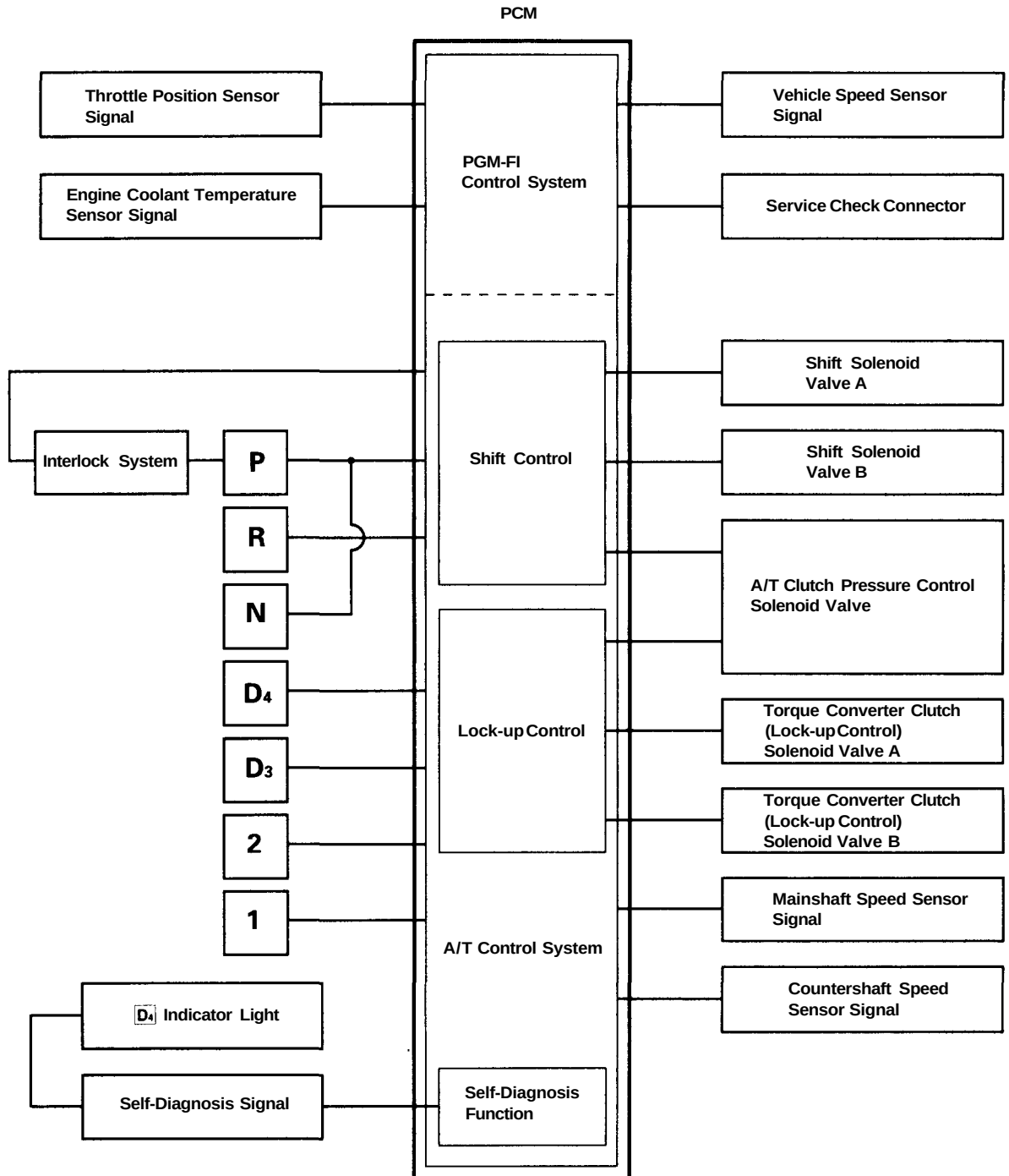




Electronic Control System

The electronic control system consists of a Powertrain Control Module (PCM), sensors, a A/T clutch pressure control solenoid and four solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, under the front lower panel on the passenger's side.



(cont'd)

Description

Electronic Control System(cont'd)

Shift Control

The PCM instantly determines which gear should be selected by various signals sent from sensors, and it actuates the shift solenoid valves A and B to control shifting. Also, a Grade Logic Control System controls shifting in **D₄** position while the vehicle is ascending or descending a slope, or reducing speed.

