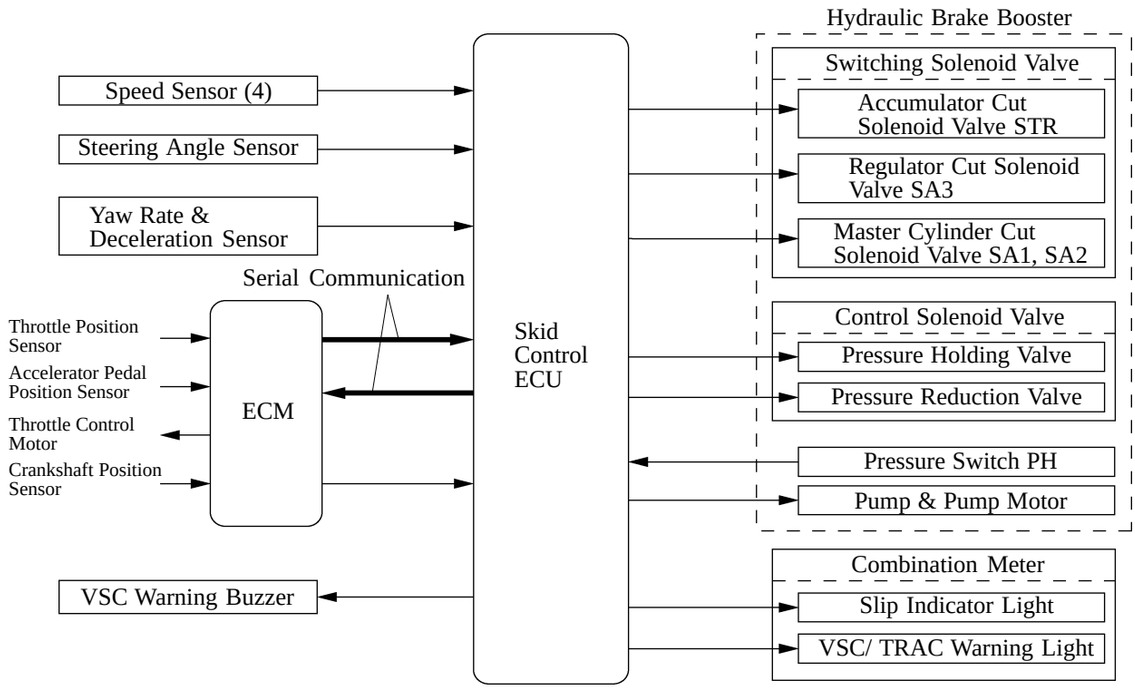
VSC Operation

1) General

- Based on the information provided by various sensors, switches, and the ECM, the skid control ECU determines the vehicle's yaw moment. Then, the skid control ECU controls the fluid pressure that is generated by the pump & pump motor and applies it by way of the solenoid valves to the brake wheel cylinder of each wheel in the following 3 modes: pressure reduction, pressure hold, and pressure increase modes. As a result, the tendency of the front wheels or the rear wheels to skid is restrained.
- At this time, the skid control ECU outputs a VSC operate signal to the ECM and the combination meter and causes the VSC warning buzzer to sound intermittently. Upon receiving this signal, the ECM effects throttle control to regulate the engine output. The combination meter causes the slip indicator light to blink.
- If the accumulator pressure drops during this operation, the skid control ECU receives the signals from the pressure switch PH and actuates the pump & pump motor to ensure the proper accumulator pressure.

