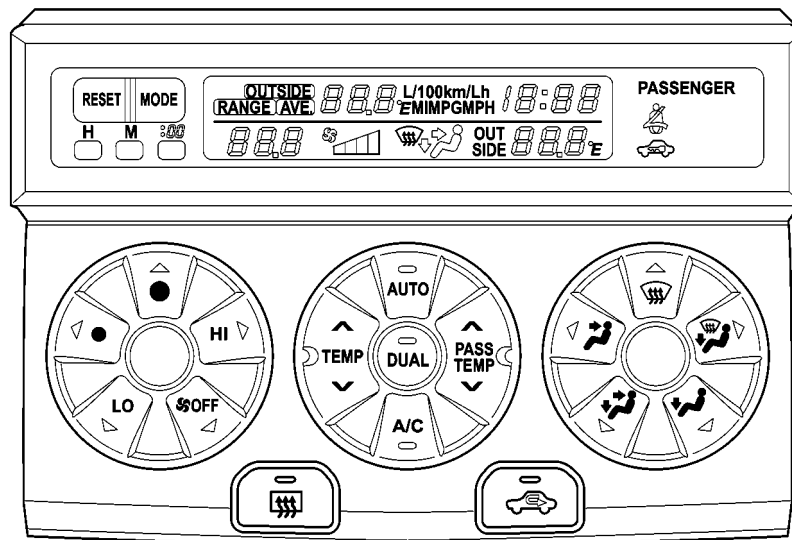


■ CONSTRUCTION AND OPERATION

1. Air Conditioning Control Panel

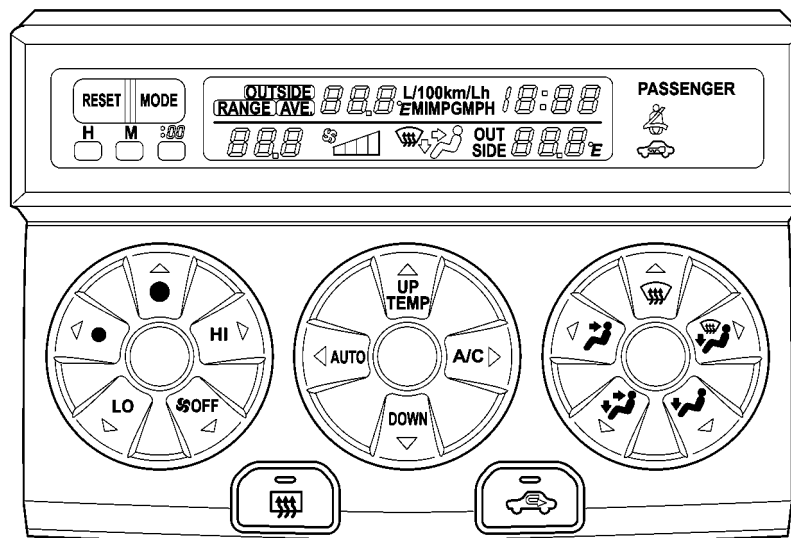
General

- The air conditioning control panel uses push button controls and a LCD (Liquid Crystal Display) to display the set temperature, air outlet mode, blower speed, clock, and trip information to ensure excellent visibility.
- On this air conditioning control panel, all the air outlet mode and blower speed selector buttons are independent. Therefore, the air outlet modes and blower speeds can be selected directly.
- Along with the adoption of the right/left independent temperature control on the Limited grade model, the temperature control switches for the driver and the front passenger have been located closer to the respective seats to enhance their ease of use.