Shift solenoid valve		A	B
Position (gear)			
D₃ , D₄	(1st)	OFF	ON
	(2nd)	ON	ON
	(3rd)	ON	OFF
D₄	(4th)	OFF	OFF
2	(2nd)	ON	ON
1	(1st)	OFF	ON
R *	(Reverse)	ON	OFF

*: See page 14-36 for reverse inhibitor control description.

Lock-up Control

From sensor input signals, the PCM determines whether to turn the lock-up ON or OFF and activates torque converter clutch (lock-up control) solenoid valve A and/or B accordingly. The combination of driving signals to torque converter clutch (lock-up control) solenoid valves A and B is shown in the table below.

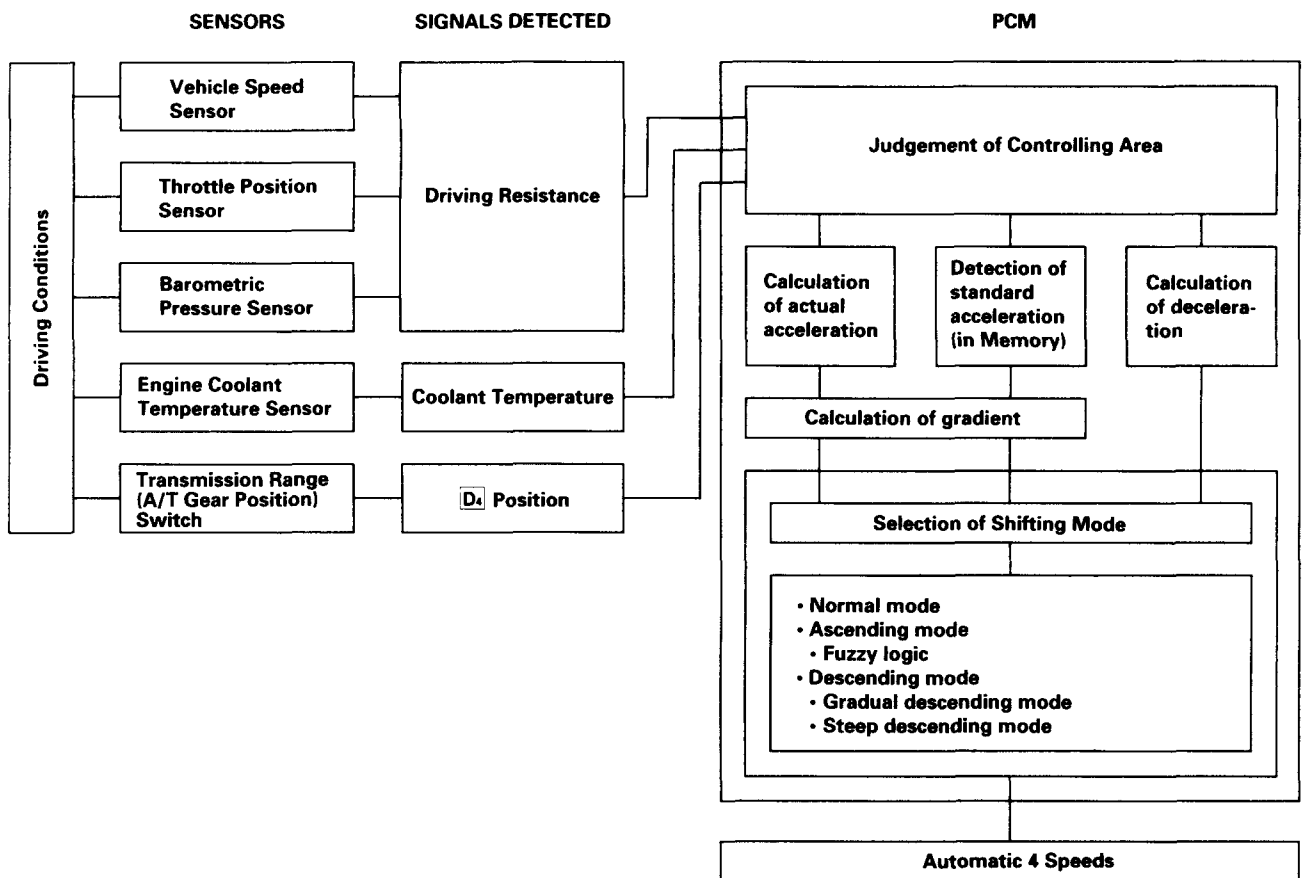
Torque converter clutch solenoid valve	A	B
Lock-up condition		
Lock-up OFF	OFF	OFF
Lock-up, slight	ON	OFF
Lock-up, half	ON	ON
Lock-up, full	ON	ON
Lock-up during deceleration	ON	Duty operation OFF ↔ ON



