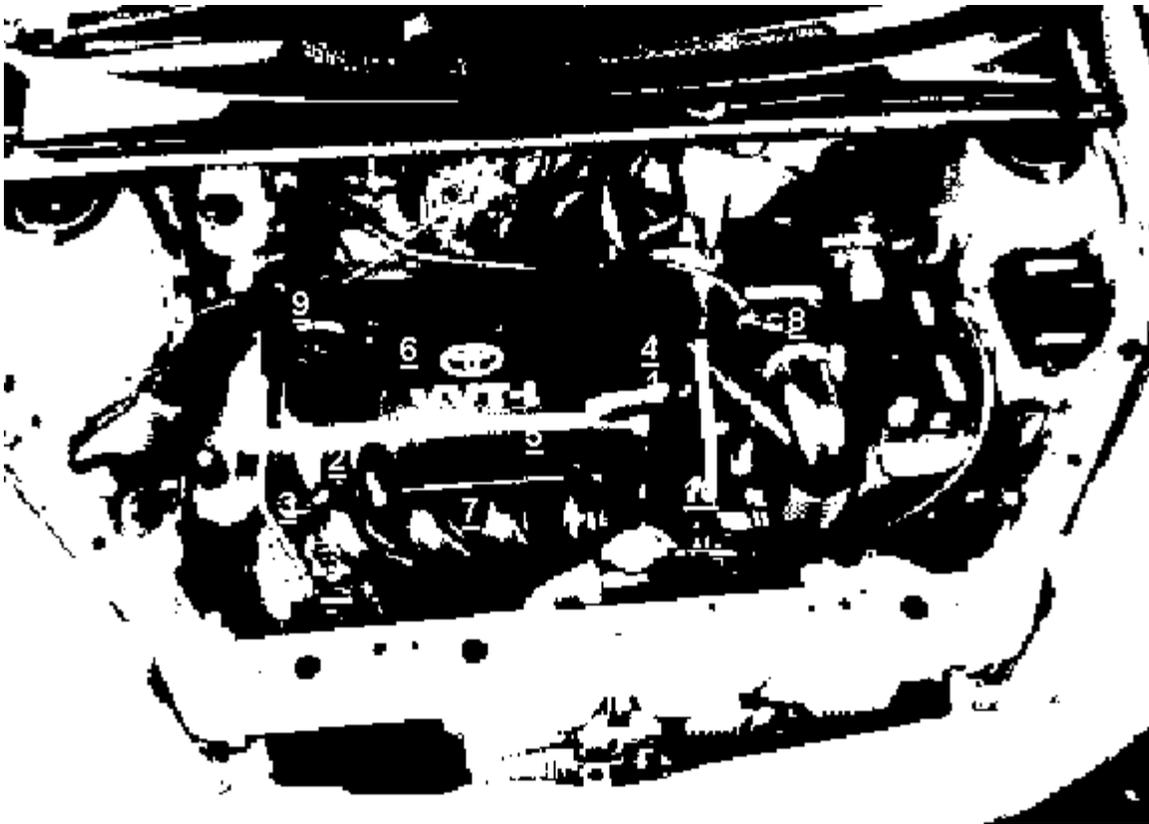


TOYOTA ECHO 1.3L (2NZ-FE Engine) 1999-04 Engine & Transmission Management System  
TOYOTA ECHO 1.5L (1NZ-FE Engine) 1999-04 Engine & Transmission Management System



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### **ABS ECM**

The ABS ECM is located with the ABS unit in the engine compartment. Modules communicate with each other through serial data.

To Test Voltage:

See [PCM Pin #B15](#) and [PCM Pin #D16](#).

### **Air Conditioner Amplifier**

The Air Conditioner Amplifier is located under the dash behind the glove compartment. The [PCM](#) communicates with the A/C Amplifier to control operation of the air conditioner.

To Test Voltage:

See [PCM Pin #D10 and D21](#).

### **Air Conditioner Single Pressure Switch**

The Air Conditioner Single Pressure Switch is located in the air conditioner pressure lines. Should the air conditioner pressure exceed specifications, this switch closes to ground. This brings the [Engine Cooling Fan](#) onto high speed.

### **Automatic Transmission**

The 4 speed Automatic Transmission is [PCM](#) controlled.

The PCM controls the transmission through:

Automatic Transmission Fluid Temperature Sensor.

[Automatic Transmission Solenoids](#).

[Automatic Transmission Turbine Speed Sensor](#).

### **Automatic Transmission Fluid Temperature (TFT) Sensor**

The TFT Sensor is located within the Automatic Transmission.

The [PCM](#) monitors this sensor to determine transmission fluid temperature.

To Test Voltage:

See [PCM Pin #B9](#) and [PCM Pin #C10](#).

### **Automatic Transmission Inhibitor Switch**

The Inhibitor Switch is incorporated with the Automatic Transmission Range Switch.

To Test Voltage:

See [PCM Pin #D11 and D22](#).

### **Automatic Transmission Range Switch**

The Automatic Transmission Range Switch incorporates the [Inhibitor Switch](#).

The [PCM](#) monitors this switch for driver demand.

It monitors Park and Neutral positions through the Inhibitor Switch.

If it sees no voltage on any of the monitored lines, it assumes Drive is selected.

To Test Voltage:

See [PCM Pin #A5](#) and [PCM Pin #D11, D17, D18, D19 and D22](#).

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### **Automatic Transmission Solenoids**

The Automatic Transmission Solenoids are located within the [Automatic Transmission](#).