Limited Grade Model

232BE15

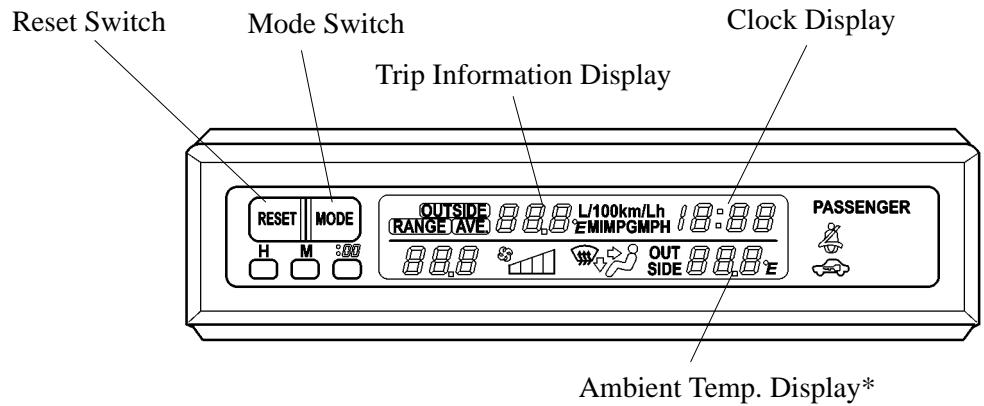


SR5 Grade Model

232BE16

Trip Information

- The meter ECU calculates the contents to be displayed and the air conditioning ECU controls the displays.
- The trip information display can be switched by operating the mode switch and reset switch.
- The trip information display has following functions.



232BE17

*: Only for SR5 Grade Model

► **Trip Information Function** ◀

Item	Display Contents	Outline
Clock and Ambient Temperature Display	<p>232BE27</p>	<ul style="list-style-type: none"> • Clock display • Displays ambient temperature in accordance with the ambient temperature sensor signal.
Average Vehicle Speed	<p>232BE28</p>	<ul style="list-style-type: none"> • Displays the value that has been calculated by the meter ECU, which is based on the elapsed time and driven distance after the ignition switch has been turned ON or the RESET button has been pressed 0.8 seconds or longer. • The display updates every 10 seconds.
Average Fuel Consumption	<p>232BE29</p>	<ul style="list-style-type: none"> • Displays the value that has been calculated by the meter ECU, which is based on the driven distance after refueling and the fuel consumption volume (fuel injection signal from No. 1 injector). • The meter ECU determines that the vehicle has been refueled in accordance with the signal from the fuel sender gauge. • The display updates every 10 seconds.
Drivable Distance	<p>232BE30</p>	<ul style="list-style-type: none"> • Displays the value that has been calculated by the meter ECU, which is based on the fuel consumption data that the meter ECU continuously monitors and stores in its memory and the residual fuel volume data, provided that the ignition switch is turned ON. • The display updates every kilometer.

► Switch Function ◀

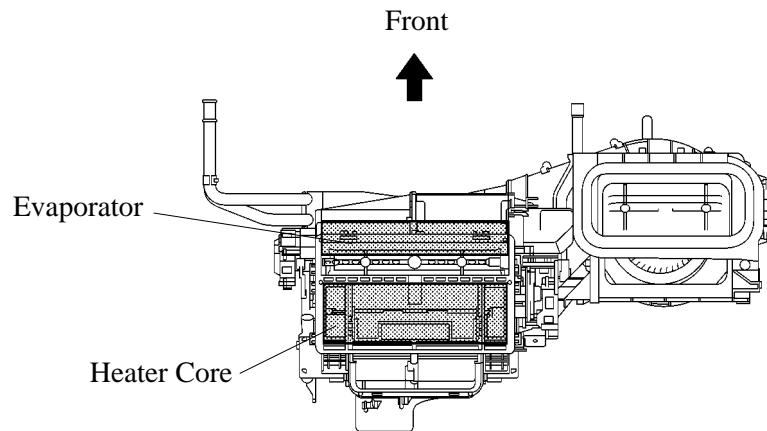
Switch	Function
MODE	<p>Pressing MODE switch changes the contents of the multi-information display in the following sequence:</p> <div style="text-align: center;"> <pre> graph TD A[Ambient Temperature*] --> B[Drivable Distance] B --> C[Average Fuel Consumption] C --> D[Average Vehicle Speed] D --> A </pre> </div>
RESET	<p>Pressing the RESET switch 0.8 seconds or longer resets the display contents of each mode.</p>

*: Only for Limited grade model (on SR5 grade, the ambient temperature appears continuously below the clock display).

