

## LAND CRUISER

### OUTLINE OF NEW FEATURES

The LAND CRUISER has been highly acclaimed for its dignity and characteristic style befitting Toyota's highest class 4WD wagon. The following changes are made for the 2000 model year.

#### 1. Engine

The specifications for the generator and battery have been made uniform.

#### 2. Automatic Transmission

Overdrive switch has been changed to the momentary type. For details, see the General 2000 Features.

#### 3. Transfer

On the models with the ABS with EBD & Brake Assist & A-TRAC & VSC system, a "center differential free mode" has been added to the transfer while engaged in the L range.

#### 4. Differential

The number of differential pinions in the front differential has been changed from 2 to 4.

#### 5. Brakes

- The ratio of the parking brake lever has been changed to shorten the operating travel of the lever, thus improving the operating feel.
- The ABS with EBD & Brake Assist & A-TRAC & VSC system is equipped.  
ABS (Anti-lock Brake System), EBD (Electronic Brake force Distribution),  
A-TRAC (Active Traction Control), VSC (Vehicle Skid Control)

#### 6. Combination Meter

Along with the adoption of the ABS with EBD & Brake Assist & A-TRAC & VSC system, the indicator lights for the respective functions have been provided in the combination meter.

#### 7. Wireless Door Lock Control System

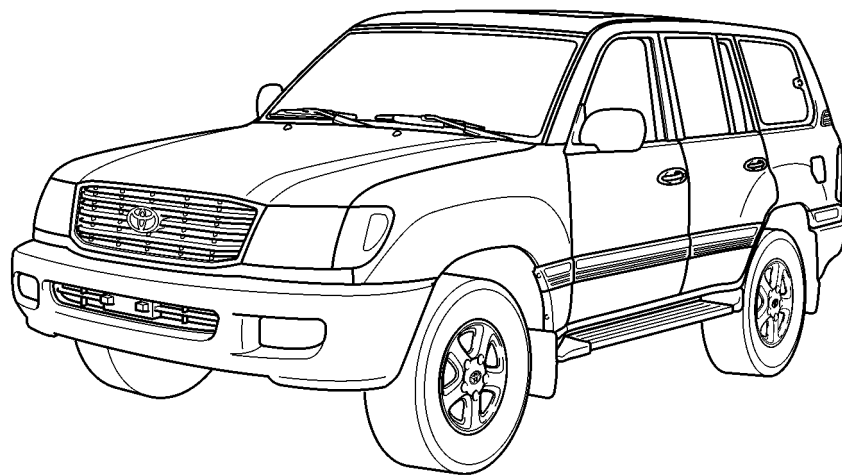
An illumination control function, which lights up the dome light and the ignition key cylinder light simultaneously with the unlocking of the doors by operating the transmitter, has been provided.

#### 8. Wiper

The lengths of the arms and the blades of the front wipers have been changed to increase the wiping range. Also, the wiper motor has been changed.

#### 9. Audio

An integrated, 2DIN size radio, cassette, and 6-disc CD changer unit is provided.



160LC01

## MODEL CODE

**UZJ100 L – G N P E K A**

1                      2                      3                      4                      5                      6                      7                      8

<b>1</b>	<b>BASIC MODEL CODE</b>
	UZJ100 : With 2UZ-FE Engine

<b>5</b>	<b>GEAR SHIFT TYPE</b>
	P : 4-Speed Automatic, Floor

<b>2</b>	<b>STEERING WHEEL POSITION</b>
	L : Left-Hand Drive

<b>6</b>	<b>GRADE</b>
	E : VX

<b>3</b>	<b>BODY TYPE</b>
	G : Station Wagon

<b>7</b>	<b>ENGINE SPECIFICATION</b>
	K : DOHC and SFI

<b>4</b>	<b>BACK DOOR TYPE</b>
	N : Lift-Up Back Door

<b>8</b>	<b>DESTINATION</b>
	A : U.S.A.

## MODEL LINE-UP

DESTINA- TION	ENGINE	BACK DOOR	GRADE	DRIVE TYPE	TRANSMISSION
					4-Speed Automatic
					A343F
U.S.A.	2UZ-FE	Lift-Up	VX	Full-Time 4WD	UZJ100L-GNPEKA

**NEW FEATURES**

**ENGINE**

The specifications for the generator and battery have been made uniform.

**► Specifications ◀**

Item		'00 Model	'99 Model
Generator	Standard	100 A, 1200 W	80 A, 960 W
	With Dual Air Conditioning		100 A, 1200 W
Battery	Standard	105 D 31 L	105 D 31 L
	Without Cold Area Specification		80 D 26 L

**DIFFERENTIAL**

The number of differential pinions in the front differential has been changed from 2 to 4. Accordingly, the oil capacity of the front differential has been changed.

**► Specifications ◀**

Item		'00 Model	'99 Model
Ring Gear Size	mm	205	←
Reduction Gear Ratio		4.300	←
Number of Differential Pinions		4	2
Oil Capacity	liters (US qts, Imp. qts)	1.6 (1.7, 1.4)	1.7 (1.8, 1.5)
Oil Viscosity		SAE 90*1, SAE 80 W or 80 W-90*2	←
Oil Grade		API GL-5	←

\*1: Temperatures above –18°C (0°F)

\*2: Temperatures below –18°C (0°F)

## ■ BRAKES

### 1. General

The ABS with EBD & Brake Assist & A-TRAC & VSC system is provided as optional equipment on the '00 model.

