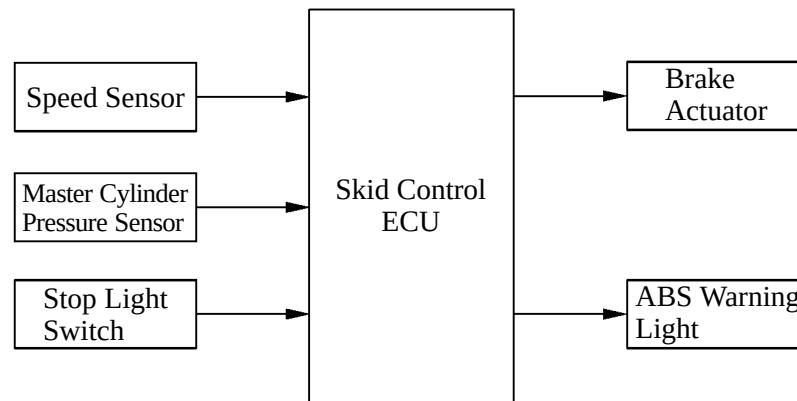


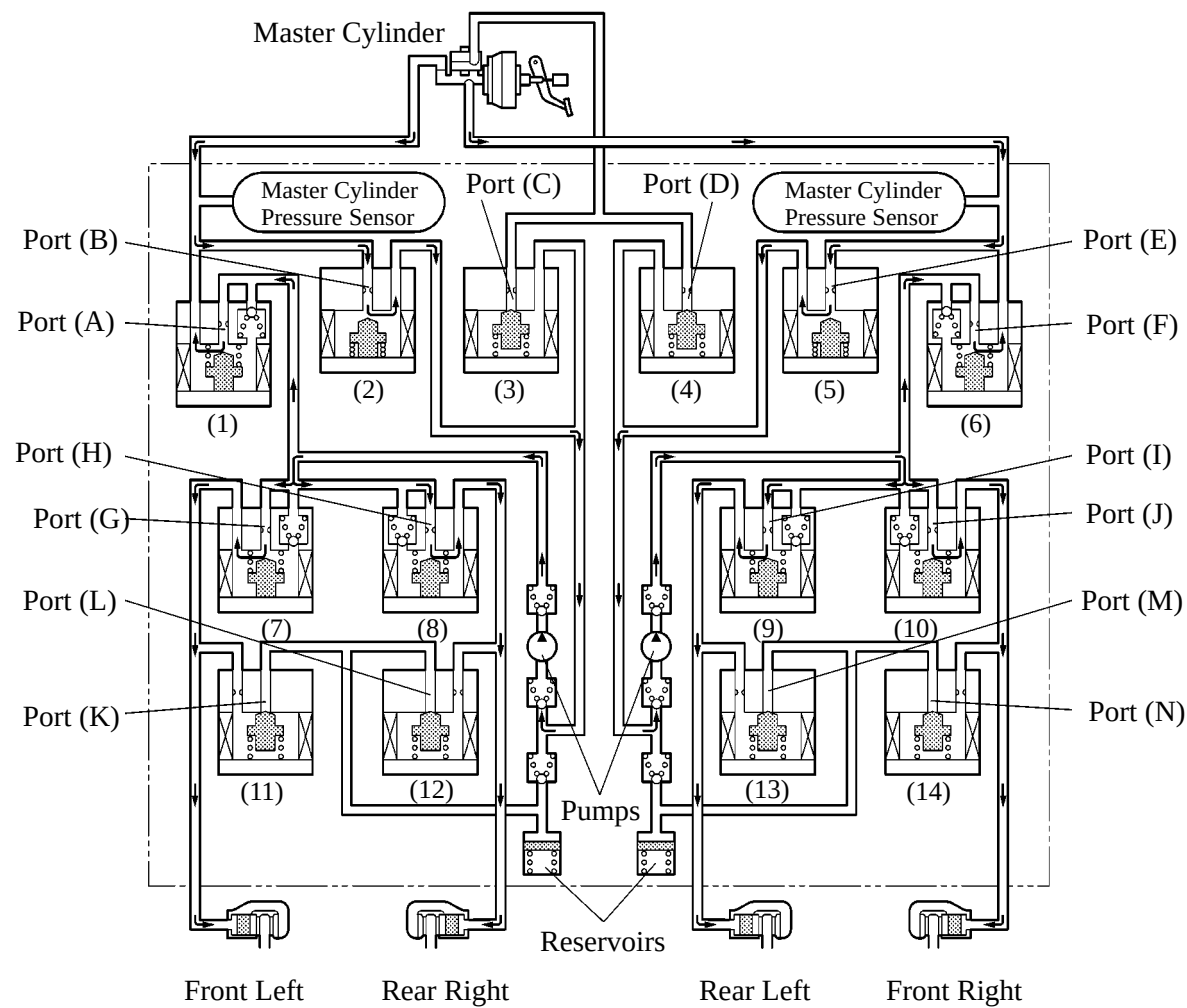
ABS with EBD Operation

The ABS with EBD operation is the same as the operation of the ABS with EBD system. Refer to that system for details.