2. Air Conditioning Unit

General

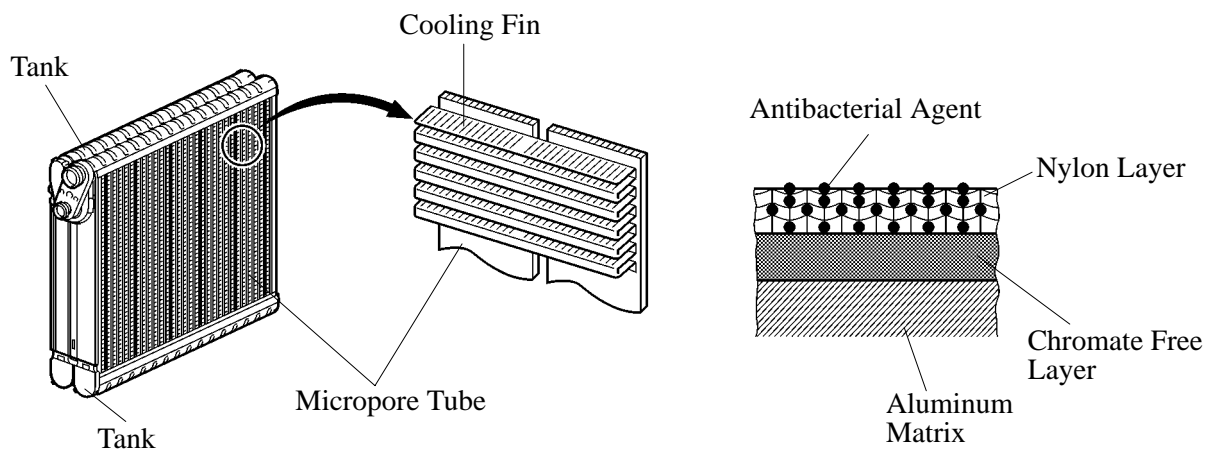
A semi-center location air conditioning unit, in which the evaporator and heater core are placed in the vehicle's longitudinal direction. As a result, the air conditioning unit has been made compact and lightweight.



232BE18

Evaporator

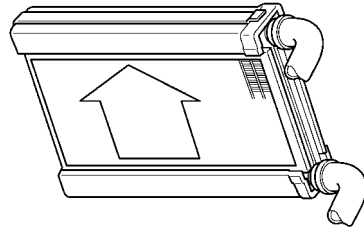
- A revolutionary-slim structure evaporator has been adopted.
- By placing the tanks at the top and the bottom of the evaporator unit and adopting a micropore tube construction, the following effects have been realized:
 - a) The heat exchanging efficiency has been improved.
 - b) The temperature distribution has been made more uniform.
 - c) The evaporator has been made thinner.
- The evaporator body has been coated with a type of resin that contains an antibacterial agent in order to minimize the source of foul odor and the propagation of bacteria. The substrate below this coating consists of a chromate-free layer to help protect the environment.



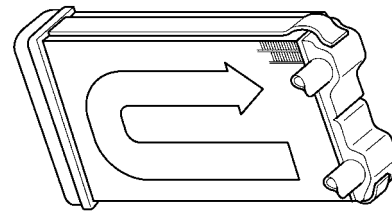
232BE19

Heater Core

A compact, lightweight, and highly efficient straight flow (full-path flow) aluminum heater core has been adopted.



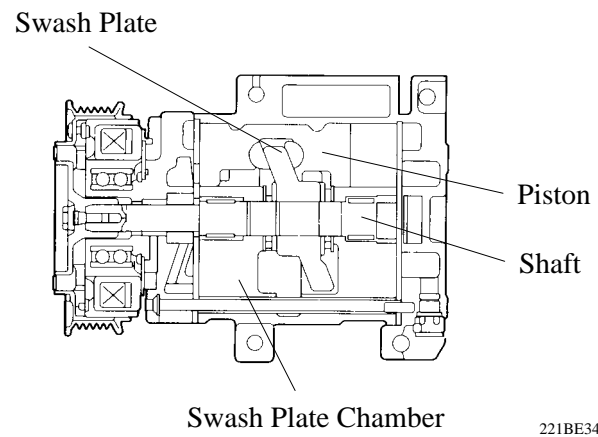
'03 4Runner 151BE21



'02 4Runner 151BE22

3. Compressor

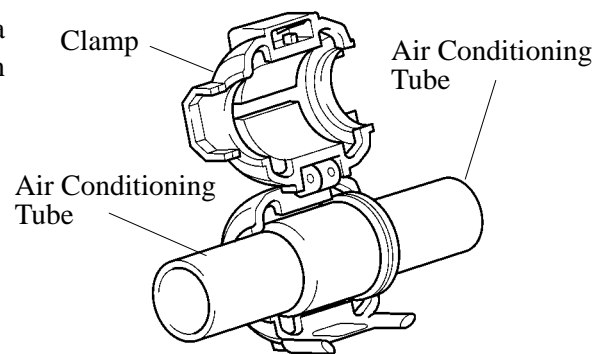
A compact, lightweight, and low-noise swash plate type compressor has been adopted.