▶ System Diagram ◀



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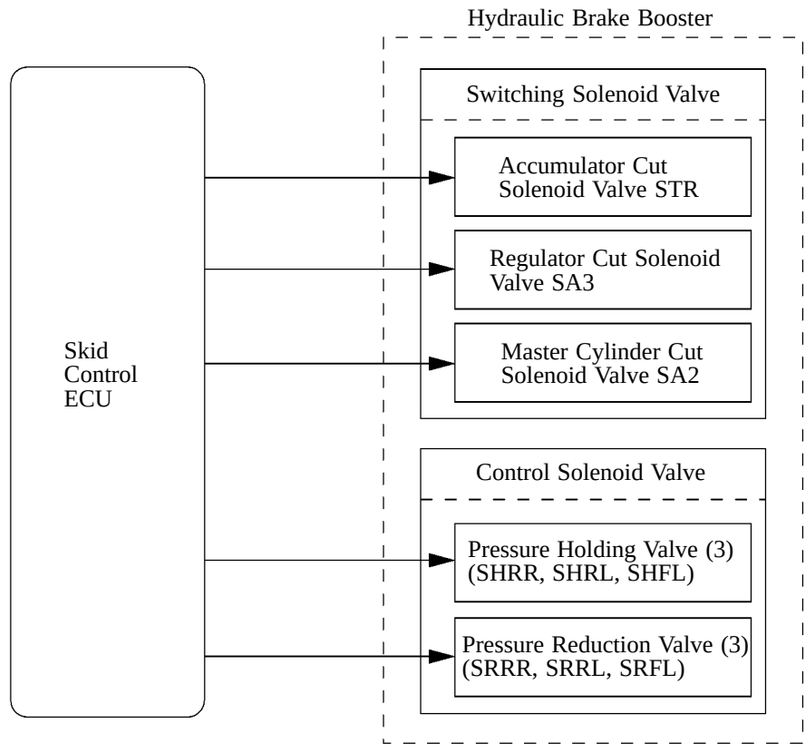
2) Front Wheel Skid Restraining Control (Turning to the Right)

In front wheel skid restraining control, the brakes of the rear wheels and front wheel of the outer side of the turn is applied. Also, depending on whether the brake is ON or OFF and the condition of the vehicle, there are circumstances in which the brake might not be applied to the wheels even if those wheels are targeted for braking. The diagram below shows the hydraulic circuit in the pressure increase mode, as it restrains a front wheel skid condition while the vehicle makes a right turn.
In other operating modes, the pressure holding valve and the pressure reduction valve are turned ON/OFF according to the ABS with EBD operation pattern.

▶ System Diagram ◀



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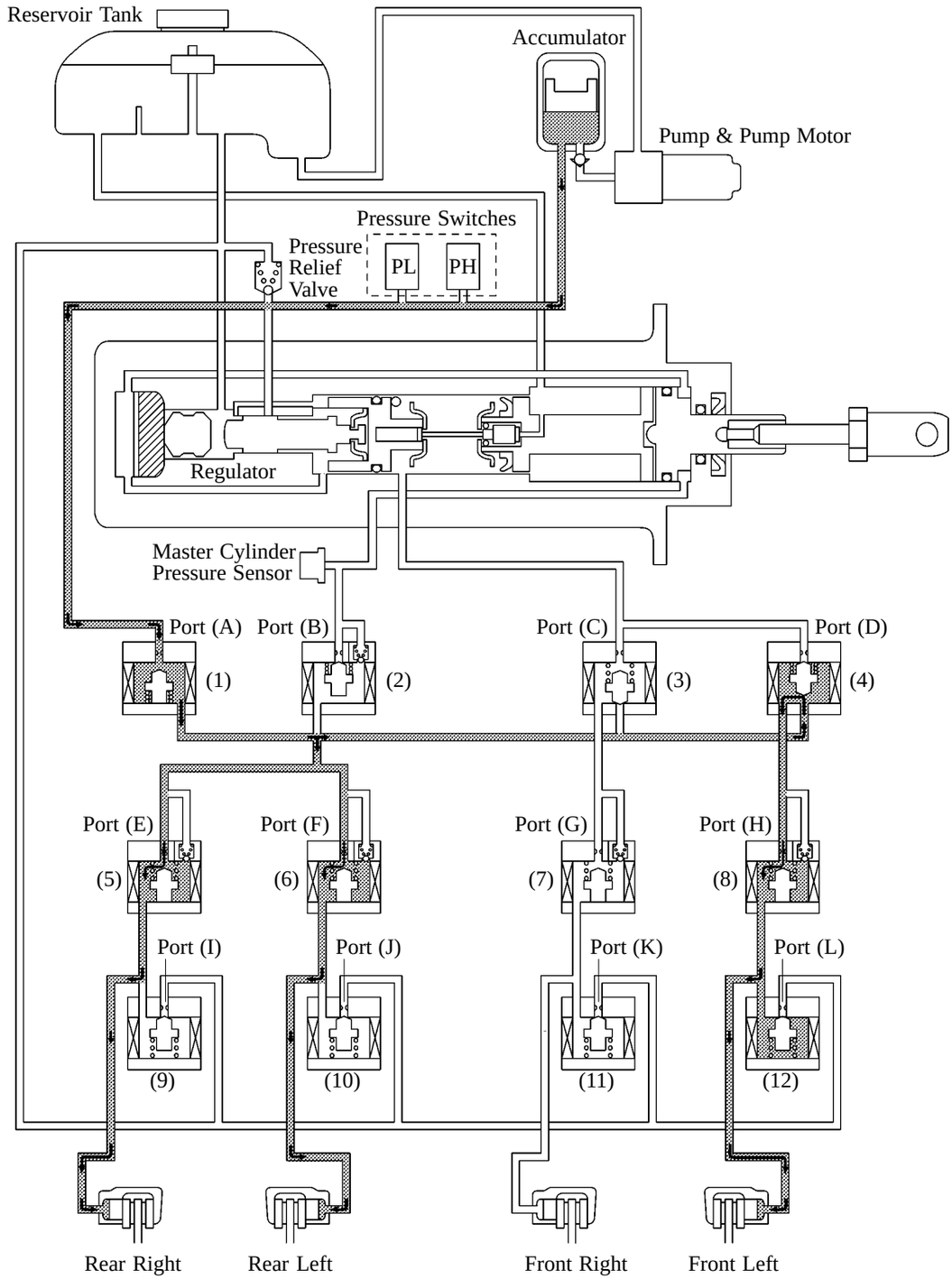

