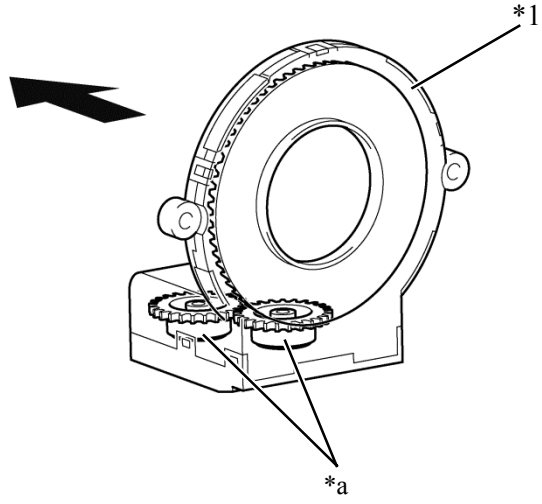
■ DETAILS

►Models with CAN Communication System◄

a. Steering Angle Sensor

The steering angle sensor detects the steering direction and angle, and sends this signal to the skid control ECU.



0479CH15

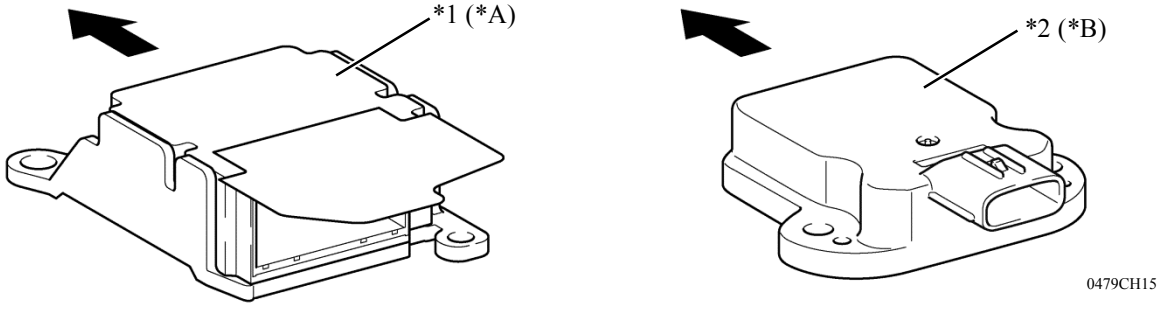
Text in Illustration

*1	Steering Angle Sensor	-	-
*a	Detection Gear	-	-
0479CH26	Front	-	-

b. Yawrate and Deceleration Sensor

1) The Yaw rate and deceleration sensor are built into the airbag ECU assembly. *1
2) The Yaw rate and deceleration sensor are built into the yawrate sensor.*2
3) The yaw rate and deceleration sensor detect the following items.
   - The vehicle's yaw rate.
   - The vehicle's longitudinal and lateral acceleration and deceleration.

*1: Models with SRS Airbag System
*2: Models without SRS Airbag System



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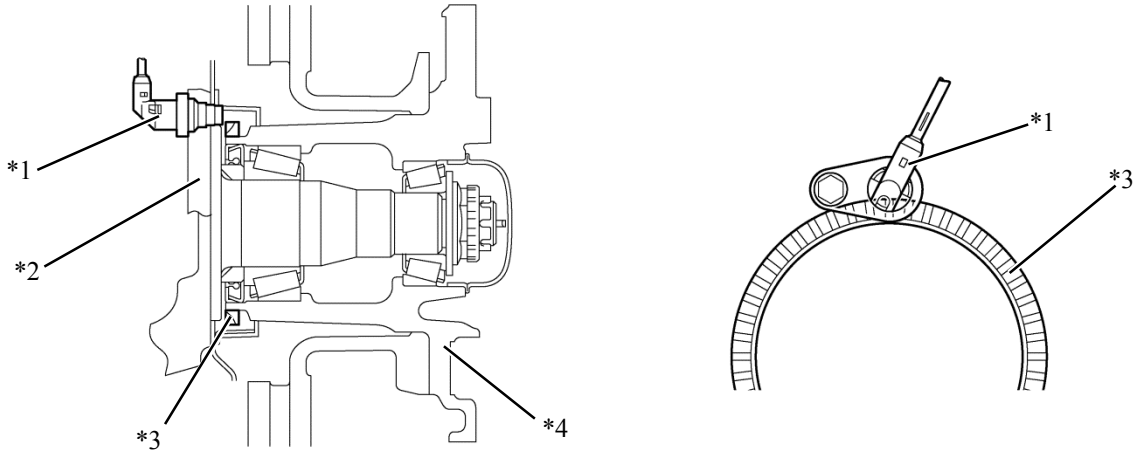
Text in Illustration

