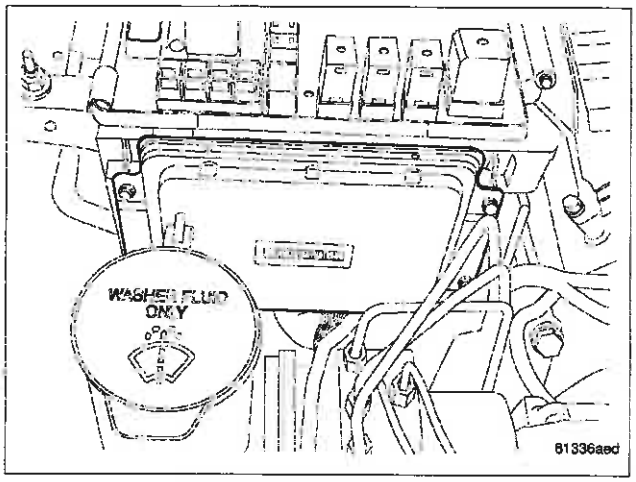
MODULE-FRONT CONTROL

DESCRIPTION

The Front Control Module (FCM) is a micro controller based module located in the right front corner of the engine compartment. The front control module mates to the power distribution center to form the Integrated Power Module (IPM). The IPM connects directly to the battery and provides the primary means of circuit protection and power distribution for all vehicle electrical systems. The FCM controls power to some of these vehicle systems electrical and electromechanical loads based on inputs received from hard wired switch inputs and data received on the CAN bus circuit.



OPERATION

As messages are sent over the CAN bus circuit, the Front Control Module (FCM) reads these messages and controls power to some of the vehicles electrical systems by completing the circuit to ground (low side driver) or completing the circuit to 12 volt power (high side driver). The following functions are controlled by the FCM:

- Air conditioning condenser cooling fan
- Daytime running lamps - if equipped
- Fog Lamps
- Front and rear hazard warning lamps
- Front turn signals
- Headlamps
- Horn
- Radiator fans
- Rear window defroster power and timing
- Stop, turn signal and tail lamps
- Windshield and liftgate wiper and washer systems

The FCM provides the following features for the above function:

- Acts as a link between the CAN bus network for critical powertrain, anti-lock brake systems, electronic stability program systems and the network for body and interior modules.
- Controls the wipers based on messages on the CAN B bus from the rain sensor module (if equipped).
- Controls the adjustable pedal motor on non-memory equipped vehicles.
- Controls back-up lamps.
- Flashes lamps in response to turn signal, Remote Keyless Entry (RKE) and Vehicle Theft Security System (VTSS) inputs.
- Illuminated approach feature that turns the headlamps on when the vehicle is unlocked with the Remote Keyless Entry (RKE) transmitter.
- Minimizes voltage variations to the headlamps to extend bulb life and to equalize the light output from the lamps, which might otherwise differ due to variations in wiring resistance.
- Monitors battery voltage and turns off non-essential functions such as the fog lamps, rear window defogger, and heated seats if necessary to conserve battery power.
- Operates the high-beam headlamps at reduced intensity by pulse-width modulation of the power supply to provide the daytime running lamps.

- Protects the battery from discharge if the headlamps are left on, by automatically turning them off after eight minutes.
- Provides ambient temperature sensor information.
- Provides A/C pressure transducer information.
- Provides brake fluid level information.
- Provides washer fluid level information.
- Provides the variable delay intermittent windshield and liftgate wiper time delay features, and the vehicle speed sensitive windshield wiper delay variation.
- Sounds the horn in response to RKE and VTSS inputs.
- Turns off the horn in the event of excessively long operation that could otherwise damage the horn.
- Turns off the windshield washer motor after 10 seconds of continuous operation to protect the motor.
- Controls headlamp washers (if equipped).
- Provides wheel speed information on non-ABS equipped vehicles.
- Stores vehicle configuration data.

