05ILO–01

SYSTEM DESCRIPTION

1. COMPONENTS AND FUNCTION

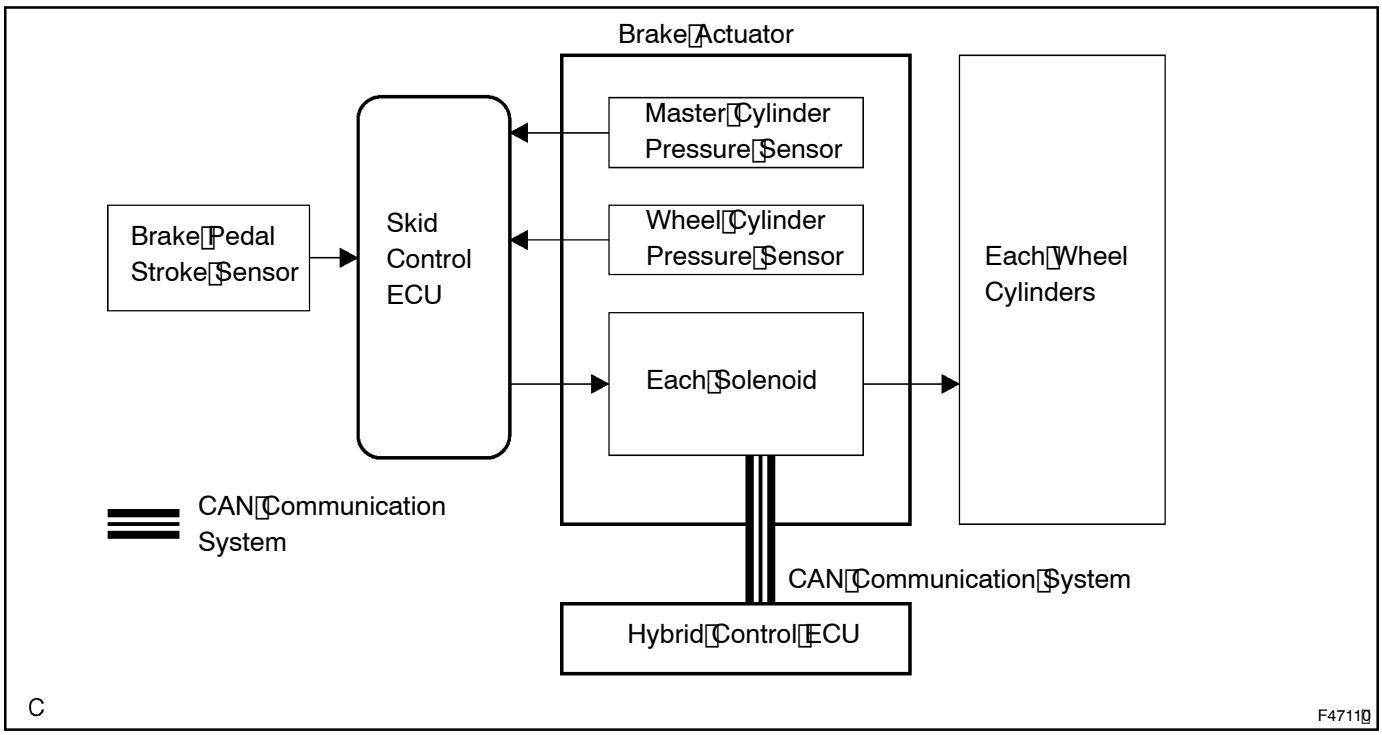
Skid Control ECU (*)	Calculates brake control in accordance with sensor/ECU signals or communication with the hybrid ECU.
Brake Control Power Supply Assy (*)	Charges the capacitor inside the unit and supplies power source to the system by discharging when the voltage of the vehicle's power source drops.
Speed sensor	Detects speed of each wheel and inputs the data into the skid control ECU.
Pedal stroke sensor (*)	Detects brake pedal stroke and inputs the data into the skid control ECU.
Yaw rate/deceleration sensor (*)	Detects forward/rearward and lateral acceleration, and then inputs the data into the skid control ECU
Steering sensor	Detects steering wheel angle and steering wheel direction, and then inputs the data into the skid control ECU.
Accumulator	Accumulates fluid pressure generated by the pump.
Accumulator pressure sensor (PACC)	Detects accumulator pressure and inputs the data into the skid control ECU.
Master cylinder	Generates pressure according to pedal effort.
Brake fluid reservoir	Stores master cylinder system/power supply system brake fluid. The brake fluid level warning switch built into the reservoir detects decrease of brake fluid.
Stroke simulator	Generates smooth pedal stroke in accordance with pedal effort during system control.
Stroke simulator cut valve (SCSS)	Changes intake/cutoff of brake fluid from master cylinder to stroke simulator. Sends oil pressure generated in master cylinder to stroke simulator during system control. Cuts brake fluid flow from master cylinder to stroke simulator when system is not controlling.
Master cylinder pressure sensor 1, 2 (PMC1, PMC2)	Detects fluid pressure inside the master cylinder and inputs the data into the skid control ECU.
Relief valve	Releases brake fluid into the reservoir and prevents excessively high power supply system pressure when the pump operates continuously due to malfunctions in parts such as accumulator oil pressure sensor.
Wheel cylinder pressure sensor	Detects the pressure in each wheel cylinder and inputs the data into the skid control ECU.
ABS No.1 relay ABS No.2 relay	Supplies power to each solenoid according to the skid control ECU signals. Supplies power to the skid control ECU. Stores power source after turning the power source off.
ABS MTR1 relay ABS MTR2 relay	Supplies power to each motor according to the skid control ECU signals. Drives relay1 under normal condition and drives relay 2 under the ABS operation. Substitutes relay operation when one relay malfunctions.
Changeover solenoid valve (SMC1, SMC2)	The changeover solenoid valve switches the brake hydraulic pressure passage depending on whether the system is in operation or not operation.
Linear solenoid valve (SLA##, SLR##)	Controls wheel cylinder hydraulic pressure according to regenerative braking force in order to generate braking force required by the driver under normal brake operation. Controls the hydraulic pressure of each wheel cylinder under ABS, VSC+ brake operation. SLA## adjusts the pressure increase level. SLR## adjusts the pressure decrease level.
Stop lamp switch	Illuminates the brake light when the brake pedal is depressed. (Sends brake ON signal to skid control ECU)
BRAKE warning light (Red)	Informs the driver that there is trouble with the ECB (normal brake) by turning on. Informs the driver when the parking brake is applied and brake fluid level drops by turning on.
BRAKE warning light ((Yellow) Brake Control warning light)	Informs the driver when there is trouble with ECB or a problem with the brake system that has no influence on driving, by turning on.
ABS warning light	Informs the driver that there is trouble with ABS by illuminating the light.
VSC warning light	Informs the driver that there is trouble with VSC+ by illuminating the light.
SLIP indicator	Informs the driver that VSC+, and ABS are operating by blinking the light.
Skid control buzzer	Informs the driver when there is trouble with the hydraulic pressure source or power source by continuous buzzer sound. Informs that VSC+ is operating by an intermittent buzzer sound.

