■ DETAILS

1. Function of Main Components

Component		Function
Torque Converter Clutch Assembly		● Transmits the engine power to the transmission. ● Increases engine torque.
Oil Pump		Provides oil pressure necessary for the transmission operation.
No. 1 Clutch (C_1)		Connects the input shaft and the intermediate shaft.
No. 2 Clutch (C_2)		Connects the input shaft and the center planetary gear assembly.
No. 1 Brake (B_1)		Locks the rotations of the front planetary carrier and the center planetary ring gear.
No. 2 Brake (B_2)		Locks the rotation of the rear planetary ring gear.
No. 3 Brake (B_3)		Locks the rotation of the front planetary ring gear.
1-way Clutch (F)		Locks the counter-clockwise rotations of the center planetary carrier and the rear planetary ring gear.
Planetary Gears		Change power transmission route in accordance with clutch and brake operation, and increase or decrease output shaft revolutions accordingly.
Shift Solenoid Valve SL1 (SL1)		Performs shift controls.
Shift Solenoid Valve SL1 (SL2)		
Shift Solenoid Valve SL1 (SL3)		
Shift Solenoid Valve SL1 (SL4)		
Shift Solenoid Valve (SLT) (Line Pressure Control Solenoid Assembly)		Controls line pressure.
Shift Solenoid Valve (SLU) (Lock Up Control Solenoid Assembly)		● Performs lock-up clutch controls. ● Performs B_2 brake hydraulic pressure controls (only for the 1st range when the S position is selected).
Shift Solenoid Valve DSL (SL)		Shifts supplies to both lock-up hydraulic pressure and B_2 brake hydraulic pressure.
No. 1 ATF Temperature Sensor		Detects the ATF temperature.
No. 2 ATF Temperature Sensor		
Transmission Revolution Sensor (NT)		Detects the input speed of the transmission.
Transmission Revolution Sensor (SP2)		Detects the output speed of the transmission.
Park/Neutral Position Switch Assembly		Detects the shift lever position (P, R, N, D).
Shift Lock Control Unit Assembly	Transmission Control Switch	● Detects that the shift lever is in S. ● Detects the driver's shift-up and shift-down operations when the shift lever is in S.
ECM		● Controls each shift solenoid valve and engine output in response to a signal from each sensor and switch. ● When the ECM detects a malfunction, it makes a diagnosis and memorizes the failed section.
Combination Meter Assembly	Shift Position Indicator and Shift Range	Indicates the shift lever position.
	MIL	Illuminates or blinks to inform the driver when the ECM detects a malfunction.
DLC3		The Diagnostic Trouble Codes (DTCs) can be read by connecting a Global TechStream (GTS).

2. System Control

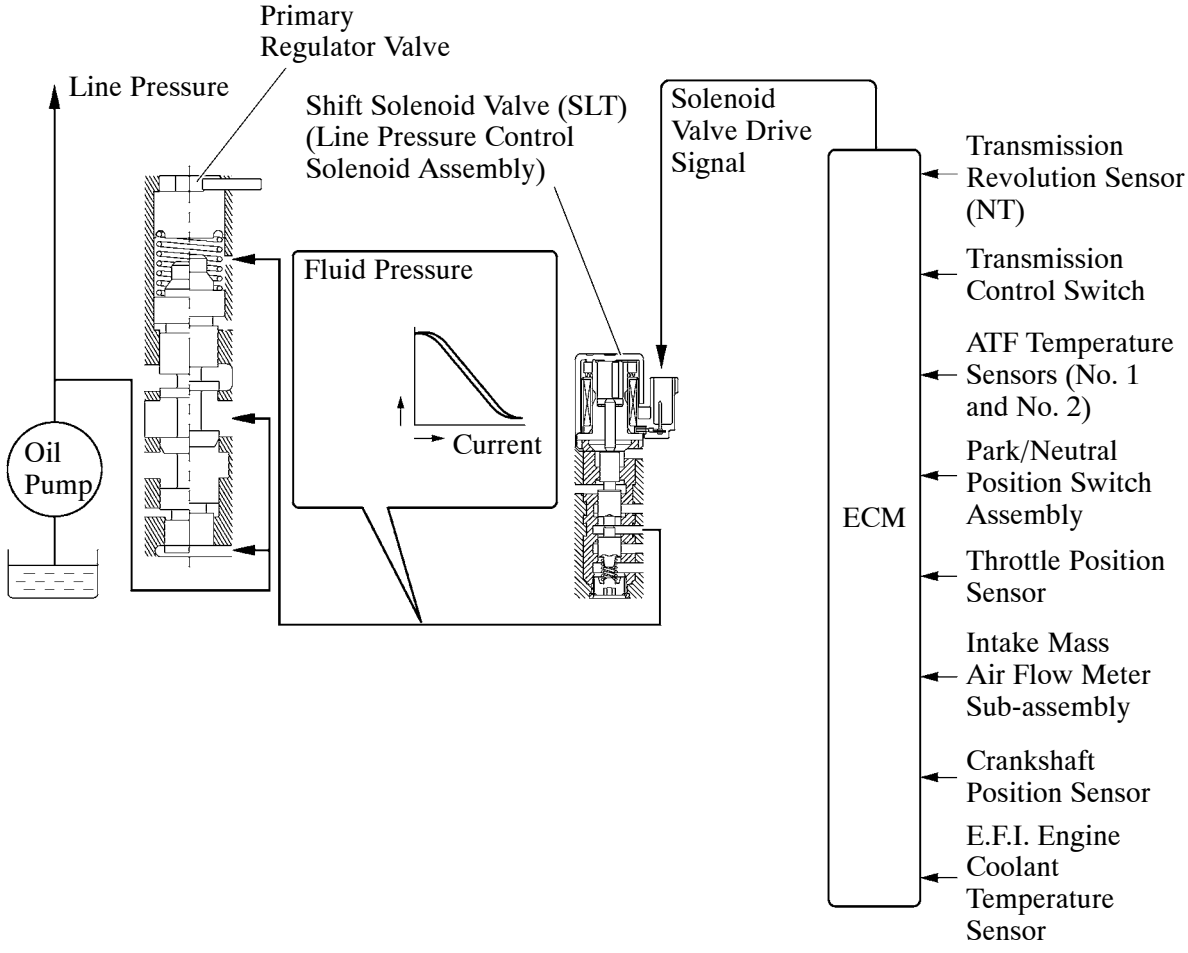
▶ Electronic Control of Automatic Transmission ◀

Control	Function
Shift Timing Control	The ECM sends current to shift solenoid valve SL1 (SL1, SL2, SL3 and SL4) and/or shift solenoid valve DSL (SL) based on signals from various sensors in order to shift the gears.
Line Pressure Control	Actuates the shift solenoid valve (SLT) (line pressure control solenoid assembly) to control the line pressure in accordance with information from the ECM and the operating conditions of the transmission.
Clutch Pressure Optimal Control	The shift solenoid valve SL1 (SL1) and shift solenoid valve (SLT) (line pressure control solenoid assembly) minutely control the clutch pressure in accordance with the engine output and driving conditions of the transmission.
Clutch to Clutch Pressure Control	By utilizing pressure outputted from shift solenoid valve SL1 (SL1, SL2, SL3, and SL4) to be controlled based on drive signals sent from the ECM, it has been realized that each of clutch and brake hydraulic pressures are controlled directly and independently.
Vehicle Lift Control	To restrain the upward movement of the vehicle when the shift lever is moved from D to N, the clutch release speed has been optimized.
Shift Down Control	In order to ensure a smooth shift feel during downshifting to accelerate the vehicle, the hydraulic passages and control have been optimized.
Engine Torque Control	Retards the engine ignition timing temporarily to improve shift feeling while upshifts or downshifts occur.
Coast Downshift Control	To prevent engine speed from decreasing and thereby maintain fuel cut, the ECM performs downshifts before fuel cut ends.
Lock-up Timing Control	The ECM sends current to the shift solenoid valve (SLU) (line pressure control solenoid assembly) based on signals from various sensors and engages or disengages the lock-up clutch.
Flex Lock-up Clutch Control	Controls the shift solenoid valve (SLU) (line pressure control solenoid assembly), provides an intermediate mode for when the lock-up clutch is between on and off, and increases the operating range of the lock-up clutch to improve fuel economy.
Artificial Intelligence-shift Control (AI-shift Control)	Based on the signals from various sensors, the ECM determines the road conditions and the intention of the driver. Thus, an appropriate shift pattern is automatically determined, thus improving driveability.
Multi-mode Automatic Transmission	The ECM appropriately controls the automatic transmission in accordance with the shift range position selected while the shift lever is in S.

(a) Line Pressure Control

(1) In order to obtain a predetermined line pressure characteristic in accordance with each sensor signal, the ECM activates the shift solenoid valve (SLT) (line pressure control solenoid assembly) to regulate the throttle pressure.

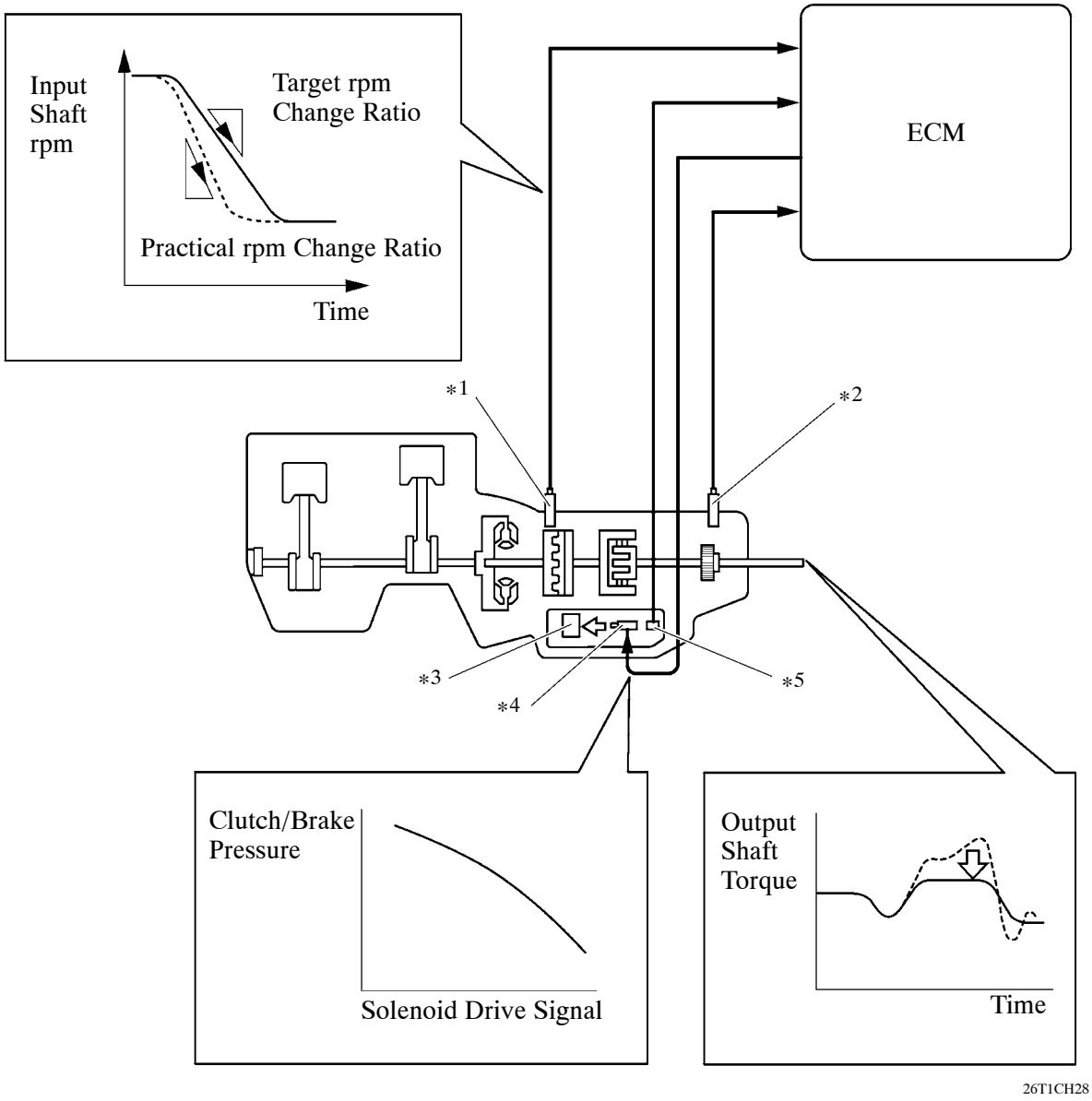
(2) This makes it possible for the primary regulator valve to precisely and minutely control the line pressure in accordance with the engine output, thus providing smoother shift characteristics.



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(b) Clutch Pressure Optimal Control

(1) The ECM monitors the signals from various types of sensors, such as the transmission revolution sensor (NT), allowing shift solenoid valve SL1 (SL1, SL2, SL3 and SL4), shift solenoid valve (SLT) (line pressure control solenoid assembly) and (SLU) (lock up control solenoid assembly) to minutely control the clutch pressure in accordance with engine output and driving conditions. As a result, smooth shift characteristics are achieved.