They are:

- Shift Solenoid #1
- Shift Solenoid #2
- Solenoid ST
- Line Pressure Solenoid
- Lock Up Solenoid

To Test Voltage:

See [PCM Pin #C1, C2, C3, C6, C7 and C9](#).

### **Automatic Transmission Turbine Speed Sensor**

The Automatic Transmission Turbine Speed Sensor is located in the [Automatic Transmission](#).

The [PCM](#) monitors this sensor for transmission speed.

To Test Voltage:

See [PCM Pin #C5 and C11](#).

### **Brake Lamp Switch**

The Brake Lamp Switch is located at the brake pedal cluster.

The [PCM](#) monitors this switch to determine when the brakes are applied.

To Test Voltage:

See [PCM Pin #A6](#).

## **1 Camshaft Position Sensor**

The Camshaft Position Sensor is located at the left end of the camshaft.

It incorporates a single tooth plate on the camshaft and a pickup coil.

The [PCM](#) monitors this sensor for engine position.

It also uses this signal to monitor operation of the Camshaft Timing Oil Control Valve.

To Test Voltage:

See [PCM Pin #A16 and A18](#).

## **2 Camshaft Timing Oil Control Valve**

The Camshaft Timing Oil Control Valve is located at the right end of the camshaft.

The [PCM](#) actuates this valve to vary the opening of the intake valves.

To Test Voltage:

See [PCM Pin #A10 and A23](#).

To Test:

With the engine idling at operating temperature disconnect the Oil Control Valve connector.

Apply battery voltage to the valve.

If the engine runs rough or stalls, the valve is operating.

If there is no change, the valve is faulty and should be replaced.

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**Canister Purge Solenoid**

The Canister Purge Solenoid is located at the left rear of the cylinder head.  
The **PCM** actuates this solenoid to purge the carbon canister of gaseous hydrocarbons.  
It will do this when it has the least effect on driveability.

To Test Voltage:  
See **PCM Pin #A9**.

**Check Engine Lamp**

The Check Engine Lamp is located in the instrument panel.  
Should the **PCM** detect a fault it will illuminate this lamp.  
Manual 2 digit **Fault Codes** can also be read through this lamp.

To Test Voltage:  
See **PCM Pin #D5**.

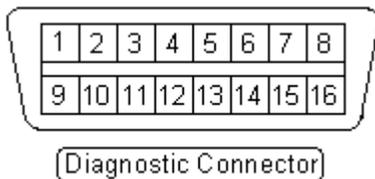
**3 Crankshaft Position Sensor**

The Crankshaft Position Sensor is located at the right end of the crankshaft.  
It incorporates a signal plate with 34 teeth and a pick up coil.  
The **PCM** monitors this sensor for crankshaft angle and engine speed.

To Test Voltage:  
See **PCM Pin #A16 and A17**.

**Diagnostic Connector**

The 16 pin OBDII type Diagnostic Connector is located under the drivers side dash.



To Test Voltage:  
See **PCM Pin #B15** and **PCM Pin #D16**.

**4 Engine Coolant Temperature Sensor**

The Engine Coolant Temperature Sensor is located at the right end of the cylinder head.  
It is to the rear of the **Camshaft Position Sensor**.  
The **PCM** monitors this sensor to determine engine coolant temperature.

To Test Voltage:  
See **PCM Pin #B4 and B9**.

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**Engine Coolant Temperature Switch (Models with A/C)**

The Engine Coolant Temperature Switch is located at the radiator.  
When the engine coolant temperature exceeds specifications, this switch closes.  
This brings the Engine Cooling Fan on to high speed.

**Engine Cooling Fan**

The Engine Cooling Fan is located at the radiator.  
It is actuated by Engine Cooling Fan Relay #1.

**Operation:**

In models without air conditioning;  
The fan is actuated on a single speed by the [PCM](#).

To Test Voltage:  
See [PCM Pin #A8](#).

In models with air conditioning:  
The fan is actuated on low speed by the Air Conditioner Amplifier.  
It is actuated on high speed by:  
[PCM](#),  
[Air Conditioner Single Pressure Switch](#) or  
[Engine Coolant Temperature Switch](#).

To Test Voltage:  
See [PCM Pin #A8](#), and [PCM Pin #D10 and D21](#).

**Engine Cooling Fan Relays**

The Engine Cooling Fan Relays are in the main fuse relay box in the engine compartment.  
Models without air conditioning use Fan Relay #1 only.  
Models with air conditioning use both Fan Relay #1 and Fan Relay #2.  
(See [Engine Cooling Fan](#))

To Test Voltage:  
See [PCM Pin #A8](#).

**Engine Cooling Fan Resistor - Low Speed (A/C)**

The Engine Cooling Fan Low Speed Resistor is located behind the left headlamp.  
It is used through [Engine Cooling Fan Relay](#) #2 to operate the fan on low speed.

**Firing Order**

1, 3, 4, 2.

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**5 Fuel Injectors**

The Fuel Injectors are located in the intake ports of the cylinder head.

To Test Voltage:

See [PCM Pin #A11, A12, A24 and A25](#).

To Test Resistance @ 20°C:

Disconnect connectors and test individually - should be 13.4 to 14.2 Ohms.

**Fuel Pressure**

Engine idling 304 to 343 kPa.

**Fuel Pressure Regulator**

The Fuel Pressure Regulator is incorporated within the Fuel Pump Assembly in the fuel tank. This negates the need for a fuel return line and keeps the fuel in the tank cooler.

**Fuel Pump Assembly**

The Fuel Pump Assembly is located in the fuel tank.

It incorporates the [Fuel Pressure Regulator](#), Fuel Pump and the Fuel Gauge Sender.