Brake Assist Operation

The fluid pressure that has been generated by the pump in the brake actuator is directed to the wheel cylinders. By applying a greater fluid pressure than the master cylinder, a greater braking force is achieved.

► System Diagram ◀



208CH29

Item		Brake Assist Not Activated	Brake Assist Activated
(1), (6)	Master Cylinder Cut Solenoid Valve	OFF (Open)	ON*
	Port: (A), (F)		
(3), (4)	Reservoir Cut Solenoid Valve	OFF (Close)	OFF (Close)
	Port: (C), (D)		
(2), (5)	Suction Solenoid Valve	OFF (Close)	ON (Open)
	Port: (B), (E)		
(7), (8), (9), (10)	Pressure Holding Valve	OFF (Open)	OFF (Open)
	Port: (G), (H), (I), (J)		
(11), (12), (13), (14)	Pressure Reduction Valve	OFF (Close)	OFF (Close)
	Port: (K), (L), (M), (N)		

*: The solenoid valve controls the hydraulic pressure between “open” through “close” according to the operating condition by adjusting continually.

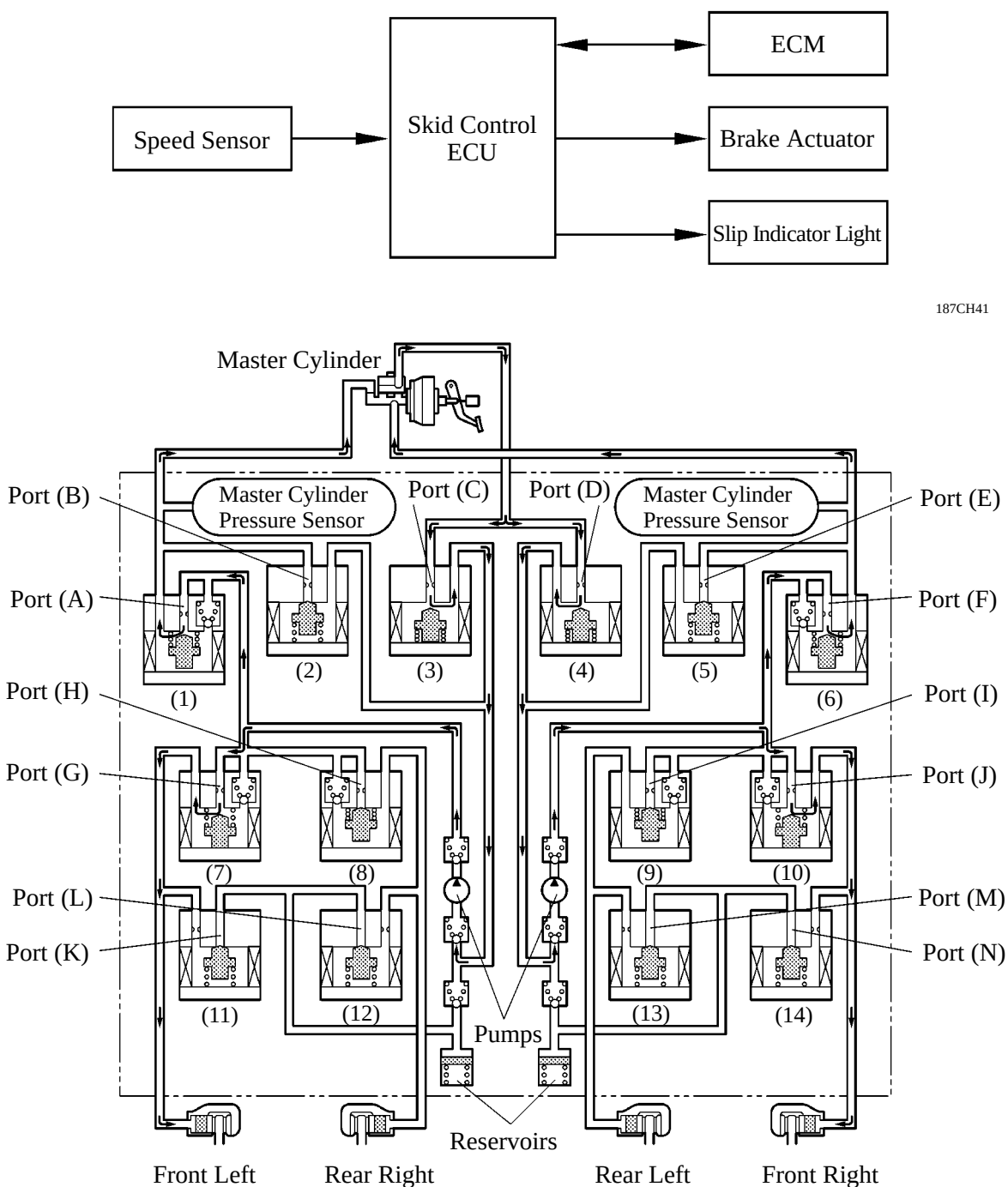
TRAC Operation

The fluid pressure that is generated by the pump is regulated by the master cylinder cut solenoid valve to the required pressure. Thus, the wheel cylinder of the drive wheels are controlled in the following 3 modes: pressure reduction, pressure holding, and pressure increase modes, to restrain the slippage of the drive wheels.

The diagram below shows the hydraulic circuit in the pressure increase mode when the TRAC system is activated.