221BE34

4. Quick Joint

The clamp type quick joint has been adopted. As a result, the ease of operation and service has been improved.



160CM04

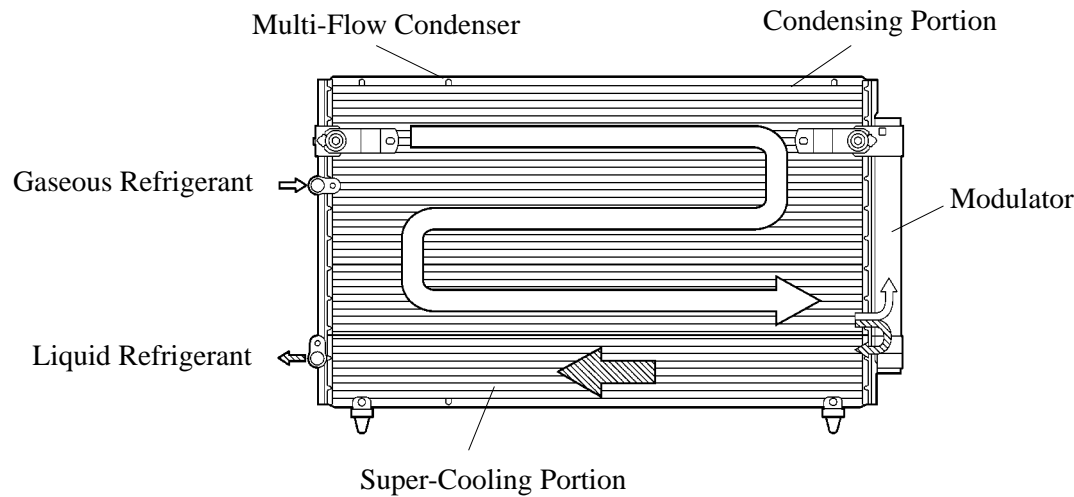
5. Condenser

General

The '03 4Runner has adopted a sub-cool condenser. This is a multi-flow condenser consisting of two cooling portions: a condensing portion and a super-cooling portion, and a gas-liquid separator (modulator) all integrated together. This condenser has adopted a sub-cool cycle for its cooling cycle system to improve heat-exchanging efficiency.

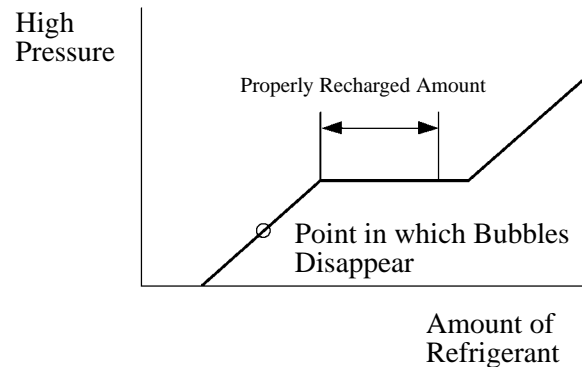
Sub-Cool Cycle

In the sub-cool cycle, after the refrigerant passes through the condensing portion of the condenser, both the liquid refrigerant and the gaseous refrigerant that could not be liquefied, are cooled again in the super-cooling portion. Thus, the refrigerant is sent to the evaporator in an almost completely liquefied state.



NOTE: The point at which the air bubbles disappear in the refrigerant of the sub-cool cycle is lower than the proper amount of refrigerant with which the system must be filled. Therefore, if the system is recharged with refrigerant based on the point at which the air bubbles disappear, the amount of refrigerant would be insufficient. As a result, the cooling performance of the system will be affected. If the system is overcharged with refrigerant, this will also lead to a reduced performance.

For the proper method of verifying the amount of the refrigerant and to recharge the system with refrigerant, see the 2003 4Runner Repair Manual (Pub. No. RM1001U).