**Fuel Pump Relay**

The Fuel Pump Relay is in the instrument panel junction box in the passenger compartment.

To Test Voltage:

See [PCM Pin #D14](#).

**Fuse Locations**

The following Fuses are in the Fusible Link Block in the engine compartment.

Fuse Alt - 100 Amp.

Fuse Main - 60 Amp.

The following Fuses are in the main fuse relay box in the engine compartment.

Fuse AM2 - 15 Amp.

Fuse EFI - 15 Amp.

Fuse RDI - 30 Amp

Fuse ST - 30 Amp.

The following Fuses are in the instrument panel junction box in the passenger compartment.

Fuse AM1 - 50 Amp.

Fuse ECU-IG - 7.5 Amp.

Fuse Gauge - 10 Amp.

Fuse OBD - 7.5 Amp.

Fuse Stop - 10 Amp.

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### **Idle Air Control Valve**

The rotary solenoid type Idle Air Control Valve is located at the [Throttle Body](#).  
The [PCM](#) actuates this valve to alter the air bypassing the throttle plate.

To Test Voltage:  
See [PCM Pin #A2](#).

### **Idle Speed (Base)**

Idle speed is PCM controlled.  
It can be checked as follows:  
Ensure that:  
Engine is @ operating temperature  
All accessories including air conditioner are off.  
Transmission is in neutral or park.

Connect suitable tachometer to terminal 9 of the [Diagnostic Connector](#).  
Start engine and check idle speed is as follows:  
100 to 700 RPM (Manual)  
650 to 750 RPM (Auto)

## **6 Ignition Coils**

There are 4 Ignition Coils located at the spark plugs.  
Each coil incorporates its own Igniter.

To Test Voltage:  
See [PCM Pin #A3, A19, A20, A21 and A22](#).

### **Ignition System**

The Ignition System used is an Electronic Distributorless Ignition System.  
It has a single [Ignition Coil / Igniter](#) for each spark plug.  
The [PCM](#) determines ignition timing and outputs a signal for each cylinder (IGT).  
Simultaneously, the Igniter also sends a confirmation signal back to the PCM (IGF).  
This acts as a failsafe for misfire detection.

### **Ignition Timing (Base)**

Ignition timing is ECM controlled and cannot be adjusted.  
It can be checked as follows:  
Ensure that:  
Engine is @ operating temperature  
All accessories including air conditioner are off.  
Transmission is in neutral or park.

Bridge terminal 13 of the [Diagnostic Connector](#) to ground.  
Connect timing light to cylinder #1.  
Start engine and check ignition timing is 8° to 12° BTDC.

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**Intake Air Temperature Sensor**

The Intake Air Temperature Sensor is incorporated within the [Mass Air Flow Meter](#).  
The [PCM](#) monitors this sensor to determine the temperature of the incoming air.

To Test Voltage:  
See [PCM Pin #B3 and B9](#).

**Kickdown Switch (If Fitted)**

These vehicles may be fitted with a Kickdown Switch.

To Test Voltage:  
See [PCM Pin #C12](#).

**7 Knock Sensor**

The piezoelectric Knock Sensor is located on the front of the engine block.  
When the [PCM](#) detects a knocking condition it retards the ignition timing to alleviate the knock.

To Test Voltage:  
See [PCM Pin #B13](#).

**Main (EFI) Relay**

The Main (EFI) Relay is located in the main fuse relay box in the engine compartment.

To Test Voltage:  
See [PCM Pin #D12](#).

**8 Mass Air Flow Meter**

The hot wire Mass Air Flow Meter is located in the intake duct.  
It incorporates the [Intake Air Temperature Sensor](#).

To Test Voltage:  
See [PCM Pin #B2, B3, B9 and B10](#).

**Overdrive Off Lamp**

The Overdrive Off Lamp is located in the instrument panel.  
It is actuated by the Overdrive Off Switch.  
The [PCM](#) monitors this lamp to determine when the Overdrive Off Switch has been activated.

To Test Voltage:  
See [PCM Pin #C4](#).

**Overdrive Off Switch**

The Overdrive Off Switch is located in the gear selector lever.  
The driver activates this switch to prevent actuation of the overdrive gear.

To Test Voltage:  
See [PCM Pin #C4](#).

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**Overview**

These vehicles are fitted with the 1.3 Litre 2NZ-FE and the 1.5 Litre 1NZ-FE VVTi engines. The system manages both engine and automatic transmission control. Battery voltage as well as air conditioning and engine cooling fans are PCM controlled. Air Mass calculations are by a hot wire Mass Air Flow Meter. Close monitoring of stoichiometric air fuel ratio is through a heated Oxygen Sensor. Exhaust gases are cleaned using a 3 way catalytic converter.

**Oxygen Sensor**

The heated zirconium dioxide Oxygen Sensor is in the exhaust before the catalytic converter.

To Test Voltage:  
See [PCM Pin #B6 and B8](#).

**9 Power Steering Oil Pressure Sensor**

The Power Steering Oil Pressure Sensor is located at the power steering pump. The [PCM](#) monitors this sensor for power steering load. It will adjust idle speed to the most appropriate dependant upon this signal.

To Test Voltage:  
See [PCM Pin #B1, B9 and B12](#).

**Power Steering Pressure Test Connector**

The Power Steering Pressure Test Connector is located under the passenger side dash.

To Test Voltage:  
See [PCM Pin #A7](#).

**Security Indicator LED**

The Security Indicator LED is located in the instrument panel. It indicates the state of the security system.

To Test Voltage:  
See [PCM Pin #D6](#).

**SRS ECM**

The SRS ECM is located behind the centre console. Modules communicate with each other through serial data.

