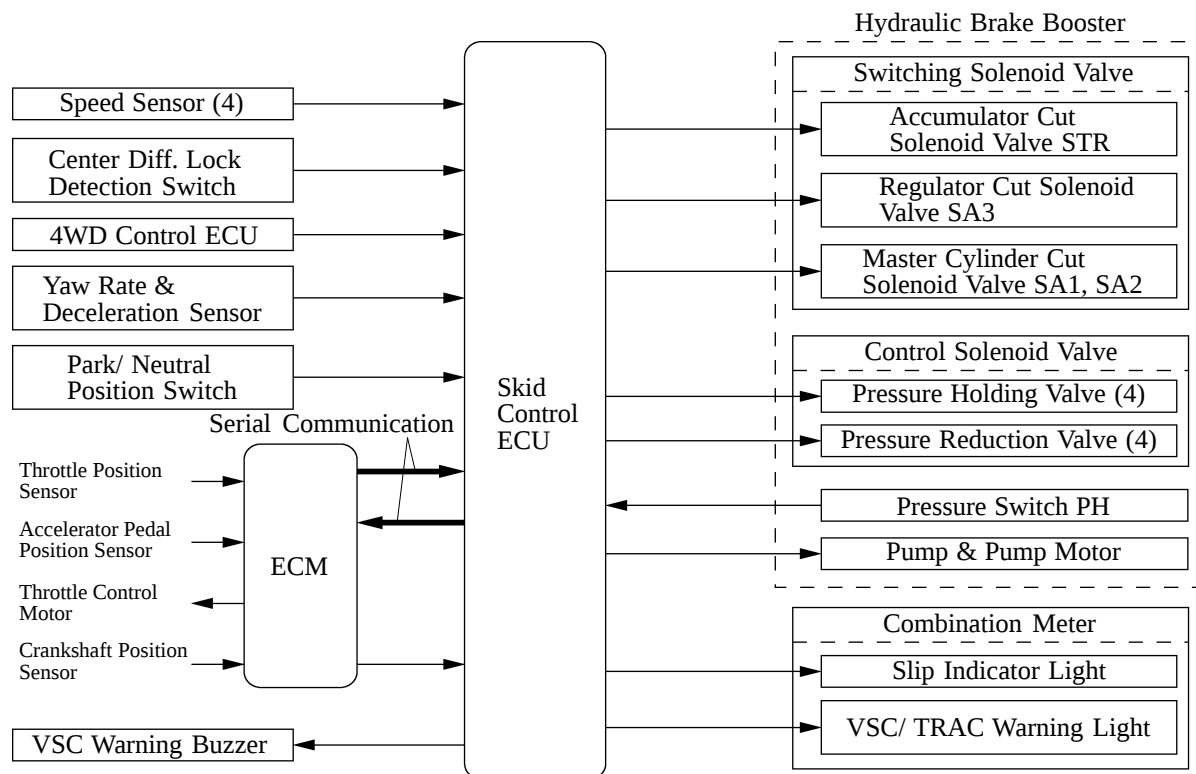


A-TRAC Operation

- Based on the vehicle speed that has been calculated from each speed sensor and deceleration signal of the yaw rate & deceleration sensor, the skid control ECU computes the target control speed in accordance with the transfer range.
- The skid control ECU outputs an A-TRAC operate signal to the ECM and the combination meter. 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.
- Furthermore, when the A-TRAC is operating continuously while the vehicle is being driven on a slippery surface, the temperature of the brake actuator in the hydraulic brake booster increases. After a prescribed length of time elapses, the skid control ECU alerts the driver of this condition by causing the VSC warning buzzer to sound intermittently for approximately 3 seconds, and the VSC/TRAC warning light to illuminate. Also, the A-TRAC operation is momentarily interrupted to protect the brake actuator. When the temperature of the brake actuator decreases, the VSC/TRAC warning light turns OFF, and the A-TRAC is automatically restored to an operating state.