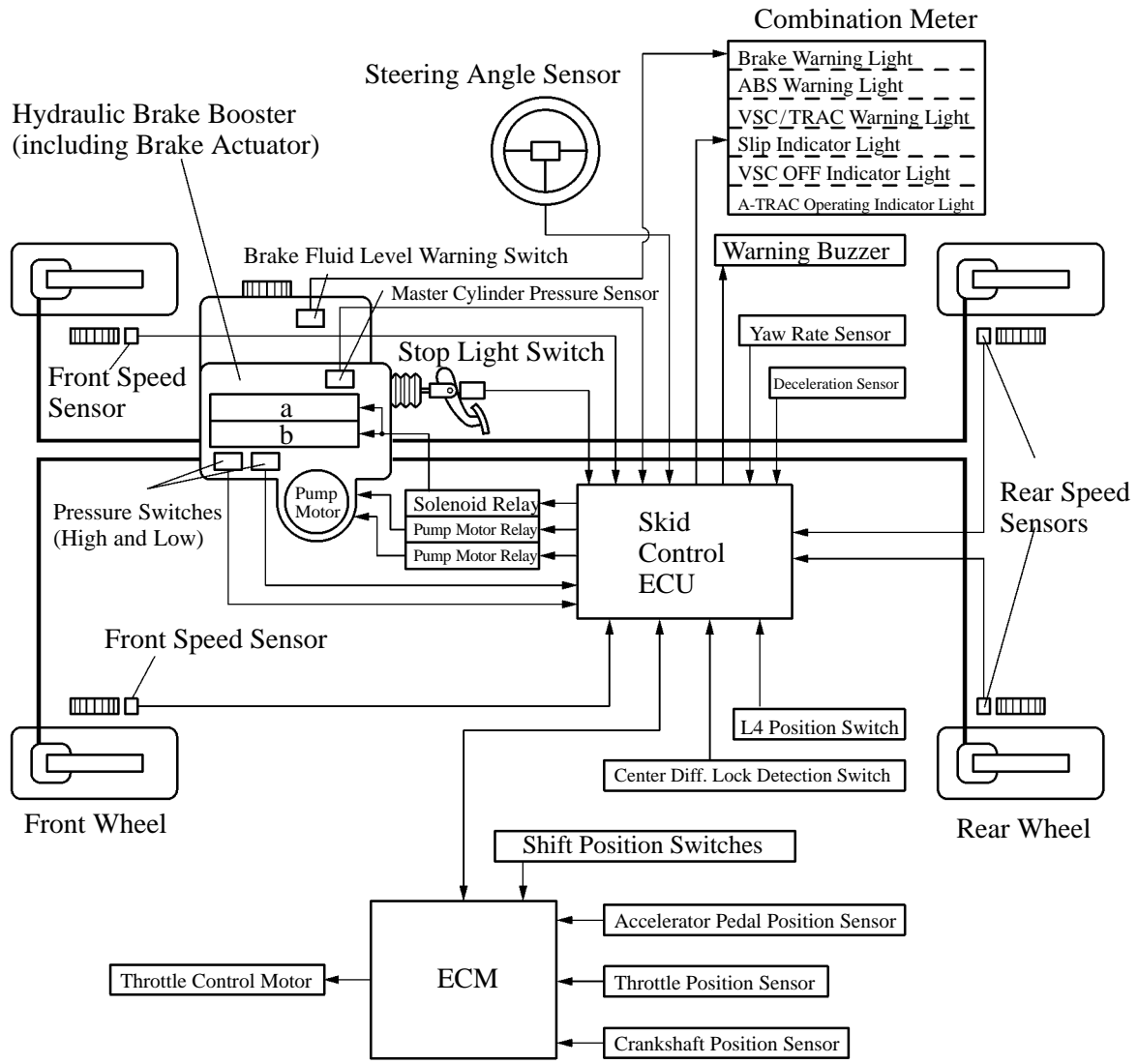
ABS (Anti-lock Brake System), EBD (Electronic Brake force Distribution),  
A-TRAC (Active Traction Control), VSC (Vehicle Skid Control)

### 2. Function

The table below gives an outline of the functions that comprise the ABS with EBD & Brake Assist & A-TRAC & VSC system.

Function	Outline
VSC Function	If the vehicle is about to experience a loss of traction or side slips during an unexpected occurrence, such as a sudden change in the road conditions or while making an emergency avoidance maneuver, this function automatically controls the brake fluid pressure applied to the wheels and regulates the engine output in order to help maintain traction. As a result, the vehicle's off-road drivability is improved
A-TRAC Function	During rugged offroad driving, this function controls the engine output and the brake fluid pressure that is applied to the slipping wheel, and distributes the drive force that would have been lost through the slippage to the remaining wheels in order to achieve a LSD (Limited Slip Differential) effect. As a result, the vehicle's offroad drivability and ability to free itself from the mogul have been improved.
ABS with EBD Function	This function controls the brake fluid pressure acting on the wheel cylinders to help prevent the wheels locking and thus helps to maintain good directional stability and steerability on slippery surfaces and during panic braking. Based on the signals received from the speed sensors, the EBD detects the difference in the speed between the front and rear wheels, and operates the brake actuators to control the fluid pressure in order to effect an appropriate front/rear wheel braking force distribution in accordance with the vehicle's driving conditions. This functions like an electronic load-sensing proportioning valve.
Brake Assist Function	When the brake pedal is depressed suddenly, and the Skid Control ECU has determined that it is emergency braking, this function mechanically generates a large brake force to assist the driver who does not strongly depress the brake pedal.

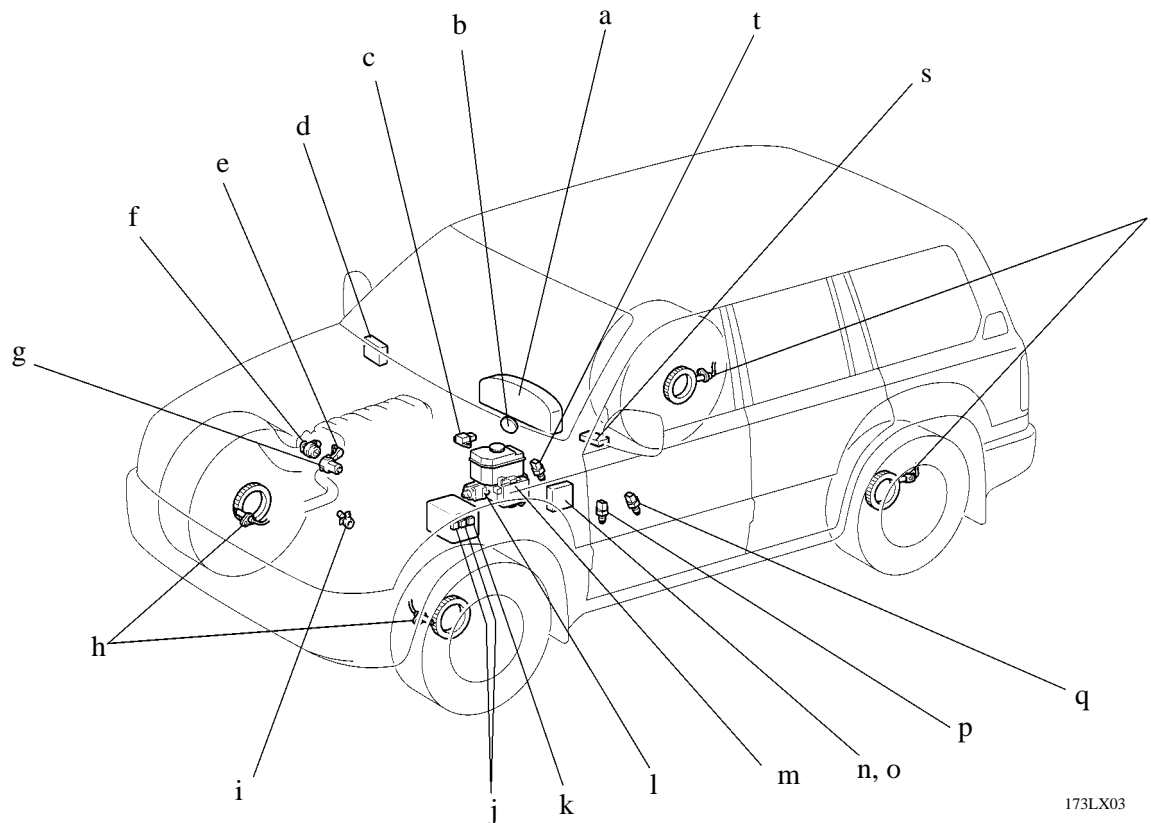
3. System Diagram



a: Switching Solenoid Valves  
 b: Control Solenoid Valves

172LC02

#### 4. Layout of Components



173LX03

- a : Combination Meter (Brake Warning Light, ABS Warning Light, VSC/TRAC Warning Light, Slip Indicator Light, VSC OFF Indicator Light, A-TRAC Operating Indicator Light)
- b : Steering Angle Sensor
- c : Yaw Rate Sensor
- d : ECM
- e : Throttle Position Sensor
- f : Accelerator Pedal Position Sensor
- g : Throttle Control Motor
- h : Front Speed Sensors
- i : Crankshaft Position Sensor
- j : Pump Motor Relays
- k : Solenoid Relay
- l : Master Cylinder Pressure Sensor
- m : Hydraulic Brake Booster (Including Brake Actuator)
- n : Skid Control ECU
- o : Warning Buzzer (VSC Warning Buzzer, TRAC Warning Buzzer, Brake Warning Buzzer)
- p : Center Diff. Lock Detection Switch
- q : L4 Position Switch
- r : Rear Speed Sensors
- s : Deceleration Sensor
- t : Stop Light Switch