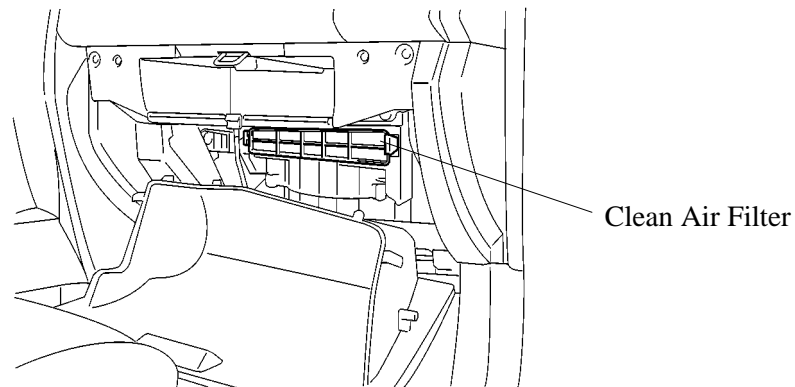


6. Clean Air Filter

A clean air filter that excels in removing dust is standard equipment.

This filter, which cleans the air in the cabin, is made of polyester. Thus, it can be disposed of easily as a combustible material, a feature that is friendly the environment.

In case of changing this filter, the operation can be done easily by removing the clips at both positions, opening the filter door and taking out the filter from inside, thus an excellent serviceability has been realized.



232BE20

Service Tip

The clean air filter on U.S.A. model should be changed at 22,500 miles. On Canada model, it should be changed at 16,000km. However, it varies with the use conditions (or environment).

7. Air Conditioning ECU

General

The air conditioning ECU has following control.

Control	Outline	'03 4Runner	'02 4Runner
Outlet Air Temp. Control	In response to the temperature control switch setting, the required outlet air temperature, evaporator temperature sensor, and engine coolant temperature sensor compensations are used by the air mix control damper control to calculate a tentative damper opening angle, through an arithmetic circuit in the air mix damper, to arrive at a target damper opening angle.	○	○
	The temperature setting for the driver and front passenger is controlled independently in order to provide a separate air temperature for the right and left outside. Thus, air conditioning that accommodates the occupants' preferences has been realized.	○	—
Blower Control	This function controls the operation of the blower motor in accordance with the signals from the engine coolant temperature sensor, evaporator temperature sensor, and the solar sensor. In addition, it protects the blower motor controller from the sudden drive current that occurs when the blower motor is activated.	○	○
Air Outlet Control	When the AUTO switch has been turned ON, automatic control causes the servomotor (for air mix control) to rotate to a desired position in accordance with the target damper opening, which is based on the calculation of the required outlet air temperature. Furthermore, under automatic control, the potentiometer in the servomotor (for air mix control) is used to detect the actual damper opening, as opposed to the calculated target damper opening, so that control can be effected to match the actual damper opening to the calculated target damper opening.	○	○
	In accordance with the engine coolant temperature, outside air temperature, amount of sunlight, required blower outlet temperature, and vehicle speed conditions, this control automatically switches the blower outlet to the FOOT/DEF mode to prevent the window from becoming fogged when the outside air temperature is low.	○	—
Air Inlet Control	Drives the servomotor (for air inlet) according to the operation of the air inlet control switch and fixes the dampers in the FRESH or RECIRC position.	○	○
	When selecting RECIRC mode with a manual operation, if the outside air temperature is low and the refrigerant pressure has malfunction, the air conditioning ECU automatically switched the air inlet mode to the FRESH mode. However, if the outside air temperature is much lower than the specified temperature, in spite of the malfunction of the refrigerant pressure, the air conditioning ECU automatically switches the air inlet mode to the FRESH mode.	○	—
	When selecting RECIRC mode with a manual operation, if the compressor turns OFF, the air conditioning ECU automatically switched the air inlet mode to the FRESH mode.	○	—

(Continued)