► System Diagram ◀



232CH45

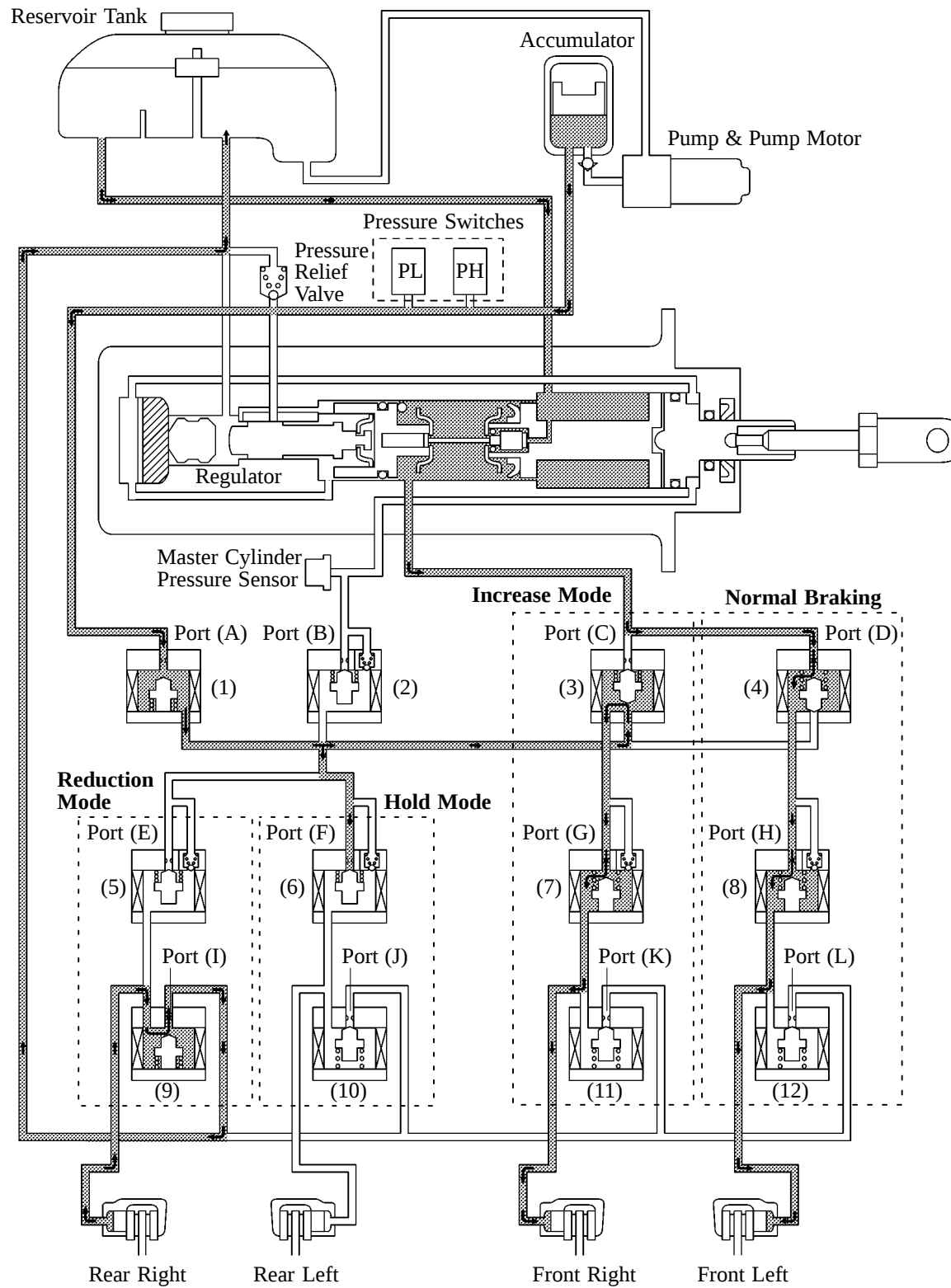
- The engine output control of the A-TRAC function varies in accordance with the range in which the transfer is engaged. When the transfer is engaged in the H range, this function effects engine output control that varies between stability-priority and drivability-priority in accordance with the amount of pedal effort applied to the accelerator pedal. When the transfer is engaged in the L range, it effects engine output control on a drivability-priority basis.

- The skid control ECU compares the target control speed and the speeds of the wheels to determine whether or not a slippage exists. Upon detecting a slippage, the skid control ECU controls the solenoid valve of the hydraulic brake booster to control the brake fluid pressure that is applied to the slipping wheel. When the wheel speed becomes lower than the target control speed, the skid control ECU stops controlling the brake fluid pressure.
- As shown in the table below, the target control speed and the brake fluid pressure control vary in accordance with the transfer range.

Road Condition	Transfer Range	Control	Contents	Outline
Ordinary Road	H	Target Control Speed	Vehicle Speed + Slip Rate (H range set value)	Control designed to ensure the ease of driving on low-friction roads, dirt roads, and general roads.
		Brake Control	Gradual Fluid Pressure Control	
Rocky or Offroad	L	Target Control Speed	Vehicle Speed + Slip Rate (L range set value)	Control designed for rugged offroad driving.
		Brake Control	Sudden fluid Pressure Control	
Downhill	L + 1st gear	Target Control Speed	Vehicle speed when deceleration slippage has been determined during downhill driving.	Designed for rugged, offroad downhill driving with the engine brake applied. It prevents the acceleration of the vehicle that could be caused by the release of the engine brake.
		Brake Control	Fluid pressure control to the front wheels	

- The fluid pressure control of the A-TRAC independently controls the brake of each wheel by operating the individual solenoid valves in accordance with the signals received from the skid control ECU. The brake of each wheel is controlled in the following 3 modes: pressure reduction, pressure holding, and pressure increase modes.

NOTE: The “L” range shift position is used when a maximum amount of drive force or engine brake is required, such as to free the vehicle that is stuck or to drive down a steep hill.



Item			A-TRAC not Activated	A-TRAC Activated			
				Increase Mode	Hold Mode	Reduction Mode	
Switching Solenoid Valve	(1)	Accumulator Cut Solenoid Valve STR	OFF (Close)	ON* ¹ (Open)	←	←	
		Port (A)					
	(2)	Regulator Cut Solenoid Valve SA3	OFF (Open)	ON* ¹ (Close)	←	←	
		Port (B)					
	(3)	Master Cylinder Cut Solenoid Valve SA1	OFF (Open)	ON* ² (Close)	←	←	
		Port (C)					
	(4)	Master Cylinder Cut Solenoid Valve SA2	OFF (Open)	ON* ³ (Close)	←	←	
		Port (D)					
Control Solenoid Valve	Front Brake	(7), (8)	Pressure Holding Valve	OFF (Open)	←	ON (Close)	←
		(11), (12)	Pressure Reduction Valve	OFF (Close)	←	←	ON (Open)
		Wheel Cylinder Pressure		—	Increase	Hold	Reduction
	Rear Brake	(5), (6)	Pressure Holding Valve	OFF (Open)	←	ON (Close)	←
		(9), (10)	Pressure Reduction Valve	OFF (Close)	←	←	ON (Open)
		Wheel Cylinder Pressure		—	Increase	Hold	Reduction

*1: When either wheel is under brake control (A-TRAC), STR and SA3 are ON.

*2: When the front right wheel is under brake control (A-TRAC), SA1 is ON.

*3: When the front left wheel is under brake control (A-TRAC), SA2 is ON.