TCM [FW6A-EL, FW6AX-EL]

id0517h2362000

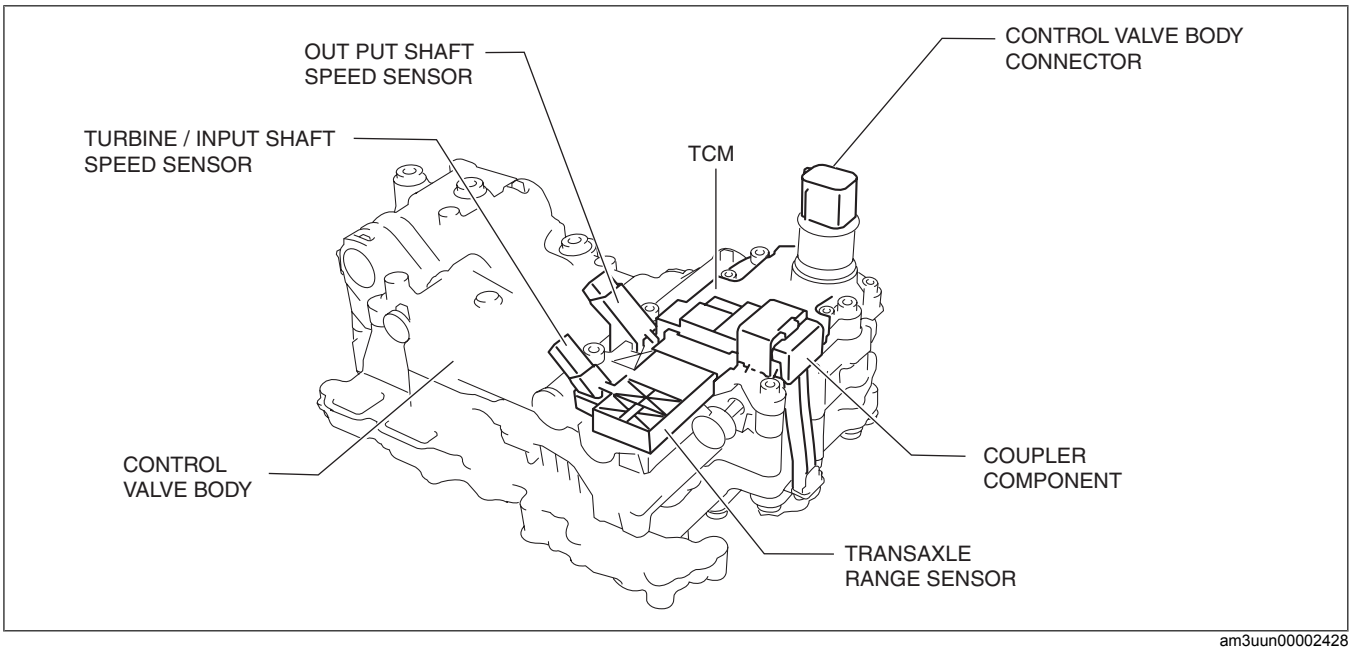
Purpose/Function

- The TCM detects the vehicle conditions and performs calculations and processing based on input information from each type of sensor and switch.
- Outputs control signals to each solenoid valve so that each type of control is optimally implemented according to the vehicle conditions.

