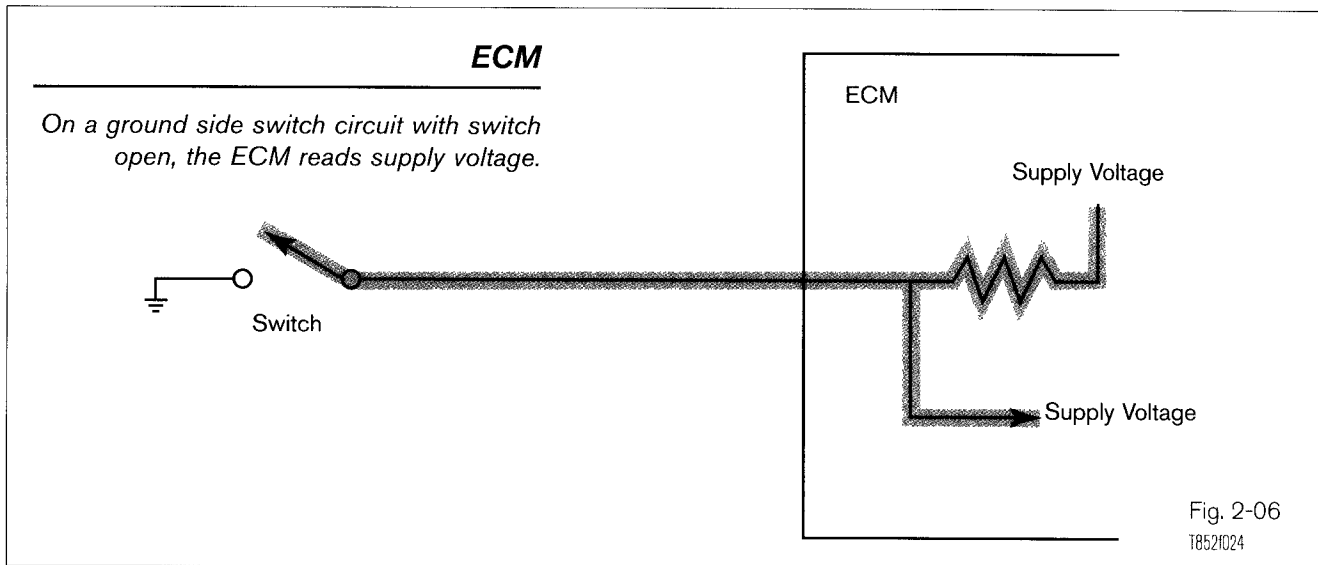


Fig. 2-05
T8521023



Ground Side Switch Circuit

A ground side switch is located between the load and ground in a circuit. Inside the ECM there is resistor (load) connected in series to the switch. The ECM measures the available voltage between the resistor and switch. When the switch is open, the ECM reads supply voltage. When the switch is closed, voltage is nearly zero.

The following switches are typically found on the ground side of the circuit:

- TPS Idle Contact (IDL signal) The TPS Idle Contact Switch uses a 12 volt reference voltage from the ECM.
- Power Steering Pressure Switch.
- Overdrive Switch.

DVOM

A DVOM will measure supply voltage when the switch is open.

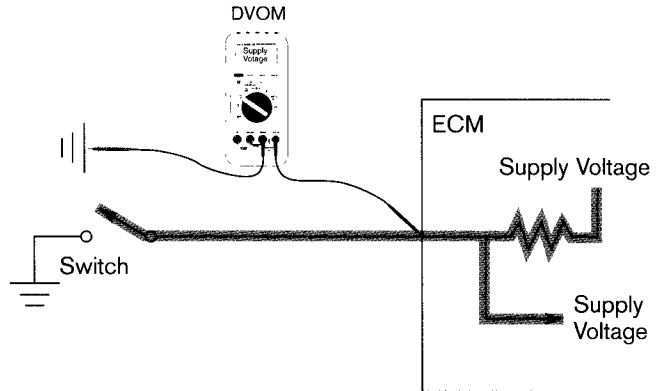


Fig. 2-08

T8521026

DVOM

When the switch closes, the DVOM measures nearly 0 Volts. Using the DVOM confirms the circuit is good.

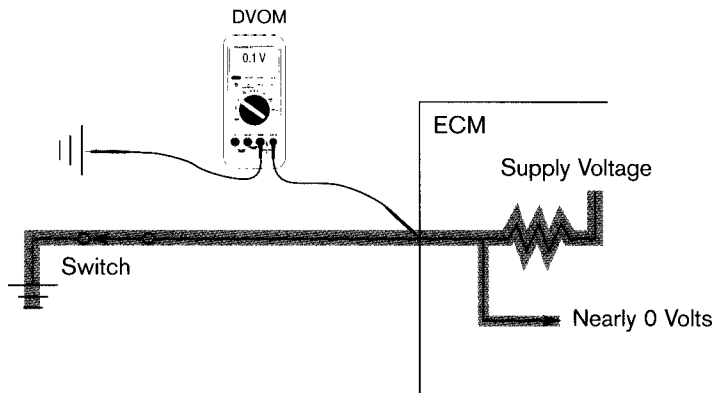


Fig. 2-09

T8521027

STA Mode

When the ignition switch is turned to the Start position, battery voltage is applied to the STA terminal. This drawing is a general representation, there are many variations.