To Test Voltage:  
See [PCM Pin #B15](#) and [PCM Pin #D16](#).

**Starter Relay**

The Starter Relay is located in the main fuse relay box in the engine compartment.

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**Throttle Body**

The Throttle Body incorporates:  
[Idle Air Control Valve](#).  
Throttle Position Sensor.

**10 Throttle Position Sensor**

The potentiometer type Throttle Position Sensor is located at the [Throttle Body](#).

To Test Voltage:  
See [PCM Pin #B1, B9 and B11](#).

**Transponder Key Amplifier**

The Transponder Key Amplifier is located at the steering column next to the ignition switch.  
It is part of the immobiliser system.

To Test Voltage:  
See [PCM Pin #D3, D4 and D15](#).

**Unlock Warning Switch**

The Unlock Warning Switch is located at the steering column next to the ignition switch.

To Test Voltage:  
See [PCM Pin #D7](#).

**Variable Valve Timing (VVT) System**

These engines use a Variable Valve Timing (VVT) System.  
The [PCM](#) monitors the [Camshaft Position Sensor](#) for camshaft actual position.  
It actuates the [Camshaft Timing Oil Control Valve](#) to vary the intake valve timing.

**Vehicle Speed Sensor**

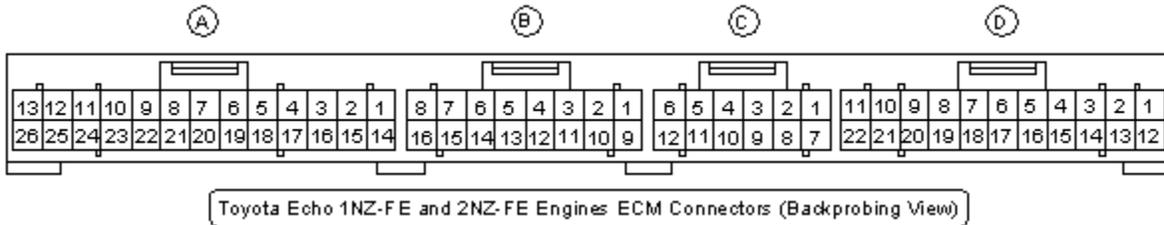
The Vehicle Speed Sensor is located at the transmission.  
It sends a signal (4 pulses per revolution) to the speedometer.  
The speedometer converts this signal to a more regular waveform and sends it to the [PCM](#).

To Test Voltage:  
See [PCM Pin #D9](#).

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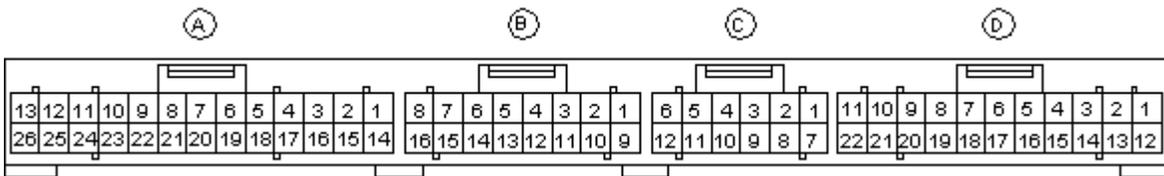
**PCM**

The 4 connector PCM is located behind the glove compartment.



**PCM Voltage Table**

**Connector `A`**

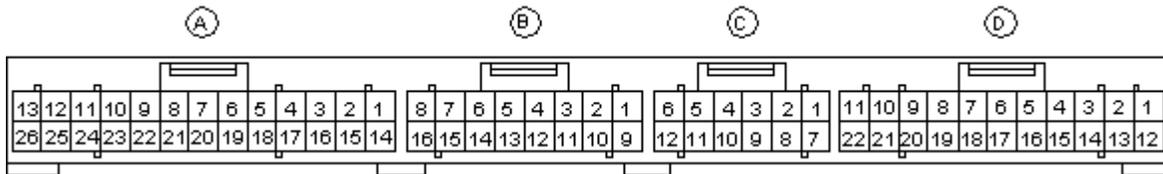


Pin #	Circuit and Status.....	Voltage
<b>A1</b>	<b>Ground</b> All Times.....	0 Volts
<b>A2</b>	<b>Idle Air Control Valve</b> Ignition ON ECM Connector C Disconnected.....	0 to 3 Volts
<b>A3</b>	<b>Ignition Coil Feedback (IGF)</b> Ignition ON..... Engine Idling.....	4.5 to 5.5 Volts Voltage Pulse
<b>A4</b>	<b>Alternator M Terminal</b> No Specifications Available.....	N/A
<b>A5</b>	<b>Transmission Switch D Position</b> Ignition ON Gear Selector in D Position..... Gear Selector in any other Position.....	Battery Volts 0 Volts
<b>A6</b>	<b>Brake Lamp Switch</b> Brake Pedal at Rest..... Brake Pedal Depressed.....	<1.5 Volts Battery Volts
<b>A7</b>	<b>Power Steering Pressure Test Connector</b> Engine Running Connector Not Bridged.....	High Volts

