

Chassis

No compromise on safety and security

- New hydraulic brake booster is world first to integrate Skid Control ECU, with gains in weight and space
- Active Traction Control (A-TRC) adapts to both on-road or off-road situations
- Hill-start Assist Control (HAC) provides a more reassuring feel on uphill starts
- Downhill Assist Control (DAC) controls downhill speed, even in reverse



The Toyota Land Cruiser is packed with advanced technology to offer the driver complete control under all driving conditions. Many of these technologies are unique to Land Cruiser.

Improved brake system

- World's first brake booster with integrated ECU

Now this technical package is improved still further with the fitment of a **new hydraulic brake booster with integrated skid control ECU** to manage functions such as vehicle stability and traction control. As well as providing better brake control, this 'world-first' is more compact than conventional solutions and offers further weight saving.



New hydraulic brake booster

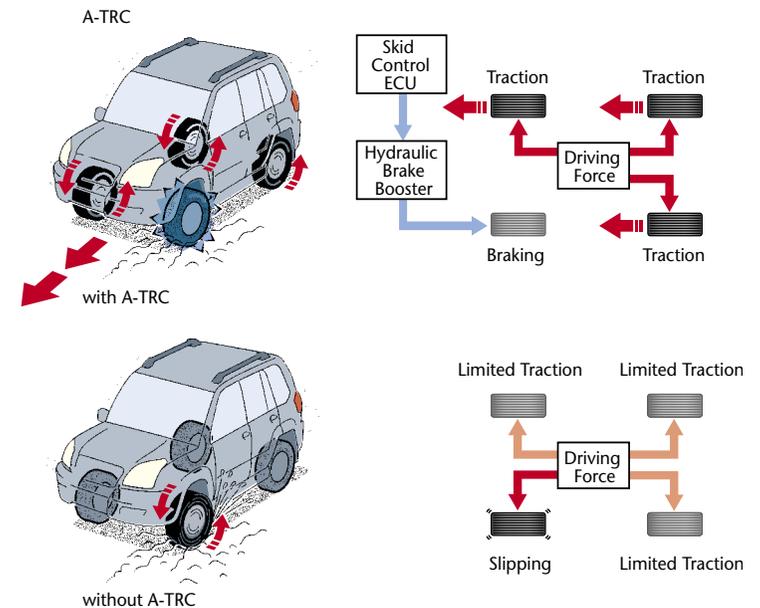
Active Traction Control (A-TRC)

- Maximum efficiency on every surface
- Features downhill travelling control mode

At the heart of the Land Cruiser control package is the Active Traction Control (A-TRC) system which not only sets out to control initial traction and acceleration in slippery conditions but is also compatible with good handling performance.

Electronic Active Traction Control (A-TRC) applies braking control independently to whichever of the four wheels might be slipping, thereby creating a strong limited slip differential effect. The drive force that is lost by the slipping wheel can be transferred instead to a different wheel, making it possible to ensure the same degree of rough road performance provided by a centre plus rear locking mechanism.

A-TRC uses the same basic hardware configuration as the Vehicle Stability Control (VSC) with active-type wheel speed sensors detecting wheel spin and reporting to the integrated central control unit which also measures vehicle behaviour and driver input.



Active Traction Control

On Land Cruiser, the wheel speed sensors can detect backward, as well as forward, movement and are highly sensitive, detecting movement from stationary.

In addition, Active Traction Control features a **downhill travelling control**.

When the vehicle is in first gear, LO-range and going down a rough slope, the Land Cruiser is making use of engine braking to control the speed. However, if one of the wheels lifts, all the engine braking power will tend to go to that wheel, making the vehicle's speed abruptly increase.

A-TRC counteracts this phenomenon, applying brakes to the wheels that remain on the ground. This feature is particularly useful to control downhill speed in the versions equipped with manual transmission.

Road condition	Transfer range	Parameters	Type of control performed	Usage situation
Ordinary road	HI	Target speed	Vehicle speed + wheel slip rate (set for HI range)	Control designed to ensure the ease of driving on low-friction or dirt roads, as well as general roads.
		Braking	Gradual pressure control	
Rocky or off-road	LO	Target speed	Vehicle speed + wheel slip rate (set for LO range)	Control designed for rugged off-road driving.
		Braking	Sudden pressure control	
Downhill	LO + 1st gear	Target speed	Vehicle speed when wheel slip occurs during downhill driving	Designed for rugged, off-road downhill driving with the engine brake applied. It prevents the possible vehicle acceleration that could be caused by a wheel lift.
		Braking	Pressure control to the front wheels	

Hill-start Assist Control (HAC)