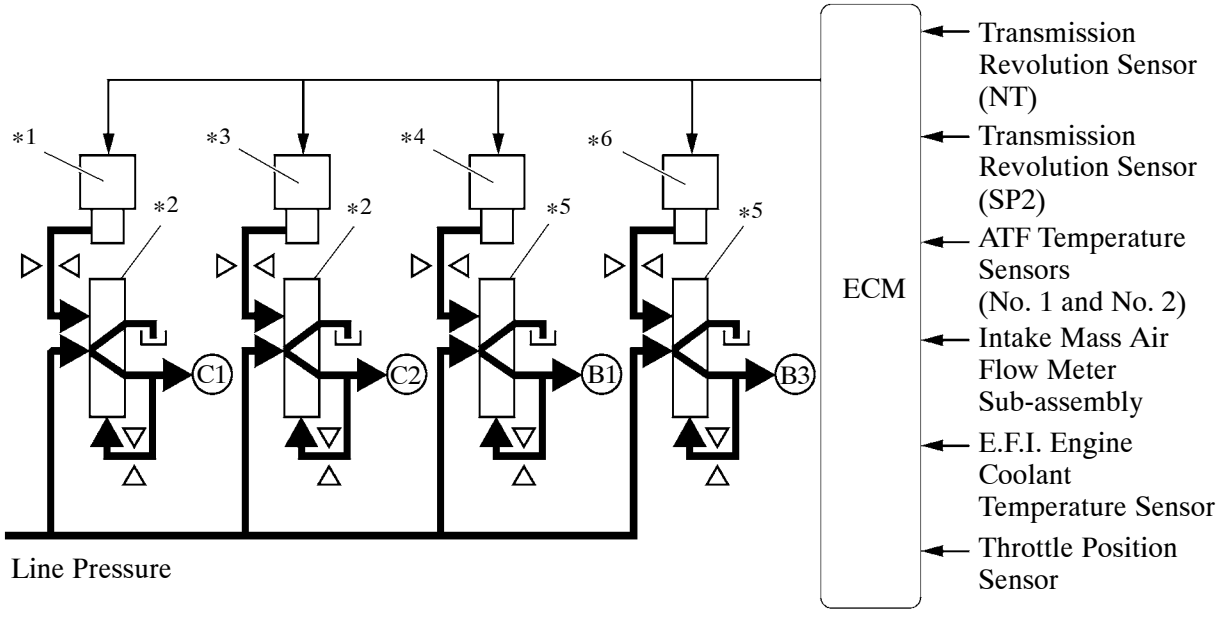
▶ Text in Illustration ◀

∗1	Transmission Revolution Sensor (NT)	∗2	Transmission Revolution Sensor (SP2)
∗3	Accumulator Control Valve	∗4	Shift Solenoid Valve SL1 (SL1, SL2, SL3 and SL4), Shift Solenoid Valve (SLT) (Line Pressure Control Solenoid Assembly) and (SLU) (Lock Up Control Solenoid Assembly)
∗5	ATF Temperature Sensors (No. 1 and No. 2)	—	—

(c) Clutch to Clutch Pressure Control

(1) By adopting a clutch-to-clutch shift control without using 1-way clutches in the 2nd or higher gears, a light, compact 6-speed automatic transmission has been provided.

(2) By utilizing pressure outputted from shift solenoid valve SL1 (SL1, SL2, SL3, and SL4) to be controlled based on drive signals sent from the ECM, it has been realized that each of clutch and brake hydraulic pressures are controlled directly and independently.



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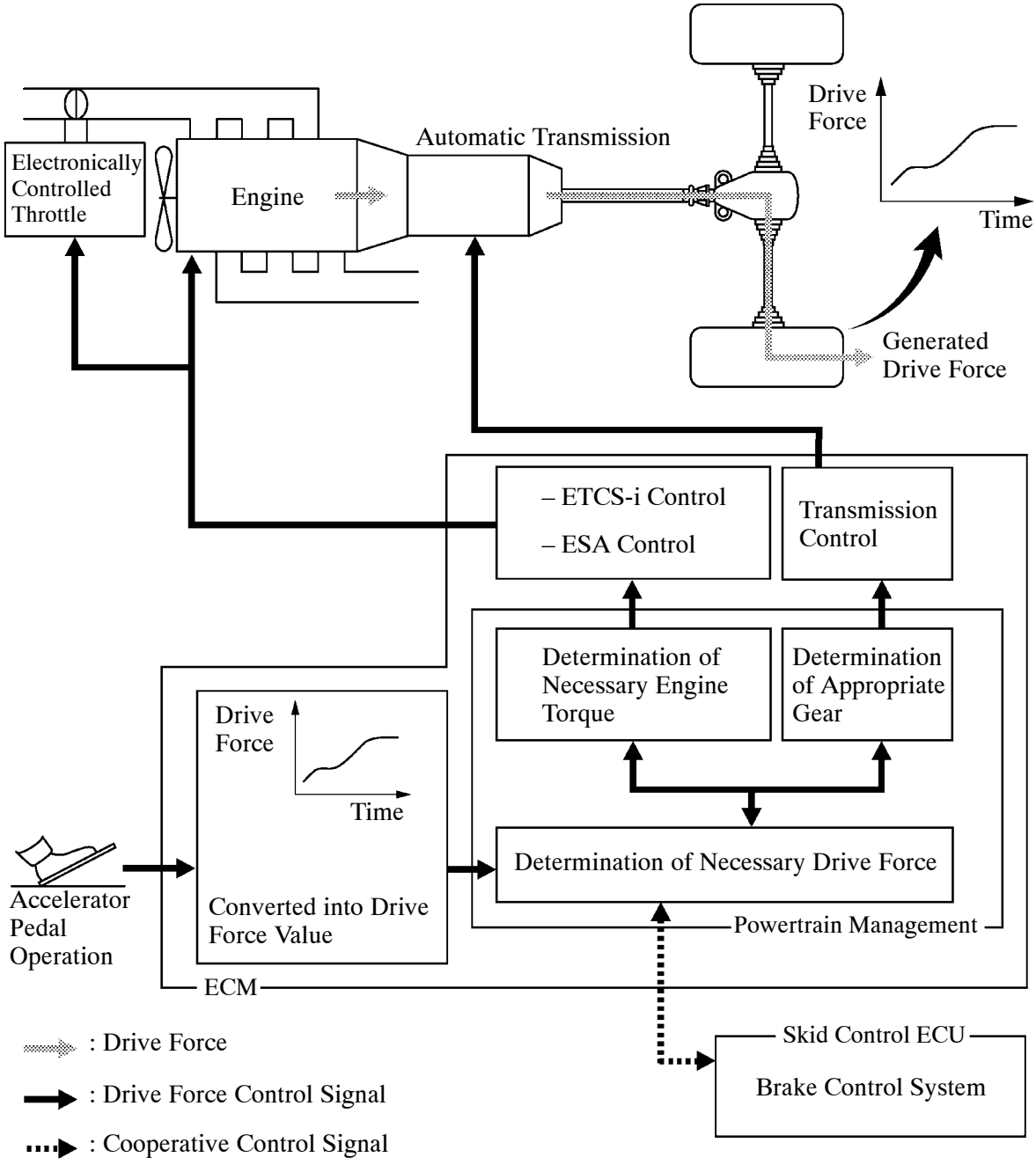
▶ Text in Illustration ◀

∗1	Shift Solenoid Valve SL1 (SL1)	∗2	Clutch Control Valve
∗3	Shift Solenoid Valve SL1 (SL2)	∗4	Shift Solenoid Valve SL1 (SL3)
∗5	Brake Control Valve	∗6	Shift Solenoid Valve SL1 (SL4)

(d) Powertrain Cooperative Control

(1) Driving Response and Acceleration Management System (DRAMS) is used for this vehicle. This system integrally controls the engine, transmission and other driving related controls in order to improve vehicle maneuverability and driving comfort, as well as provide optimal drive feeling as a whole including the behavior of the vehicle while taking into account drivers' needs and environment.

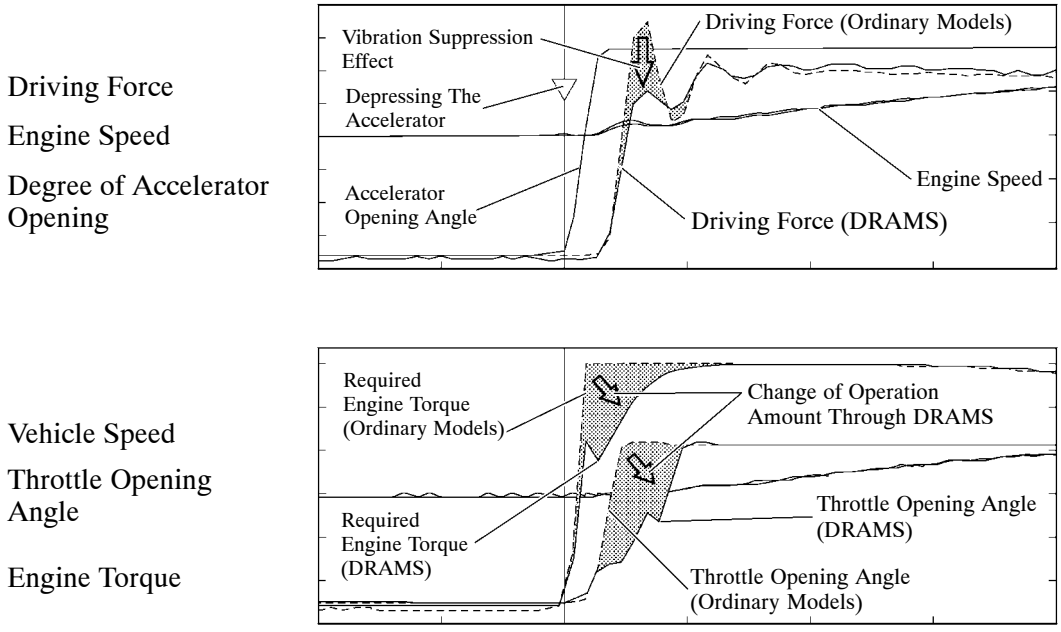
(2) By integrally controlling the engine and automatic transmission using this system where acceleration maneuvers will be replaced with driving force that the driver demands, quick response and a high quality driving feel in accordance with the driver's intentions are achieved, such as when accelerating or decelerating or during gear shifts to provide demanded driving force even for smoother shift transient and when starting or decelerating.



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(3) Start Control

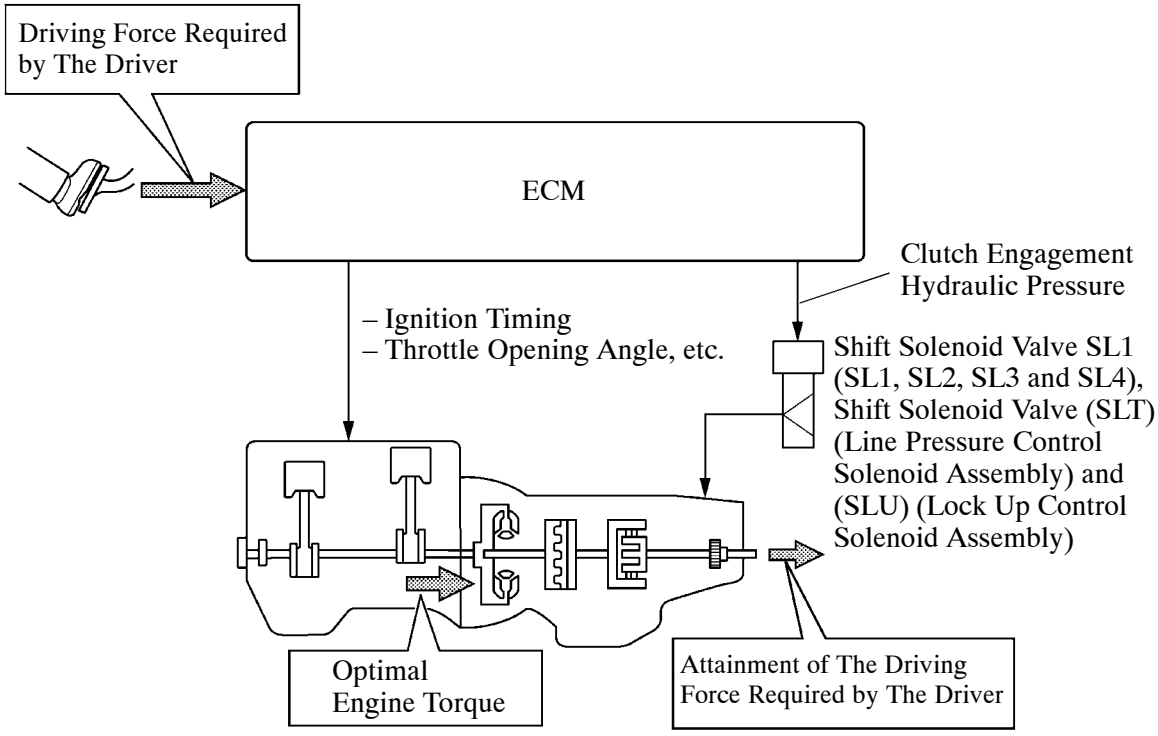
With DRAMS, engine torque will optimally be controlled in a real-time manner in accordance with speed ratios between engine speed and turbine speed so that finely controlled starting capability has been provided while balancing the “reduction of a feel of jump and suppression of tire slipping” and “smooth responsiveness” when starting.

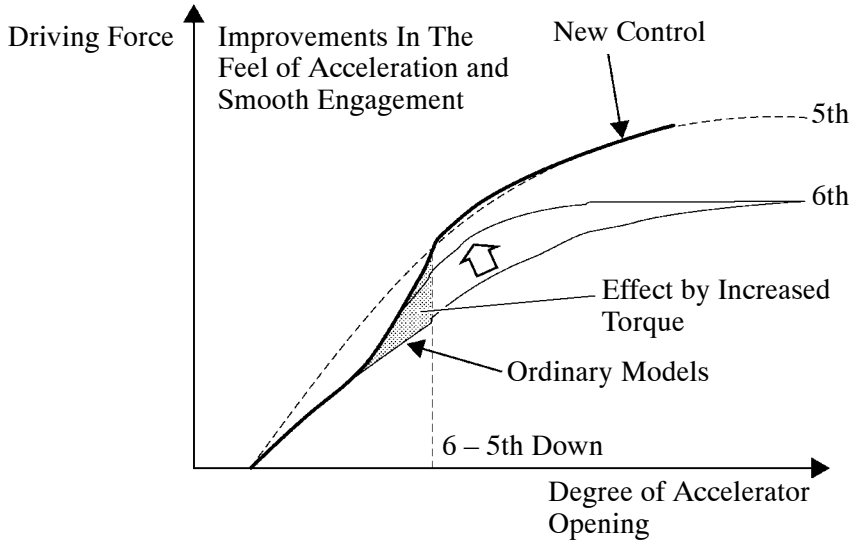


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(4) Integrated Driving Force Control

By increasing driving force before making a down shift when accelerating, a feel of slowness after down-shifting has been reduced, making it possible to balance smooth shift characteristic and responsiveness when accelerating.

