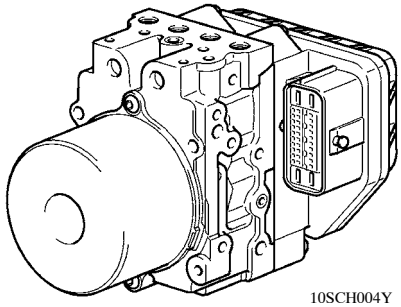
■ BRAKE CONTROL SYSTEM (WITH VSC FUNCTION)

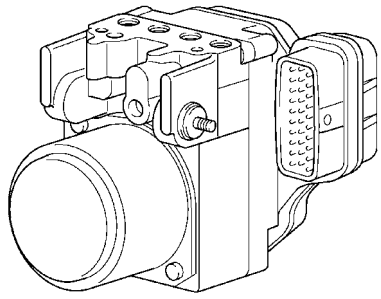
1. Brake Actuator

- A compact and lightweight brake actuator is used. The basic construction and operation are the same as that of the previous models.
- The motor relay and motor cut relay are integrated in the skid control ECU.



10SCH004Y

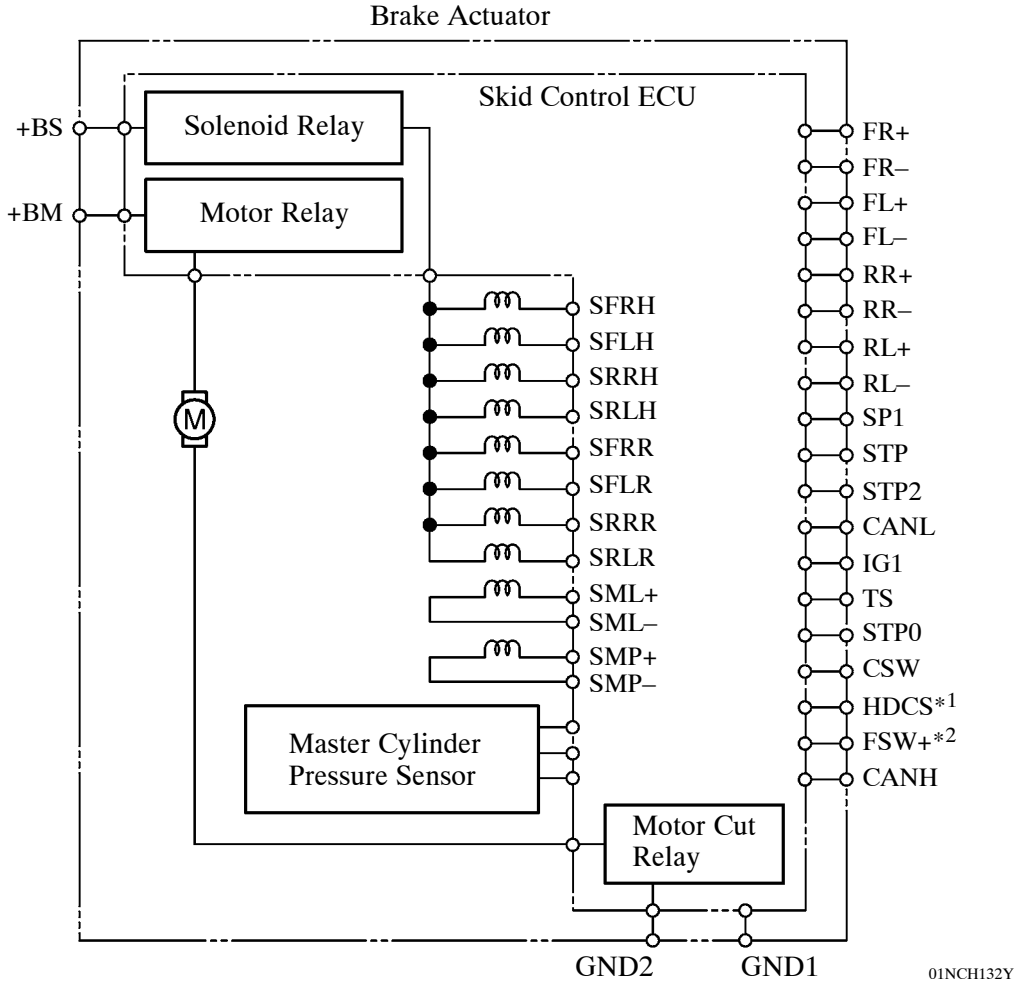
New



01MCH29Y

Previous

▶ Electric Circuit Diagram ◀



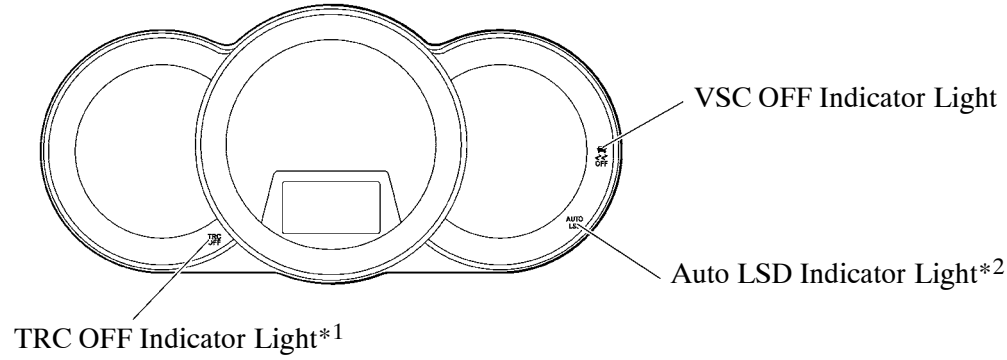
*1: Models with downhill assist control