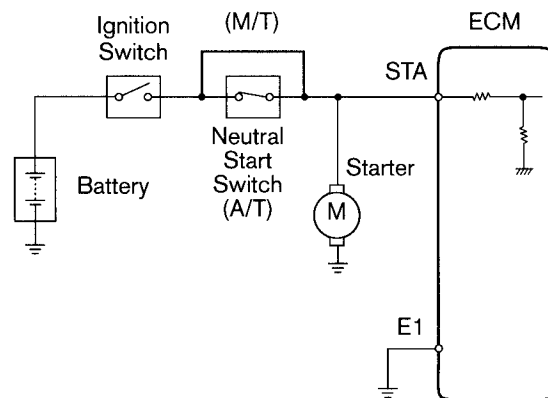


Fig. 2-10

T8521028

Electrical Load Signal

The ELS circuit signals the ECM when a significant electrical load has been placed on the charging system, such as when the defogger or tail lamp circuit is on.

The ELS signal will be low when both circuits are off. If either circuit or both circuits are on, the ELS signal goes to battery voltage. The diodes are used to isolate the circuit.

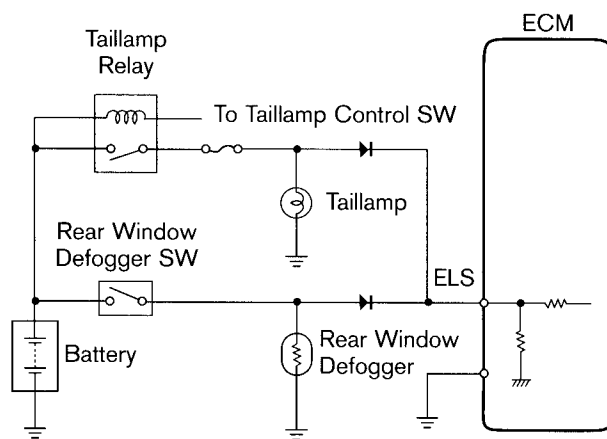


Fig. 2-11

T8524029

A/C Signal

The A/C signal is used by the ECM to stabilize the idle speed, modify the ignition timing, and modify deceleration fuel cut parameters when the compressor is running. In the event the signal malfunctions, idle quality may suffer and driveability during deceleration could be affected.

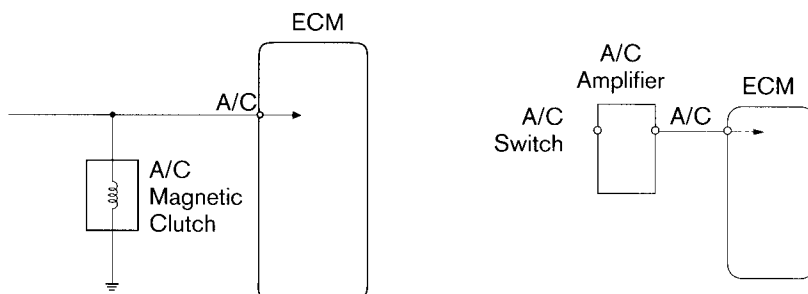


Fig. 2-12

T8524030/T8524031

Overdrive Circuit

The O/D circuit is a ground side switched circuit. When the switch is turned on, overdrive is cancelled and the light illuminates.

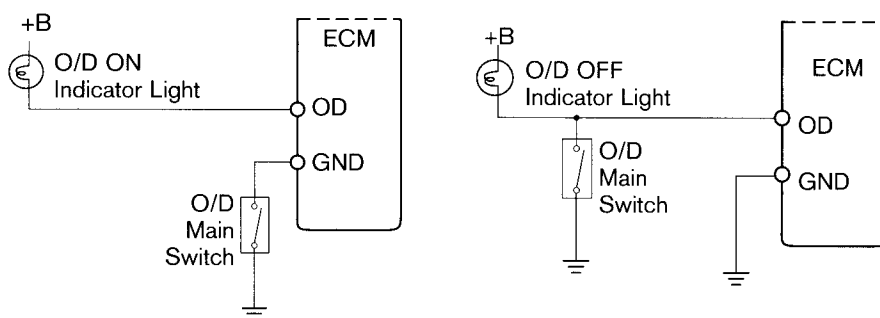


Fig. 2-13

T8524032/T8524034