- Another world-first for Land Cruiser
- Improves driving comfort
- More reassuring off-road performance

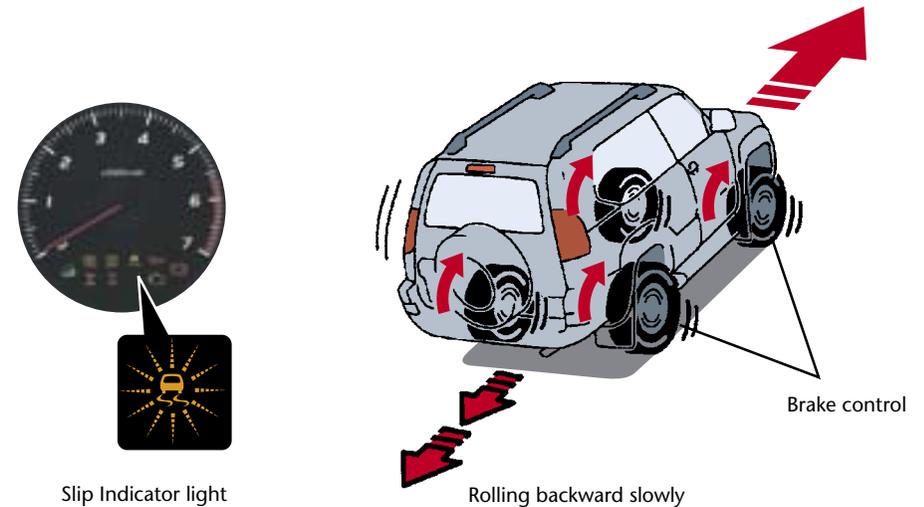
The Toyota Land Cruiser was the first vehicle in the world to be fitted with Hill-start Assist Control (HAC).

This not only **controls wheel-spin when trying an uphill start** on a slippery surface but also **detects if the vehicle is starting to slip backwards** down the slope rather than move forwards.

To prevent this from occurring, HAC temporarily (during five seconds at the maximum) applies the brakes to each wheel in order to reduce the backward speed of the vehicle. By controlling the rotation of each individual wheel, HAC is able to arrest the downhill motion and then allows the driver to pull away forwards without losing control.

This not only boosts hill start performance but also increases driver confidence in the ability to cope with the challenge ahead.

HAC is fully automated and is available with automatic transmission and Vehicle Stability Control.



Slip Indicator light

Rolling backward slowly

Precise Downhill Assist Control (DAC)

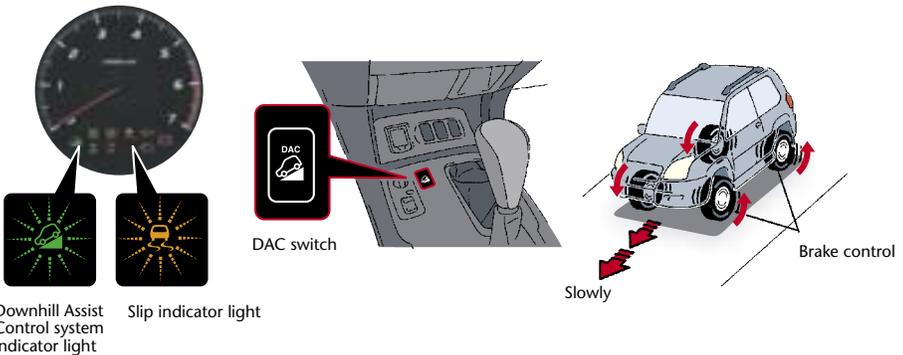
- Controls downhill speed
- Operates both forward or reverse
- More accurate speed sensors provide better speed control

Downhill Assist Control (DAC) is a brake control system which works automatically on the wheels to control speed and prevent the Toyota Land Cruiser from slipping down the hill out of control. This offers far greater control than the foot brake, where there is difficulty in keeping the vehicle under control due to wheel lock, or engine braking which may not be sufficient to control vehicle speed.

The DAC is driver operated and can be switched on when low range is selected on the transfer box. It operates at speeds of less than 25 km/h and with the accelerator and brake pedal off. Speeds are controlled to between 5 and 7 km/h if moving forwards and between 3 and 5 km/h if moving backwards.

The active wheel speed sensors have the ability to detect extremely low speed and the rotating direction of each wheel. This enables DAC to set the correct target speed for both forward and reverse movement. At the same time, the DAC settings have been precisely tuned to a wide range of off-road scenarios.

This feature is only available with automatic transmission and Vehicle Stability Control.



Downhill Assist Control