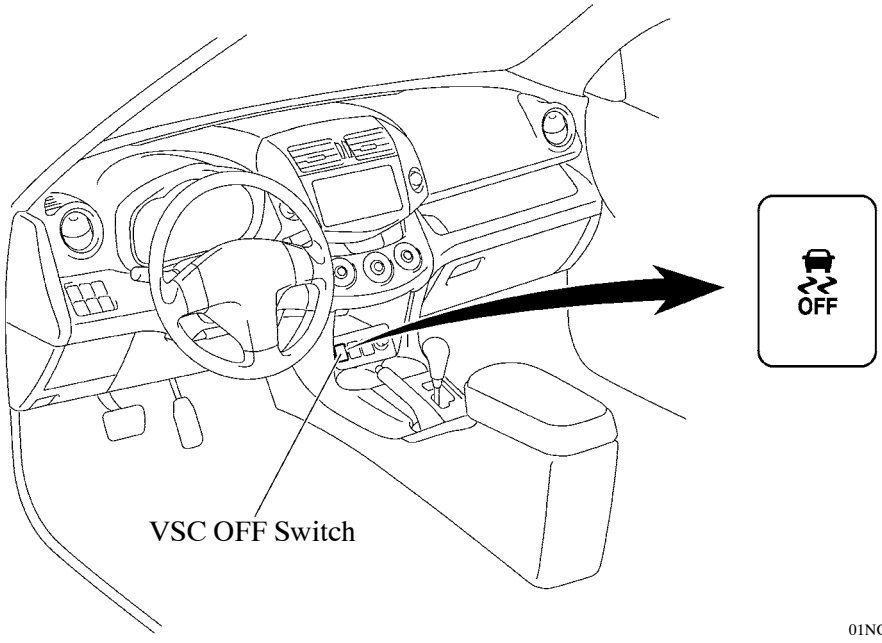
*2: Models with E359F manual transaxle

2. VSC OFF Switch

General

A VSC OFF switch is used. This switch can stop the operation of the VSC and TRC functions. While the vehicle is running off the shoulder of a road or running on a dirt road, it stops the engine output control in order to maintain drive torque. On the 2WD models, the Auto LSD switch has been discontinued. The driver can select the TRC OFF mode by operating the VSC OFF switch. At the same time, the Auto LSD turns ON, thus enabling the operation of the Auto LSD function.

