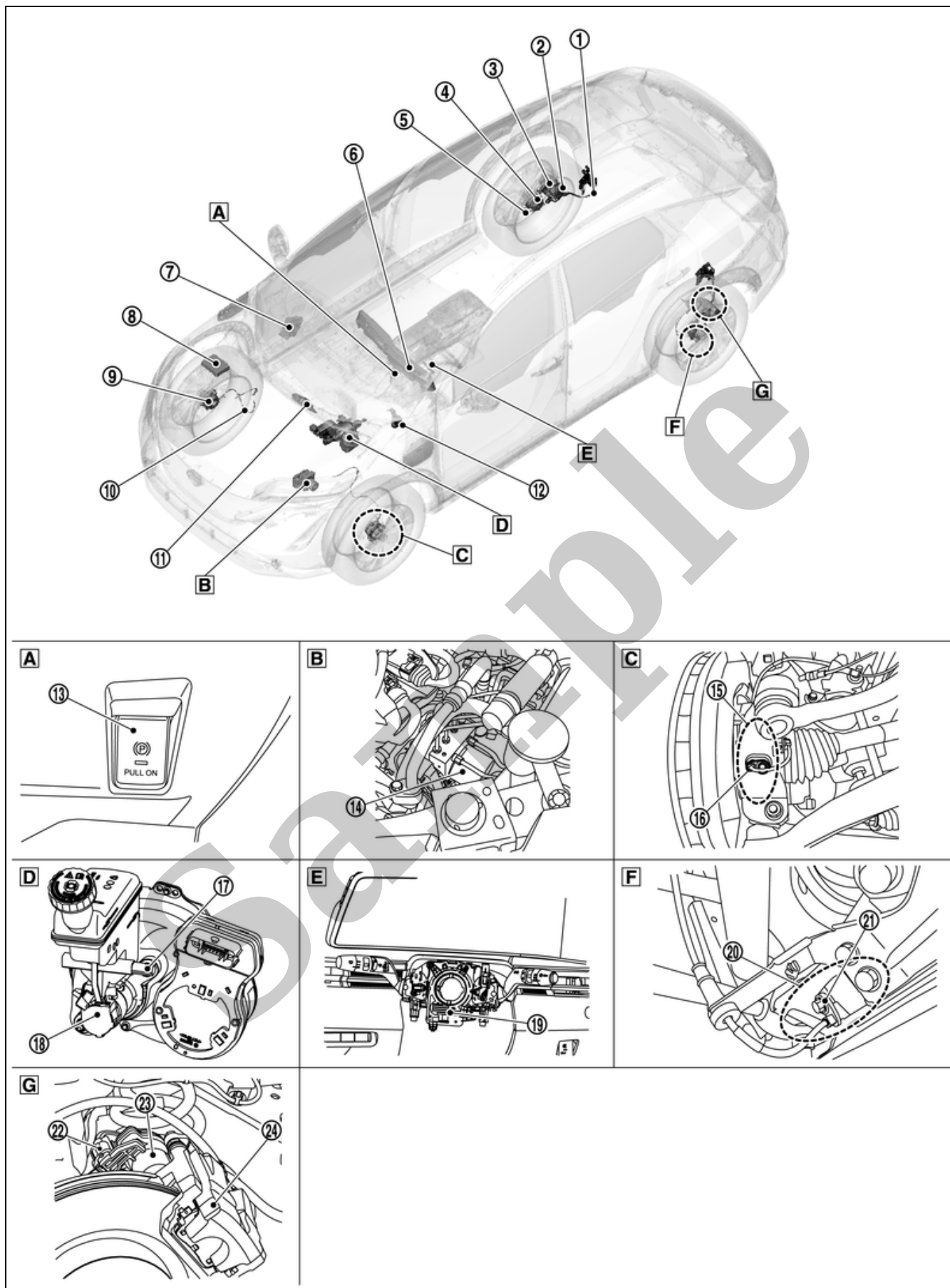


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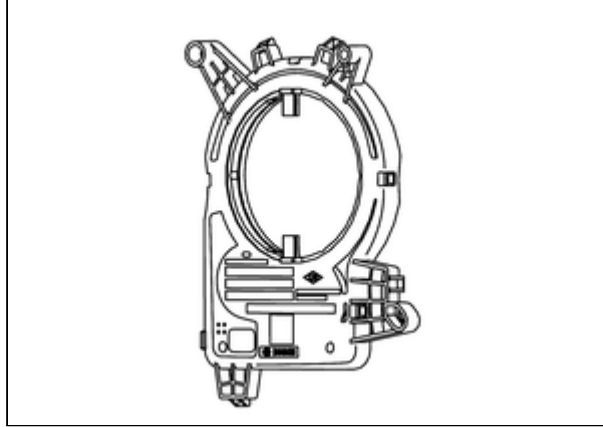
A	Instrument lower panel	B	Motor room (LH side)	C	Steering knuckle
D	Motor room (LH side)	E	Back of spiral cable assembly	F	Rear axle housing
G	Rear brake caliper assembly (LH side)				

①	Parking brake actuator harness (RH)	②	Parking brake actuator (RH)	③	Rear brake caliper assembly (RH)
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④	Rear RH sensor rotor	⑤	Rear RH wheel sensor	⑥	Combination meter Refer to Component Parts Location for detailed installation location.
⑦	BCM Refer to Component Parts Location for detailed installation location.	⑧	IPDM E/R Refer to Component Parts Location for detailed installation location.	⑨	Front RH sensor rotor
⑩	Front RH wheel sensor	⑪	VCM Refer to Component Parts Location for detailed installation location.	⑫	Chassis control module Refer to Component Parts Location for detailed installation location.
⑬	Parking brake switch	⑭	ABS actuator and electric unit (control unit)	⑮	Front LH sensor rotor
⑯	Front LH wheel sensor	⑰	Brake fluid level switch	⑱	Electrically-driven intelligent brake unit