Control	Outline	'03 4Runner	'02 4Runner
Compressor Control	This control turns OFF the magnetic clutch of the compressor when the blower motor is turned OFF at the time the engine coolant temperature is below a predetermined value, an abnormal refrigerant pressure has been input, or the discharge temperature of the evaporator is below a predetermined value.	○	○
	When the DEF mode switch is turned on, the magnetic clutch relay is activated automatically to engage the compressor. Also, when the blower is turned off, and the front defroster switch is turned on, the blower will turn on in the automatic control condition.	○	○
Automatic ECON (Economy) Control	Effects the ON/OFF control of the compressor based on the temperatures (evaporator temperature, ambient temperature, required outlet air temperature, and compressor control temperature) that have been calculated by the sensors and the air conditioning ECU in order to improve fuel economy.	○	—
Outer Temperature Indication Control	Based on the signals from the ambient temperature sensor, this control calculates the outside temperature, which is then corrected in the air conditioning ECU, and shown in the air conditioning control panel.	○	○
Self-Diagnosis	Checks the sensor in accordance with operation of the air conditioning switches, then heater control panel display portion a DTC (Diagnosis Trouble Code) to indicate if there is a malfunction or not (sensor check function).	○	○
	Drives the actuators through a predetermined sequence in accordance with the operation of the air conditioning switches (actuator check function).	○	○

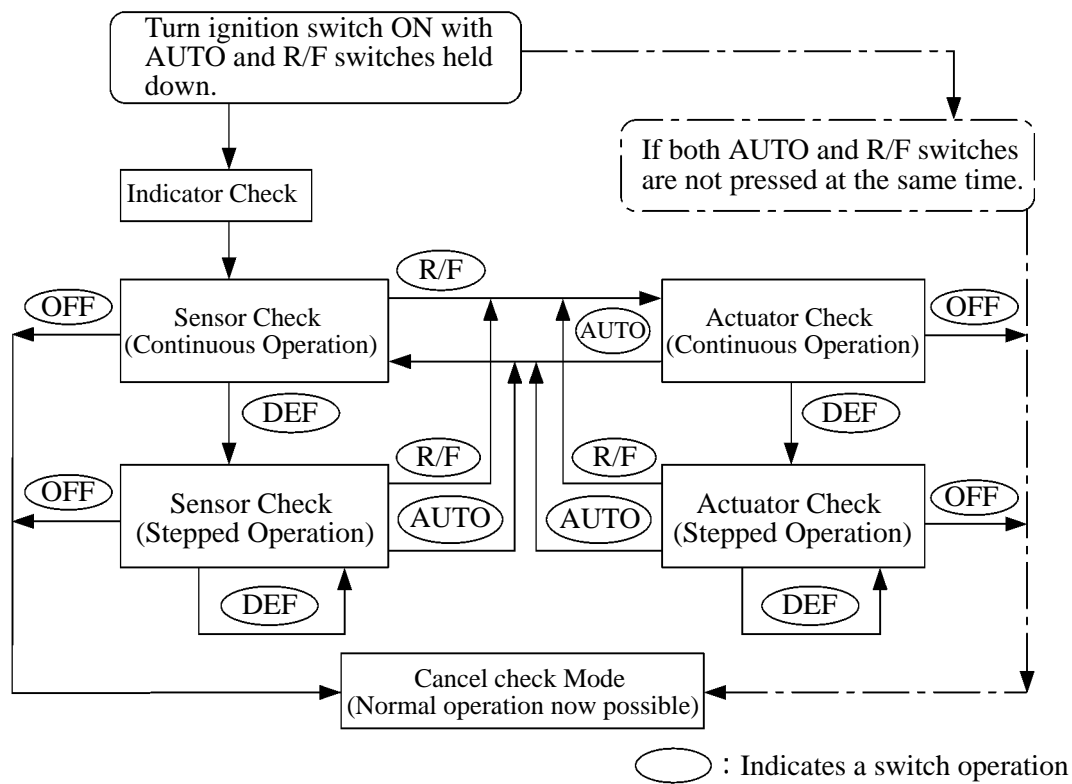
Self-Diagnosis

- The air conditioning ECU has a self-diagnosis function. It stores any operation failures in the air conditioning system memory in the form of a malfunction code. By operating switches on the air conditioning control switches, the stored malfunction code will be indicated. Since diagnostic results are stored directly by electric power from the battery, they are not cleared even when the ignition switch is turned off.

► **Functions** ◀

Function	Outline
Indicator Check	Checks indicator lights and temperature setting display.
Sensor Check	Checks the past and present malfunctions of the sensors, and clearing the past malfunction data.
Actuator Check	Checks against actuator check pattern if blower motor, servomotors and magnetic clutch are operating correctly according to signals from ECU.

- The check function can be started by the following procedure shown below.



187BE33

- For details on the indicator check, sensor check, actuator check function, and clearing DTC of this system, refer to the 2003 4Runner Repair Manual (Pub. No. RM1001U).