	Connector Bridged.....	<1 Volts
<b>A8</b>	<b>Engine Cooling Fan Relay (Models without A/C)</b> Ignition ON	
	Engine Cooling Fan OFF.....	Battery Volts
	Engine Cooling Fan ON.....	0 Volts
<b>A8</b>	<b>Engine Cooling Fan Relay #2 (Models with A/C)</b> Engine Running with A/C ON	
	Engine Cooling Fan on Low Speed.....	Battery Volts
	Engine Cooling Fan on High Speed.....	0 Volts
<b>A9</b>	<b>Canister Purge Solenoid</b>	
	Ignition ON.....	Battery Volts
<b>A10</b>	<b>Camshaft Timing Oil Control Valve Positive</b>	
	No Specifications Available.....	N/A
<b>A11</b>	<b>Fuel Injector #2</b>	
	Ignition ON.....	Battery Volts
	Engine Idling.....	Voltage Pulse
<b>A12</b>	<b>Fuel Injector #1</b>	
	Ignition ON.....	Battery Volts
	Engine Idling.....	Voltage Pulse
<b>A13</b>	<b>Ground</b>	
	All Times.....	0 Volts
<b>A14</b>	<b>Ground</b>	
	All Times.....	0 Volts
<b>A15</b>	<b>Case Ground</b>	
	All Times.....	0 Volts
<b>A16</b>	<b>Camshaft and Crankshaft Position Sensor Negative</b>	
	All Times.....	0 Volts
<b>A17</b>	<b>Crankshaft Position Sensor Signal</b>	
	Engine Idling.....	Voltage Pulse
<b>A18</b>	<b>Camshaft Position Sensor Signal</b>	
	Engine Idling.....	Voltage Pulse
<b>A19</b>	<b>Ignition Coil #4</b>	
	Engine Idling.....	Voltage Pulse
<b>A20</b>	<b>Ignition Coil #3</b>	
	Engine Idling.....	Voltage Pulse
<b>A21</b>	<b>Ignition Coil #2</b>	
	Engine Idling.....	Voltage Pulse

<b>A22</b>	<b>Ignition Coil #1</b> Engine Idling.....	Voltage Pulse
<b>A23</b>	<b>Camshaft Timing Oil Control Valve Negative</b> No Specifications Available.....	N/A
<b>A24</b>	<b>Fuel Injector #4</b> Ignition ON..... Engine Idling.....	Battery Volts Voltage Pulse
<b>A25</b>	<b>Fuel Injector #3</b> Ignition ON..... Engine Idling.....	Battery Volts Voltage Pulse
<b>A26</b>	<b>Ground</b> All Times.....	0 Volts

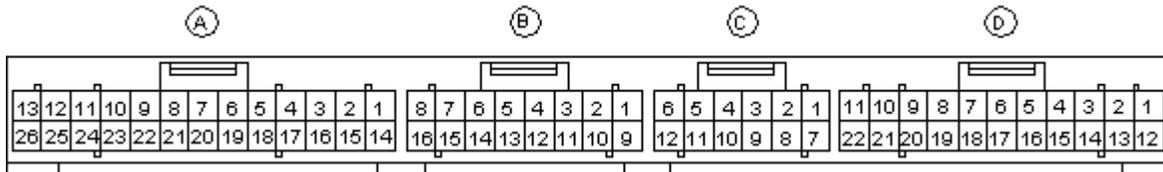
**Connector `B`**



<b>Pin #</b>	<b>Circuit and Status.....</b>	<b>Voltage</b>
<b>B1</b>	<b>5 Volts Sensor Power Supply</b> Ignition ON.....	4.5 to 5.5 Volts
<b>B2</b>	<b>Mass Air Flow Meter Signal</b> <i>Engine Idling in Neutral</i> A/C OFF.....	1.1 to 1.5 Volts
<b>B3</b>	<b>Intake Air Temperature Sensor Signal</b> <i>Engine Idling</i> Intake Air Temperature @ 20°C.....	0.5 to 3.4 Volts
<b>B4</b>	<b>Engine Coolant Temperature Sensor Signal</b> <i>Engine Idling</i> Engine Coolant Temperature @ 80°C.....	0.2 to 1.0 Volts
<b>B5</b>	<b>ATCP Module (If Fitted)</b> BUS Negative.....	Serial Data
<b>B6</b>	<b>Oxygen Sensor Signal</b> <i>Engine @ Operating Temperature</i> Engine speed steady @ 2500 RPM.....	0 to 1 Volts Switching
<b>B7</b>	<b>ATCP Module (If Fitted)</b> BUS Positive.....	Serial Data
<b>B8</b>	<b>Oxygen Sensor Heater Control</b>	

	Ignition ON.....	Battery Volts
	Engine Idling.....	<3 Volts
<b>B9</b>	<b>Sensor Ground</b>	
	All Times.....	0 Volts
<b>B10</b>	<b>Mass Air Flow Meter Return</b>	
	All Times.....	0 Volts
<b>B11</b>	<b>Throttle Position Sensor Signal</b>	
	Ignition ON	
	Throttle @ Idle Position.....	0.3 to 1.0 Volts
	Throttle @ Wide Open Position.....	3.2 to 4.9 Volts
<b>B12</b>	<b>Power Steering Pressure Switch</b>	
	Engine Idling	
	Power Steering Pressure @ 0 kPa.....	0.5 Volts
	Power Steering Pressure @ 3500 kPa.....	2.5 Volts
	Power Steering Pressure @ 7000 kPa.....	4.5 Volts
<b>B13</b>	<b>Knock Sensor Signal</b>	
	Engine Idling.....	Voltage Pulse
<b>B15</b>	<b>Diagnostic Connector Terminal 13</b>	
	No Specifications Available.....	N/A