⑲	Steering angle sensor	⑳	Rear LH sensor rotor	㉑	Rear LH wheel sensor
㉒	Parking brake actuator harness (LH)	㉓	Parking brake actuator (LH)	㉔	Rear brake caliper assembly (LH)

FUNCTIONS WITHIN THE SYSTEM

Steering angle sensor transmits steering angle sensor signal to ABS actuator and electric unit (control unit) via CAN communication.



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INDIVIDUAL FUNCTIONS WITHIN THE SYSTEM

Steering angle sensor detects the following status.

- Steering wheel rotation amount
- Steering wheel rotation angular velocity
- Steering wheel rotation direction

VIDUAL OPERATION

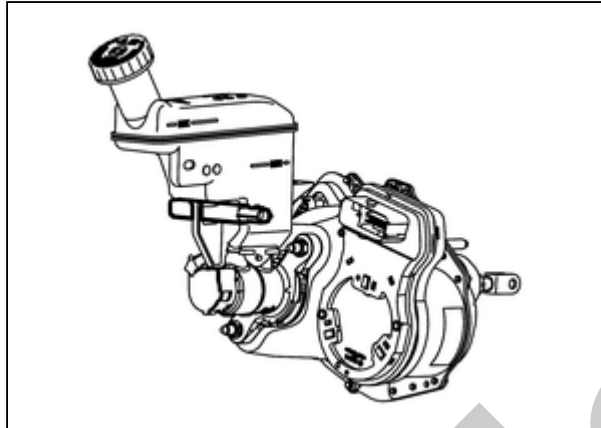
The sensor converts the rotation amount, rotation angular velocity and rotation direction of the steering wheel as the steering angle sensor signal.

PARTS LOCATION

Refer to [Component Parts Location](#).

FUNCTIONS WITHIN THE SYSTEM

Detects the brake fluid level in reservoir tank and transmits converted electric signal from combination meter to ABS actuator and electric unit (control unit) via CAN communication, when brake fluid level is the specified level or less.