*A	Models with SRS Airbag System	*B	Models without SRS Airbag System
*1	Airbag ECU Assembly · Yawrate and Deceleration Sensor	*2	Yawrate Sensor · Yawrate and Deceleration Sensor
0479CH26	Front	-	-

c. Speed Sensor

1) An active type speed sensor is used. This sensor contains a sensor IC.
2) The front speed sensors use a gear type rotor that is mounted on the front axle hub.
3) The rear speed sensors use a gear type rotor that is mounted on the rear axle hub.

►Front Speed Sensor◄

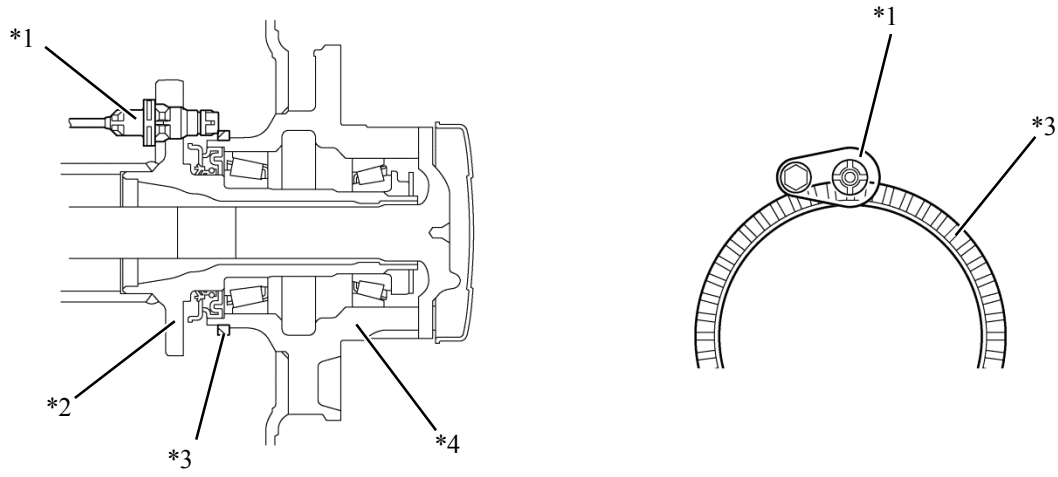


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Text in Illustration

*1	Front Speed Sensor	*2	Steering Knuckle
*3	Skid Control Rotor Front	*4	Front Axle Hub

►Rear Speed Sensor◄



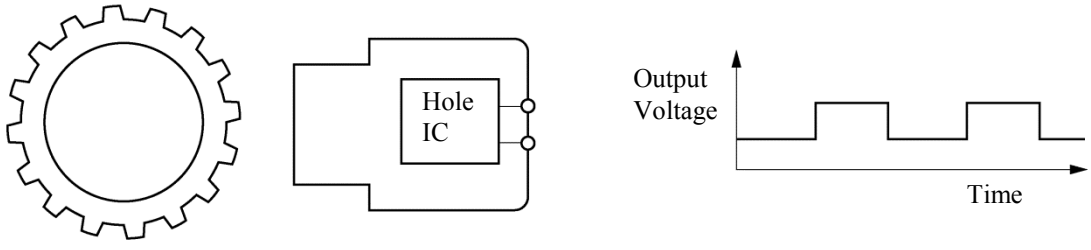
0479CH18

▸Text in Illustration◂

*1	Rear Speed Sensor	*2	Rear Axle Shaft
*3	Skid Control Rotor Rear	*4	Rear Axle Hub

►Active Type Speed Sensor◄

1) The active type speed sensor uses a sensor IC to detect magnetic field changes caused when the sensor rotor rotates, and the sensor outputs the detected information to the skid control ECU as digital pulses (vehicle speed signal).
2) To detect the vehicle speed, the frequency of the output pulses is used. Because the active type sensor outputs digital pulses, it can detect the vehicle speed even when the vehicle is nearly stationary.