In other, the pressure holding valve and the pressure reduction valve are turned ON/OFF according to the ABS operation pattern described on the previous page.

► System Diagram ◀



187CH41

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Item		TRAC not Activated	TRAC Activated			
			Increase Mode	Holding Mode	Reduction Mode	
(1), (6)	Master Cylinder Cut Solenoid Valve	OFF (Open)	ON*	ON*	ON*	
	Port: (A), (F)					
(3), (4)	Reservoir Cut Solenoid Valve	OFF (Close)	ON (Open)	ON (Open)	ON (Open)	
	Port: (C), (D)					
(2), (5)	Suction Solenoid Valve	OFF (Close)	OFF (Close)	OFF (Close)	OFF (Close)	
	Port: (B), (E)					
Front Brake	(7), (10)	Pressure Holding Valve	OFF (Open)	OFF (Open)	ON (Close)	ON (Close)
		Port: (G), (J)				
	(11), (14)	Pressure Reduction Valve	OFF (Close)	OFF (Close)	OFF (Close)	ON (Open)
		Port: (K), (N)				
	Wheel Cylinder Pressure		—	Increase	Hold	Reduction
Rear Brake	(8), (9)	Pressure Holding Valve	OFF (Open)	ON (Close)	ON (Close)	ON (Close)
		Port: (H), (J)				
	(12), (13)	Pressure Reduction Valve	OFF (Close)	OFF (Close)	OFF (Close)	OFF (Close)
		Port: (L), (M)				
	Wheel Cylinder Pressure		—	—	—	—

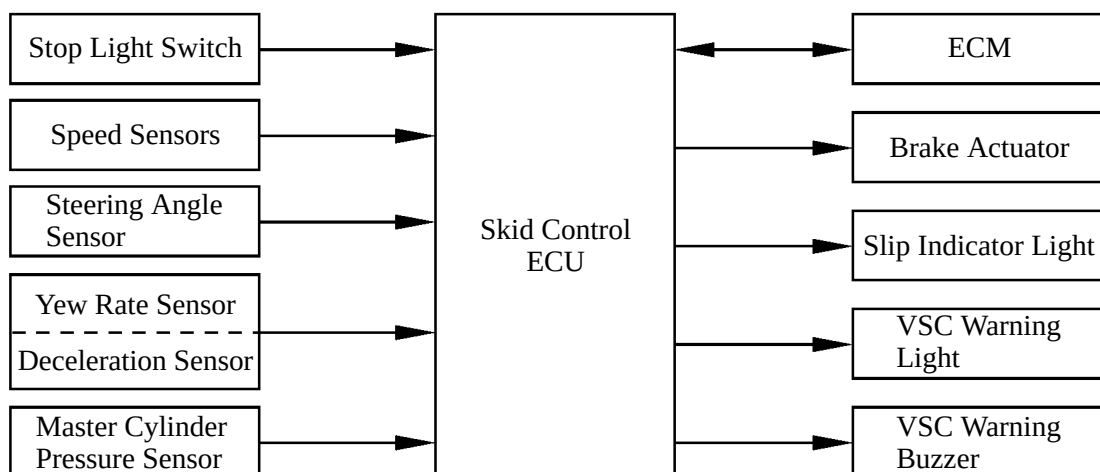
*: The solenoid valve controls the hydraulic pressure between “open” through “close” according to the operating condition by adjusting continually.