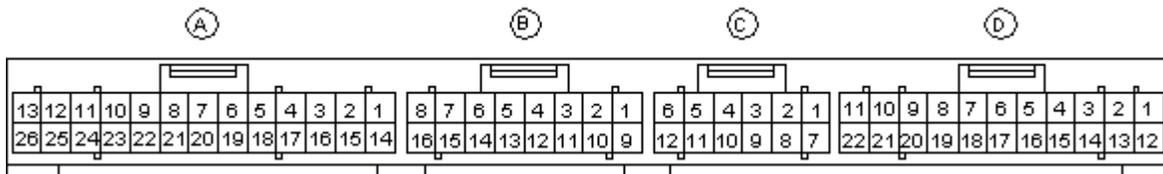
**Connector 'C'**



<b>Pin #</b>	<b>Circuit and Status.....</b>	<b>Voltage</b>
<b>C1</b>	<b>Line Pressure Solenoid Positive (Auto)</b>	
	Ignition ON.....	<1 Volt
	In Reverse Gear.....	Battery Volts
<b>C2</b>	<b>ST Solenoid (Auto)</b>	
	Ignition ON.....	Battery Volts
<b>C3</b>	<b>Shift Solenoid 1 (Auto)</b>	
	Ignition ON.....	Battery Volts
	In First or Second Gear.....	Battery Volts
	In Third or Overdrive Gear.....	<1 Volt
<b>C4</b>	<b>Overdrive Off Switch (Auto)</b>	
	Ignition ON	
	Switch ON.....	Battery Volts
	Switch OFF.....	<1 Volt
<b>C5</b>	<b>Transmission Speed Sensor (Auto)</b>	

	Engine Running.....	0 to 5 Volts Pulse
<b>C6</b>	<b>Lock Up Solenoid (Auto)</b>	
	Ignition ON.....	<1 Volt
	Under Lockup Conditions.....	Battery Volts
<b>C7</b>	<b>Line Pressure Solenoid Negative (Auto)</b>	
	Ignition ON.....	<1 Volt
<b>C9</b>	<b>Shift Solenoid 2 (Auto)</b>	
	Ignition ON.....	<1 Volt
	In First or Second Gear.....	Battery Volts
	In Third or Overdrive Gear.....	<1 Volt
<b>C10</b>	<b>Transmission Fluid Temperature Sensor Positive</b>	
	Ignition ON	
	Temperature @ 110°C.....	<1 Volt
<b>C11</b>	<b>Transmission Speed Sensor (Auto)</b>	
	Engine Running.....	0 to 5 Volts Pulse
<b>C12</b>	<b>Kickdown Switch (Auto)</b>	
	Ignition ON	
	Switch Open.....	Battery Volts
	Switch Closed.....	0 Volts

**Connector 'D'**



<b>Pin #</b>	<b>Circuit and Status.....</b>	<b>Voltage</b>
<b>D1</b>	<b>Permanent Battery Supply</b>	
	All Times.....	Battery Volts
<b>D2</b>	<b>Ignition Feed</b>	
	Ignition ON.....	Battery Volts
<b>D3</b>	<b>Transponder Key Amplifier</b>	
	No Specifications Available.....	N/A
<b>D4</b>	<b>Transponder Key Amplifier</b>	
	No Specifications Available.....	N/A
<b>D5</b>	<b>Check Engine Lamp</b>	
	Engine Idling	
	Lamp ON.....	<3 Volts
	Lamp OFF.....	Battery Volts
<b>D6</b>	<b>Security Indicator LED</b>	

	<b>Ignition ON</b>	
	Lamp Illuminated.....	Battery Volts
	Lamp Not Illuminated.....	0 Volts
<b>D7</b>	<b>Unlock Warning Switch</b>	
	<b>Ignition ON</b>	
	Switch Open.....	Battery Volts
	Switch Closed.....	0 Volts
<b>D8</b>	<b>Tachometer Signal</b>	
	Engine Idling.....	Voltage Pulse
<b>D9</b>	<b>Vehicle Speed Signal</b>	
	<b>Ignition ON</b>	
	Drive Wheels Rotating Slowly.....	Voltage Pulse
<b>D10</b>	<b>Air Conditioner Amplifier (AC Circuit)</b>	
	<b>Engine Idling</b>	
	Air Conditioner Switch ON.....	<1.5 Volts
	Air Conditioner Switch OFF.....	7.5 to 14 Volts
<b>D11</b>	<b>Start Signal</b>	
	Engine Cranking.....	>6 Volts
<b>D12</b>	<b>ECM Power Supply</b>	
	Ignition ON.....	Battery Volts
<b>D13</b>	<b>Ignition Feed</b>	
	Ignition ON.....	Battery Volts
<b>D14</b>	<b>Fuel Pump Relay Control</b>	
	Engine Cranking or Idling.....	0 Volts
<b>D15</b>	<b>Transponder Key Amplifier</b>	
	No Specifications Available.....	N/A
<b>D16</b>	<b>Diagnostic Connector Terminal 7</b>	
	No Specifications Available.....	N/A
<b>D17</b>	<b>Transmission Switch R Position</b>	
	<b>Ignition ON</b>	
	Gear Selector in R Position.....	Battery Volts
	Gear Selector in any other Position.....	0 Volts
<b>D18</b>	<b>Transmission Switch 2 Position</b>	
	<b>Ignition ON</b>	
	Gear Selector in 2 Position.....	Battery Volts
	Gear Selector in any other Position.....	0 Volts
<b>D19</b>	<b>Transmission Switch L Position</b>	
	<b>Ignition ON</b>	
	Gear Selector in L Position.....	Battery Volts
	Gear Selector in any other Position.....	0 Volts