Grade Logic Control System

How it works:

The PCM compares actual driving conditions with driving conditions memorized in the PCM, based on the input from the vehicle speed sensor, throttle position sensor, engine coolant temperature sensor, barometric pressure sensor, brake pedal position switch signal and shift lever position signal, to control shifting while a vehicle is ascending or descending a slope.



(cont'd)

Description

Electronic Control System (cont'd)

Ascending Control

When the PCM determines that the vehicle is climbing a hill in **D₄** position, the system extends the engagement area of 3rd gear to prevent the transmission from frequently shifting between 3rd and 4th gears, so the vehicle can run smooth and have more power when needed.

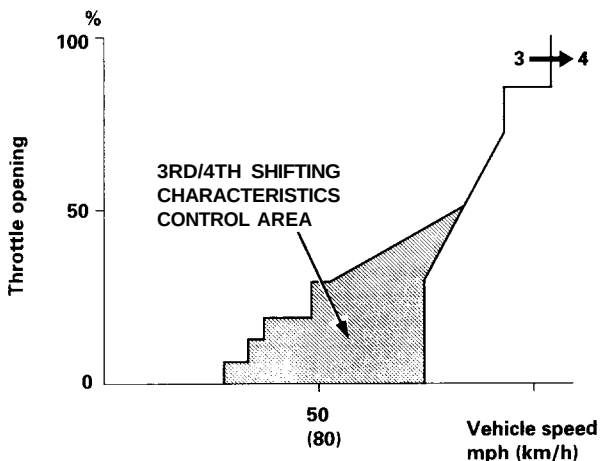
NOTE:

- Shift schedules between 3rd and 4th gear stored in the PCM enable the PCM's fuzzy logic to automatically select the most suitable gear according to the magnitude of a gradient.
- Fuzzy logic is a form of artificial intelligence that lets computers respond to changing conditions much like a human mind would.

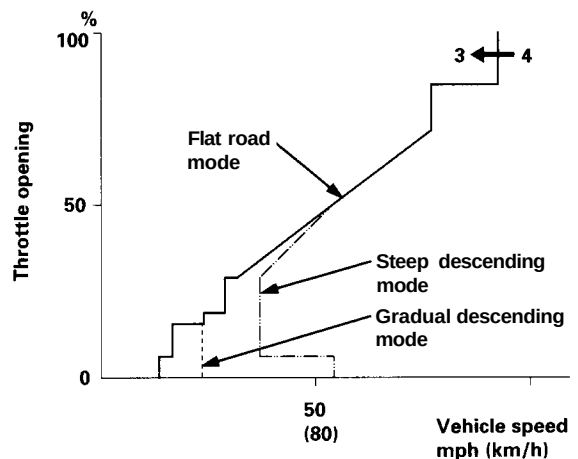
Descending Control

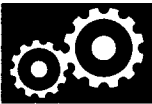
When the PCM determines that the vehicle is going down a hill in **D₄** position, the shift-up speed from 3rd to 4th gear when the throttle is closed becomes faster than the set speed for flat road driving to widen the 3rd gear driving area. This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending. There are two descending modes with different downshift (4-3) schedules according to the magnitude of a gradient stored in the PCM. When the vehicle is in 4th gear, and you are decelerating on a gradual hill, or when you are applying the brakes on a steep hill, the transmission will downshift to 3rd gear. When you accelerate, the transmission will then return to 4th gear.