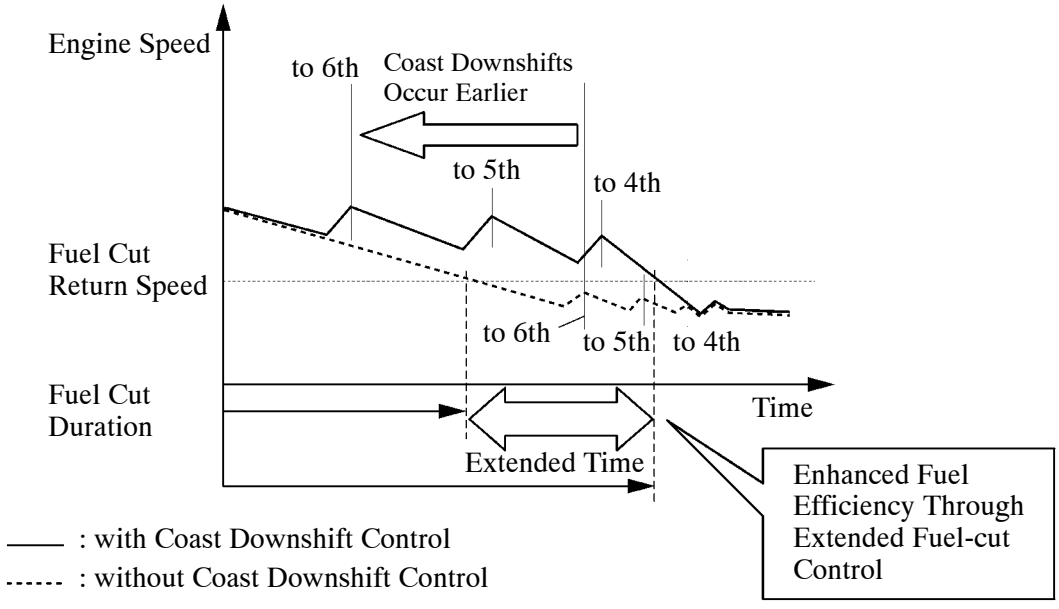




26T1CH32

(e) Coast Downshift Control

(1) A down-shift control when decelerating allowing low fuel consumption by extending a fuel cut control when decelerating in maximum has been adopted.
(2) By performing flex lock-up control and down-shift control at the same time when decelerating, a decrease of engine speed has been suppressed, while extending the fuel-cut control in maximum without lowering the engine speed below the engine's fuel-cut recovery speed.
(3) By expanding operating gears and widening operating areas through close-gear ratios, fuel efficiency has significantly been enhanced and drivability has been improved by optimizing deceleration force when controls are activated.



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(f) Lock-up Timing Control

(1) By activating the lock-up control at the 4th, 5th, and 6th gears while running normally, the transmission efficiency of the torque convertor, as well as fuel efficiency, have been improved. Along with the expansion of operating gears, various controls are implemented, while taking into account vehicle quietness, (direct) drivability, and fuel efficiency. However, the lock-up control does not take place if the engine water temperature is below 70°C.

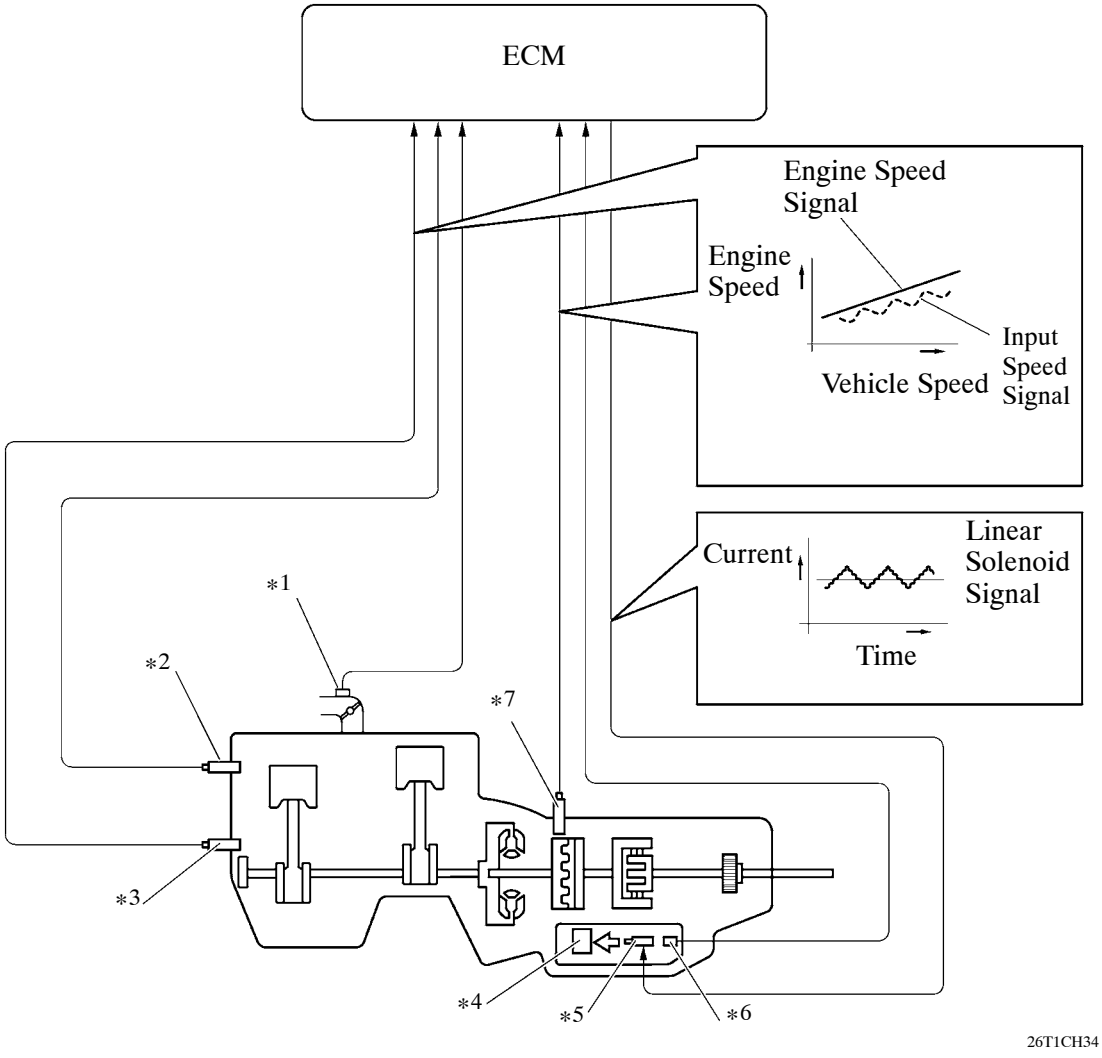
▶ Lock-up Timing Control Operation ◀

Gear	Shift Lever Position or Shift Range		
	D, S6	S5	S4
1st	×	×	×
2nd	×	×	×
3rd	×	×	×
4th	○	○	○
5th	○	○	—
6th	○	—	—

HINT:
○: Operates
×: Does not operate
—: Not applicable

(g) Flex Lock-up Clutch Control

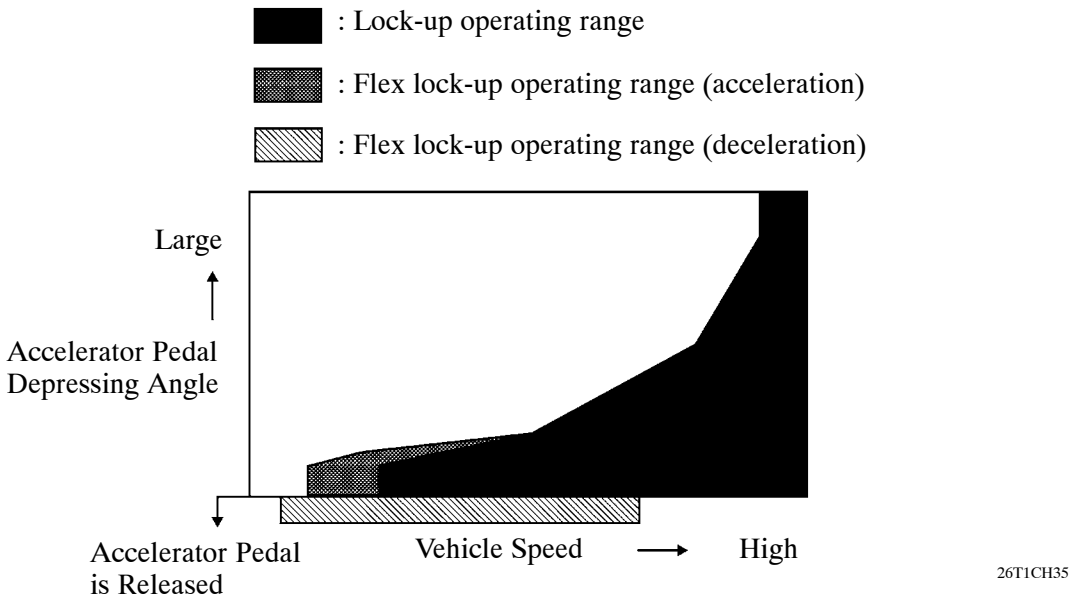
(1) During acceleration, partial control of the power transmission between the lock-up clutch and torque converter greatly boosts transmission efficiency in accordance with the driving conditions, improving fuel economy.
(2) Even when the vehicle is decelerating (the accelerator pedal is released), flex lock-up clutch control operates. As a result, the fuel-cut area is expanded and fuel economy is improved.
(3) By allowing flex lock-up clutch control to continue operating during gearshifts, smooth torque transmission is obtained. As a result, fuel economy and driveability are improved.
(4) For flex lock-up clutch control, H infinity (H∞) control theory is used to achieve a high level of system stability and response to various characteristic changes.



▶ Text in Illustration ◀

∗1	Throttle Position Sensor	∗2	E.F.I. Engine Coolant Temperature Sensor
∗3	Crankshaft Position Sensor	∗4	Lock-up Control Valve
∗5	Shift Solenoid Valve (SLU) (Lock Up Control Solenoid Assembly)	∗6	ATF Temperature Sensors (No. 1 and No. 2)
∗7	Transmission Revolution Sensor (NT)	—	—

Flex Lock-up Operating Range:



▶ Flex Lock-up Timing Control Operation ◀

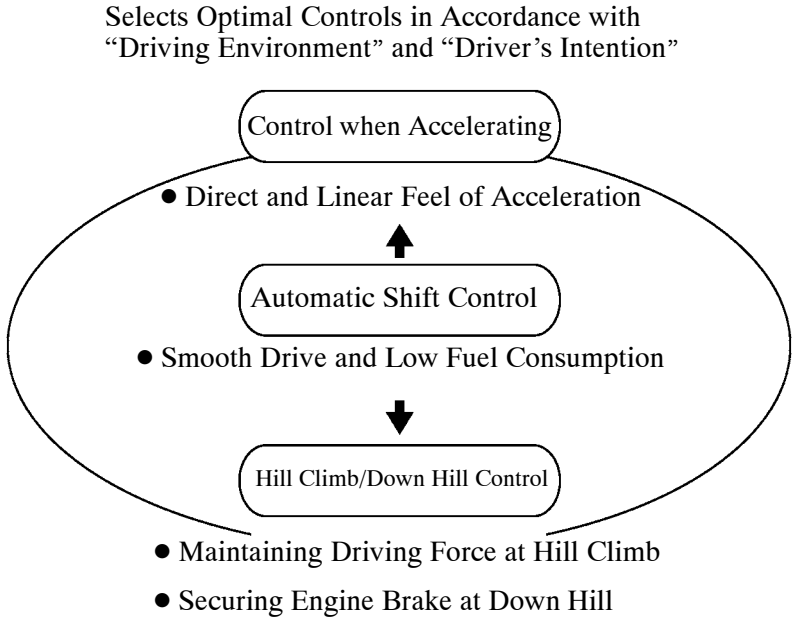
Gear	Shift Lever Position or Shift Range		
	D, S6	S5	S4
1st	×	×	×
2nd	×	×	×
3rd	×	×	×
4th	○*	○*	○
5th	○*	○*	—
6th	○*	—	—

HINT:
○*: Flex lock-up clutch control operates during both acceleration and deceleration.
○: Flex lock-up clutch control operates during acceleration only.
×: Flex lock-up clutch control does not operate.
—: Not applicable gear

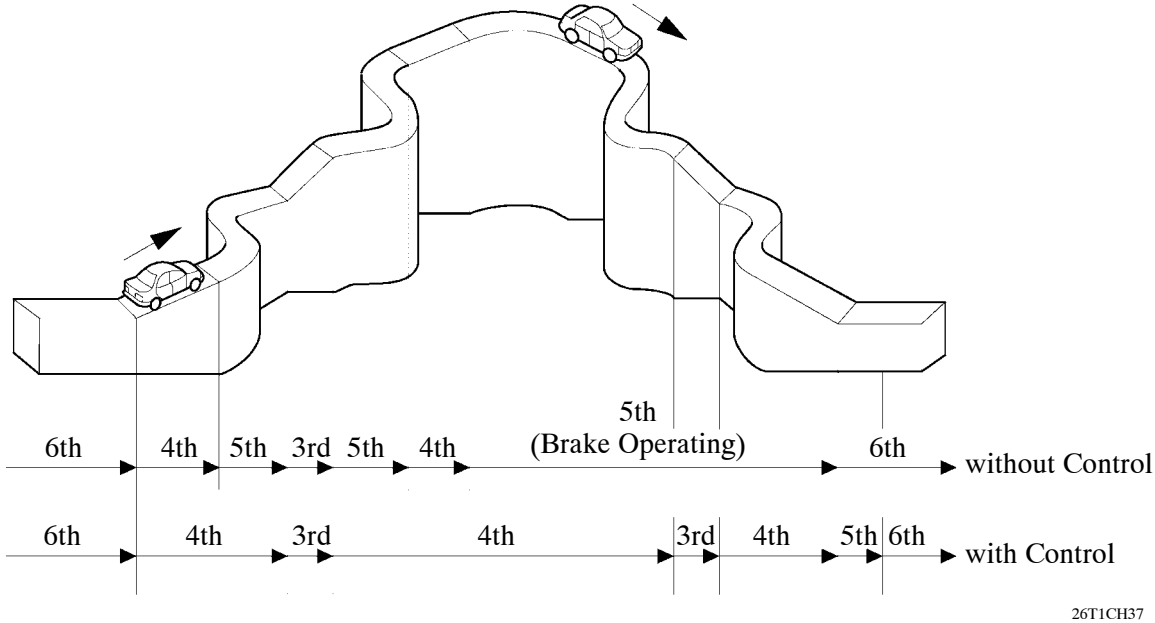
(h) Artificial Intelligence-shift Control (AI-shift Control)

(1) AI-shift control selects optimal controls in accordance with "driving environment" and "driver's intention" based on the degree of accelerator opening, vehicle speed, brake signals, etc.