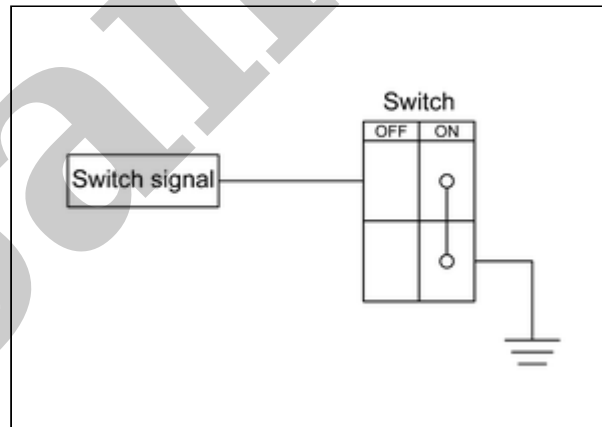
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INDIVIDUAL FUNCTIONS WITHIN THE SYSTEM

Brake fluid level switch detects the brake fluid level in reservoir tank.

INDIVIDUAL OPERATION

- The switch is turned ON when brake fluid level is the specified level or less.



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- Ground is supplied as the switch signal to the control unit when the switch is turned ON.

PARTS LOCATION

Refer to [Component Parts Location](#).

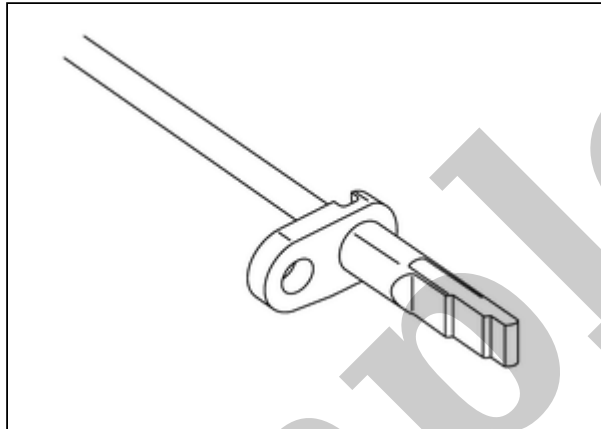
FUNCTIONS WITHIN THE SYSTEM

Wheel sensor and sensor rotor detect each wheel speed. And wheel sensor inputs wheel speed signal to ABS actuator and electric unit (control unit).

INDIVIDUAL FUNCTIONS WITHIN THE SYSTEM

Wheel Sensor

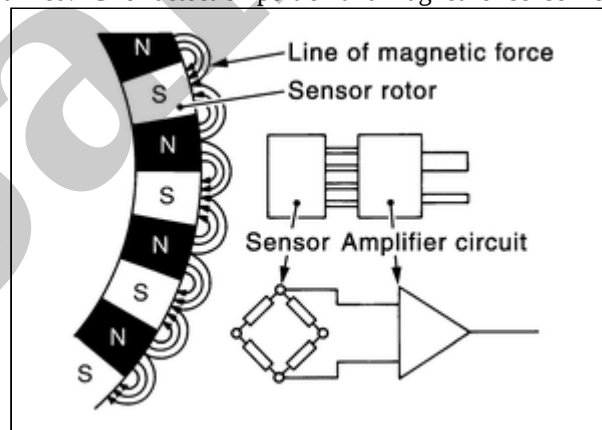
The wheel sensor reads a magnetic field change.



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INDIVIDUAL OPERATION

- Downsize and weight reduction is aimed. IC for detection portion and magnet for sensor rotor are adopted.



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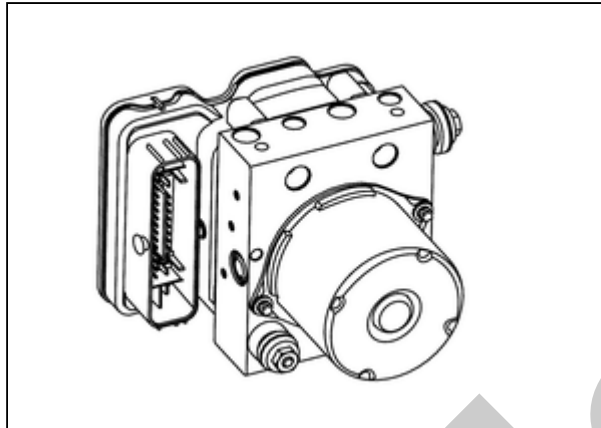
When sensor rotor rotates, magnetic field changes. Magnetic field change is converted to current signals (rectangular wave) and is transmitted to ABS actuator and electric unit (control unit). Change of magnetic field is proportional to wheel speed.