Increase Mode

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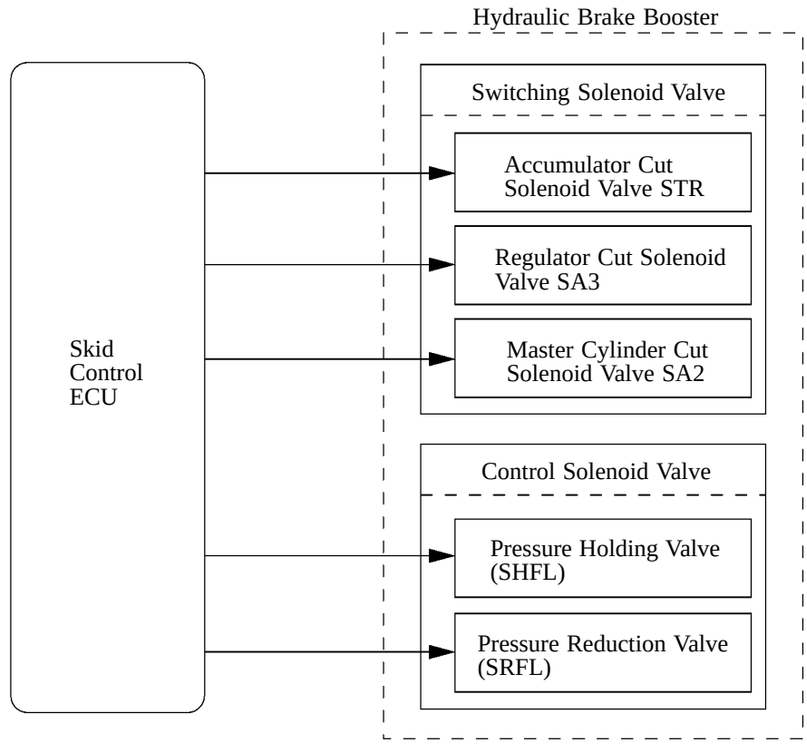
Item					VSC not Activated	VSC Activated		
						Increase Mode	Hold Mode	Reduction Mode
Switching Solenoid Valve		(1)	Accumulator Cut Solenoid Valve STR	Port (A)	OFF (Close)	ON (Open)	←	←
		(2)	Regulator Cut Solenoid Valve SA3	Port (B)	OFF (Open)	ON (Close)	←	←
		(3)	Master Cylinder Cut Solenoid Valve SA1	Port (C)	OFF (Open)	←	←	←
		(4)	Master Cylinder Cut Solenoid Valve SA2	Port (D)	OFF (Open)	ON (Close)	←	←
Control Solenoid Valve	Front Brake	(7)	Pressure Holding Valve	Port: (G)	OFF (Open)	←	←	←
		(8)	Pressure Holding Valve	Port: (H)	OFF (Open)	←	ON (Close)	←
		(11)	Pressure Reduction Valve	Port: (K)	OFF (Close)	←	←	←
		(12)	Pressure Reduction Valve	Port: (L)	OFF (Close)	←	←	ON (Open)
		Wheel Cylinder Pressure		Right	—	—	—	—
				Left	—	Increase	Hold	Reduction
	Rear Brake	(5), (6)	Pressure Holding Valve	Port: (E), (F)	OFF (Open)	←	ON (Close)	←
		(9), (10)	Pressure Reduction Valve	Port: (I), (J)	OFF (Close)	←	←	ON (Open)
		Wheel Cylinder Pressure			—	Increase	Hold	Reduction