**5. Function of Components**

Components		Function
Hydraulic Brake Booster (including Brake Actuator)		<ul style="list-style-type: none"> <li>● Assists with the pedal effort applied to the brake pedal.</li> <li>● Changes the fluid path based on the signals from the Skid Control ECU during the operation of the ABS with EBD, Brake Assist, A-TRAC and VSC functions, in order to control the fluid pressure that is applied to the wheel cylinders.</li> </ul>
	Brake Fluid Level Warning Switch	Detects the brake fluid level.
	Master Cylinder Pressure Sensor	Assembled in the hydraulic brake booster and detects the master cylinder pressure.
	Pressure Switches	Monitors the hydraulic pressure of the accumulator and outputs control signals for the pump motor. There are two types: the pressure switch PH for controlling the pump, and the pressure switch PL for giving a warning when the pressure is low.
Yaw Rate Sensor		Detects the vehicle's yaw rate.
ECM		Controls the throttle valve opening angle based on the signals received from the Skid Control ECU, in order to control the engine output. Also, sends the throttle valve opening angle signal, accelerator pedal position signal, etc., to the Skid Control ECU.
Throttle Position Sensor		Detects the opening of the throttle valve and inputs it into the ECM.
Accelerator Pedal Position Sensor		Detects the opening of the accelerator pedal and inputs it into the ECM.
Throttle Control Motor		Controls the opening of the throttle valve in accordance with the signals received from the ECM.
Speed Sensors		Detect the wheel speed of each of four wheels.
Crankshaft Position Sensor		Detects the engine rpm, and sends it via the ECM to the Skid Control ECU.
Pump Motor Relays		Control the pump motor operation in the hydraulic brake booster.
Solenoid Relay		Supply power to the solenoid valves in the hydraulic brake booster.
Skid Control ECU		Judges the vehicle driving condition based on signals from each sensor, and sends brake control signal to the hydraulic brake booster. Also, sends the throttle opening angle demand signal and other control signals to the ECM.
Warning Buzzer	VSC Warning Buzzer	Together with the slip indicator light, the buzzer sounds intermittently to inform the driver that the VSC function is active.
	TRAC Warning Buzzer	The buzzer sounds intermittently to inform the driver if the temperature of the brake actuator has increased excessively due to the continuous operation of the A-TRAC function.
	Brake Warning Buzzer	Together with the brake warning light, the buzzer sounds continuously to inform the driver that the hydraulic pressure of the accumulator in the hydraulic brake booster has decreased, and that the power supply system is malfunctioning.

Components		Function
Center Diff. Lock Indicator Switch		Detects the condition of the center differential lock.
L4 Position Switch		Detects the transfer shifted in the low.
Deceleration Sensor		Detects the vehicle's acceleration in the longitudinal and lateral directions.
Stop Light Switch		Detects the brake signal.
Combination Meter	Brake Warning Light	<ul style="list-style-type: none"> <li>● Lights up to alert the driver when the accumulator pressure is low or the hydraulic brake booster is abnormal.</li> <li>● Lights up together with the ABS warning light to inform the driver of the abnormal condition of the system in case the EBD function malfunctions.</li> </ul>
	ABS Warning Light	<ul style="list-style-type: none"> <li>● Lights up to alert the driver when the Skid Control ECU detects the malfunction in the ABS and Brake Assist functions.</li> <li>● Lights up together with the brake warning light to inform the driver of the abnormal condition of the system in case the EBD function malfunctions.</li> </ul>
	VSC/TRAC Warning Light	<ul style="list-style-type: none"> <li>● Alert the driver when the Skid Control ECU detects the malfunction in the A-TRAC function and/or VSC function.</li> <li>● Lights up to inform the driver when the operation of the A-TRAC function is momentarily interrupted in order to protect the system.</li> </ul>
	Slip Indicator Light	Blinks to inform the driver when the VSC function is operated.
	VSC OFF Indicator Light	Lights up to inform the driver when the center differential has been locked and the operation of the VSC function has been stopped.
	A-TRAC Operating Indicator Light	Blinks to inform the driver when the A-TRAC function is operated.
Steering Angle Sensor		Detects the steering direction and angle of the steering wheel.