VSC Operation

1) General

The VSC system, by way of solenoid valves, controls the fluid pressure that is generated by the pump and applies it to the brake wheel cylinder of each wheel in the following 3 modes: pressure reduction, pressure holding, and pressure increase modes. As a result, the tendency to understeer or oversteer is restrained.

► System Diagram ◀



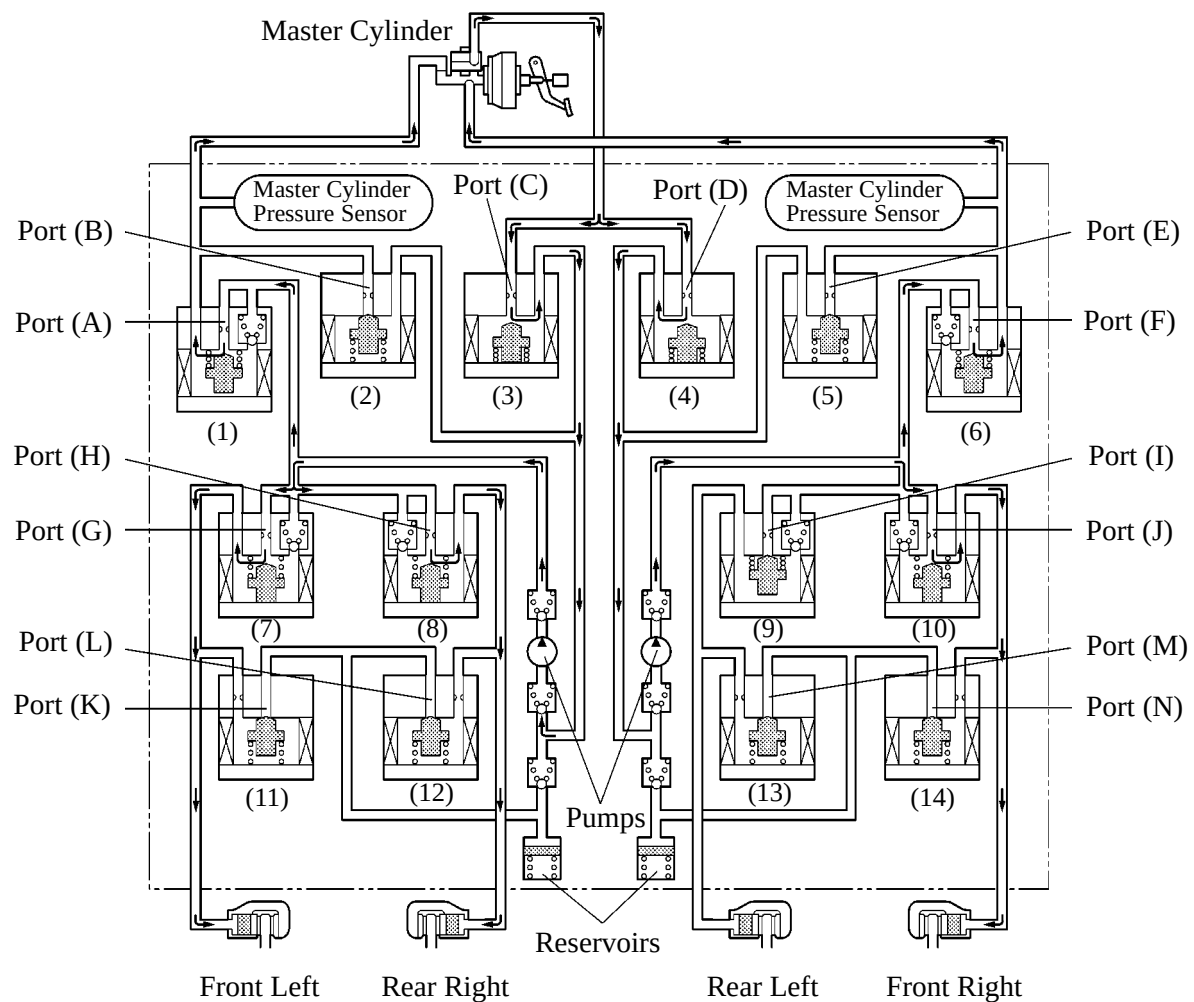
2) Understeer Restraining Control (Turning to the Right)

In understeer restraining control, the brake of the front wheels and rear wheel of the inner 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 an understeer condition while the vehicle makes a right turn.