PARTS LOCATION

Refer to [Component Parts Location](#).

FUNCTIONS WITHIN THE SYSTEM

Electric unit (control unit) is integrated with actuator and comprehensively controls VDC function, TCS function, ABS function, EBD function, hill start assist function, brake limited slip differential (BLSD) function, brake assist function, brake force distribution function, cooperative regenerative brake function, and electric parking brake function.



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ELECTRIC UNIT (CONTROL UNIT)

- Brake fluid pressure are controlled according to signals from each sensor.
- Parking brake actuator are controlled according to parking brake switch and signals from each control unit.
- If malfunction is detected, the system enters fail-safe mode.

ACTUATOR

The following components are integrated with ABS actuator.

Pump

- Returns the brake fluid reserved in reservoir to master cylinder by reducing pressure.
- Pressure the brake fluid and send.

Motor

Activates the pump according to signals from electric unit (control unit).

Motor Relay

Operates the motor ON/OFF according to signals from electric unit (control unit).

Actuator Relay

Operates each valve ON/OFF according to signals from electric unit (control unit).

ABS In Valve

Switches the fluid pressure line to increase or hold according to signals from electric unit (control unit).



NOTE:

Valve is a solenoid valve.

ABS Out Valve

Switches the fluid pressure line to increase, hold or decrease according to signals from electric unit (control unit).



NOTE:

Valve is a solenoid valve.

Cut Valve 1, Cut Valve 2

Shuts off the brake line from electrically-driven intelligent brake unit to each brake to according signal from control unit.



NOTE:

Valve is a solenoid valve.

Suction Valve 1, Suction Valve 2

Opens the brake line from electrically-driven intelligent brake unit to pump to according signal from control unit.



NOTE:

Valve is a solenoid valve.

Inlet Valve

Brake fluid sucked from the reservoir by the pump does not backflow.



NOTE:

Valve is a solenoid valve.

Outlet Valve

Brake fluid discharged from the pump does not backflow.



NOTE:

Valve is a solenoid valve.

Return Check Valve

Returns the brake fluid from brake caliper to electrically-driven intelligent brake unit by bypassing orifice of each valve when brake is released.

Reservoir

Temporarily reserves the brake fluid drained from brake caliper, so that pressure efficiently decreases when decreasing pressure of brake caliper.

Yaw Rate/Side/Decel G Sensor

Calculates the following information that affects the vehicle, and transmits a signal to electric unit (control unit). [Yaw rate/side/decels G sensor is integrated in ABS actuator and electric unit (control unit).]

- Vehicle rotation angular velocity (yaw rate signal)
- Vehicle lateral acceleration (side G signal) and longitudinal acceleration (decels G signal)

Pressure Sensor

Detects the brake fluid pressure and transmits signal to electric unit (control unit). [Pressure sensor is integrated in ABS actuator and electric unit (control unit).]

INDIVIDUAL OPERATION

- Brake fluid pressure and traction motor are controlled according to signals from each sensor.
- Parking brake actuator are controlled according to parking brake switch and signals from each control unit.
- If malfunction is detected, the system enters fail-safe mode.