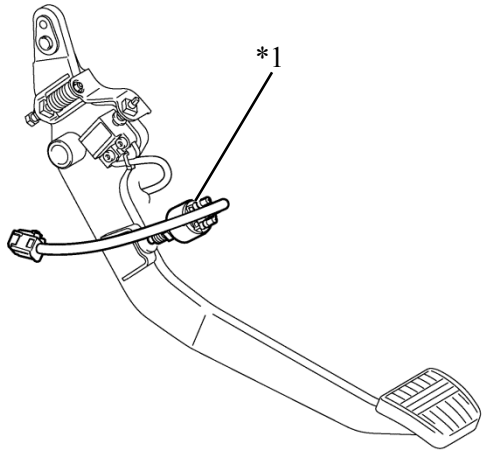
Skid Control Rotor (Axle Shaft)

Digital Output

0479CH19

d. Stop Light Switch

Following a change of the brake system, the stop light switch assembly was changed.



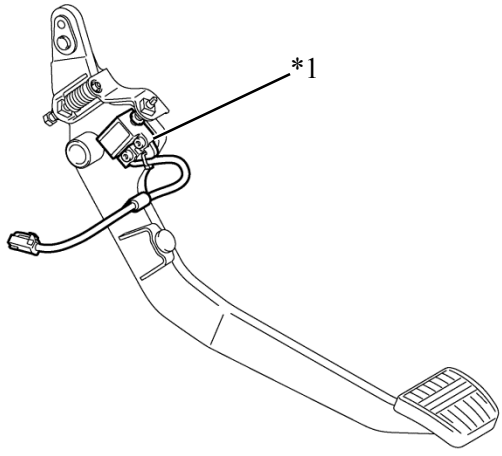
0479CH20

Text in Illustration

*1	Stop Light Switch Assembly	-	-

e. Brake Pedal Load Sensing Switch

The brake pedal load sensing switch which is attached to the brake pedal is detected the brake pedal force.



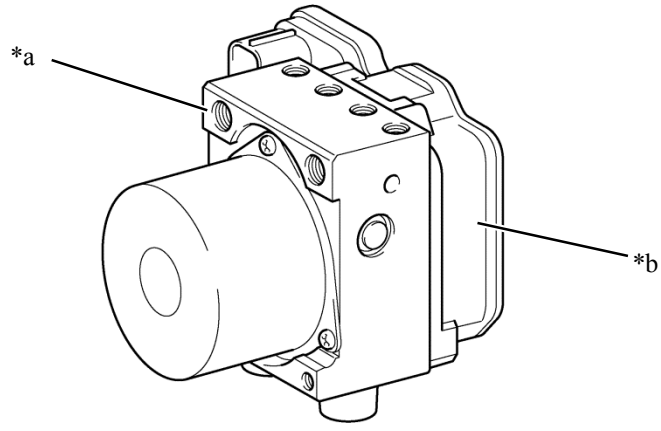
0479CH21

Text in Illustration

*1	Brake Pedal Load Sensing Switch (Brake Pedal Sub-assembly)	-	-

f. Brake Actuator

1) A brake actuator assembly integrated with a skid control computer was employed for vehicles with an ABS that uses CAN communication. The brake actuator assembly has a small size and light weight while still having sufficient ejection performance and guarantees excellent safety and running performance even for heavy vehicles.
2) The brake actuator assembly consists of the actuator, skid control ECU, solenoid relay, pump motor, and master cylinder pressure sensor.



