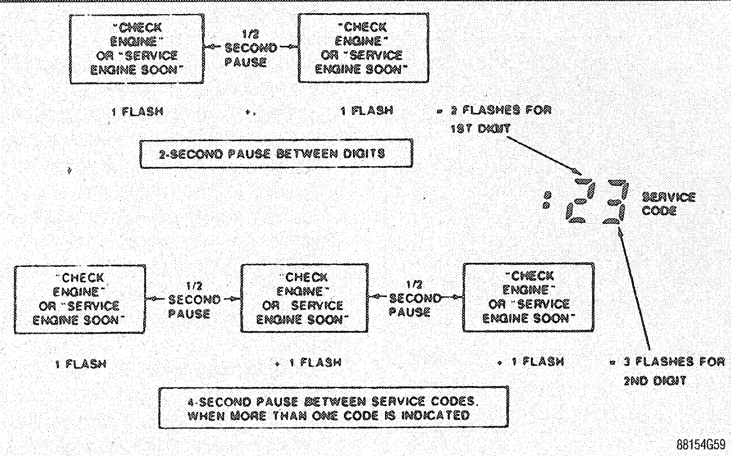

Fig. 81 Code display pattern using the dashboard warning lamp

Other Test Modes

CONTINUOUS MONITOR OR WIGGLE TEST

Once entered, this mode allows the operator to attempt to recreate intermittent faults by wiggling or tapping components, wiring or connectors. The test may be performed during either KOEO or KOER procedures. The test requires the use of either an analog voltmeter or a hand-held scan tool.

To enter the continuous monitor mode during KOEO testing, turn the ignition switch **ON** . Activate the test, wait 10 seconds, then deactivate, and reactivate the test; the system will enter the continuous monitor mode. Tap, move, or wiggle the harness, component or connector suspected of causing the problem; if a fault is detected, the code will store in the memory. When the fault occurs, the dash-warning lamp will illuminate, the STAR tester will light a red indicator (and possibly beep) and the analog meter needle will sweep once.

To enter this mode in the KOER test:

1. Start the engine and run it at 2000 rpm for two minutes. This action warms up the oxygen sensor.
2. Turn the ignition switch **OFF** for 10 seconds.
3. Start the engine.
4. Activate the test, wait 10 seconds, then deactivate, and reactivate the test; the system will enter the continuous monitor mode.
5. Tap, move, or wiggle the harness, component or connector suspected of causing the problem; if a fault is detected, the code will store in the memory.
6. When the fault occurs, the dash-warning lamp will illuminate, the STAR tester will light a red indicator (and possibly beep) and the analog meter needle will sweep once.

OUTPUT STATE CHECK

This testing mode allows the operator to energize and de-energize most of the outputs controlled by the EEC-IV system. Many of the outputs may be checked at the component by listening for a click or feeling the item move or engage by a hand placed on the case. To enter this check:

1. Enter the KOEO test mode.
2. When all codes have been transmitted, depress the accelerator all the way to the floor and release it.
3. The output actuators are now all ON. Depressing the throttle pedal to the floor again switches the all the actuator outputs OFF.
4. This test may be performed as often as necessary, switching between ON and OFF by depressing the throttle.
5. Exit the test by turning the ignition switch **OFF** , detaching the jumper at the diagnostic connector or releasing the test button on the scan tool.

Clearing Codes

CONTINUOUS MEMORY CODES

These codes are retained in memory for 40 warm-up cycles. To clear the codes for purposes of testing or confirming repair, perform the code reading procedure. When the fault codes begin to be displayed, de-activate the test either by disconnecting the jumper wire (if using a meter, MIL or message center) or by releasing the test button on the hand scanner. Stopping the test during code transmission will erase the Continuous Memory. Do not disconnect the negative battery cable to clear these codes; the Keep Alive memory will be cleared and a new code, 19, will be stored for loss of PCM power.

KEEP ALIVE MEMORY

The Keep Alive Memory (KAM) contains the adaptive factors used by the processor to compensate for component tolerances and wear. It should not be routinely cleared during diagnosis. If an emission related part is replaced during repair, the KAM must be cleared. Failure to clear the KAM may cause severe driveability problems since the correction factor for the old component will be applied to the new component.

To clear the Keep Alive Memory, disconnect the negative battery cable for at least 5 minutes. After the memory is cleared and the battery reconnected, the vehicle must be driven at least 10 miles (16 km) so that the processor may relearn the needed correction factors. The distance to be driven depends on the engine and vehicle, but all drives should include steady-throttle cruise on open roads. Certain driveability problems may be noted during the drive because the adaptive factors are not yet functioning.

TROUBLE CODES —EEC-V SYSTEM (OBD-II)

General Information

The Powertrain Control Module (PCM) is given responsibility for the operation of the emission control devices, cooling fans, ignition and advance and in some cases, automatic transmission functions. Because the EEC-V oversees both the ignition timing and the fuel injection operation, a precise air/fuel ratio will be maintained under all operating conditions. The PCM is a microprocessor or small computer that receives electrical inputs from several sensors, switches, and relays on and around the engine.

Based on combinations of these inputs, the PCM controls various output devices concerned with engine operation and emissions. The control module relies on the signals to form a correct picture of current vehicle operation. If any of the input signals is incorrect, the PCM reacts to whatever picture is painted for it. For example, if the coolant temperature sensor is inaccurate and reads too low, the PCM may see a picture of the engine never warming up. Consequently, the engine settings will be maintained as if the engine were cold. Because so many inputs can affect one output, correct diagnostic procedures are essential on these systems.

One part of the PCM is devoted to monitoring both input and output functions within the system. This ability forms the core of the self-diagnostic system. If a problem is detected within a circuit, the control module will recognize the fault, assign it an Diagnostic Trouble Code (DTC), and store the code in memory. The stored code(s) may be retrieved during diagnosis.

While the EEC-V system is capable of recognizing many internal faults, certain faults will not be recognized. Because the control module sees only electrical signals, it cannot sense or react to mechanical or vacuum faults affecting engine operation. Some of these faults may affect another component which will set a code. For example, the PCM monitors the output signal to the fuel injectors, but cannot detect a partially clogged injector. As long as the output driver responds correctly, the computer will read the system as functioning correctly. However, the improper flow of fuel may result in a lean mixture. This would, in turn, be detected by the oxygen sensor and noticed as a constantly lean signal by the PCM. Once the signal falls outside the pre-programmed limits, the control module would notice the fault and set an trouble code.

Additionally, the EEC-V system employs adaptive fuel logic. This process is used to compensate for normal wear and variability within the fuel system. Once the engine enters steady-state operation, the control module watches the oxygen sensor signal for a bias or tendency to run slightly rich or lean. If such a bias is detected, the adaptive logic corrects