PARTS LOCATION

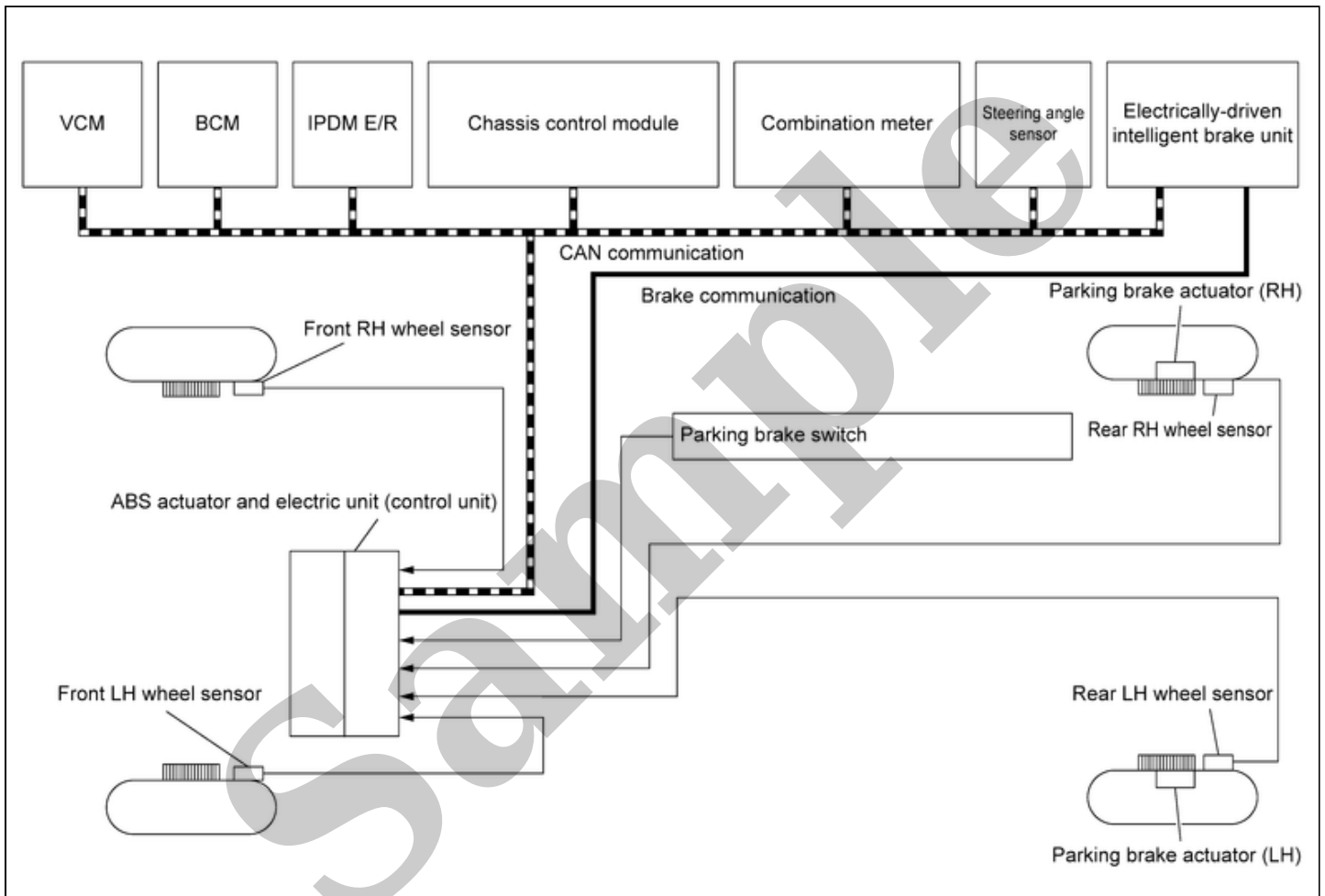
Refer to [Component Parts Location](#).

System Description

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- The system switches fluid pressure of each brake to increase, to hold or to decrease according to signals from control unit in ABS actuator and electric unit (control unit). This control system is applied to VDC function, TCS function, ABS function, EBD function, hill start assist function, brake limited slip differential (BLSD) function, brake assist function, brake force distribution function, and cooperative regenerative brake function.
- The electric parking brake function uses the signal from the parking brake switch to have the ABS actuator and electric unit (control unit) operate the parking brake actuator to apply and release the parking brake.
- Fail-safe function is available for each function and is activated by each function when system malfunction occurs.

SYSTEM DIAGRAM



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INPUT SIGNAL AND OUTPUT SIGNAL

Major signal transmission between each unit via communication lines is shown in the following table.

Component parts	Signal description
ABS actuator and electric unit (control unit)	Refer to Component Description .
Front LH wheel sensor	Refer to Component Description .
Front RH wheel sensor	
Rear LH wheel sensor	
Rear RH wheel sensor	
Steering angle sensor	Refer to Component Description .
Parking brake switch	Refer to Component Description .