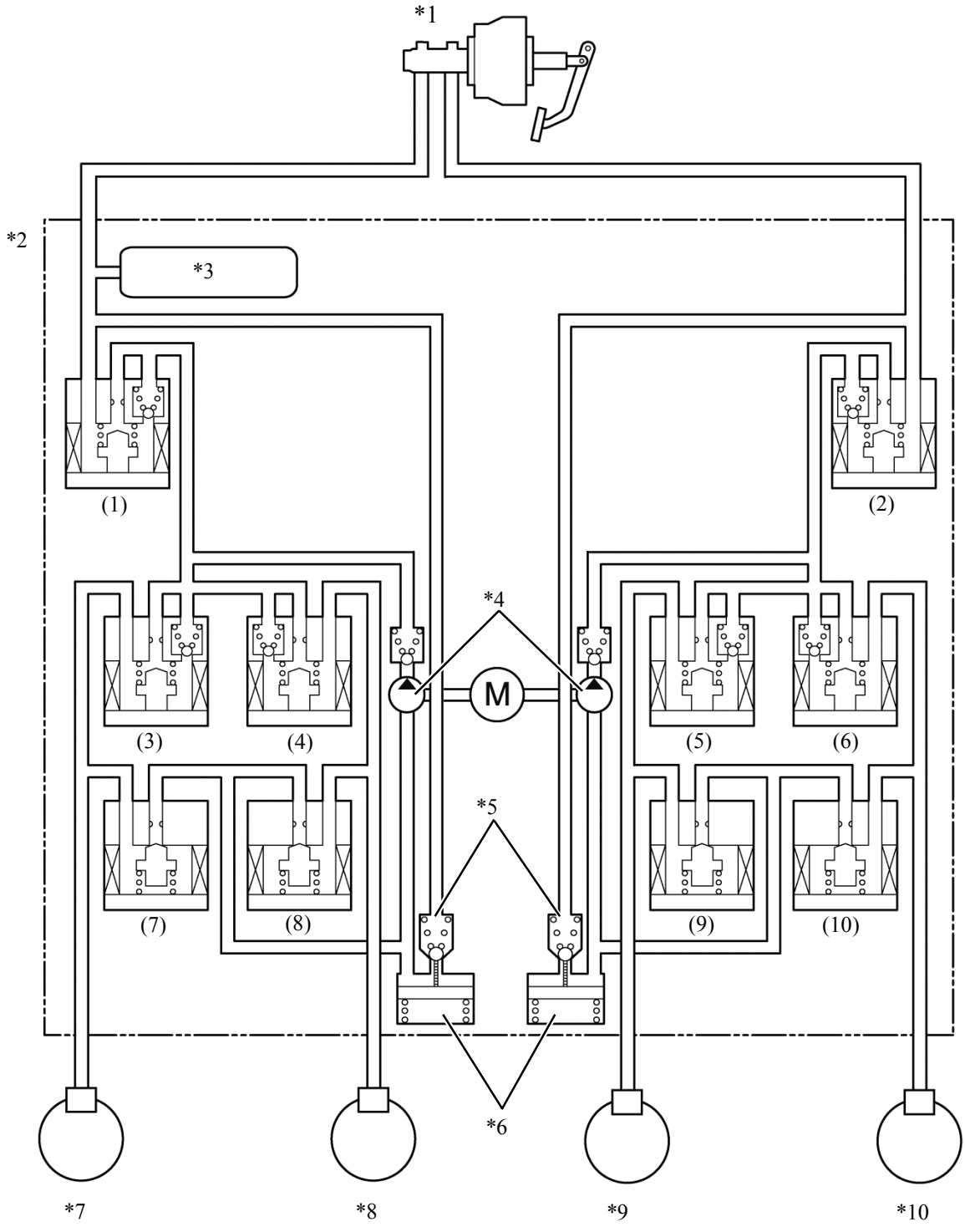
0479CH22

Text in Illustration

*a	Actuator Portion	*b	Skid Control ECU

3) The actuator portion consists of 10 solenoid valves, 2 pressure regulator valves, 2 pump, 2 reservoirs, and master cylinder pressure sensor.
4) The 10 solenoid valves consist of 2 master cylinder cut solenoid valves [(1), (2)], 4 pressure holding solenoid valves [(3), (4), (5), (6)], and 4 pressure reduction solenoid valves [(7), (8), (9), (10)].