3) Rear Wheel Skid Restraining Control (Turning to the Right)

In rear wheel skid restraining control, the brakes front wheel of the outer side of the turn is applied. Also, depending on whether the brake is ON or OFF and the condition of the vehicle, there are circumstances in which the brake might not be applied to the wheels even if those wheels are targeted for braking. The diagram below shows the hydraulic circuit in the pressure increase mode, as it restrains a rear wheel skid condition while the vehicle makes a right turn.
In other operating modes, the pressure holding valve and the pressure reduction valve are turned ON/OFF according to the ABS with EBD operation pattern.

▶ System Diagram ◀



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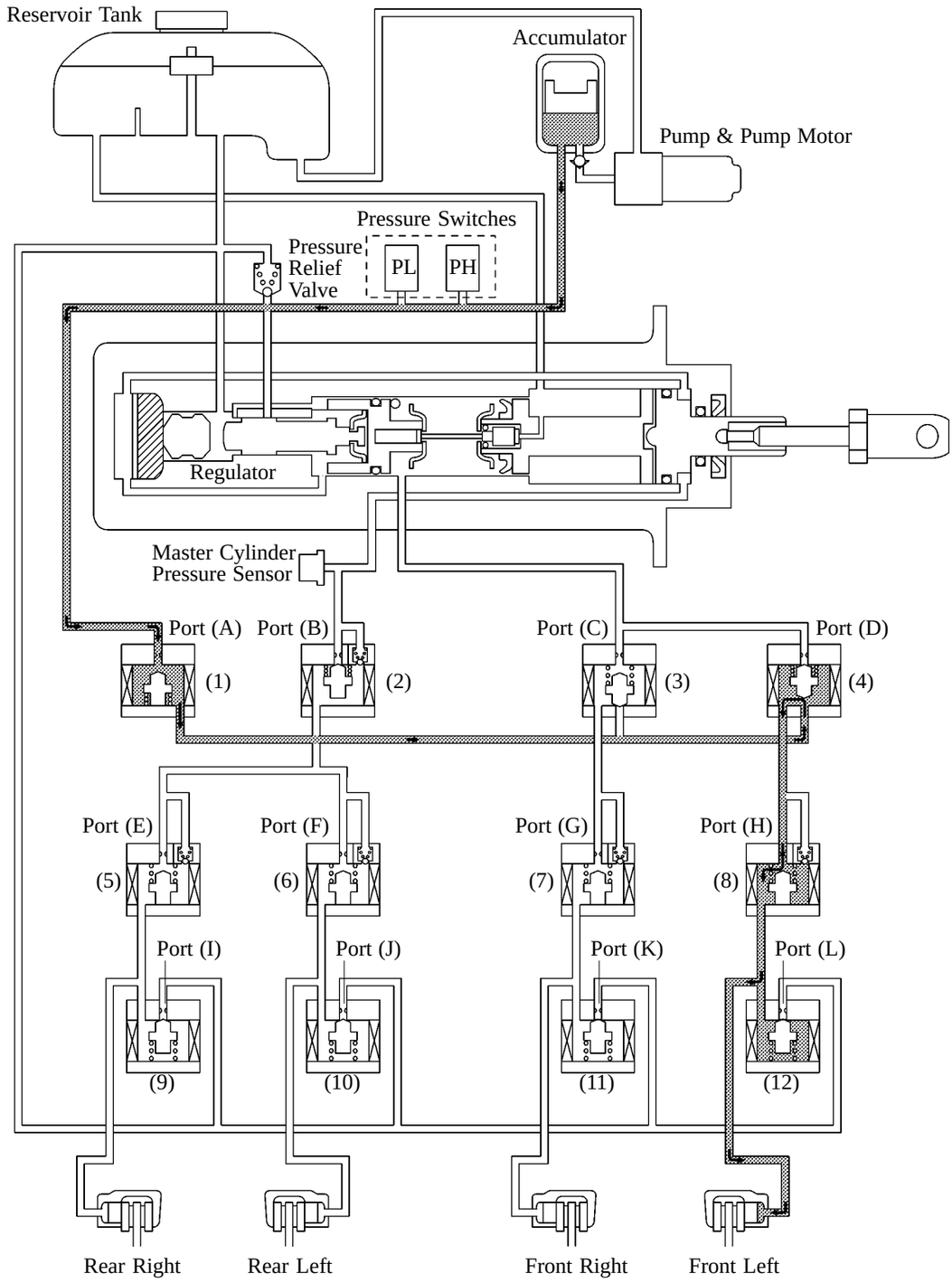