**D21 Air Conditioner Amplifier (ACT Circuit)**

**Engine Idling**

Air Conditioner Switch ON..... Battery Volts

Air Conditioner Switch OFF..... <2 Volts

**D22 Inhibitor Switch (Auto)**

**Ignition ON**

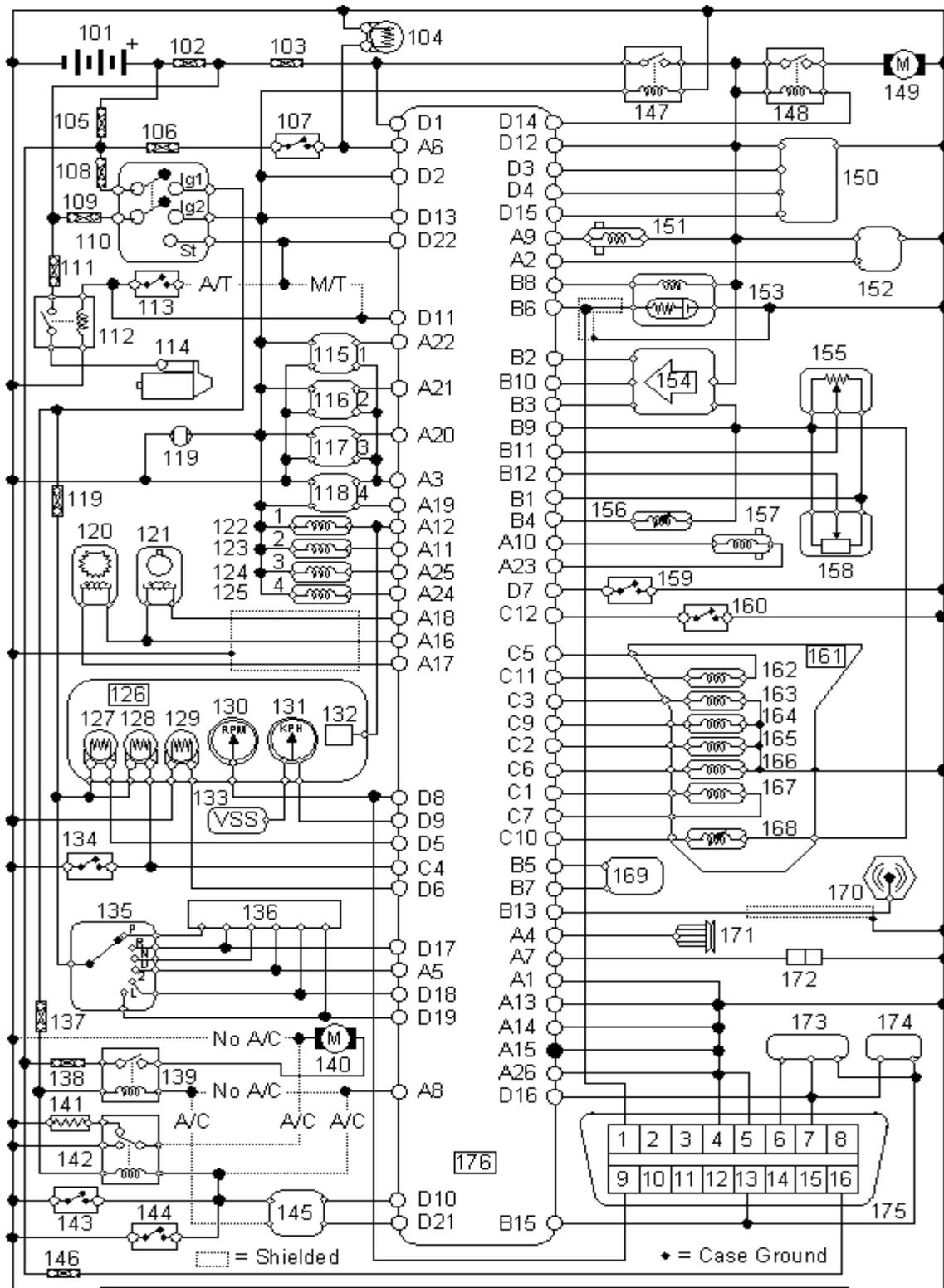
Selector Lever in P or N Position.....0 to 3 Volts

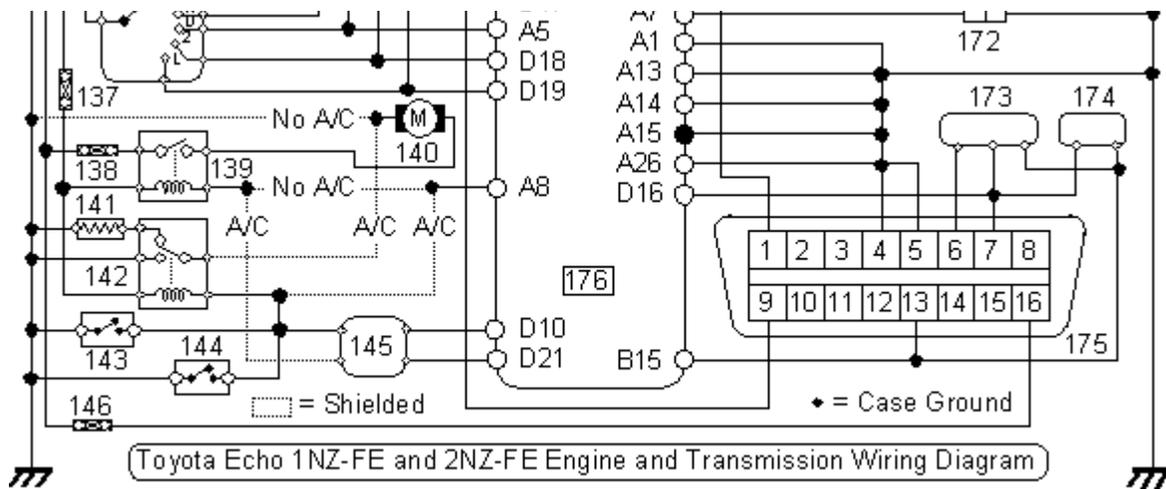
Selector Lever in any other Position..... Battery Volts

**TOYOTA ECHO 1.3L (2NZ-FE Engine) 1999-04 Engine & Transmission Management System**  
**TOYOTA ECHO 1.5L (1NZ-FE Engine) 1999-04 Engine & Transmission Management System**

**Wiring Diagram**

See [Key to Wiring Diagram](#).