► Hydraulic Circuit ◄

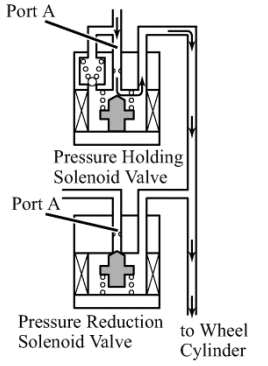
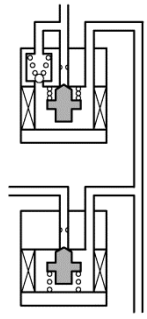
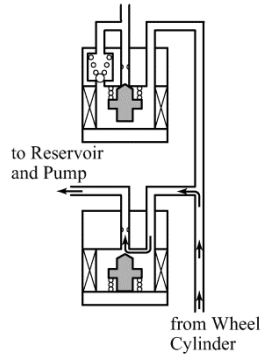


▸ Text in Illustration ◂

*1	Brake Master Cylinder Sub-assembly	*2	Brake Actuator Assembly
*3	Master Cylinder Pressure Sensor	*4	Pump
*5	Pressure Regulator Valves	*6	Reservoirs
*7	Rear Left Wheel Cylinder	*8	Rear Right Wheel Cylinder
*9	Front Left Wheel Cylinder	*10	Front Right Wheel Cylinder

5) ABS with EBD Operation

Based on the signals received from the 4 wheel speed sensors and yaw rate & deceleration sensor, the skid control ECU calculates the wheel rotation speed and deceleration for each wheel, in order to check for a wheel slippage condition. According to the slippage condition, the ECU controls the pressure holding solenoid valves and pressure reduction solenoid valves in order to adjust the fluid pressure of the brakes for each of the wheels in the following 3 modes: pressure reduction, pressure holding, and pressure increase modes.

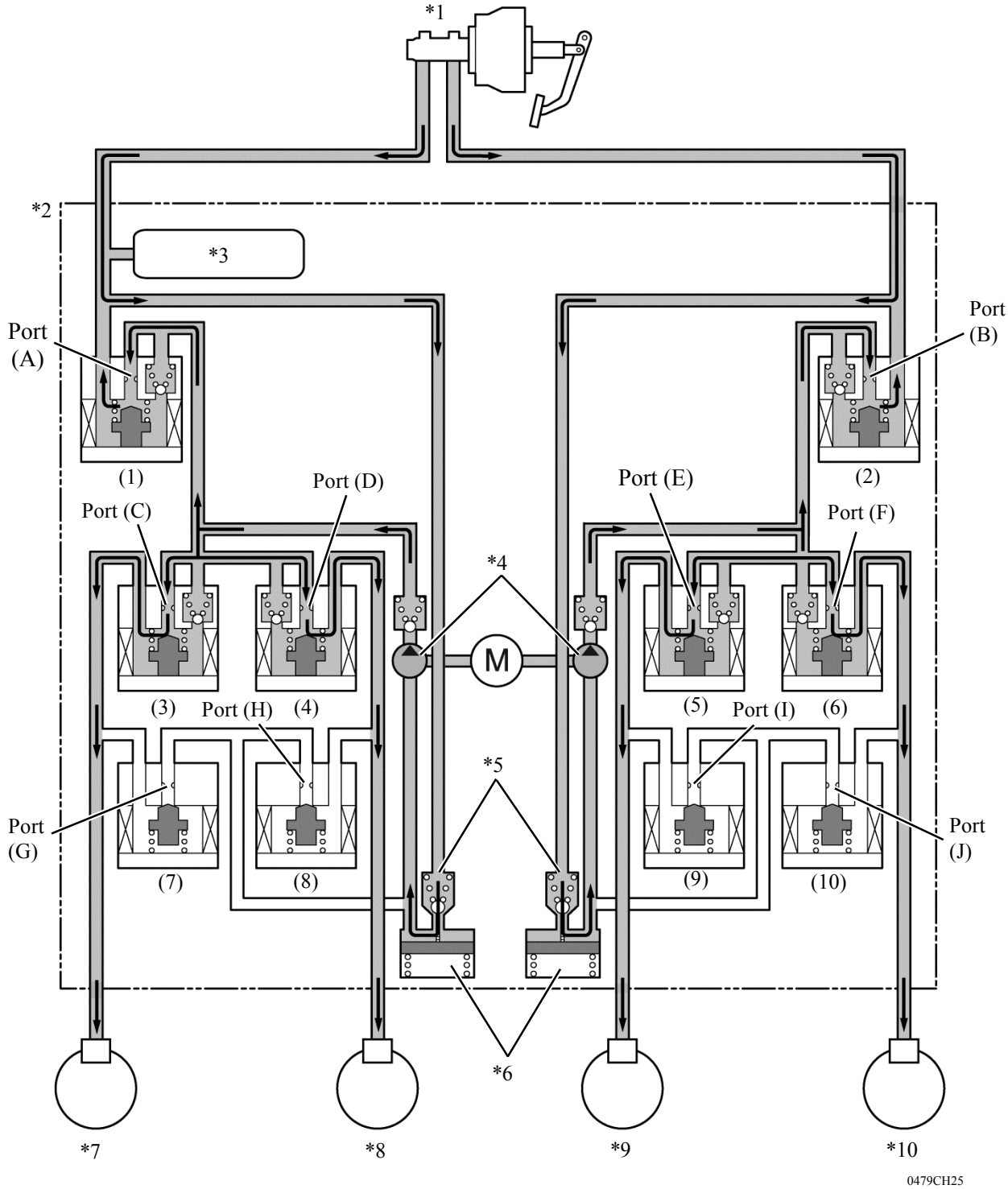
Not Activated	Normal Braking	-	-
Activated	Pressure Increase Mode	Pressure Holding Mode	Pressure Reduction Mode
Hydraulic Circuit			
Pressure Holding Valve	Off/Open	On/Closed	On/Closed
Pressure Reduction Valve	Off/Closed	Off/Closed	On/Open
Pressure	Increase	Hold	Reduce

