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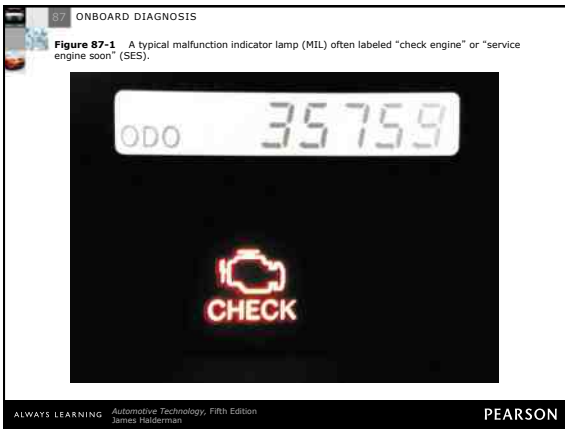
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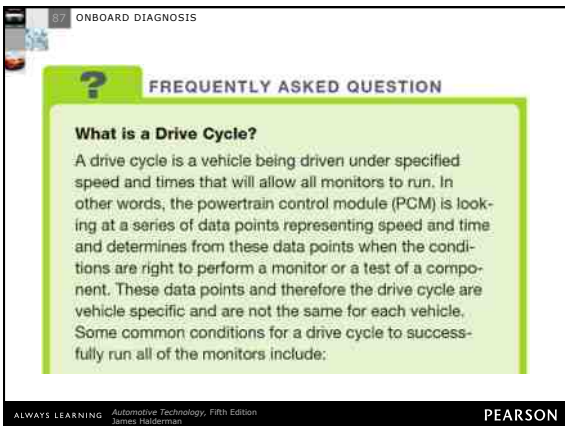
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87 ONBOARD DIAGNOSIS

1. Cold start with intake air temperature (IAT) and engine coolant temperature (ECT) close to each other indicating that the engine has cooled to the temperature of the surrounding air temperature.
2. Fuel level within a certain range usually between 15% and 85%.
3. Vehicle speed within a certain speed range for a certain amount of time usually 4 to 12 minutes.
4. Stop and idle for a certain time.

Each monitor requires its own set of parameters needed to run the test and sometimes these conditions cannot be met. For example, some evaporative emissions control (EVAP) systems require a temperature that may not be possible in winter months in a cold climatic area.

A typical universal drive cycle that works for many vehicles includes the following steps.

MIL must be off.  
 No DTCs present.  
 Fuel fill between 15% and 85%.  
 Cold start—Preferred = 8-hour soak at 66°F to 86°F.  
 Alternative = ECT below 86°F.

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87 ONBOARD DIAGNOSIS

- STEP 1** With the ignition off, connect scan tool.
- STEP 2** Start engine and drive between 20 and 30 mph for 22 minutes, allowing speed to vary.
- STEP 3** Stop and idle for 40 seconds, gradually accelerate to 55 mph.
- STEP 4** Maintain 55 mph for 4 minutes using a steady throttle input.
- STEP 5** Stop and idle for 30 seconds, then accelerate to 30 mph.
- STEP 6** Maintain 30 mph for 12 minutes.
- STEP 7** Repeat steps 4 and 5 four times.

Using scan tool, check readiness. Always check service information for the exact drive cycle conditions for the vehicle being serviced for best results.

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87 ONBOARD DIAGNOSIS

**Figure 87-2** OBD-II DTC identification format.

**EXAMPLE: P0302 = CYLINDER #2 MISFIRE DETECTED**

**B - BODY**  
**C - CHASSIS**  
**P - POWERTRAIN**  
**U - NETWORK**

**0 - GENERIC (SAE)**  
**1 - MANUFACTURER SPECIFIC**

**SPECIFIC FAULT DESIGNATION**

**SPECIFIC VEHICLE SYSTEM**

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87 ONBOARD DIAGNOSIS

**?** FREQUENTLY ASKED QUESTION

**What Are Pending Codes?**

Pending codes are set when operating conditions are met and the component or circuit is not within the normal range, yet the conditions have not yet been met to set a DTC. For example, a sensor may require two consecutive faults before a DTC is set. If a scan tool displays a pending code or a failure, a driveability concern could also be present. The pending code can help the technician to determine the root cause before the customer complains of a check engine light indication.

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87 ONBOARD DIAGNOSIS

**CHART 87-1** PCM Determination of Faults Chart

DIAGNOSTIC NAME	DIAGNOSTIC TYPE (HOW OFTEN IT COMPLETES)	NUMBER OF FAULTS OR SEVERAL TRIPS TO SET A PENDING DTC	NUMBER OF SEPARATE CONSECUTIVE TRIPS TO LIGHT MIL, STORE A DTC	NUMBER OF TRIPS WITH NO FAULTS TO ERASE A MALFUNCTIONING DTC	NUMBER OF TRIPS WITH NO FAULTS TO TURN THE MIL OFF	NUMBER OF STARTS UP CYCLES TO ERASE DTC AFTER MIL IS TURNED OFF
ECM	Continuous (when no conditions allow it)	1	2	1-5-trip	3-trips	40
Catalyst	Once per drive cycle	1	1	1	3-400 drive cycle	40
Misfire Type A	Continuous	1	1	1	3-drive conditions	40
Misfire Type B	Continuous	1	2	1	3-drive conditions	40
Fuel System	Continuous	1	2	1	3-drive conditions	40
Oxygen Sensor	Once per trip	1	2	1-5-trip	3-trips	40
EGP	Once per trip	1	2	1-5-trip	3-trips	40
EVAP	Once per trip	1	1	1-5-trip	3-trips	40
ABS	Once per trip	1	2	1-5-trip	3-trips	40

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87 ONBOARD DIAGNOSIS

**?** FREQUENTLY ASKED QUESTION

**How Can You Tell Generic from Factory?**

When using a scan tool on an OBD-II-equipped vehicle, if the display asks for make, model, and year, then the factory or enhanced part of the PCM is being accessed. If the generic or global part of the PCM is being scanned, then there is no need to know the vehicle identification details.

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