(2) Smooth driving and low fuel consumption have been achieved while driving normally. Strong and linear feel of acceleration has been provided when accelerating. A direct feel of deceleration through engine brake and high fuel efficiency have been realized when decelerating.

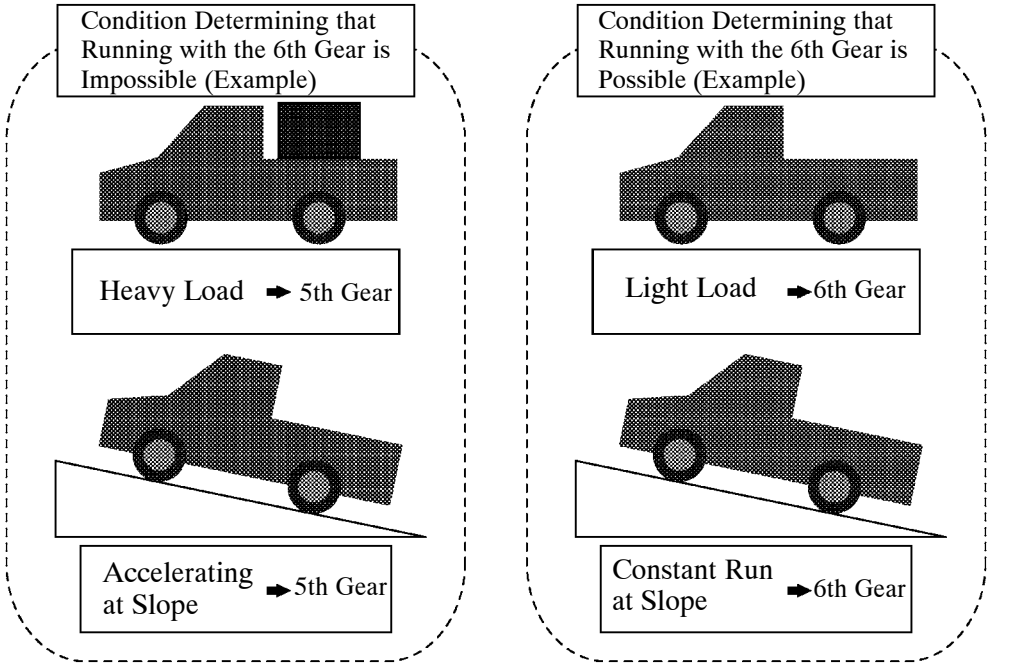


(3) Under road condition support control, the ECM identifies the throttle valve opening angle, accelerator pedal opening angle and vehicle speed to determine whether the vehicle is being driven uphill or downhill. Unnecessary upshift is restrained to automatically achieve optimal drive force at all times while driving uphill. Downshift is automatically conducted to achieve optimal engine brake force, while driving downhill.



(4) Higher gear settings have been added for high speed gears (5th and 6th gears). In order to balance the reduction of additional driving force and the improvement of fuel efficiency when driving at high speeds, a high speed gear effective utilization control has been adopted.

(5) By calculating a maximum additional driving force to be generated at high speed gears in a real-time manner, as well as determining the availability of high speed gears according to driving conditions (running resistance, driver's acceleration maneuvers), "balanced, improved fuel efficiency and driving capability" have been achieved.

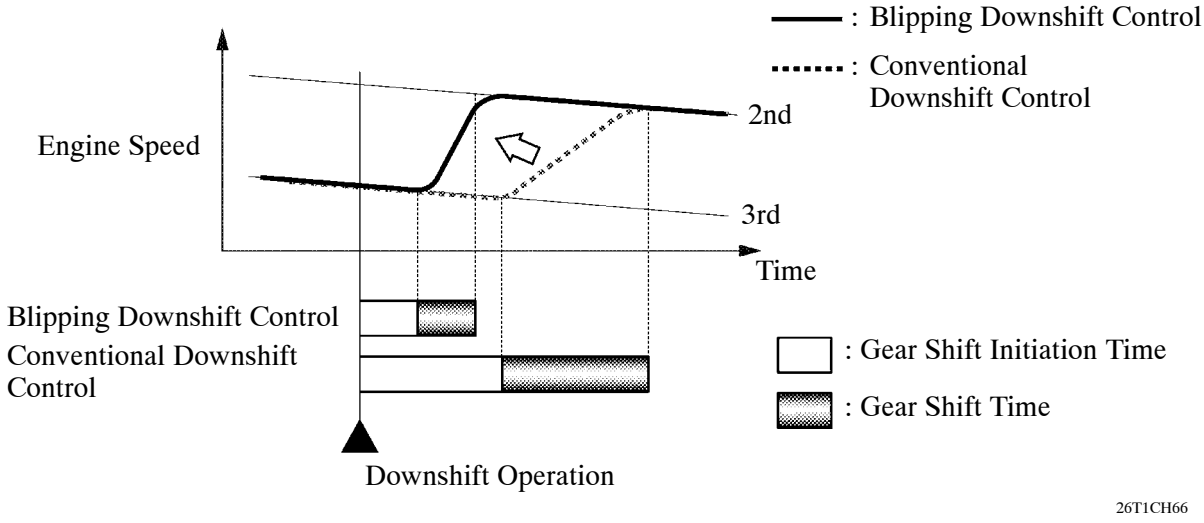


26T1CH64

(i) Blipping Downshift Control

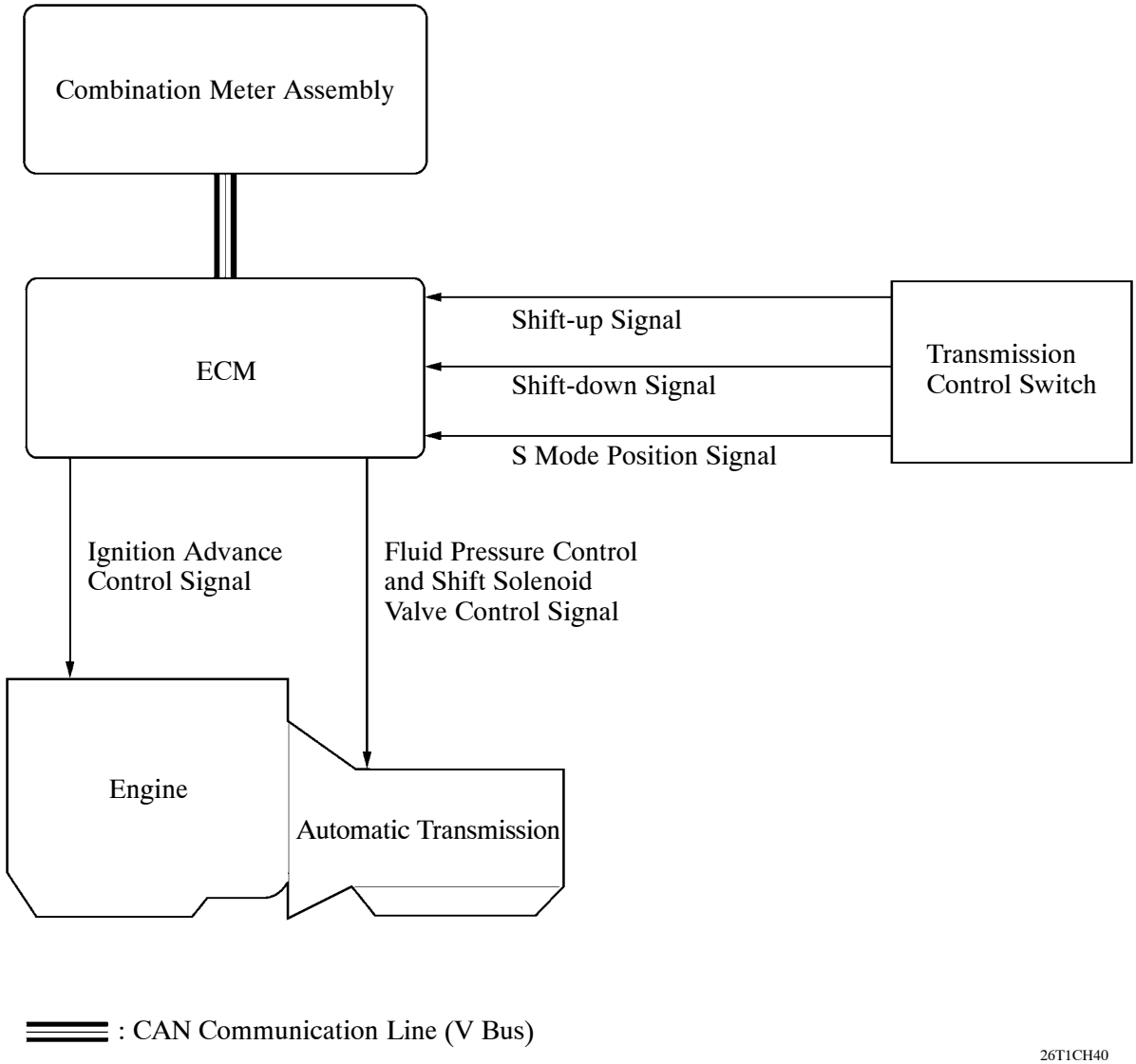
(1) The blipping downshift control regulates each clutch and brake using the clutch to clutch pressure control, allowing them to be engaged smoothly and disengaged quickly. In addition, fuel injection volume is increased and engine speed is boosted by the powertrain cooperative control, thus ensuring engine brake force. In this way, a smooth and quick downshift is achieved. In addition, further quick down-shifting has been available by directly controlling clutch pressure.

HINT:
The shift change response will be the same with that of when the blipping down-shift control is not available, if the temperatures of ATF and engine coolant are low.

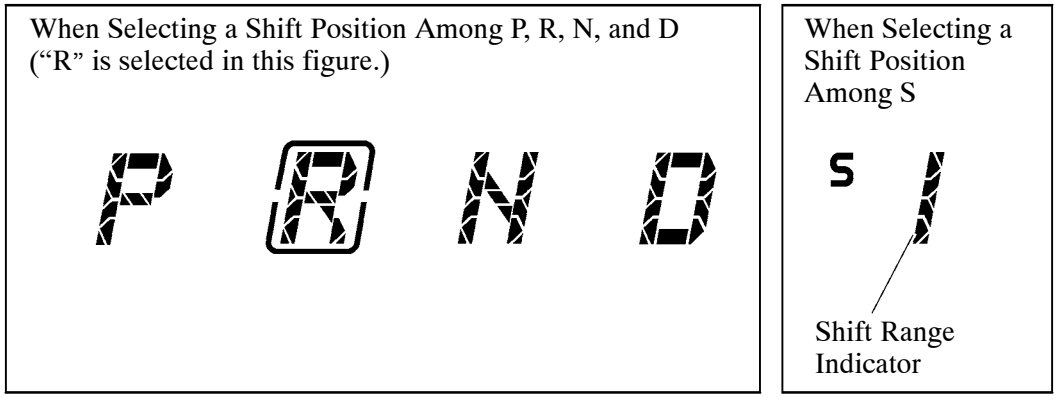


(j) Multi-mode Automatic Transmission

(1) The driver can select the desired gear step by moving the shift lever "+" (forward) or to "–" (backward) while the shift lever is in S (6-speed sequential shiftmatic mode). Thus, the driver is able to change gear steps with a manual-like feel.
(2) 6-speed sequential shiftmatic mode can be selected from normal driving mode by moving the shift lever to S. The driver can change the gear step by selecting it using the shift lever.



(3) A new combination meter assembly provided with a shift position indicator has been adopted. When a shift position is selected from among P, R, N, and D, it will be shown in the shift position indicator. When the shift position "S" is selected, "S" will be shown in the shift position indicator, as well as a shift range being selected will be displayed.



26T1CH41

(4) The ECM will restrict the changing of the shift range if it detects a malfunction in the automatic transmission system.

(5) If the vehicle speed and engine speed exceeds or goes below a preset level in response to the driver's downshift operation request, changing the shift range will be prohibited. In this case, the buzzer in the combination meter will sound to alert the driver.

3. Function

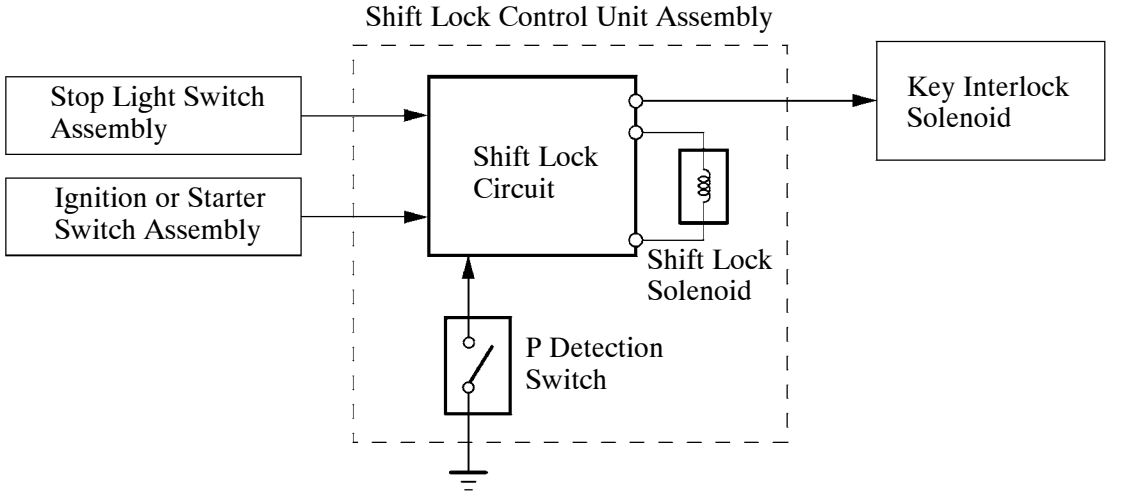
(a) Shift Lock System

(1) The key interlock device prevents the key from being pulled out after the ignition switch assembly is turned OFF, unless the shift lever is moved to the P position. Thus, the driver is urged to park the vehicle in the P position.