Function Table

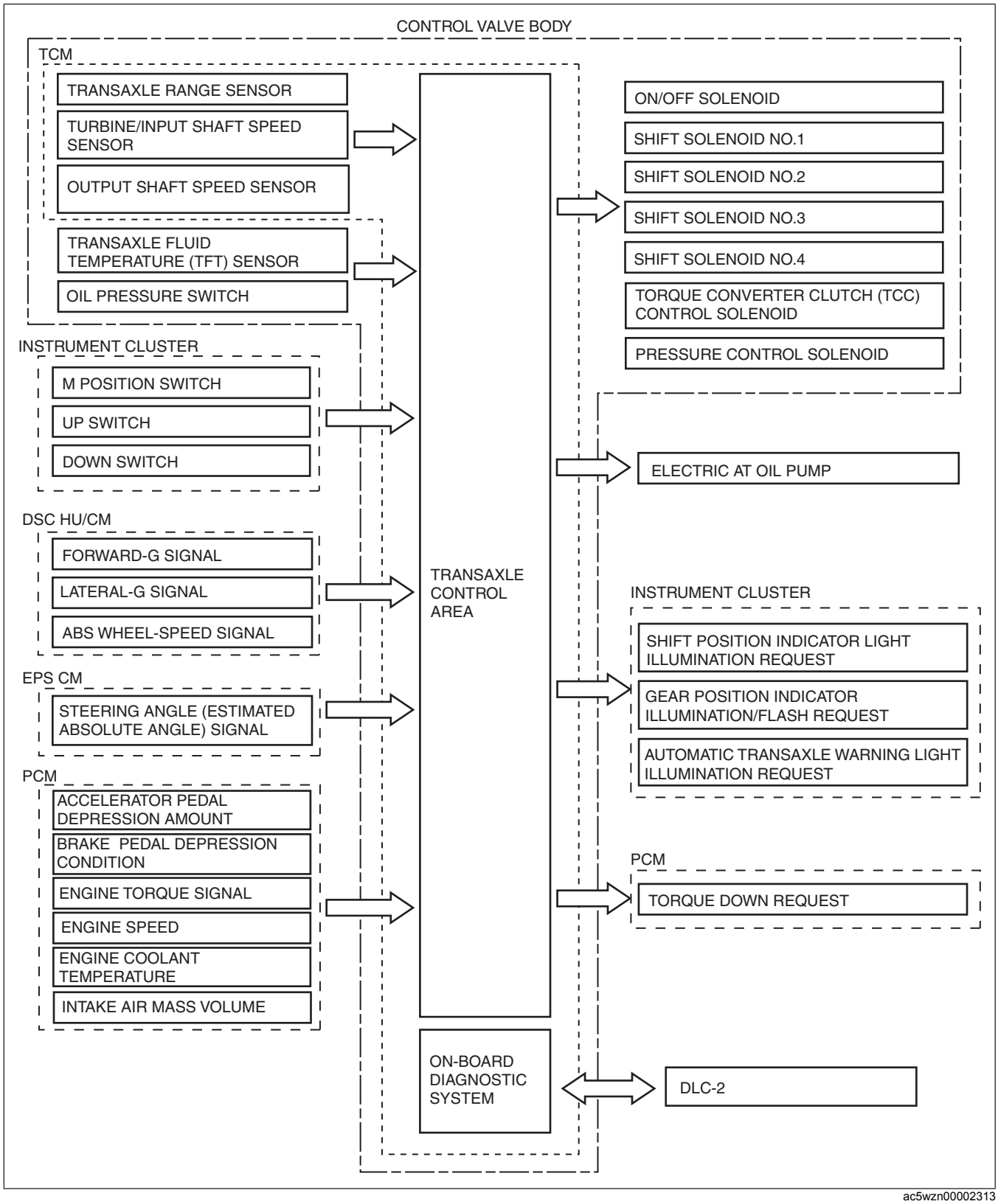
Control item				Main control content
Shift point control	Automatic shift control (D position)	Driving mode	Normal mode	• Mode selection during normal driving • Performs automatic shift corresponding to vehicle speed and accelerator pedal depression amount
			Active Adaptive Shift (AAS) mode	• Unnecessary shift up is suppressed for several seconds by maintaining the gear corresponding to the operation speed at which the accelerator pedal is released • The optimum gear on the low vehicle-speed side is selected and shift down is executed corresponding to the operation force at which the brake pedal is depressed • During cornering, shift up is suppressed in preparation for acceleration after cornering • In regions of high elevation, the optimum gear is selected corresponding to the environment • The slope is estimated in the TCM to select the appropriate gear for ascent and descent
			High ATF temperature mode	• Controls engine torque when the ATF temperature is high
	Manual shift control (M position)			• When M position is selected, manual shifting is prioritized according to the driver's shift up/shift down operation.
Shift pressure control	Line pressure control			• Controls line pressure with high accuracy and fine control corresponding to engine load conditions and vehicle driving conditions
	Direct electric shift control			• Performs direct, electronic control of clutch engagement pressure appropriate to engine load conditions and vehicle driving conditions
	Learning control			• Learns engine performance changes and transaxle deterioration over time to optimally correct clutch engagement pressure
Torque converter clutch (TCC) control				• Based on adoption of full range TCC control, active TCC control directly after acceleration from stop • By gradually engaging/disengaging TCC piston, shock during operation is reduced • Implements TCC control when accelerator pedal is fully closed for improved fuel economy and emission performance
Engine-transaxle integration control				• Optimally controls engine output torque when shifting • Calculates optimum clutch engagement pressure according to engine output torque
On-board diagnostic system				• Main part of transaxle control includes self-diagnosis function. In case of malfunction, automatic transmission warning light illuminates to alert driver, and DTC is stored in TCM • When transaxle malfunction is determined resulting from on-board diagnostic test, system control is switched to prevent any dangerous situation while driving