In other, the pressure holding valve and the pressure reduction valve are turned ON/OFF according to the ABS operation pattern.



Increase Mode

208CH33

Item			VSC not Activated	VSC Activated			
				Increase Mode	Holding Mode	Reduction Mode	
(1), (6)	Master Cylinder Cut Solenoid Valve		OFF (Open)	ON*	ON*	ON*	
	Port: (A), (F)						
(3), (4)	Reservoir Cut Solenoid Valve		OFF (Close)	ON (Open)	ON (Open)	ON (Open)	
	Port: (C), (D)						
(2), (5)	Suction Solenoid Valve		OFF (Close)	OFF (Close)	OFF (Close)	OFF (Close)	
	Port: (B), (E)						
Front Brake	(7), (10)	Pressure Holding Valve	OFF (Open)	OFF (Open)	ON (Close)	ON (Close)	
		Port: (G), (J)					
	(11), (14)	Pressure Reduction Valve	OFF (Close)	OFF (Close)	OFF (Close)	ON (Open)	
		Port: (K), (N)					
	Wheel Cylinder Pressure		—	Increase	Hold	Reduction	
Rear Brake	(8)	Pressure Holding Valve (Rear Right)	OFF (Open)	OFF (Open)	ON (Close)	ON (Close)	
		Port: (H)					
	(9)	Pressure Holding Valve (Rear Left)	OFF (Open)	ON (Close)	ON (Close)	ON (Close)	
		Port: (I)					
	(12)	Pressure Reduction Valve (Rear Right)	OFF (Close)	OFF (Close)	OFF (Close)	ON (Open)	
		Port: (L)					
	(13)	Pressure Reduction Valve (Rear Left)	OFF (Close)	OFF (Close)	OFF (Close)	OFF (Close)	
		Port: (M)					
	Wheel Cylinder Pressure		Right	—	Increase	Hold	Reduction
			Left	—	—	—	—

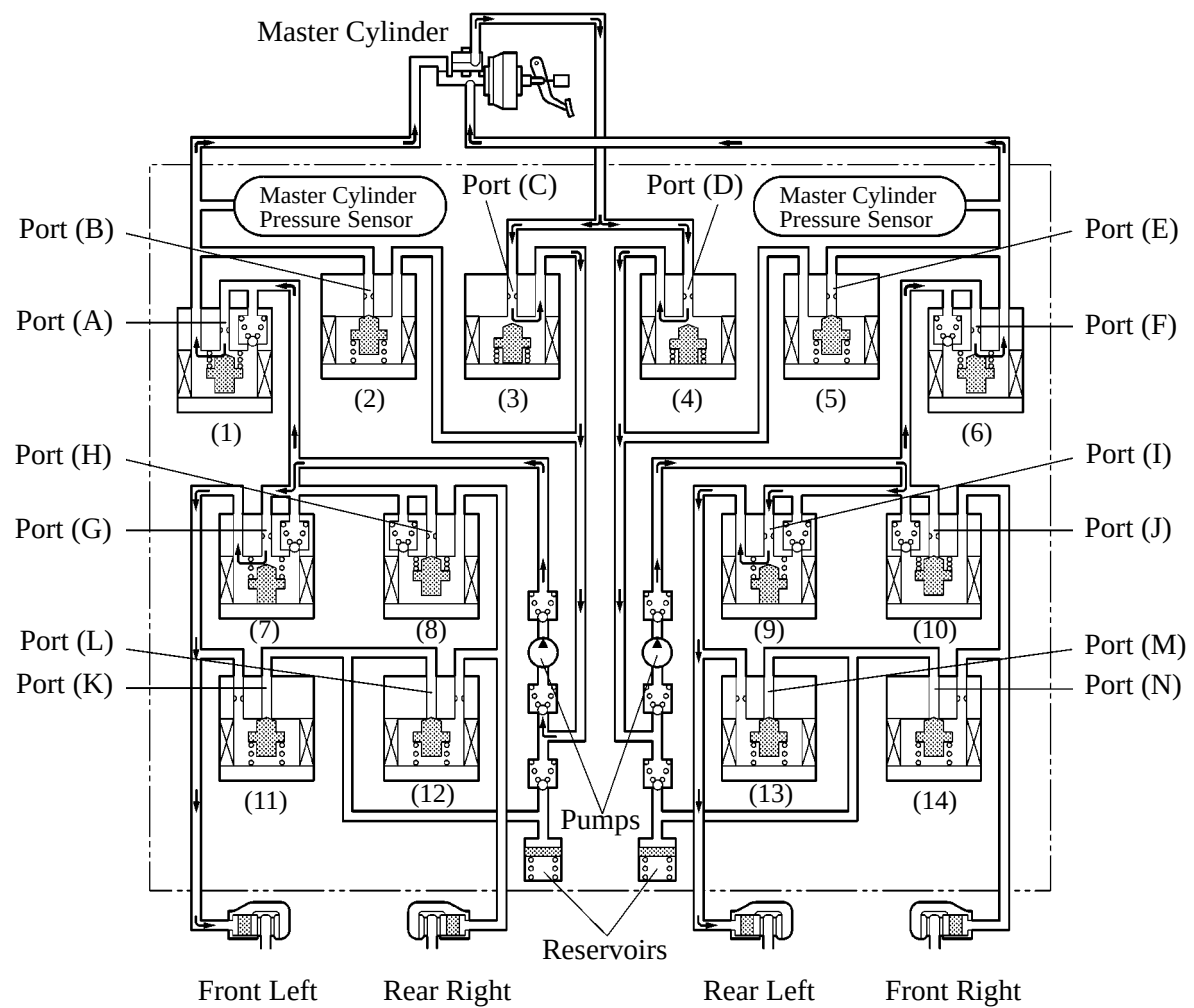
*: The solenoid valve controls the hydraulic pressure between “open” through “close” according to the operating condition by adjusting continually.