(2) The shift lock mechanism prevents the shift lever from being shifted to any position other than the P position, unless the ignition switch assembly is ON and the brake pedal is pressed. It prevents the vehicle from starting off suddenly against the wish of the driver.

(3) The shift lock control unit assembly uses the P detection switch to detect the shift lever position, and receives the inputs of the stop light switch and ignition switch signals. Upon receiving these signals, the shift lock control unit assembly turns ON the key interlock solenoid and the shift lock solenoid in order to release the key interlock and shift lock.

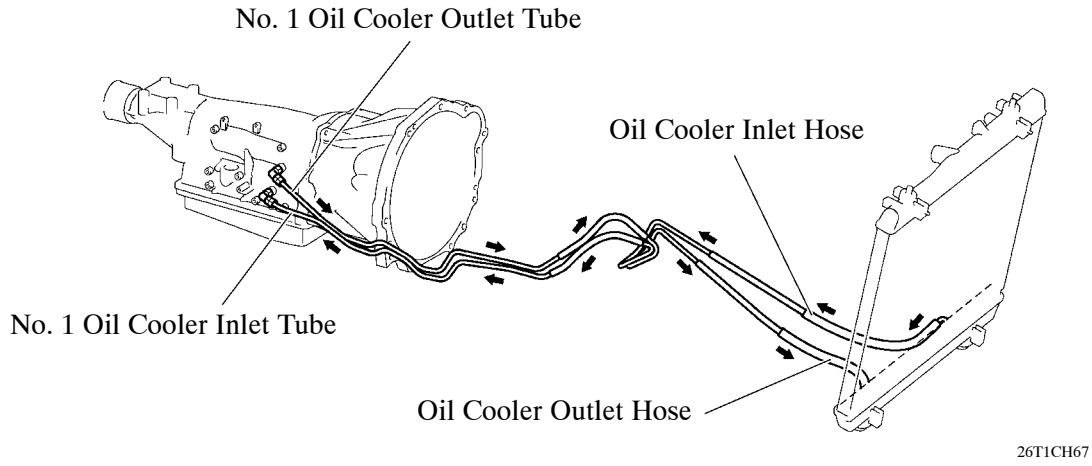
(4) A shift lock release button, which manually overrides the shift lock mechanism, is provided.



4. Construction

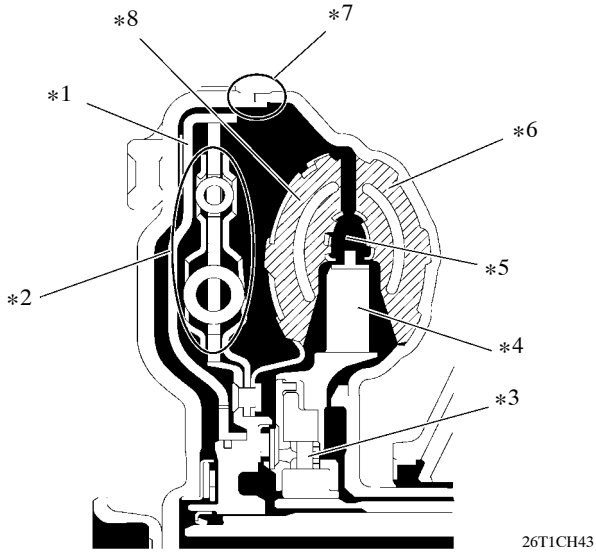
(a) ATF Cooler

(1) A water-cooled, radiator lower tank built-in oil cooler has been adopted.



(b) Torque Converter Assembly

(1) A compact, lightweight torque convertor clutch assembly in which fluid couplers inside are optimized has been adopted.
(2) A low rigidity, long traveling dumper has been adopted for improving vibration suppression characteristic, extending lock-up ranges and enhancing fuel efficiency.
(3) Laser welding has been adopted for outer periphery of the torque convertor to suppress welding distortion and stabilize flex controls.

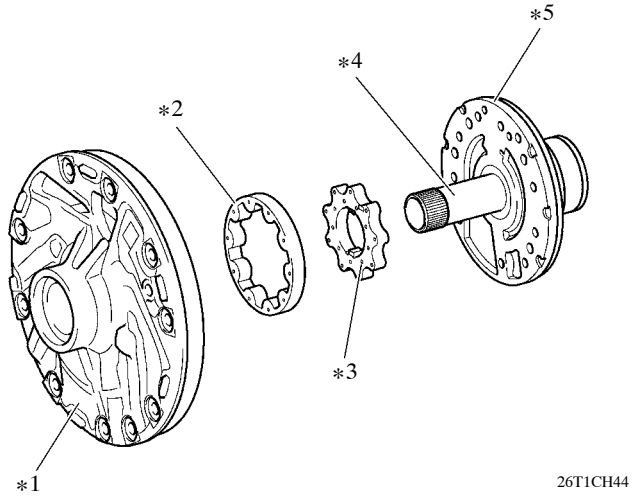


▶ Text in Illustration ◀

*1	Lock-up Clutch	*2	Damper
*3	1-way Clutch	*4	Stator
*5	Fluid Coupler	*6	Pump Impeller
*7	Laser Welded Portion	*8	Turbine Runner

(c) Oil Pump Assembly

(1) The oil pump is operated by the torque converter assembly. It lubricates the planetary gear units and supplies operating fluid pressure for hydraulic control. The front oil pump drive gear is continually driven by the engine via the pump impeller. The pump has sufficient capacity to supply the necessary fluid pressure throughout all speed ranges, as well as in reverse.

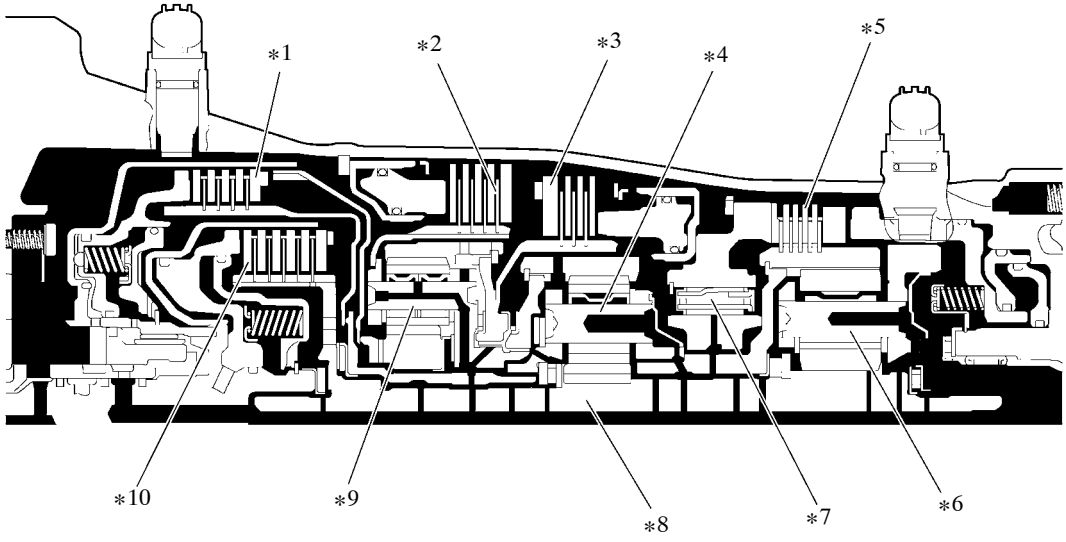


▶ Text in Illustration ◀

*1	Front Oil Pump Body Sub-assembly	*2	Front Oil Pump Driven Gear
*3	Front Oil Pump Drive Gear	*4	Stator Shaft Assembly
*5	Oil Pump Cover	—	—

(d) Planetary Gear Unit

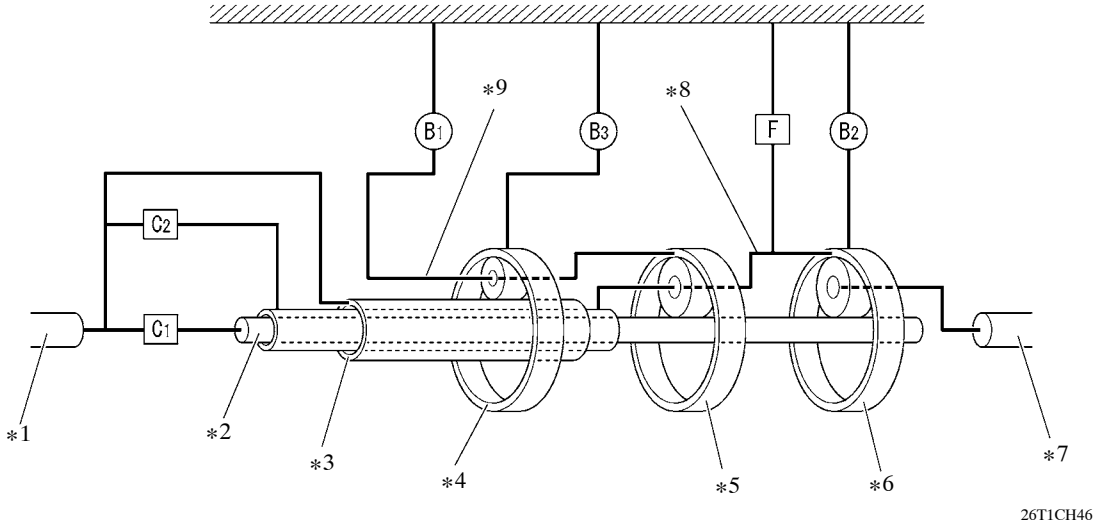
(1) The gear train consists of 2 multi-plate clutches, 3 multi-plate brakes, a 1-way clutch, and 3 sets of planetary gears each consisting of a sun gear, a pinion gear and a ring gear.



26T1CH45

▶ Text in Illustration ◀

*1	No. 2 Clutch (C_2)	*2	No. 1 Brake (B_1)
*3	No. 3 Brake (B_3)	*4	Center Planetary Gear Assembly
*5	No. 2 Brake (B_2)	*6	Rear Planetary Gear Assembly
*7	1-way Clutch Assembly	*8	Intermediate Shaft
*9	Front Planetary Gear Assembly	*10	No. 1 Clutch (C_1)



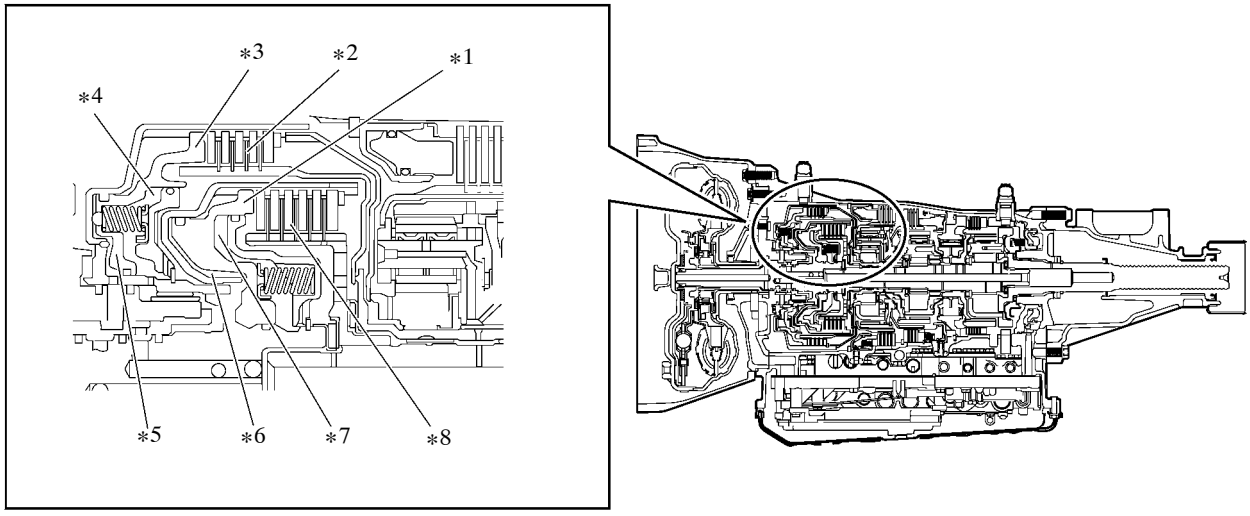
▶ Text in Illustration ◀

∗1	Input Shaft	∗2	Intermediate Shaft
∗3	Front Planetary Sun Gear Assembly	∗4	Front Planetary Gear Assembly
∗5	Center Planetary Gear Assembly	∗6	Rear Planetary Gear Assembly
∗7	Output Shaft	∗8	Center Planetary Carrier
∗9	Front Planetary Carrier	—	—

(e) Centrifugal Fluid Pressure Canceling Mechanism

(1) The centrifugal fluid pressure canceling mechanism is used on the C_1 and C_2 clutches that are applied when shifting 2nd-3rd, 3rd-4th, 4th-5th and 5th-6th.

(2) Clutch shifting operation is affected not only by the valve body controlling fluid pressure but also by centrifugal fluid pressure that is present due to fluid in the clutch piston oil pressure chamber. The centrifugal fluid pressure canceling mechanism uses chamber B to reduce the affect applied to chamber A. As a result, smooth shifting with excellent response has been achieved.