DIAGNOSIS AND TESTING

BODY VERIFICATION TEST – VER 1

Diagnostic Test

1. Perform Body Verification Test

1. Disconnect all jumper wires and reconnect all previously disconnected components and connectors.
2. Ensure that all accessories are turned off.
3. Ensure that the battery is fully charged. If the battery was disconnected for any reason, refer to (Refer to 8 - ELECTRICAL/BATTERY SYSTEM - STANDARD PROCEDURE) for accessory calibration procedures.
4. If the FCM has been replaced, the Pinion Fact MUST be programmed into the FCM. Refer to the scan tool for program procedure.
5. Turn the ignition on.
6. With the scan tool, record and erase DTCs from all modules.
7. Perform this step only if diagnosing faults related to the HVAC system.
   - The Manual Temperature Control (MTC) is not on the Bus and not addressable with a scan tool. Perform the following to clear DTCs from the MTC: 1. Turn the blower control on. 2. Press the A/C mode switch down, turn the blower control to off, wait three seconds and then release the A/C mode switch. 3. When the A/C status indicator begins flashing DTCs, press the A/C mode switch down for three seconds and then release the switch.
   - For vehicles equipped with Automatic Temperature Control (ATC), if repairs were made to any of the HVAC doors, linkage, door actuators, or door actuator circuits, run the actuator calibration function by selecting the following from the scan tool menu: select HVAC, More Options, System Tests, Actuator Calibration Test, and Start. Follow the directions displayed by the scan tool. Allow the test to run to completion before proceeding.
   - For vehicles equipped with MTC, if repairs were made to any of the HVAC doors, linkage, door actuators, or door actuator circuits, run the actuator calibration function by performing the following: 1. Turn the ignition on. 2. Turn the blower control to off. 3. Press the EBL mode switch down for five seconds and then release it. Wait approximately 90 seconds for the calibration process to run to completion before proceeding.
8. Turn the ignition off, wait 10 seconds, and then turn the ignition on.
9. Operate all functions of the system that caused the original concern.
10. With the scan tool, select ECU View and check for DTCs in the modules.
11. Perform this step only if diagnosing faults related to the MTC HVAC system.

Note: The A/C status indicator displays active DTCs when the EBL status indictor is not illuminated and stored DTCs when the EBL status indicator is illuminated.

- Perform the following to read DTCs from the MTC: 1. Turn the blower control on. 2. Press the A/C mode switch down, turn the blower control to off, wait three seconds and then release the A/C mode switch. 3. Read the DTCs from the flashing A/C status indicator.

Are DTCs present in any of the modules or is the original condition still present?

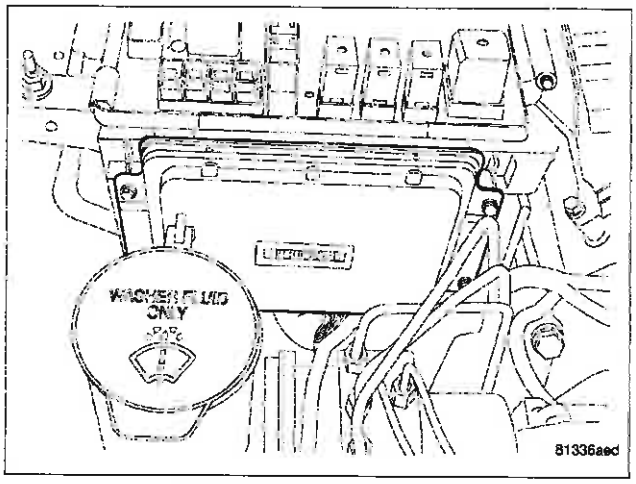
Yes >> The repair is not complete. Refer to the related category for the DTC or symptom that is still present.

No >> The repair is complete.

REMOVAL

Note: A battery reconnect procedure must be performed anytime the battery has been disconnected. (Refer to 8 - ELECTRICAL/BATTERY SYSTEM - STANDARD PROCEDURE).

1. Disconnect and isolate the battery negative cable.
2. Remove mounting fasteners.
3. Disconnect electrical connectors and remove Front Control Module (FCM).



INSTALLATION

Note: A battery reconnect procedure must be performed anytime the battery has been disconnected. (Refer to 8 - ELECTRICAL/BATTERY SYSTEM - STANDARD PROCEDURE).

1. Position Front Control Module (FCM) and connect electrical connectors.
2. Install and tighten mounting fasteners.
3. Connect battery negative cable.