## 6. Construction and Operation of Main Components

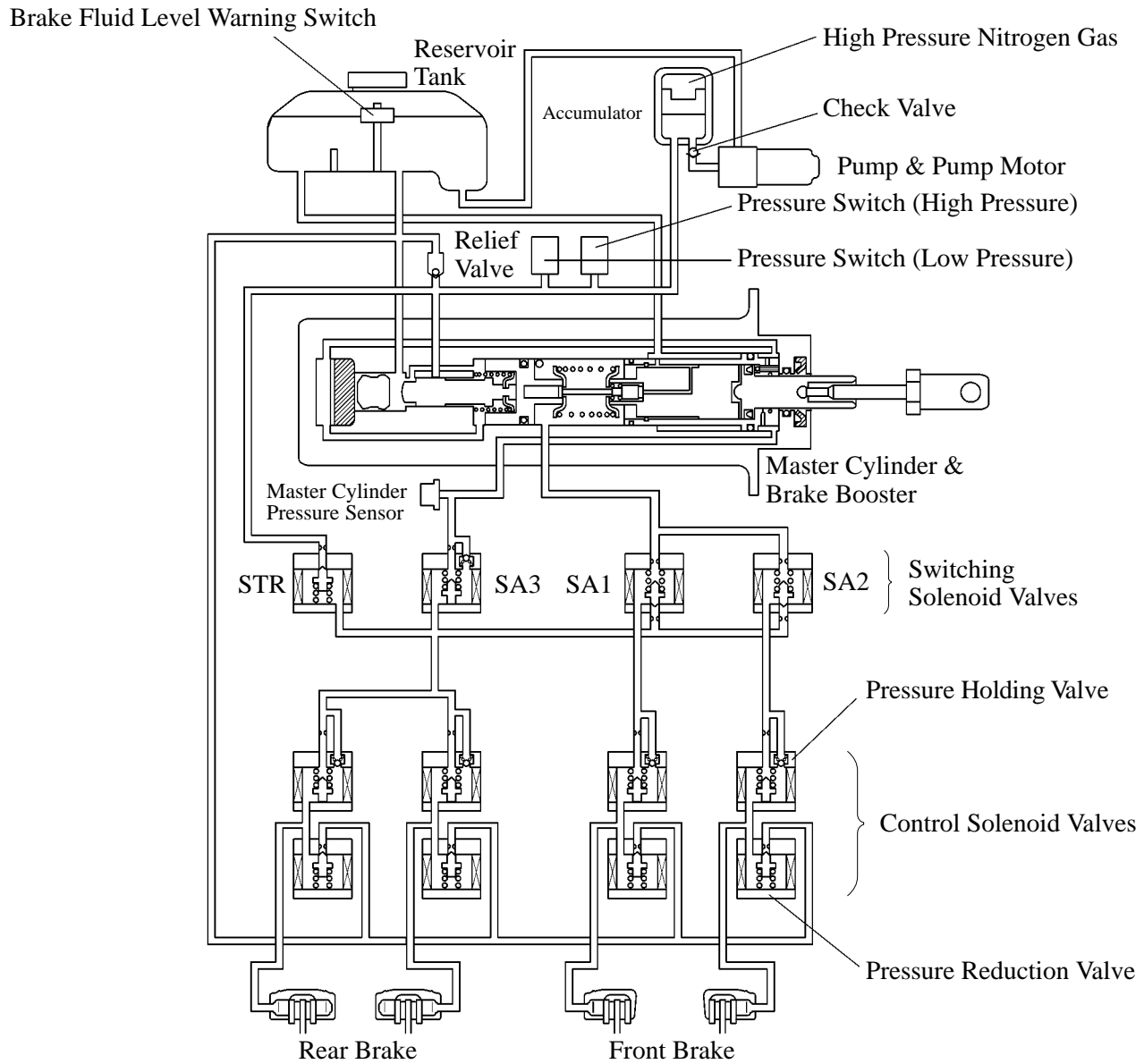
### Hydraulic Brake Booster

The construction of the hydraulic brake booster has been changed as follows:

- A master cylinder pressure sensor, which detects the fluid pressure that has been generated in accordance with the pedal effort, has been added.
- Along with the adoption of the ABS with EBD function, the P&B valve that controls the brake force distribution to the rear brake has been discontinued.
- Four switching solenoid valves (SA1, SA2, SA3 and STR) are provided.
- The control solenoid valves consist of 4 pressure holding valves and 4 pressure reduction valves.

Except for the items indicated above, the basic construction and operation of the hydraulic brake booster are the same as in the previous model. For details, see the 1998 Land Cruiser New Car Features (Pub. No. NCF156U).

► Hydraulic Circuit ◀



173LX04

**1) Switching Solenoid Valve**

Two switching solenoid valves (SA3 and STR) have been newly added to the 2000 model, in addition to the two switching solenoid valves (SA1 and SA2) that are provided on the '99 model.

The control signals from the Skid Control ECU open and close the switching solenoid valves to switch the brake fluid paths.

The solenoid valves SA1 and SA2 open and close the fluid path from the master cylinder, the solenoid valve SA3 opens and closes the fluid path from the regulator, and the solenoid valve STR opens and closes the fluid path from the accumulator.

**2) Control Solenoid Valve**

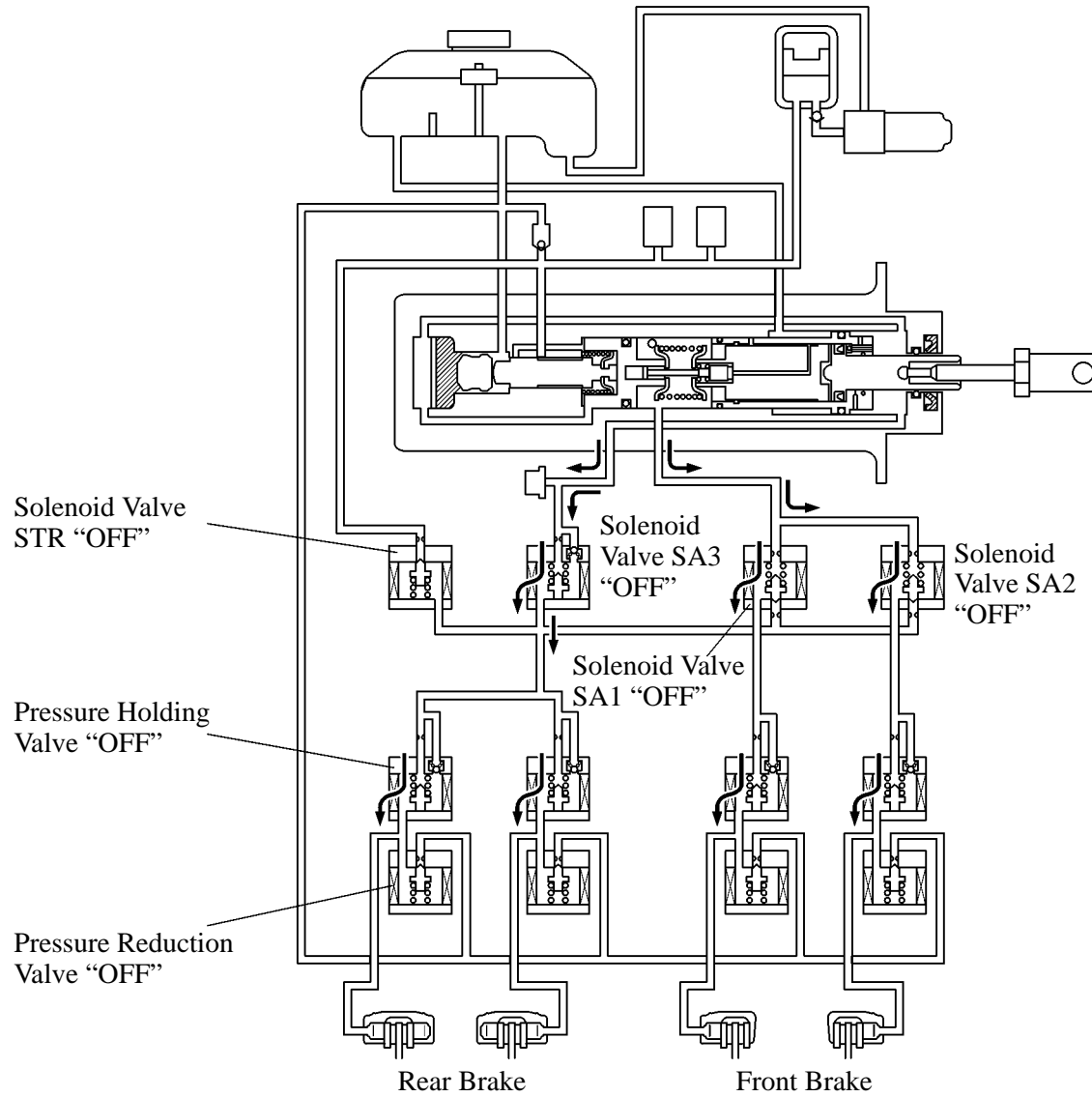
The control solenoid valve consists of a pressure holding valve and a pressure reduction valve. The control signal from the skid control ECU opens and closes the valve to switch the brake fluid path.

In contrast to the three pairs of control solenoid valves that are provided on the '99 model, the 2000 model is provided with four pairs of control solenoid valves. They enable independent control of both right and left rear brakes in addition to the independent control of the front brakes.