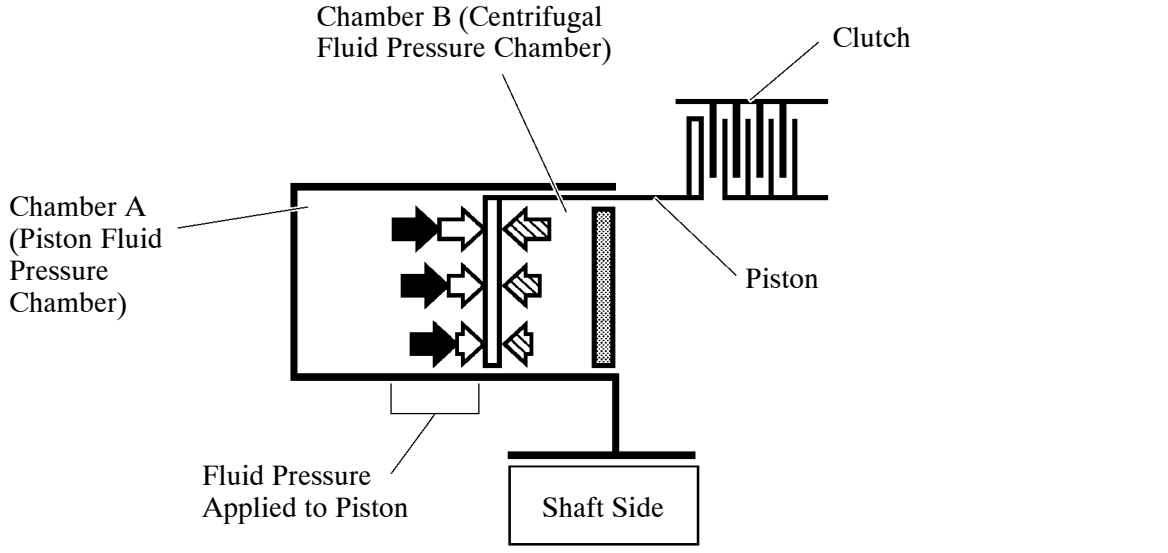


26T1CH72

▶ Text in Illustration ◀

*1	Piston (for C_1)	*2	No. 2 Clutch (C_2)
*3	Piston (for C_2)	*4	Chamber B (for C_2)
*5	Chamber A (for C_2)	*6	Chamber A (for C_1)
*7	Chamber B (for C_1)	*8	No. 1 Clutch (C_1)

(3) Chamber B is filled by fluid supplied to the shaft for lubrication. As a result of filling chamber B, the same amount of fluid pressure is present on both sides of the piston due to centrifugal force. This cancels the effects of fluid pressure on the piston caused by centrifugal force. Accordingly, it is not necessary to discharge the fluid through the use of a check ball, and highly responsive and smooth shifting characteristics are achieved.



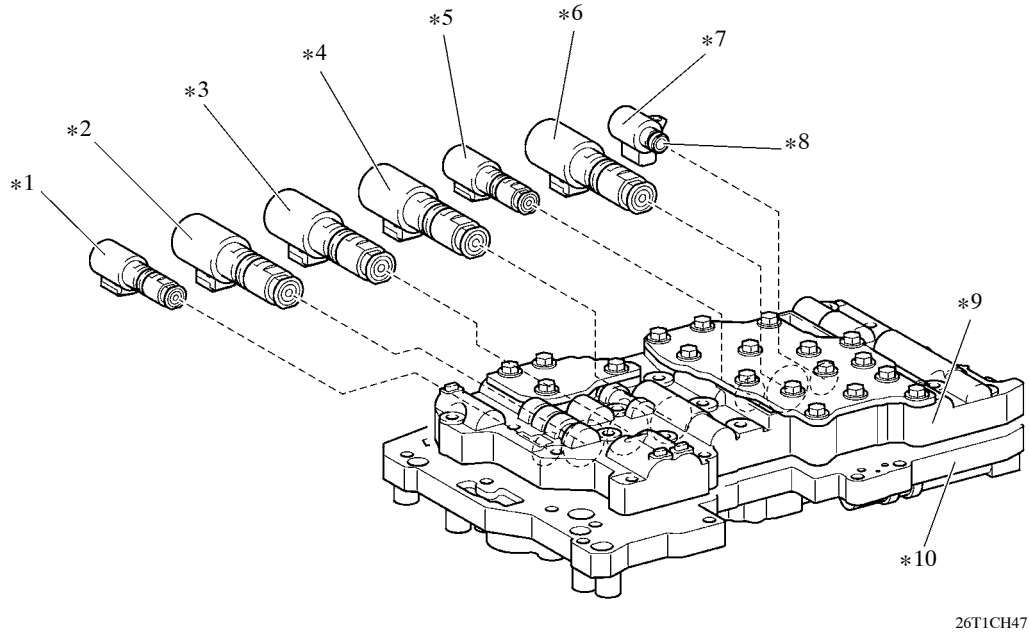
26T1CH73

▶ Text in Illustration ◀

26T1CH74	Target fluid pressure	26T1CH76	Centrifugal fluid pressure applied to chamber A
26T1CH75	Centrifugal fluid pressure applied to chamber B	—	—

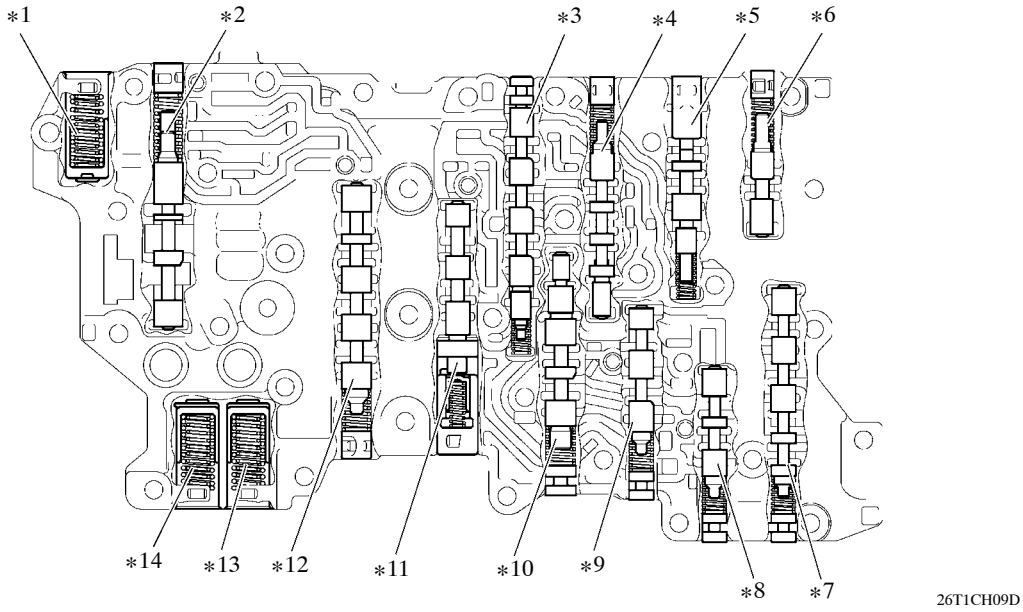
(f) Transmission Valve Body Assembly

(1) The transmission valve body assembly consists of upper and lower valve bodies and 7 shift solenoid valves.



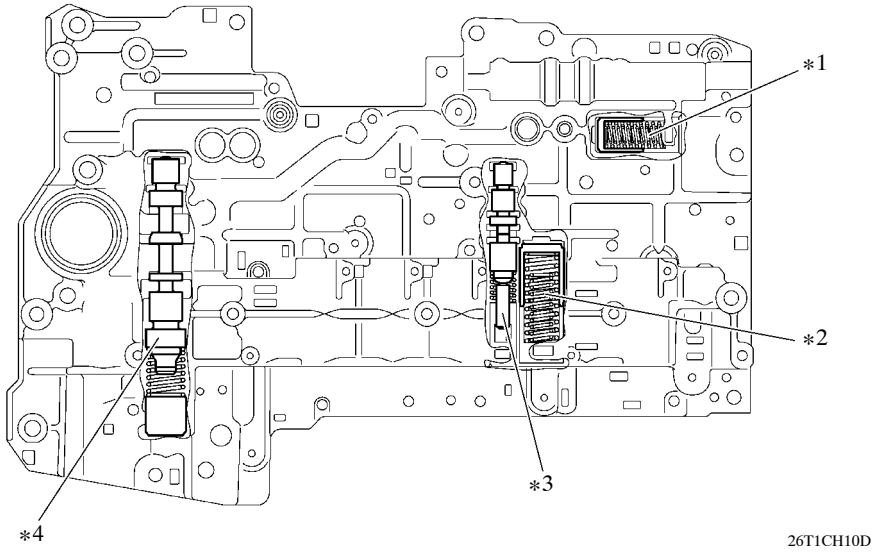
▶ Text in Illustration ◀

∗1	Shift Solenoid Valve (SLT) (Line Pressure Control Solenoid Assembly)	∗2	Shift Solenoid Valve SL1 (SL2)
∗3	Shift Solenoid Valve SL1 (SL1)	∗4	Shift Solenoid Valve SL1 (SL3)
∗5	Shift Solenoid Valve (SLU) (Lock Up Control Solenoid Assembly)	∗6	Shift Solenoid Valve SL1 (SL4)
∗7	Shift Solenoid Valve DSL (SL)	∗8	Strainer
∗9	Upper Valve Body	∗10	Lower Valve Body



▶ Text in Illustration (Upper Valve Body) ◀

*1	C_2 Damper	*2	Secondary Regulator Valve
*3	Sequence Valve	*4	Clutch Control Valve
*5	B_1 Apply Control Valve	*6	Solenoid Modulator Valve
*7	Solenoid Relay Valve	*8	B_1, B_4 Apply Control Valve
*9	B_4 Control Valve	*10	B_4 Apply Control Valve
*11	Lock-up Control Valve	*12	Lock-up Relay Valve
*13	B_2 Damper	*14	SLT Damper



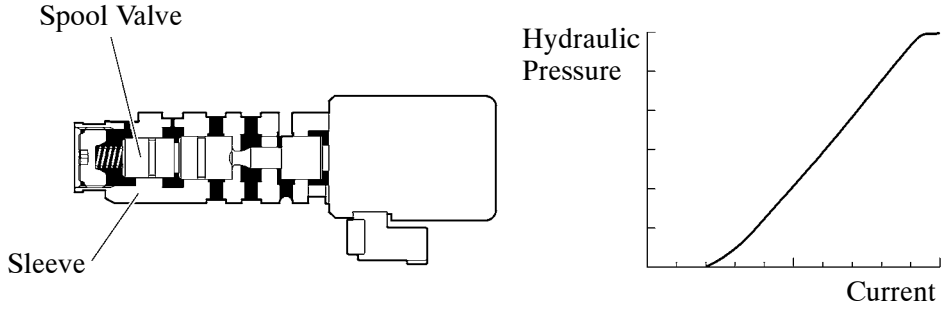
▶ Text in Illustration (Lower Valve Body Cover) ◀

*1	B_1 Damper	*2	C_1 Accumulator
*3	B_2 Apply Control Valve	*4	Primary Regulator Valve

(g) Shift Solenoid Valves SL1, SL2, SL3, SL4, SLT (Line Pressure Control Solenoid Assembly) and SLU (Lock Up Control Solenoid Assembly)

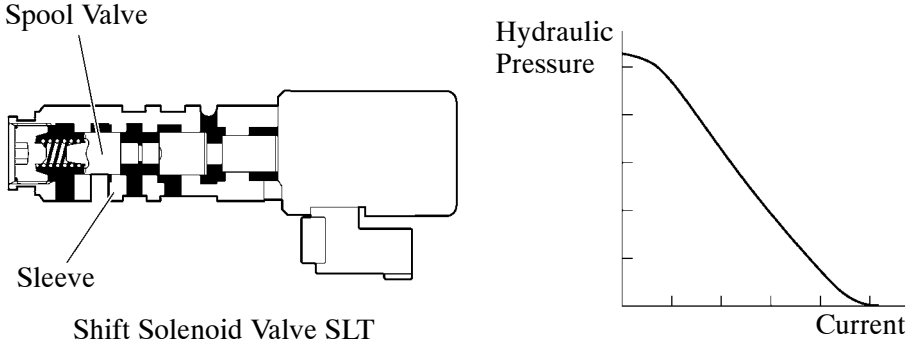
(1) Shift solenoid valves have been provided for controlling clutch engagement hydraulic pressure (SL1, SL2), lock-up clutch (SLU), Line hydraulic pressure (SLT), and brake engagement hydraulic pressure (SL3, SL4).

(2) By directly controlling the hydraulic pressure for each clutch and brake with high flow rate Shift solenoid valves (SL1, SL2, SL3 and SL4), shift-change responsiveness has been improved, shift shocks have been reduced, and the structure has been simplified through the reductions of oil passage lengths and the numbers of components.



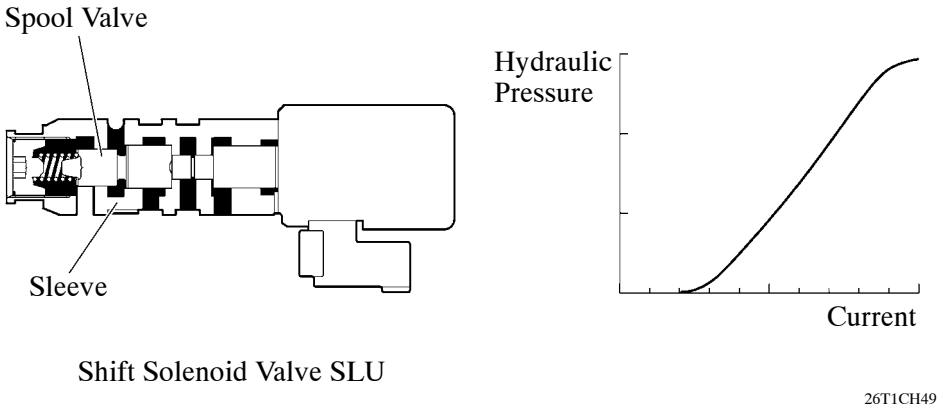
Shift Solenoid Valves SL1, SL2, SL3 and SL4

26T1CH48



Shift Solenoid Valve SLT

26T1CH50



Shift Solenoid Valve SLU

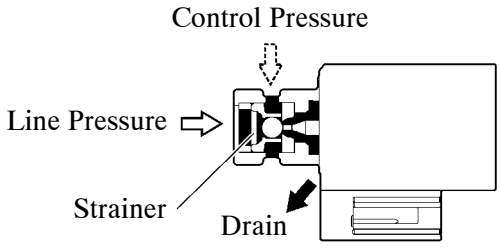
26T1CH49

▶ **Function of Shift Solenoid Valves SL1, SL2, SL3, SL4, SLT (Line Pressure Control Solenoid Assembly) and SLU (Lock Up Control Solenoid Assembly)** ◀

Shift Solenoid Valve	Function
SL1	Performs shift controls.
SL2	Performs shift controls.
SL3	Performs shift controls.
SL4	Performs shift controls.
SLT	Line pressure control.
SLU	● Performs lock-up clutch controls. ● Performs B_2 brake hydraulic pressure controls (only for the 1st range when the S position is selected).