3) Oversteer Restraining Control (Turning to the Right)

In oversteer restraining control, the brake of the front and rear wheels of the outer side of the turn is applied. As an example, the diagram below shows the hydraulic circuit in the pressure increase mode, as it restrains an oversteer condition while the vehicle make a right turn.

As in understeer restraining control, in other, the pressure holding valve and the pressure reduction valve are turned ON/OFF according to the ABS operating pattern.

However, in oversteer control, the pressure holding valve is turned ON and blocks the hydraulic passage to the front inner wheel in order to prevent applying the brake to the front inner wheel.



Increase Mode

Item			VSC not Activated	VSC Activated			
				Increase Mode	Holding Mode	Reduction Mode	
(1), (6)		Master Cylinder Cut Solenoid Valve	OFF (Open)	ON*	ON*	ON*	
		Port: (A), (F)					
(3), (4)		Reservoir Cut Solenoid Valve	OFF (Close)	ON (Open)	ON (Open)	ON (Open)	
		Port: (C), (D)					
(2), (5)		Suction Solenoid Valve	OFF (Close)	OFF (Close)	OFF (Close)	OFF (Close)	
		Port: (B), (E)					
Front Brake	(10)	Pressure Holding Valve (Front Right)	OFF (Open)	ON (Close)	ON (Close)	ON (Close)	
		Port: (J)					
	(7)	Pressure Holding Valve (Front Left)	OFF (Open)	OFF (Open)	ON (Close)	ON (Close)	
		Port: (G)					
	(14)	Pressure Reduction Valve (Front Right)	OFF (Close)	OFF (Close)	OFF (Close)	OFF (Close)	
		Port: (N)					
	(11)	Pressure Reduction Valve (Front Left)	OFF (Close)	OFF (Close)	OFF (Close)	ON (Open)	
		Port: (K)					
	Wheel Cylinder Pressure		Right	—	—	—	—
			Left	—	Increase	Hold	Reduction
Rear Brake	(8)	Pressure Holding Valve (Rear Right)	OFF (Open)	ON (Close)	ON (Close)	ON (Close)	
		Port: (H)					
	(9)	Pressure Holding Valve (Rear Left)	OFF (Open)	OFF (Open)	ON (Close)	ON (Close)	
		Port: (I)					
	(12)	Pressure Reduction Valve (Rear Right)	OFF (Close)	OFF (Close)	OFF (Close)	OFF (Close)	
		Port: (L)					
	(13)	Pressure Reduction Valve (Rear Left)	OFF (Close)	OFF (Close)	OFF (Close)	ON (Open)	
		Port: (M)					
	Wheel Cylinder Pressure		Right	—	—	—	—
			Left	—	Increase	Hold	Reduction

*: The solenoid valve controls the hydraulic pressure between “open” through “close” according to the operating condition by adjusting continually.