## 7. Operation

### Normal Braking

During normal braking, all solenoid valves are turned OFF.



**VSC Function**

**1) General**

Ordinarily, the vehicle exhibits excellent tractions and directional control in accordance with steering operation.

However, depending on the unexpected situations or external elements such as the ground surface conditions and vehicle speed, the vehicle may exhibit a loss of traction and understeer or oversteer tendencies. In such situations, the VSC functions to help dampen this tendency.

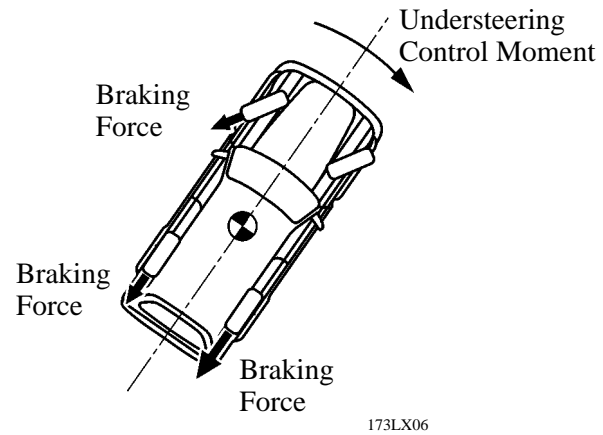
**2) Outline of VSC Performance**

**a. Method of VSC Operation**

When the Skid Control ECU determines that the vehicle exhibits a loss of traction and a tendency to understeer or oversteer, it decreases the engine output and applies the brake of a front and/or rear wheel to help control the vehicle’s yaw moment.

**i) Dampening Understeer**

When the Skid Control ECU determines that the vehicle exhibits a tendency to understeer, depending on the extent of that tendency, it controls the engine output and applies the brakes of the front wheel of the outside of the turn and rear wheels, thus providing the vehicle with an understeer yaw moment, which helps dampen its tendency to understeer.

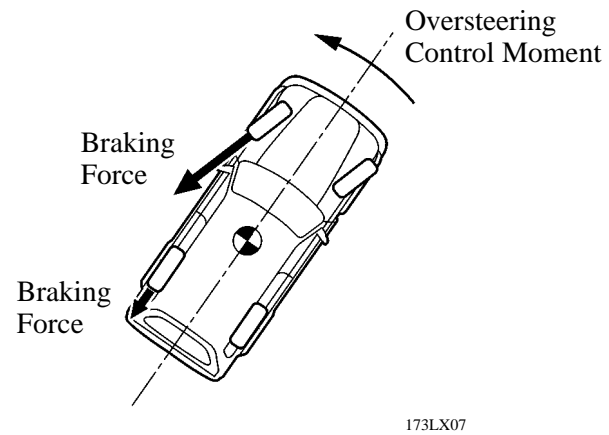


**Making a Right Turn**

173LX06

**ii) Dampening Oversteer**

When the Skid Control ECU determines that the vehicle exhibits a tendency to oversteer, depending on the extent of that tendency, it controls the engine output and applies the brake of the front wheel of the outside of the turn, thus generating an inertial moment in the vehicle’s outward direction, which helps dampen its tendency to oversteer. Also, there are instances in which the brake is applied to the rear wheel of the outside of the turn.



**Making a Right Turn**

173LX07

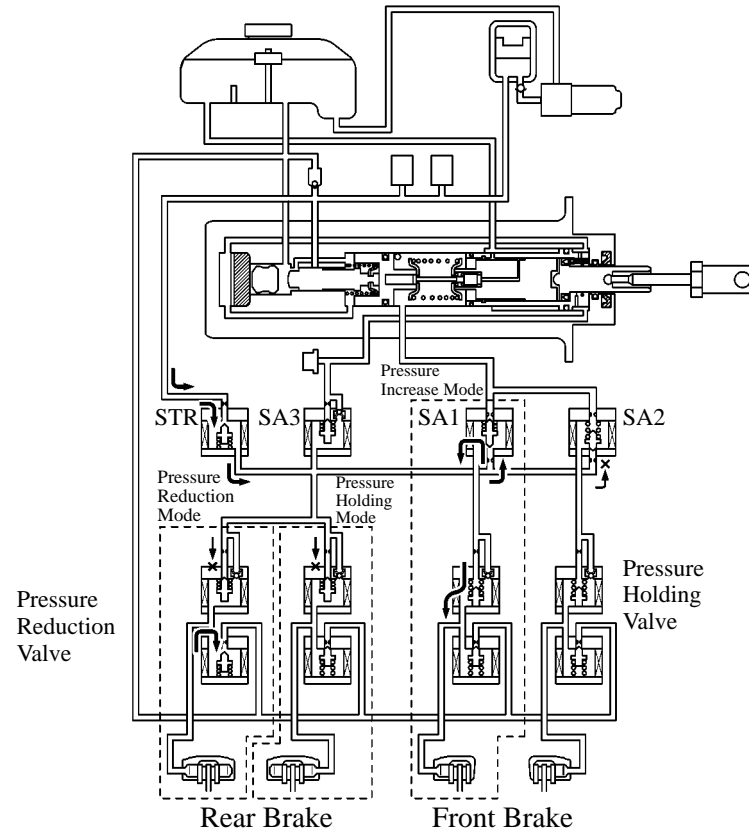
3) System Operation

The VSC function control consists of an engine output control and a brake hydraulic control. The brake hydraulic control function 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 three modes: the pressure reduction mode, pressure holding mode, and the pressure increase mode.

When the function activates to restrain oversteer, it controls the front brake of the outer wheel in the turn. It also regulates the rear brake of the outer wheel in the turn as needed.

When the function activates to restrain understeer, it controls the front brake of the outer wheel in the turn and rear brakes.



173LX08

Mode		Solenoid Valves	VSC Not Activated	VSC Activated		
				Pressure Increase Mode	Pressure Holding Mode	Pressure Reduction Mode
		Solenoid Valve STR*	OFF	ON	ON	ON
		Solenoid Valve SA3*	OFF	ON	ON	ON
Front Brake	Solenoid Valves SA1 and SA2*		OFF	ON	ON	ON
	Pressure Holding Valve		OFF	OFF	ON	ON
	Pressure Reduction Valve		OFF	OFF	OFF	ON
	Wheel Cylinder Pressure		—	Increase	Hold	Reduction
Rear Brake	Pressure Holding Valve		OFF	OFF	ON	ON
	Pressure Reduction Valve		OFF	OFF	OFF	ON
	Wheel Cylinder Pressure		—	Increase	Hold	Reduction

\*: When the front right wheel is under brake control, SA1 is ON.  
 When the front left wheel is under brake control, SA2 is ON.  
 When either wheel is under brake control, SA3 and STR are ON.

## A-TRAC Function

### 1) General

If a tire slips while the vehicle is being driven on a snow-covered road or offroad, the function of the differential gear causes a large amount of drive force to be applied to the tire that is slipping.

The A-TRAC function helps restrain the slippage by controlling the engine output and brake fluid pressure that is applied to the slipping wheel, and distributes the drive force that would have been lost through the slippage to the remaining wheels in order to achieve an effect that is similar to the LSD (Limited Slip Differential).