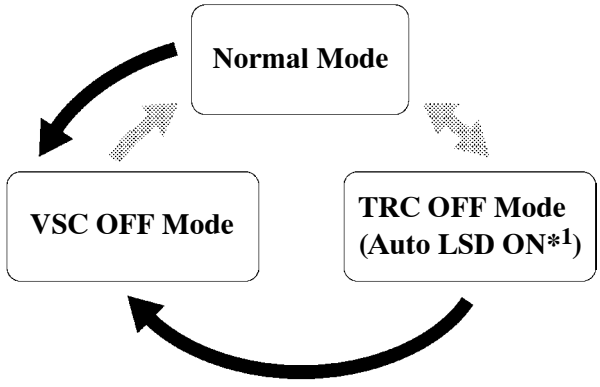




*1: 4WD models
*2: 2WD models

Function of VSC OFF Switch

- 3 modes can be selected using the VSC OFF switch [Normal mode, TRC OFF mode (Auto LSD ON*1), VSC OFF mode].
- Briefly pressing the VSC OFF switch in Normal mode selects TRC OFF mode (Auto LSD ON*1).
- Pressing and holding the VSC OFF switch for 3 seconds or more with the vehicle stopped selects VSC OFF mode, disabling the TRC, Auto LSD*1 and VSC functions.
- Briefly pressing the VSC OFF switch in TRC OFF mode (Auto LSD ON*1) or VSC OFF mode or turning the ignition switch (engine switch*2) off returns to the Normal mode.



08LCH164Y

: VSC OFF Switch Operation (Briefly press)

: VSC OFF Switch Operation (Press and hold for 3 seconds or more)

*1: 2WD models
*2: Models with entry & start system

- The operation of the brake control functions and the illumination state of the respective indicator lights in each mode are as follows:

○: Controllable ×: Not Controllable

Item	Brake Control Function			TRC OFF Indicator Light*1	Auto LSD Indicator Light*2	VSC OFF Indicator Light
	TRC	Auto LSD*2	VSC	TRC OFF 01NCH134Y	AUTO LSD 10SCH008Y	OFF 10SCH009Y
Normal Mode	○	×	○	—	—	—
TRC OFF Mode (Auto LSD ON)	×	○	○	Light ON	Light ON	Light ON*3
VSC OFF Mode	×	×	×*4	Light ON	—	Light ON

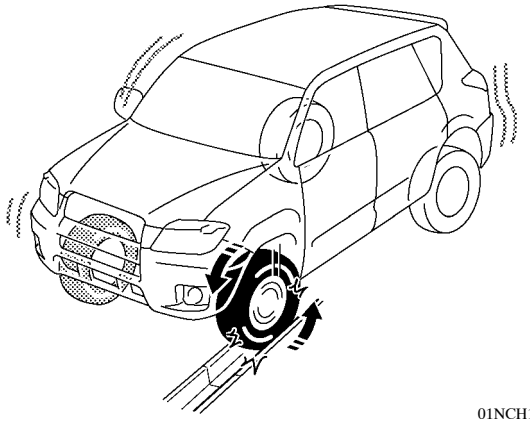
*1: 4WD models
*2: 2WD models
*3: Models with Auto LSD driving at 50 km/h (31 mph) or below
*4: When the vehicle is braking or the yaw rate is large, the VSC will operate even in the VSC OFF mode.