*: The initialization of linear solenoid valve and calibration must be performed when the skid control ECU, actuator, stroke sensor, brake control power supply assy, yaw rate (deceleration) sensor, and steering sensor are replaced (see page 05–721).
It is necessary to perform zero point calibration of yaw rate/deceleration sensor (see page 05–723).

2. OPERATION DESCRIPTION

ECB (Electronically Controlled Brake):

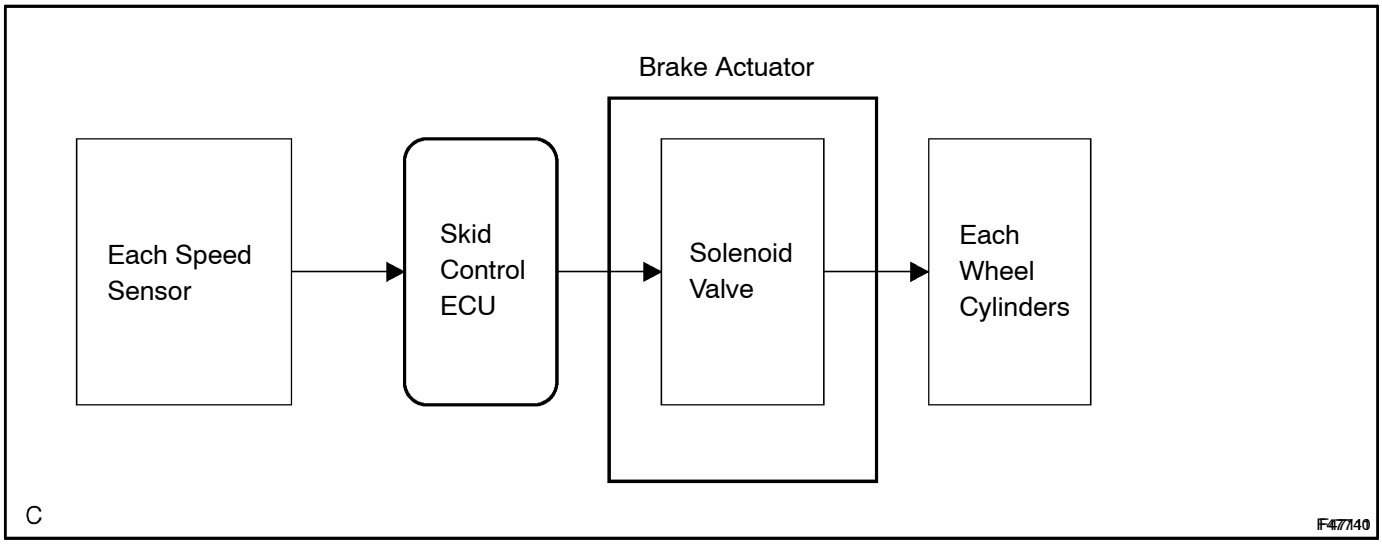
The skid control ECU receives signals from the pedal stroke sensor, master cylinder sensor and wheel cylinder pressure sensor. Based on these signals, the skid control ECU calculates necessary braking force for each wheel. The necessary hydraulic pressure braking force signal is sent to the Hybrid Control ECU via CAN communication. The skid control ECU receives a braking force (regenerative braking force) signal from the HV motor via CAN communication. The ECU calculates the necessary hydraulic pressure braking force based on the necessary braking force and regenerative braking force.
Necessary hydraulic pressure is supplied to each wheel by adjusting the brake accumulator (hydraulic pressure source) pressure with each solenoid valve.
If there is a problem with braking function, rest normally operating parts will maintain brake control as a fail–safe.



ABS with EBD & VSC+:

The skid control ECU receives a vehicle speed signal from each speed sensor and detects wheel's slip condition and then sends a control signal to the solenoid.

The solenoid valve controls each wheel cylinder's hydraulic pressure and optimizes hydraulic pressure allocation to each wheel cylinder.



BA (Brake Assist):

The skid control ECU receives the brake pedal stroke sensor signal and hydraulic pressure signal from the master cylinder pressure sensor and determines whether brake assist operation is necessary or not. If it is determined that brake assist operation is necessary, the ECU changes target hydraulic pressure applied to each wheel.