(h) Shift Solenoid Valve SL

(1) A shift solenoid valve DSL (SL) has been provided for switching lock-up hydraulic pressure and B_2 brake hydraulic pressure.



Shift Solenoid Valve SL

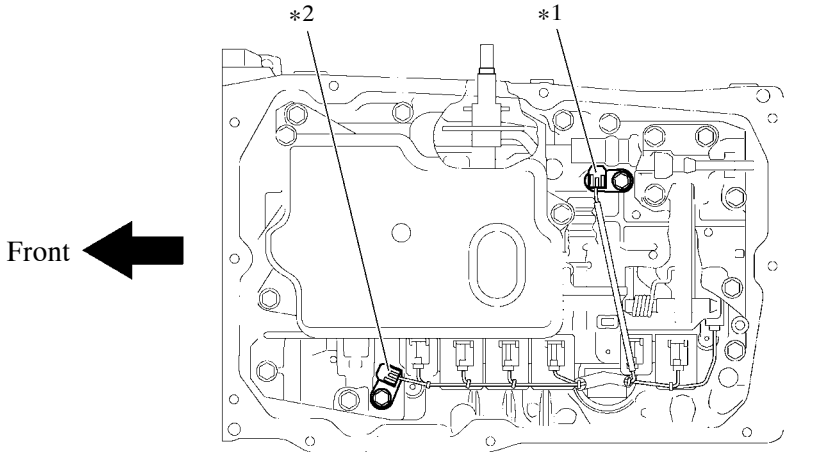
26T1CH51

▶ Function of Shift Solenoid Valve SL ◀

Shift Solenoid Valve	Function
SL	Shifts supplies to both lock-up hydraulic pressure and B_2 brake hydraulic pressure.

(i) ATF Temperature Sensor

(1) The ATF temperature sensors are used for hydraulic pressure control. These sensors are used for revision of the pressure that is used to apply clutches and brakes in the transmission. This helps to ensure smooth shift quality.



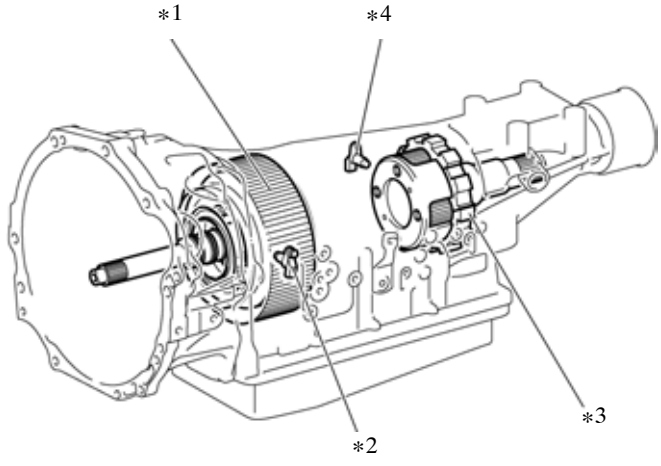
26T1CH52

▶ Text in Illustration ◀

*1	No. 1 ATF Temperature Sensor	*2	No. 2 ATF Temperature Sensor

(j) Transmission Revolution Sensors

(1) This automatic transmission uses a transmission revolution sensor (for NT signal) and a transmission revolution sensor (for SP2 signal). Thus, the ECM can detect the timing of the shifting of the gears and appropriately control the engine torque and hydraulic pressure in response to various conditions.
(2) These transmission revolution sensors are the pick-up coil type.
(3) The transmission revolution sensor (for NT signal) detects the input speed of the transmission. The direct multiple disc clutch assembly is used as the timing rotor for this sensor.
(4) The transmission revolution sensor (for SP2 signal) detects the output speed of the transmission. The parking lock gear on the rear planetary gear is used as the timing rotor for this sensor.

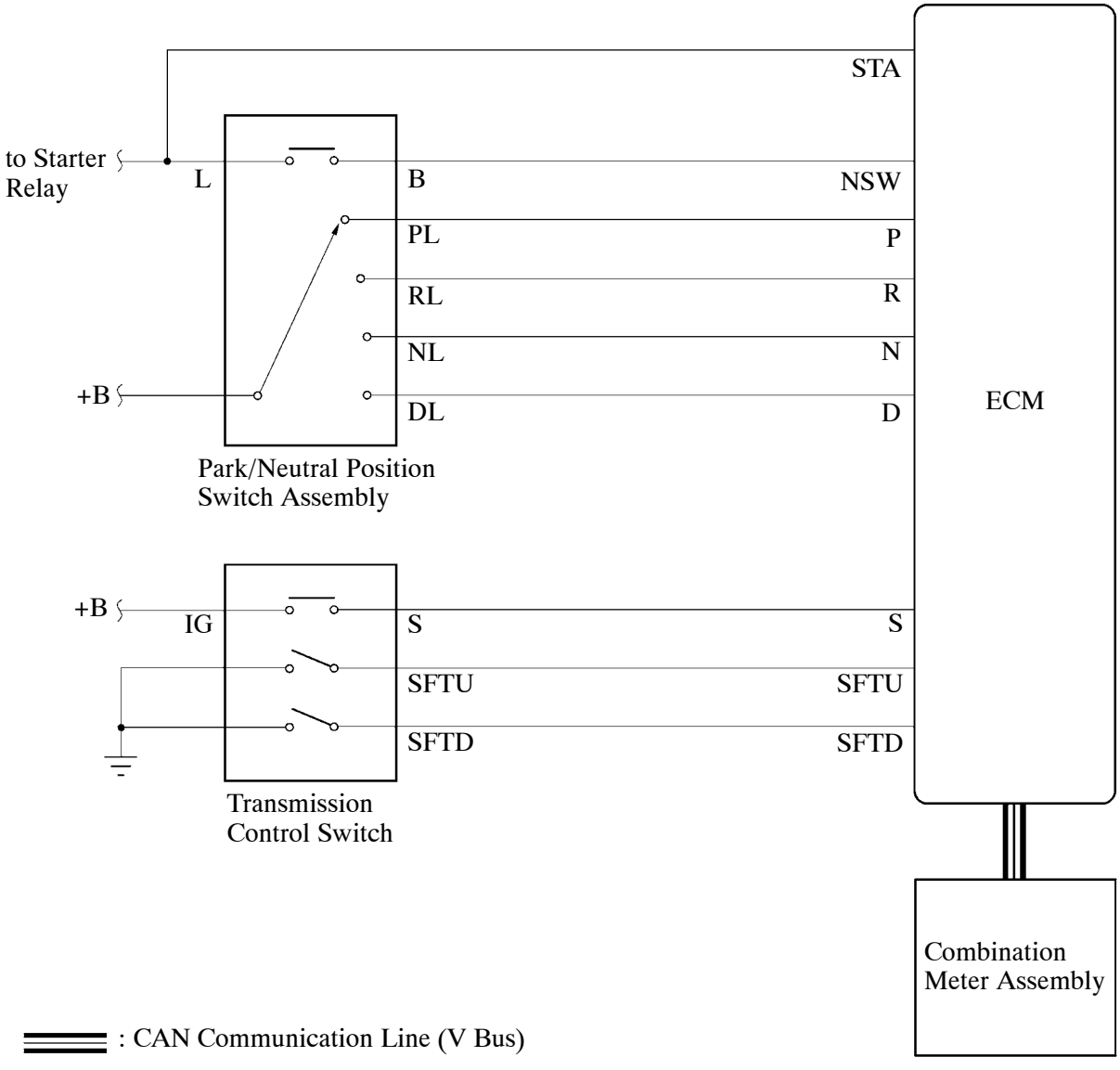


▶ Text in Illustration ◀

*1	Direct Multiple Disc Clutch Assembly	*2	Transmission Revolution Sensor (NT)
*3	Parking Lock Gear	*4	Transmission Revolution Sensor (SP2)

(k) Park/Neutral Position Switch Assembly and Transmission Control Switch

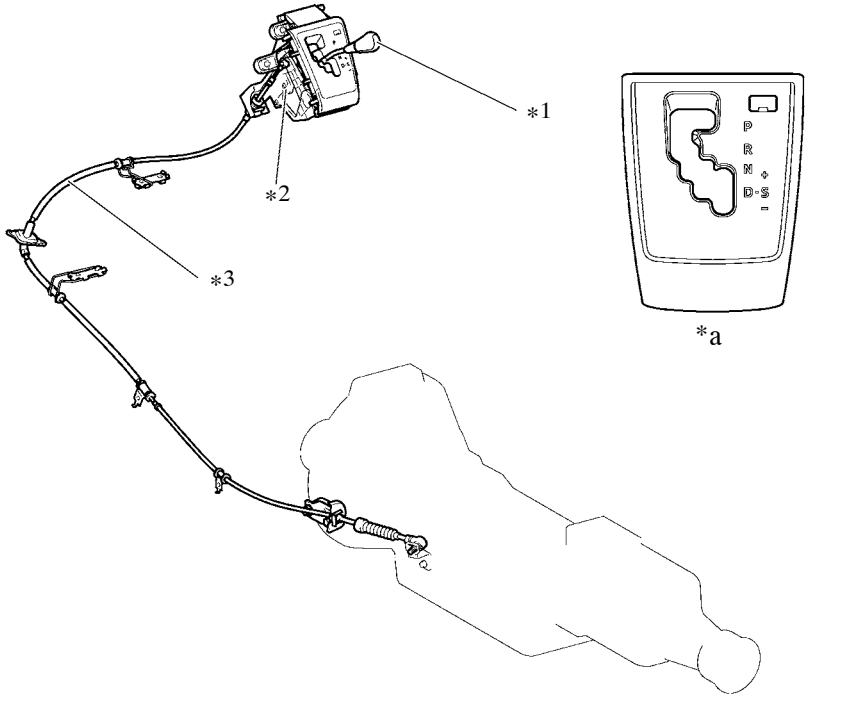
(1) The ECM uses the park/neutral position switch assembly and the transmission control switch to detect the shift lever position.
(2) The park/neutral position switch assembly sends the P, R, N, D and NSW signals to the ECM. The ECM also sends signals to the shift position indicator light "P, R, N, and D" in the combination meter assembly via CAN.
(3) The transmission control switch is located in the shift lock control unit assembly to detect the S mode position and to inform the ECM. The ECM turns on the S mode indicator light in the combination meter assembly.
(4) The transmission control switch detects whether the shift lever is in D or S, and detects the operating conditions of the shift lever ["+" (forwards) or "–" (backwards)] when the S mode is selected, and sends signals to the ECM. At this time, the ECM turns on the shift range indicator in the combination meter assembly via CAN for the selected shift range.



26T1CH54

(l) Shift Control Mechanism

(1) A gate type shift lever that uses a transmission control cable assembly is used.
(2) The shift control mechanism consists of a shift lock control unit assembly and a transmission control cable assembly.



▶ Text in Illustration ◀

*1	Shift Lever Knob Sub-assembly	*2	Shift Lock Control Unit Assembly
*3	Transmission Control Cable Assembly	—	—
*a	Shift Pattern	—	—

5. Operation

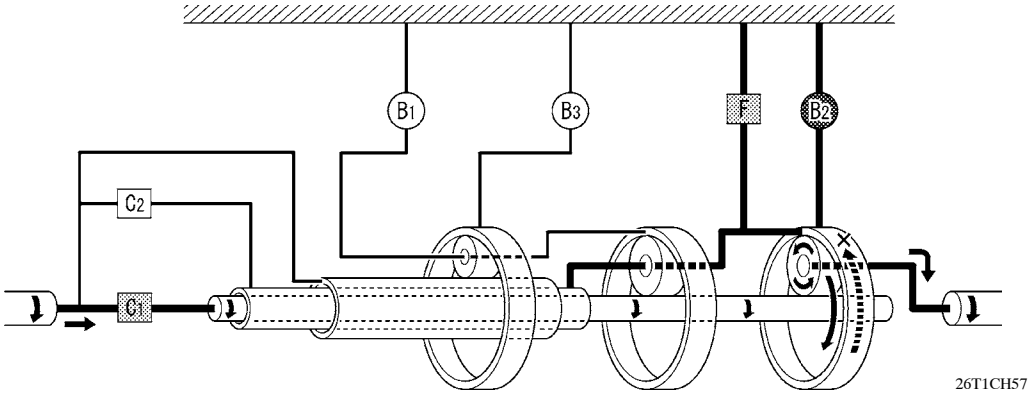
(a) Transmission Power Flow

▶ Operating Condition ◀

Shift Lever Position and Gear Range	Gear Position	Shift Solenoid Valve						Clutch		Brake			1-way Clutch
		SL1	SL2	SL3	SL4	SL	SLU	C_1	C_2	B_1	B_2	B_3	F
P	Park	Off	Off	Off	Off	Off	Off	—	—	—	—	—	—
R	Reverse	Off	Off	Off	On	Off	Off	—	—	—	○	○	—
N	Neutral	Off	Off	Off	Off	Off	Off	—	—	—	—	—	—
D, S6	1st	On	Off	Off	Off	Off	Off	○	—	—	—	—	○
	2nd	On	Off	On	Off	On	Off	○	—	○	—	—	—
	3rd	On	Off	Off	On	On	Off	○	—	—	—	○	—
	4th	On	On	Off	Off	On	On	○	○	—	—	—	—
	5th	Off	On	Off	On	On	On	—	○	—	—	○	—
	6th	Off	On	On	Off	On	On	—	○	○	—	—	—
S5	1st	On	Off	Off	Off	Off	Off	○	—	—	—	—	○
	2nd	On	Off	On	Off	On	Off	○	—	○	—	—	—
	3rd	On	Off	Off	On	On	Off	○	—	—	—	○	—
	4th	On	On	Off	Off	On	On	○	○	—	—	—	—
	5th	Off	On	Off	On	On	On	—	○	—	—	○	—
S4	1st	On	Off	Off	Off	Off	Off	○	—	—	—	—	○
	2nd	On	Off	On	Off	On	Off	○	—	○	—	—	—
	3rd	On	Off	Off	On	On	Off	○	—	—	—	○	—
	4th	On	On	Off	Off	On	On	○	○	—	—	—	—
S3	1st	On	Off	Off	Off	Off	Off	○	—	—	—	—	○
	2nd	On	Off	On	Off	On	Off	○	—	○	—	—	—
	3rd	On	Off	Off	On	On	Off	○	—	—	—	○	—
S2	1st	On	Off	Off	Off	Off	Off	○	—	—	—	—	○
	2nd	On	Off	On	Off	On	Off	○	—	○	—	—	—
S1	1st	On	Off	Off	Off	Off	Off	○	—	—	—	—	○
	Engine Braking Occurs	On	Off	Off	Off	Off	On	○	—	—	○	—	○