3. Auto LSD Function (2WD Models)

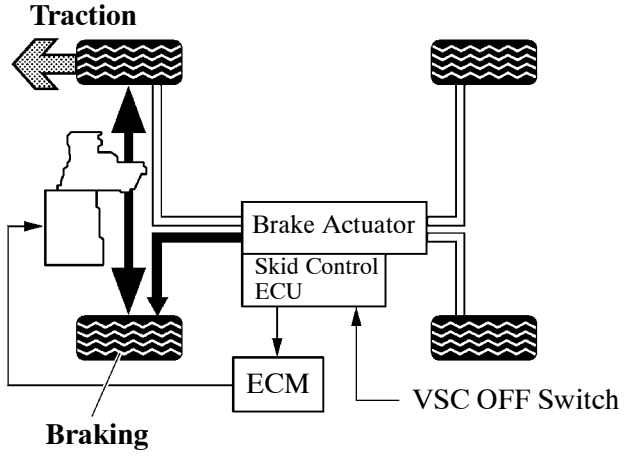
Outline of Auto LSD

- The Auto LSD achieves the equivalent functions of an LSD (Limited Slip Differential) through the use of a traction control function. For this reason, the contents of the brake control are the same in both the Auto LSD and TRC. When the driver presses the Auto LSD switch, this function achieves the LSD effect by regulating the hydraulic pressure that acts on the drive wheels and controlling the engine output in accordance with the amount of pedal effort applied on the accelerator.
- TRC enhances the start-off performance of the vehicle during low-resistance surface conditions, such as snow or mud, by restricting the acceleration effort during a start-off in order to prevent the wheels from spinning.
- On the other hand, the Auto LSD tends to enhance the acceleration effort somewhat in order to apply greater drive torque to the wheel when it is in contact with the ground. Thus, this function helps the vehicle to become unstuck if a wheel loses its grip, and enhances the vehicle's start-off performance on high-resistance surface conditions such as gravel roads.
- The following conditions are required for operating the Auto LSD function:

VSC OFF Switch	TRC OFF Mode (Auto LSD ON)
Accelerator Pedal	ON

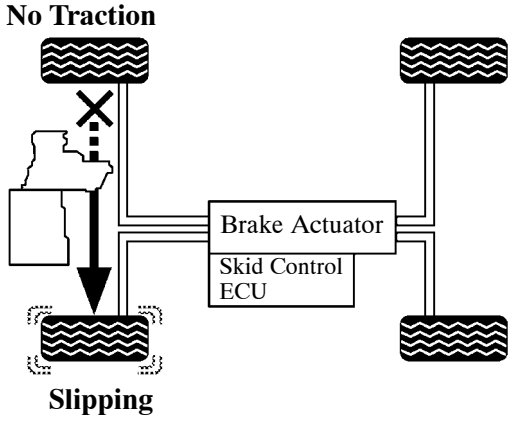


01NCH135Y



With Auto LSD

01NCH136Y



Without Auto LSD

01NCH137Y

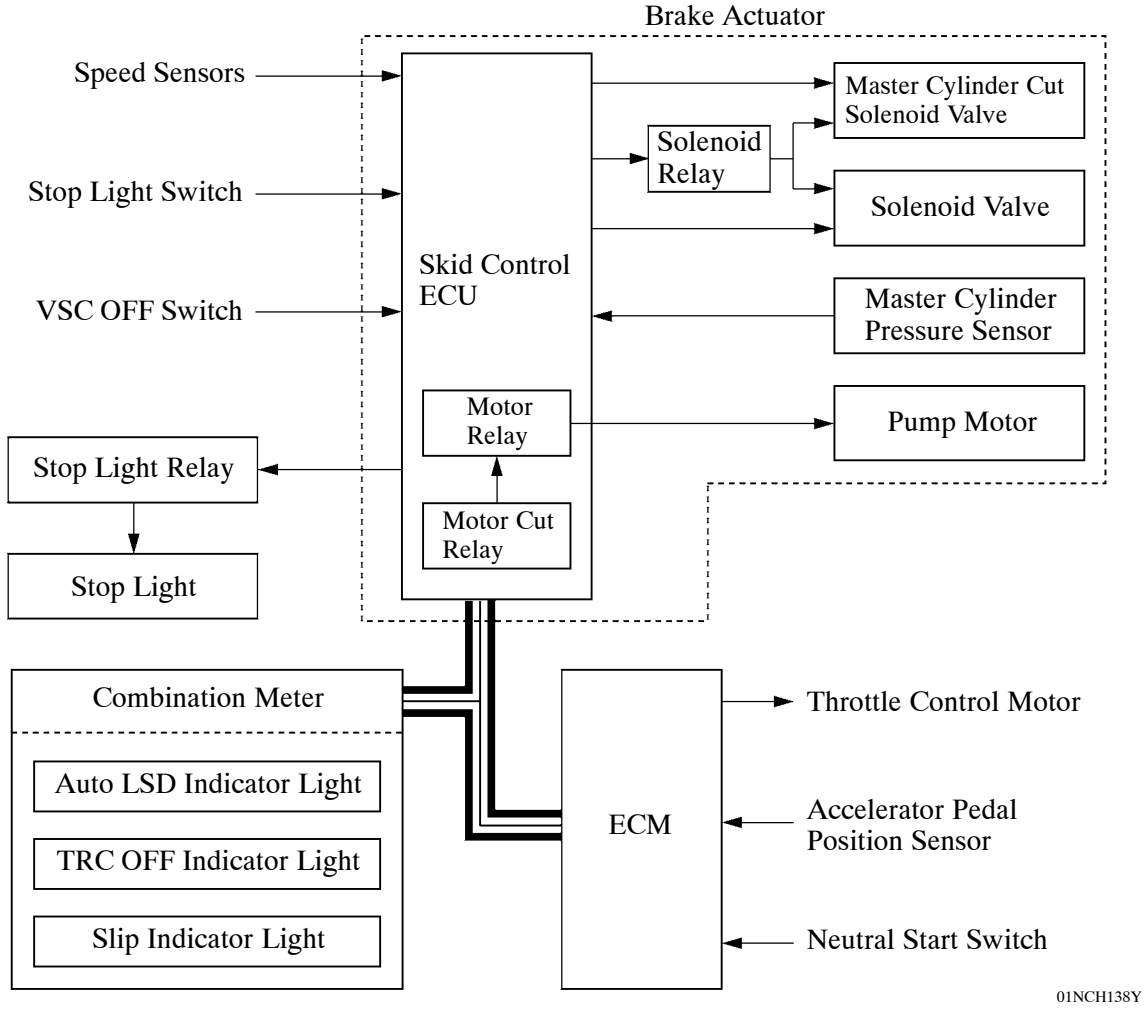
Auto LSD Operation

- The skid control ECU determines that the vehicle is in a state in which the Auto LSD can operate, by using various sensors and switches to detect the operating conditions of the VSC OFF switch, shift position, accelerator pedal, and brake pedal.
- When the vehicle is in a state in which the Auto LSD can operate, the skid control ECU effects hydraulic pressure control of the wheel cylinder in the wheel with the faster wheel speed, so that the wheel speeds of the right and left drive wheels will become equal.
- The Auto LSD indicator light illuminates when the vehicle is in a state in which the Auto LSD can operate, and the slip indicator light flashes during Auto LSD control.
- If the Auto LSD function operates due to the slippage of the left drive wheel, see the next page for the operation of the solenoid valves.