It independently controls the brake hydraulic pressure to the four wheels in accordance with the extent of the slippage at the wheels, as detected by the Skid Control ECU.

The effectiveness of the control of this function is as follows:

- Offroad drivability that is equivalent to having the center and rear differentials locked has been realized.
- This function made the operation of the differential lock switches basically unnecessary to ensure the ease of driving.
- A drive mode has been added in which the center differential does not lock when the transfer is set to the L range.
- While realizing the offroad drivability that is equivalent to having the center and rear differentials locked, as compared to the differential gear in the locked state, the essential function of the differential gear itself ensures the ease of nimble steerability.

### 2) Outline of Control Performance

The A-TRAC function consists of the following two controls: the brake control and the engine output control.

#### a. Brake Control

Based on the vehicle speed that has been calculated from the speeds of the wheels and the signal from the deceleration sensor, the Skid Control ECU computes the target control speed in accordance with the transfer range.

The 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 ECU controls the solenoid valve of the brake actuator 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 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.

Transfer Range	Control Performance		Outline
	Target Control Speed	Brake Control	
H (for ordinary driving)	Vehicle Speed + Slip rate (H range set value)	Gradual fluid pressure control	Control designed to ensure the ease of driving on low-friction roads, dirt roads, and general roads.
L (for rocky road or offroad driving)	Vehicle Speed + Slip rate (L range set value)	Sudden fluid pressure control	Control designed for rugged offroad driving.
L + 1st gear (for downhill driving)	Vehicle speed when deceleration slippage has been determined during downhill driving.	Fluid pressure control to the front wheels	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.

### b. Engine Output Control

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.

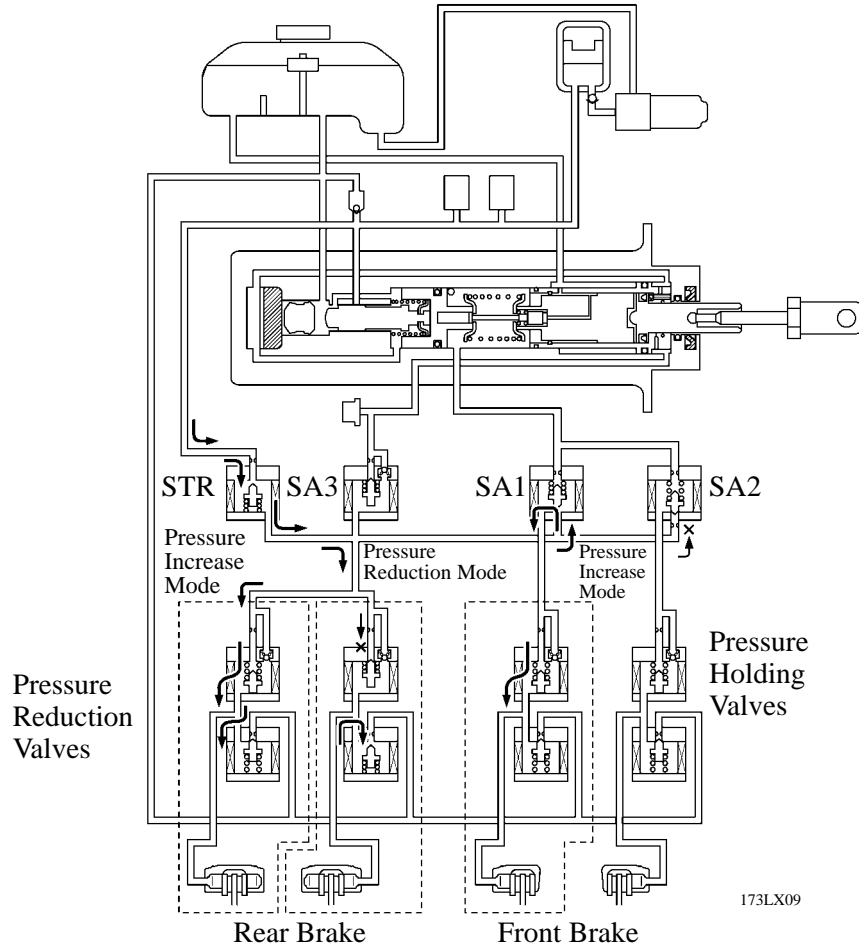
#### NOTE:

- When the brake control of the A-TRAC function 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. If the computed brake actuator temperature is too high, the Skid Control ECU causes the buzzer to sound intermittently to inform the driver.  
After the buzzer has sounded, the brake control takes over. If the temperature of the brake actuator increases even further, the VSC/TRAC warning light illuminates and the buzzer sounds, and the operation of the A-TRAC function is momentarily interrupted to protect the brake actuator. Although the A-TRAC function does not operate at this time, the vehicle can be driven normally.  
When the temperature of the brake actuator decreases, the VSC/TRAC warning light turns OFF, and the A-TRAC function is automatically restored to an operating state.
- 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.  
When the engine speed that is used ordinarily for freeing the stuck vehicle is 3000 rpm or less, brake control is effected under the following conditions:
  - The transfer is in the “L” range and the transmission is in 1st gear (the shift lever is in the “L” position or the shift lever is in the “D” or “2” position while the transmission is in 1st gear).
  - The transfer is in the “L” range and the shift lever is in the “R” position.

3) System Operation

The brake hydraulic control of the A-TRAC function 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 three modes: the pressure reduction mode, pressure holding mode, and the pressure increase mode.



Mode		A-TRAC Not Activated	A-TRAC Activated		
			Pressure Increase Mode	Pressure Holding Mode	Pressure Reduction Mode
Solenoid Valves					
Solenoid Valve STR*		OFF	ON	ON	ON
Solenoid Valve SA3*		OFF	ON	ON	ON
Front Brake	Solenoid Valves SA1 and SA2*	OFF	ON	ON	ON
	Pressure Holding Valve	OFF	OFF	ON	ON
	Pressure Reduction Valve	OFF	OFF	OFF	ON
	Wheel Cylinder Pressure	—	Increase	Hold	Reduction
Rear Brake	Pressure Holding Valve	OFF	OFF	ON	ON
	Pressure Reduction Valve	OFF	OFF	OFF	ON
	Wheel Cylinder Pressure	—	Increase	Hold	Reduction

\*: When the front right wheel is under brake control, SA1 is ON.  
 When the front left wheel is under brake control, SA2 is ON.  
 When either wheel is under brake control, SA3 and STR are ON.