HINT:
○: Operates
—: Does not operate

(1) 1st Gear (Shift Lever in D or S)



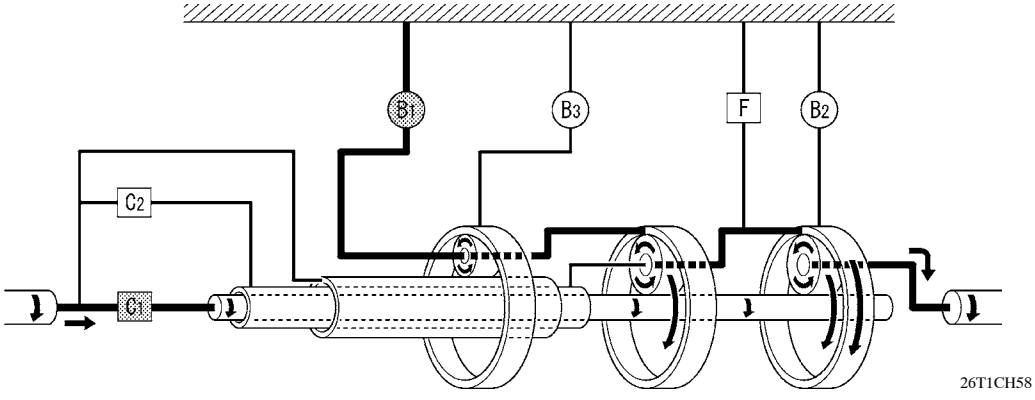
▶ Text in Illustration ◀

26T1CH70	Operates during engine breaking	26T1CH71	Operates

	C_1	C_2	B_1	B_2	B_3	F	Gear Ratio
1st	○	—	—	(○)	—	○	3.600

HINT:
○: Operates
(○): Engine braking occurs
—: Does not operate

(2) 2nd Gear (Shift Lever in D or S)



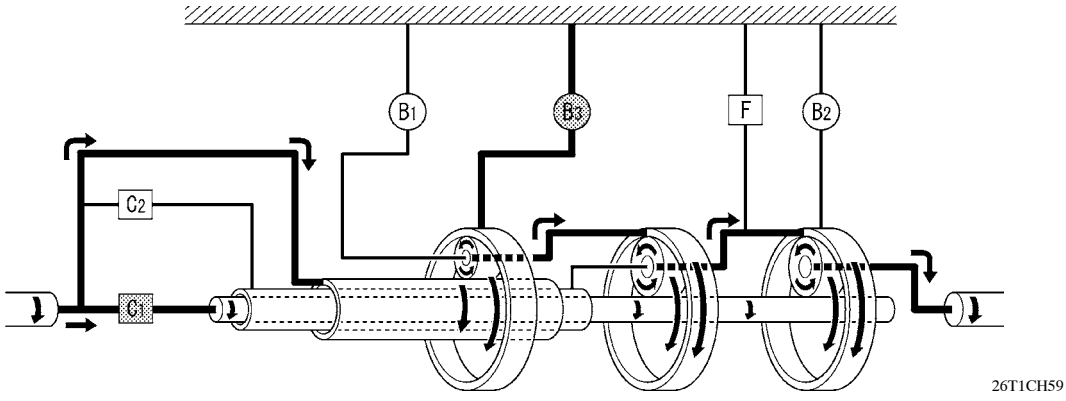
▶ Text in Illustration ◀

26T1CH71	Operates	—	—

	C_1	C_2	B_1	B_2	B_3	F	Gear Ratio
2nd	○	—	○	—	—	—	2.090

HINT:
○: Operates
—: Does not operate

(3) 3rd Gear (Shift Lever in D or S)



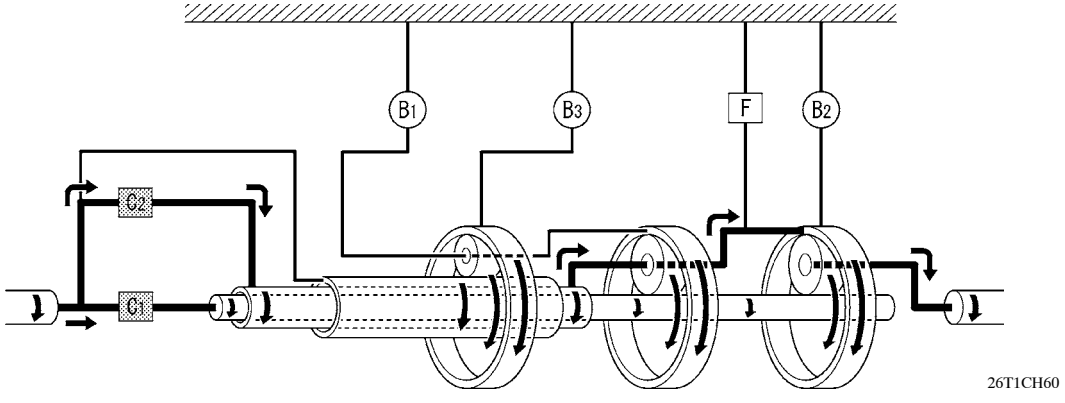
▶ Text in Illustration ◀

26T1CH71	Operates	—	—

	C_1	C_2	B_1	B_2	B_3	F	Gear Ratio
3rd	○	—	—	—	○	—	1.488

HINT:
○: Operates
—: Does not operate

(4) 4th Gear (Shift Lever in D or S)



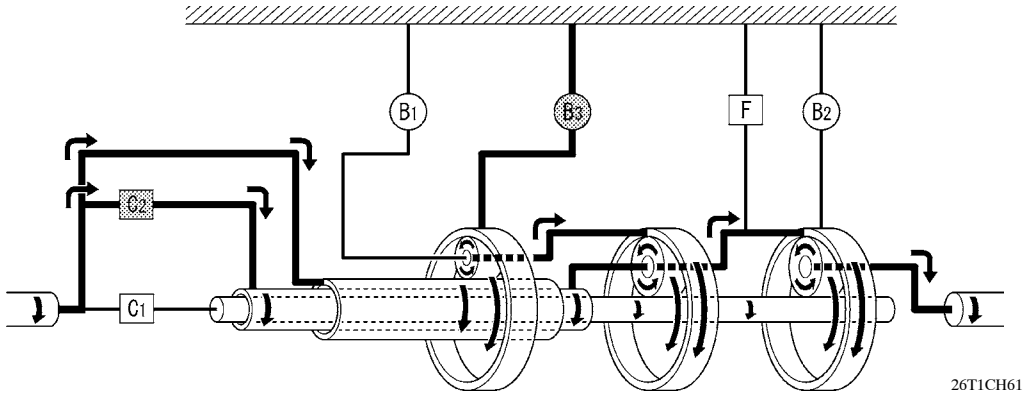
▶ Text in Illustration ◀

26T1CH71	Operates	—	—

	C_1	C_2	B_1	B_2	B_3	F	Gear Ratio
4th	○	○	—	—	—	—	1.000

HINT:
○: Operates
—: Does not operate

(5) 5th Gear (Shift Lever in D or S)



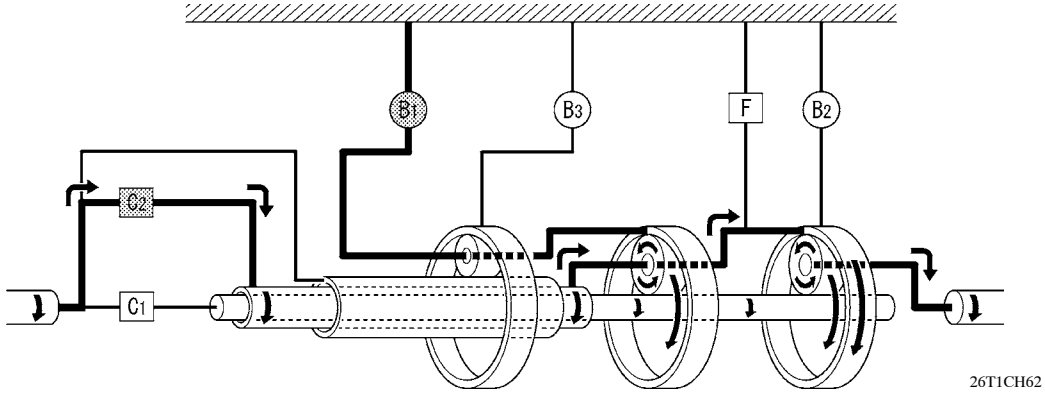
▶ Text in Illustration ◀

26T1CH71	Operates	—	—

	C_1	C_2	B_1	B_2	B_3	F	Gear Ratio
5th	—	○	—	—	○	—	0.687

HINT:
○: Operates
—: Does not operate

(6) 6th Gear (Shift Lever in D or S)



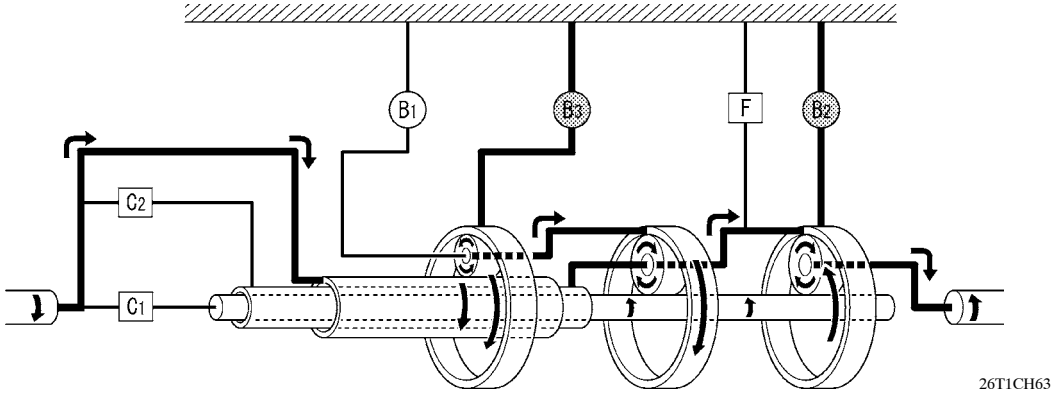
▶ Text in Illustration ◀

26T1CH71	Operates	—	—

	C_1	C_2	B_1	B_2	B_3	F	Gear Ratio
6th	—	○	○	—	—	—	0.580

HINT:
○: Operates
—: Does not operate

(7) Reverse Gear (Shift Lever in R)



▶ Text in Illustration ◀

26T1CH71	Operates	—	—

	C_1	C_2	B_1	B_2	B_3	F	Gear Ratio
R	—	—	—	○	○	—	3.732

HINT:
○: Operates
—: Does not operate

6. Fail-Safe

(a) The fail-safe function minimizes the loss of operability when an abnormality occurs in a sensor or a solenoid.

▶ Fail-safe Control List ◀

Malfunction Part	Function
Transmission Revolution Sensor (NT)	During a transmission revolution sensor (NT) malfunction, shift control is effected based on the transmission revolution sensor (SP2) signal.
Transmission Revolution Sensor (SP2)	During a transmission revolution sensor (SP2) malfunction, shift control is effected based on the speed sensors signal.
ATF Temperature Sensors (No. 1 and No. 2)	During an temperature sensor malfunction, upshifting to 5th and 6th are prohibited.
Shift Solenoid Valve SL1 (SL1, SL2, SL3 and SL4)	Stops the conduction of electric power to a failed solenoid and shifts gears by turning on/off normal solenoids. If all solenoids are malfunctioning, gears will be selected through mechanical hydraulic circuits.
Shift Solenoid Valve (SLT) (Line Pressure Control Solenoid Assembly)	During a shift solenoid valve (SLT) (line pressure control solenoid assembly) malfunction, the current to the shift solenoid valve is stopped. However, shifting is effected through normal clutch pressure control.
Shift Solenoid Valve (SLU) (Lock Up Control Solenoid Assembly)	During a shift solenoid valve (SLU) (lock up control solenoid assembly) malfunction, the current to the shift solenoid valve is stopped. This stops lock-up control, thus decreasing fuel economy.
Range Contact	Detects errors on shift positions through range contact signals.

7. Diagnosis

(a) When the ECM detects a malfunction, it makes a diagnosis and memorizes the failed section. Furthermore, the ECM illuminates or blinks the MIL in the combination meter assembly to inform the driver.

(b) The ECM will also store the Diagnostic Trouble Codes (DTCs) of the malfunctions.

(c) The DTCs can be read by connecting a Global TechStream (GTS) to the DLC3.

(d) For details, refer to the corresponding Repair Manual for this model.