6) PAB* Operation

In certain situations when the vacuum pressure of the vacuum booster calculated using the vacuum sensor and master cylinder pressure sensor is low, the skid control ECU may provide brake assist. Or in the event of a brake booster failure, based on the brake pedal load sensing switch and master cylinder pressure sensor signal, the skid control ECU may provide brake assist.
If the skid control ECU judges the need for additional brake assist, pressure is generated by the pump in the brake actuator and directed to the wheel cylinder to apply a large amount of fluid pressure.

*: Power Assist Brake (brake pressure increase function (braking force assist control, servo failure assist control)). Details are provided in a separate section. (Referent: PAB (Power Assist Brake))

►PAB (Power Assist Brake) Circuit ◄



▸ Text in Illustration ◂

*1	Brake Master Cylinder Sub-assembly	*2	Brake Actuator Assembly
*3	Master Cylinder Pressure Sensor	*4	Pump
*5	Pressure Regulator Valves	*6	Reservoirs
*7	Rear Left Wheel Cylinder	*8	Rear Right Wheel Cylinder
*9	Front Left Wheel Cylinder	*10	Front Right Wheel Cylinder

► PAB (Power Assist Brake) Control ◄

Item		PAB (Power Assist Brake) Not Activated	PAB (Power Assist Brake) Activated
(1), (2)	Master Cylinder Cut Solenoid Valve Port: (A), (B)	OFF/Open	ON*
(3), (4) (5), (6)	Pressure Holding Solenoid Valve Port: (C), (D), (E), (F)	OFF/Open	OFF/Open
(7), (8) (9), (10)	Pressure Reduction Solenoid Valve Port: (G), (H), (I), (J)	OFF/Closed	OFF/Closed

*: The solenoid valves control the hydraulic pressure by adjusting continually between “open” and “closed” according to the operating conditions.

7) Initial Check

After the ignition switch is turned ON (IG), and the vehicle attains an approximate speed of 6 km/h (4 mph) or more, the skid control ECU performs the initial check.
The functions of each solenoid valve and pump motor in the brake actuator assembly are checked in order.