Construction



am3uun00002428

Block diagram



ac5wzn00002313

Operation
Correlation between control and input/output parts

x : AVAILABLE

INPUT/OUTPUT PART		CONTROL ITEM	SHIFT POINT CONTROL				SHIFT PRESSURE CONTROL			TORQUE CONVERTER CLUTCH (TCC) CONTROL	ENGINE-TRANSAXLE INTEGRATION CONTROL	ON-BOARD DIAGNOSTIC SYSTEM
			AUTOMATIC SHIFT CONTROL (D POSITION)									
			NORMAL MODE	ACTIVE ADAPTIVE SHIFT (AAS) MODE	HIGH ATF TEMPERATURE MODE	MANUAL SHIFT CONTROL (M POSITION)	LINE PRESSURE CONTROL	DIRECT ELECTRIC SHIFT CONTROL	LEARNING CONTROL			
INPUT	TCM	TANSAXLE RANGE SENSOR	x	x	x	x	x	x	x	x	x	x
		TURBINE/INPUT SHAFT SPEED SENSOR	x	x		x	x	x	x	x		x
		OUTPUT SHAFT SPEED SENSOR	x	x		x	x	x		x		x
		TRANSAXLE FLUID TEMPERATURE (TFT) SENSOR			x		x	x	x	x		x
		OIL PRESSURE SWITCH	x	x	x	x	x	x		x		x
	PCM	ACCELERATOR PEDAL DEPRESSION AMOUNT	x	x		x	x	x		x		x
		BRAKE PEDAL DEPRESSION CONDITION	x	x						x		x
		ENGINE TORQUE SIGNAL		x		x	x	x	x	x	x	x
		ENGINE SPEED		x			x	x	x	x	x	x
		ENGINE COOLANT TEMPERATURE								x		x
		INTAKE AIR MASS VOLUME										x
	INSTRUMENT CLUSTER	M POSITION SWITCH				x					x	
		UP SWITCH				x					x	
		DOWN SWITCH				x					x	
	DSC HU/CM	FORWARD-G SIGNAL		x								
		LATERAL-G SIGNAL		x								
		ABS WHEEL-SPEED SIGNAL		x								x
	EPS CM	STEERING ANGLE (ESTIMATED ABSOLUTE ANGLE) SIGNAL		x								
OUTPUT	AUTOMATIC TRANSAXLE	ON/OFF SOLENOID	x	x	x	x			x			x
		SHIFT SOLENOID NO.1	x	x	x	x		x	x			x
		SHIFT SOLENOID NO.2	x	x	x	x		x	x			x
		SHIFT SOLENOID NO.3	x	x	x	x		x	x			x
		SHIFT SOLENOID NO.4	x	x	x	x		x	x			x
		TORQUE CONVERTER CLUTCH (TCC) CONTROL SOLENOID	x	x	x	x		x	x	x		x
		PRESSURE CONTROL SOLENOID	x	x	x	x	x	x	x	x		x
	INSTRUMENT CLUSTER	SHIFT POSITION INDICATOR LIGHT ILLUMINATION REQUEST	x	x	x	x						
		GEAR POSITION INDICATOR ILLUMINATION/FLASH REQUEST				x						
		AUTOMATIC TRANSAXLE WARNING LIGHT ILLUMINATION REQUEST			x							x
INPUT/OUTPUT (CAN)			x	x	x	x	x	x		x	x	x

ac5wzn00002314