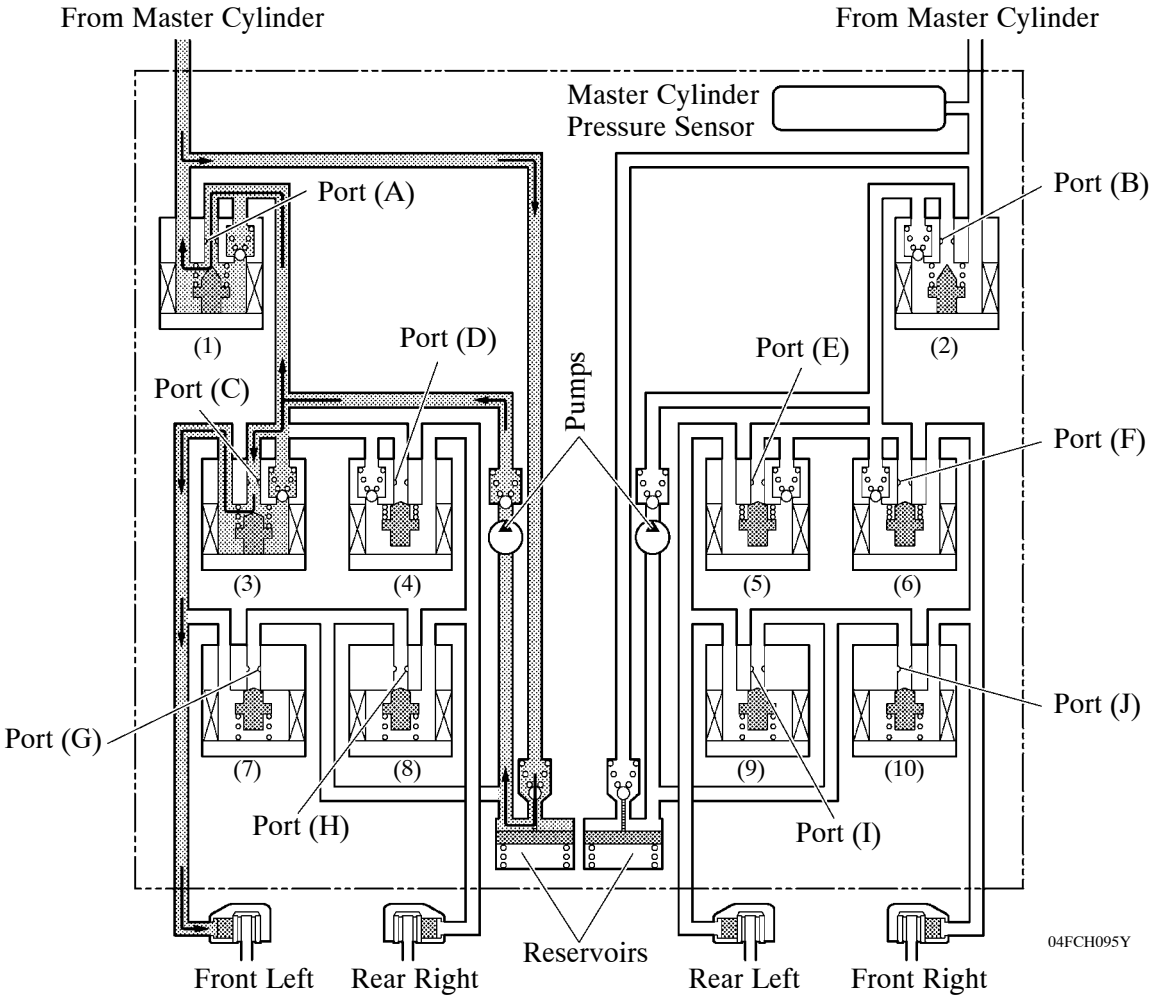
NOTICE

- Use the Auto LSD only if a wheel comes off or while driving on a road surface with high driving resistance such as sand or mud. Do not use it for normal driving. After using the Auto LSD, make sure the Auto LSD indicator light is off before resuming driving.
- To operate the VSC OFF switch, make sure the wheels are not spinning.

▶ System Diagram ◀



▶ Auto LSD Operation (Left Drive Wheel Slipping) ◀



Item			Port	Auto LSD Not Activated	Auto LSD Activated		
					Increase Mode	Holding Mode	Reduction Mode
(1)		Master Cylinder Cut Solenoid Valve	(A)	OFF (Open)	ON*	←	←
(2)			(B)	OFF (Open)	←	←	←
Front Brake	(3)	Pressure Holding Solenoid Valve	(C)	OFF (Open)	←	ON (Closed)	←
	(6)		(F)	OFF (Open)	ON (Closed)	←	←
	(7)	Pressure Reduction Solenoid Valve	(G)	OFF (Closed)	←	←	ON (Open)
	(10)		(J)	OFF (Closed)	←	←	←
	Wheel Cylinder Pressure	Right	—	—	—	—	—
		Left	—	—	Increase	Hold	Reduce
Rear Brake	(4)	Pressure Holding Solenoid Valve	(D)	OFF (Open)	ON (Closed)	←	←
	(5)		(E)	OFF (Open)	ON (Closed)	←	←
	(8)	Pressure Reduction Solenoid Valve	(H)	OFF (Closed)	←	←	←
	(9)		(I)	OFF (Closed)	←	←	←
	Wheel Cylinder Pressure	Right	—	—	—	—	—
		Left	—	—	—	—	—
Pump				OFF	ON	←	←

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