## ABS with EBD (Electronic Brake force Distribution) Function

### 1) General

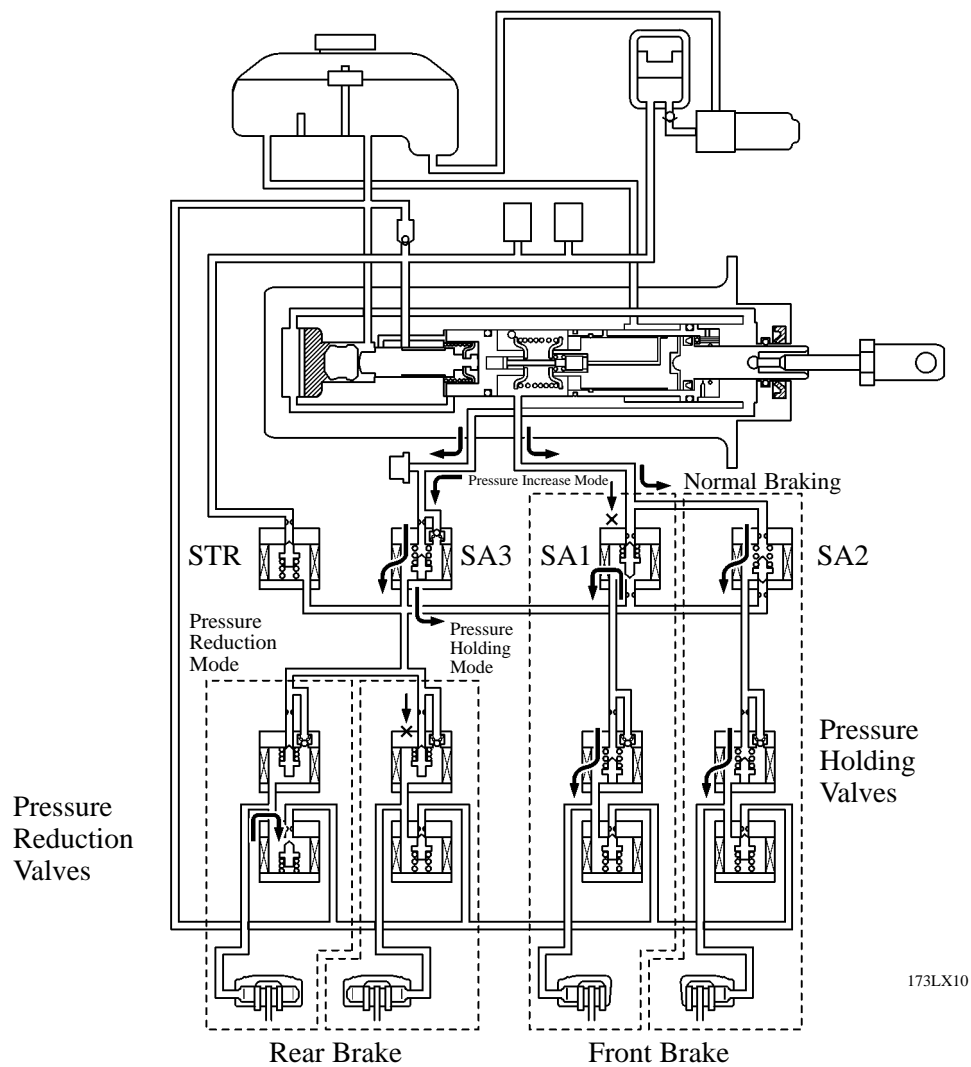
ABS controls braking hydraulic pressure of four wheels via Skid Control ECU during sudden brake or braking on slippery road surface. This helps prevent lock-up of the wheels, thereby assisting the vehicle stability and steering performance.

The EBD control utilizes ABS control unit, realizing the proper brake force distribution between front and rear wheels in accordance with the driving condition.

### 2) System Operation

The solenoid valves are turned ON and OFF as described below to switch the fluid paths in order to control the brakes.

At this time, the hydraulic path between the master cylinder and the front brakes is shut off to prevent the brake pedal from vibrating and to improve the feeling during brake application.



Mode		Normal Braking	ABS Activated		
			Pressure Increase Mode	Pressure Holding Mode	Pressure Reduction Mode
Solenoid Valves					
Solenoid Valve STR		OFF	OFF	OFF	OFF
Solenoid Valve SA3		OFF	OFF	OFF	OFF
Front Brake	Solenoid Valves SA1 and SA2*	OFF	ON	ON	ON
	Pressure Holding Valve	OFF	OFF	ON	ON
	Pressure Reduction Valve	OFF	OFF	OFF	ON
	Wheel Cylinder Pressure	Increase	Increase	Hold	Reduction
Rear Brake	Pressure Holding Valve	OFF	OFF	ON	ON
	Pressure Reduction Valve	OFF	OFF	OFF	ON
	Wheel Cylinder Pressure	Increase	Increase	Hold	Reduction

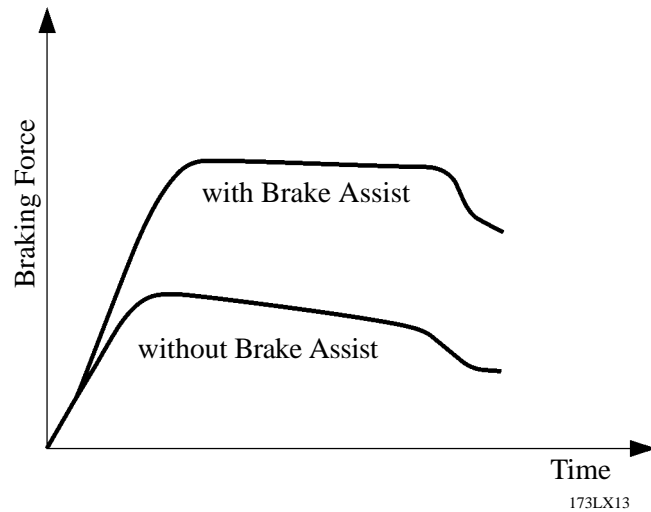
\*: When the front right wheel is under brake control, SA1 is ON.  
 When the front left wheel is under brake control, SA2 is ON.

**Brake Assist Function**

**1) General**

During emergency braking, an inexperienced driver, or a driver in a state of panic might not be able to firmly depress the brake pedal, resulting in only a small amount of brake force being generated.

The Brake Assist function assesses the driver’s intention to apply emergency braking according to the way in which the brake pedal has been depressed, and generates a brake force to assist the driver.