ASCENDING MODE

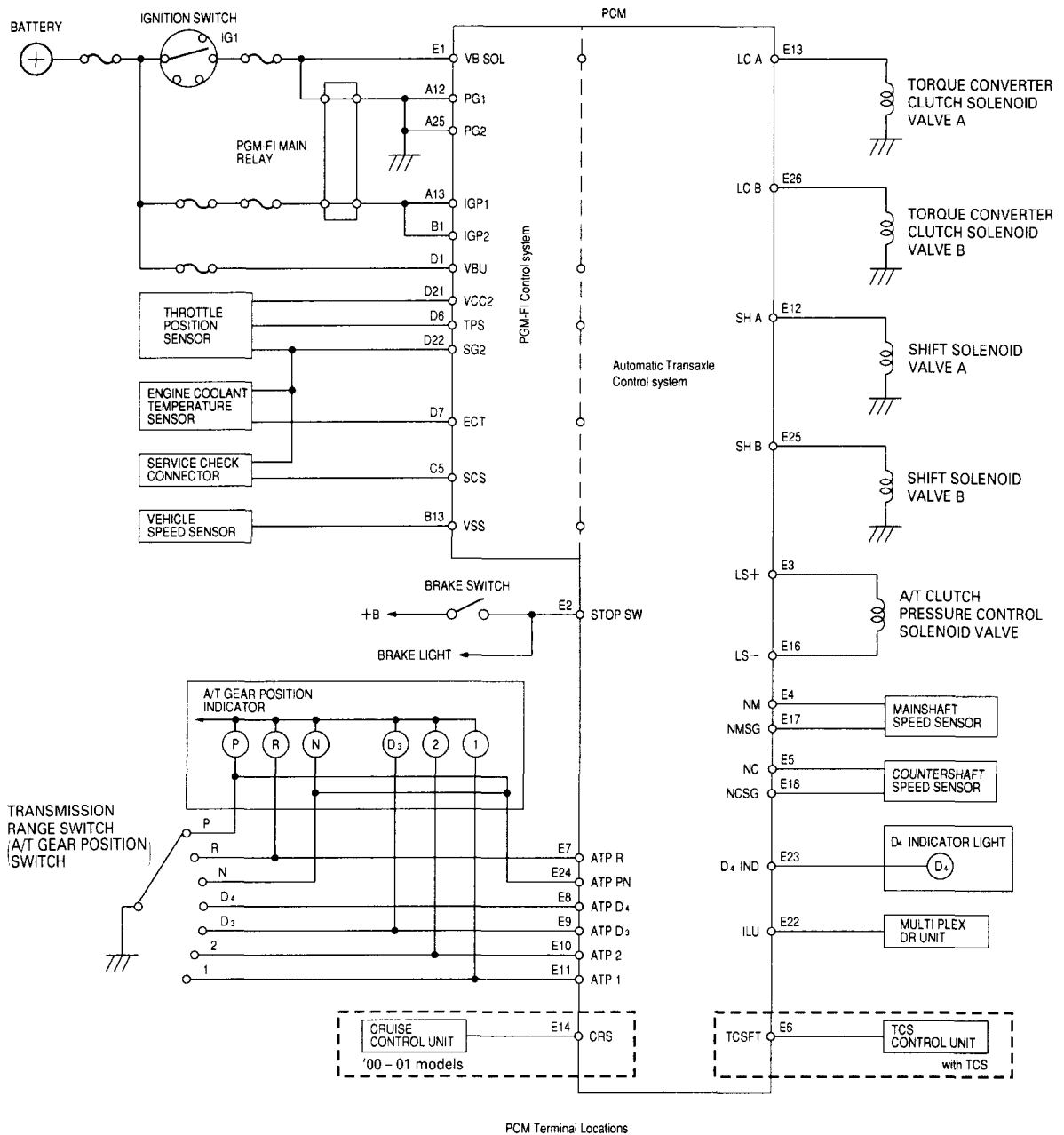


DESCENDING MODE





Circuit Diagram and Terminal Locations



PCM Terminal Locations

1	2	3	4	5	6	7	8	10	11	12	13	1	2	3	5	6	7	8	2	3	4	5	6	1	2	(3)	4	5	6	7	8	9	10	11
14	15	16	17	18	19	20	21	22	23	24	25	26	9	10	11	12	13	15	16	8	(9)	(10)	11	(12)	12	13	14	15	17	18	19	(20)	21	22

A (26P) Connector

B (16P) Connector

C (12P) Connector

D (22P) Connector

1	2	3	4	5	(6)	7	8	9	10	11	12	13
14	16	17	18	22	23	24	25	26				

E (26P) Connector

(No.) : with TCS

1	2	3	4
5	6	7	8

F (8P) Connector