Increase Mode

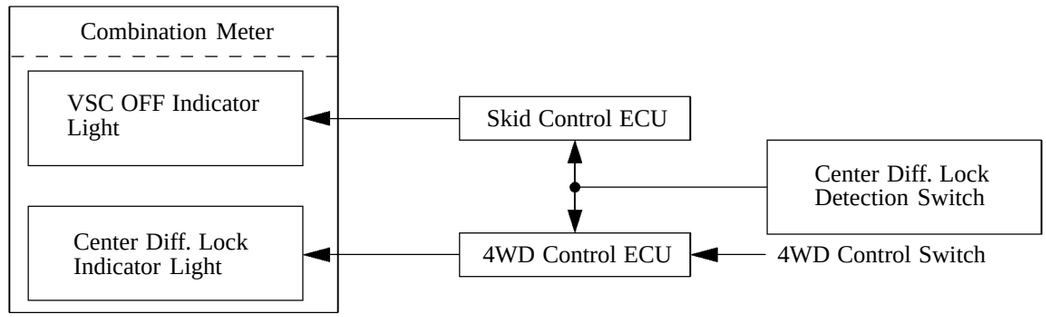
232CH136

Item					VSC not Activated	VSC Activated		
						Increase Mode	Hold Mode	Reduction Mode
Switching Solenoid Valve		(1)	Accumulator Cut Solenoid Valve STR		OFF (Close)	ON (Open)	←	←
			Port (A)					
		(2)	Regulator Cut Solenoid Valve SA3		OFF (Open)	ON (Close)	←	←
			Port (B)					
		(3)	Master Cylinder Cut Solenoid Valve SA1		OFF (Open)	ON (Close)	←	←
			Port (C)					
		(4)	Master Cylinder Cut Solenoid Valve SA2		OFF (Open)	←	←	←
			Port (D)					
Control Solenoid Valve	Front Brake	(7)	Pressure Holding Valve		OFF (Open)	←	←	←
			Port: (G)					
		(8)	Pressure Holding Valve		OFF (Open)	←	ON (Close)	←
			Port: (H)					
		(11)	Pressure Reduction Valve		OFF (Close)	←	←	←
			Port: (K)					
		(12)	Pressure Reduction Valve		OFF (Close)	←	←	ON (Open)
			Port: (L)					
		Wheel Cylinder Pressure		Right	—	—	—	—
				Left	—	Increase	Hold	Reduction
	Rear Brake	(5), (6)	Pressure Holding Valve		OFF (Open)	←	←	←
			Port: (E), (F)					
		(9), (10)	Pressure Reduction Valve		OFF (Close)	←	←	←
			Port: (I), (J)					
		Wheel Cylinder Pressure			—	—	—	—

4) VSC Prohibit Control (only for 4WD model)

When the center differential is locked, VSC is prohibited. At this time, the center differential indicator light and the VSC OFF indicator light turn ON. After the center differential is freed, the 2 indicator lights will turn OFF, and the VSC operation will turn ON.

▶ System Diagram ◀



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