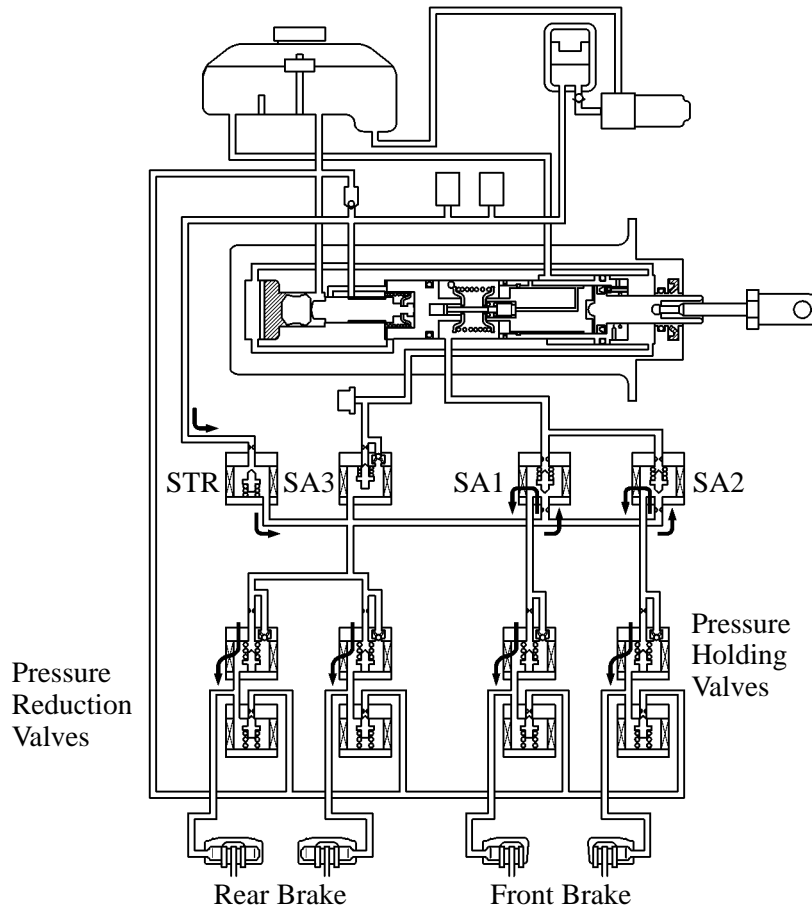


**2) System Operation**

The Skid Control ECU assesses the driver’s intention to apply emergency braking based on the vehicle speed from the speed sensor signals, and the brake pedal depressing speed and force from the master cylinder pressure sensor signal.

If the ECU determines that the driver intends to apply emergency braking, it actuates the solenoid valves in the brake actuator to send the fluid pressure from the accumulator to the wheel cylinders in order to generate the assist force. Furthermore, the ECU regulates the solenoid valves to achieve the assist force in accordance with the driver’s brake pedal effort.

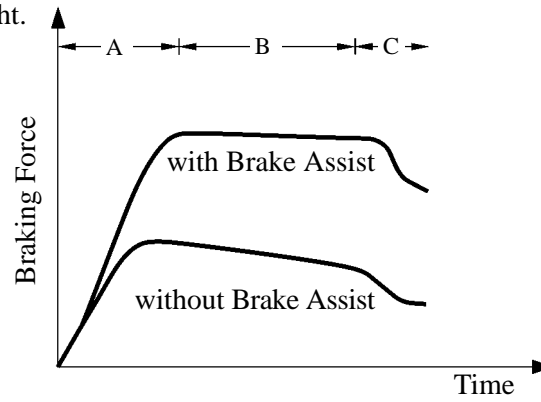
The diagram below represents the wheel cylinder in the pressure increase state (which corresponds to “A” in the table).



173LX11

Mode		Brake Assist Not Activated	Brake Assist Activated		
			A*	B*	C*
Solenoid Valves					
Solenoid Valve STR		OFF	ON	ON	OFF
Solenoid Valve SA3		OFF	ON	ON	OFF
Front Brake	Solenoid Valves SA1 and SA2	OFF	ON	ON	ON
	Pressure Holding Valve	OFF	OFF	ON	OFF
	Pressure Reduction Valve	OFF	OFF	OFF	OFF
	Wheel Cylinder Pressure	—	Increase	Hold	Reduction
Rear Brake	Pressure Holding Valve	OFF	OFF	ON	OFF
	Pressure Reduction Valve	OFF	OFF	OFF	OFF
	Wheel Cylinder Pressure	—	Increase	Hold	Reduction

\*: Applicable to A, B, and C of the diagram on the right.



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### 8. System Cooperative Control

In order to bring the effectiveness of the VSC function control into full play, the methods for controlling other control systems are changed when the VSC is active.

System	Description of Control
Throttle Valve Control	Controls the throttle valve opening angle and the engine output so that the engine drive force and the braking force of the VSC system do not interfere with each other.
ABS Control*	Gives priority to VSC Control.
Brake Assist Control*	
A-TRAC (Brake) Control	Gives priority to VSC (Brake), ABS and Brake Assist Control.

\*: in case of mechanical malfunction.

### 9. VSC Operation Prohibit Control

When the center differential is locked, the VSC function stops operation. At this time, the VSC OFF indicator light in the combination meter lights up to inform the driver that the operation of the VSC function has stopped.

○: ON –: OFF

Traction Mode		Function			
Transfer Range	Center Differential	VSC	A-TRAC	ABS with EBD	Brake Assist
H	Free	○	○	○	○
	Lock	–	○	○	○
L	Free	○	○	○	○
	Lock	–	○	○	○

9

### 10. Self-Diagnosis

If the Skid Control ECU detects a malfunction in the ABS with EBD & Brake Assist & A-TRAC & VSC system, the warning light or the indicator light that corresponds to the function in which the malfunction has been detected lights up, as indicated in the table below, to alert the driver of the malfunction. The ECU will also store the codes of the malfunctions. The DTCs (Diagnostic Trouble Codes) can be accessed through the blinking of the VSC/TRAC warning light or the use of a hand-held tester. For details, see the 2000 Land Cruiser Repair Manual (Pub. No. RM722U).

○: Light ON –: Light OFF

Function Indicator	VSC	A-TRAC	ABS	EBD	Brake Assist
VSC/TRAC Warning Light	○	○	○	○	○
VSC OFF Indicator Light	○	–	○	○	○
ABS Warning Light	–	–	○	○	○
Brake Warning Light	–	–	–	○	–

## 11. Fail-Safe

- If a malfunction occurs in any of the sensors or actuators, the Skid Control ECU turns OFF the solenoid valves of the brake actuator. At the same time, the ECM will not accept an engine output control request signal.

Thus, the brake and throttle valve opening angle control will be operated in the same conditions as those without the VSC, A-TRAC, ABS with EBD and Brake Assist functions.

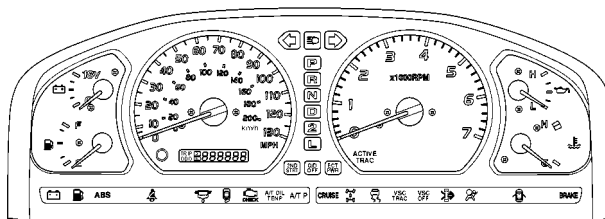
- If any form of malfunction is detected before the control of a functions starts, the operation of the respective function is prohibited immediately.

If a malfunction is detected while the control of a function is being effected, the control will end gradually to avoid causing the vehicle's behavior to change suddenly.

Malfunction Area	Control State	Control Method
ECU	—	Control prohibited
Engine Control System	Before control	Control prohibited
	During control	Control with brake only
Brake System	Before control	Control prohibited
	During control	Control with engine output control only
Sensors	Before control	Control prohibited
	During control	Control prohibited (ending gradually)

## ■ COMBINATION METER

Along with the adoption of the ABS with EBD & Brake Assist & A-TRAC & VSC system, the indicator lights for functions have been provided. Accordingly, the indicator light layout has been partially changed.



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## ■ WIPER

The lengths of the arms and the blades of the front wiper have been changed as indicated in the table below to increase the wiping range of the wipers.

Item		'00 Model	'99 Model
Driver Side	Arm	470.7 mm (18.53 in.)	518.7 mm (20.42 in.)
	Blade	600 mm (23.62 in.)	500 mm (19.69 in.)
Passenger Side	Arm	465.8 mm (18.34 in.)	←
	Blade	550 mm (21.65 in.)	500 mm (19.69 in.)

– MEMO –