### Key to Wiring Diagram

- |  |   |
|--|---|
| 101. Battery                             | 139. Engine Cooling Fan Relay #1            |
| 102. Fuse Main - 60 Amp                  | 140. Engine Cooling Fan                     |
| 103. Fuse EFI - 15 Amp                   | 141. Cooling Fan Low Speed Resistor (A/C)   |
| 104. Brake Lamps                         | 142. Engine Cooling Fan Relay #2 (A/C)      |
| 105. Fuse Alt - 100 Amp                  | 143. Engine Coolant Temp Switch (A/C)       |
| 106. Fuse Stop - 10 Amp                  | 144. A/C Single Pressure Switch (A/C)       |
| 107. Brake Lamp Switch                   | 145. Air Conditioner Amplifier              |
| 108. Fuse AM1 - 40 Amp                   | 146. Fuse OBD - 7.5 Amp                     |
| 109. Fuse AM2 - 15 Amp                   | 147. Main Relay                             |
| 110. Ignition Switch                     | 148. Fuel Pump Relay                        |
| 111. Fuse ST - 30 Amp                    | 149. Fuel Pump                              |
| 112. Starter Relay                       | 150. Transponder Key Amplifier              |
| 113. Inhibitor Switch (Auto)             | 151. Canister Purge Solenoid                |
| 114. Starter Motor                       | 152. Idle Air Control Valve                 |
| 115. Ignition Coil Cylinder #1           | 153. Oxygen Sensor                          |
| 116. Ignition Coil Cylinder #2           | 154. Mass Air Flow Meter                    |
| 117. Ignition Coil Cylinder #3           | 155. Throttle Position Sensor               |
| 118. Ignition Coil Cylinder #4           | 156. Engine Coolant Temperature Sensor      |
| 119. Fuse Gauge - 10 Amp                 | 157. Camshaft Timing Oil Control Valve      |
| 120. Crankshaft Position Sensor          | 158. Power Steering Pressure Sensor         |
| 121. Camshaft Position Sensor            | 159. Unlock Warning Switch                  |
| 122. Fuel Injector #1                    | 160. Kickdown Switch (If Fitted)            |
| 123. Fuel Injector #2                    | 161. Automatic Transmission                 |
| 124. Fuel Injector #3                    | 162. Turbine Speed Sensor                   |
| 125. Fuel Injector #4                    | 163. Shift Solenoid #1                      |
| 126. Instrument Panel                    | 164. Shift Solenoid #2                      |
| 127. Check Engine Lamp                   | 165. Solenoid ST                            |
| 128. Overdrive Off Lamp                  | 166. Lock Up Solenoid                       |
| 129. Security Indicator LED              | 167. Line Pressure Solenoid                 |
| 130. Tachometer                          | 168. Transmission Fluid Temp Sensor         |
| 131. Speedometer                         | 169. ATCP Module (If Fitted)                |
| 132. Multifunction Display               | 170. Knock Sensor                           |
| 133. Vehicle Speed Sensor                | 171. Alternator                             |
| 134. Overdrive Off Switch                | 172. Power Steering Pressure Test Connector |
| 135. Transmission Range Switch (Auto)    | 173. SRS ECM                                |
| 136. Transmission Indicator Lamps (Auto) | 174. ABS ECM                                |
| 137. Fuse ECU-IG - 7.5 Amp               | 175. Diagnostic Connector                   |
| 138. Fuse RDI - 30 Amp                   | 176. Powertrain Control Module (PCM)        |

# Reference Database Application

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## Tune Up Specifications for:

TOYOTA                      ECHO  
1999-04                      1.5Litre EFI Engine

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**Engine ID:**

**Idle Speed (rpm):**

700

**Auto / Manual:**

Auto / Manual

**Valve Clearance (mm):**

Cold; In 0.15-0.25, Ex 0.25-0.35

**Spark Plug Gap (mm):**

1.1

**Compression (kPa):**

1080-1470

**Firing Order:**

1-3-4-2

**Fuel Pressure (kPa):**

300

**Timing (deg):**

8-12 See Note #1

**Cylinder Head Tension:**

30Nm + 90deg + 90deg

**Points / Pick-up Gap (mm):**

Not Applicable

**Main Bearing Torque (Nm):**

22Nm, + 90deg

**Dwell Angle (deg):**

Not Applicable

**Conrod Torque (Nm):**

15Nm + 90deg

**Coil Resistance (Pri/Sec):**

Not Available

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**Notes:**

Note #1: With terminals "4" & "13" Jumpered.

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**Your Notes:**

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## Reference Database Application

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### Wheel Alignment Specifications for:

TOYOTA                      ECHO  
 1999-04                      1.5L 1NZ-FE Road height Front=185mm Rear=270

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**Front Camber (deg):**                      -**.58 + / - .75**  
**Front Caster (deg):**                      **.7 + / - .75**  
**Front Toe-In (mm):**                      **0 + / - 2**  
**SAI (deg):**                                      **10.08**  
**Included Angle (deg):**                      **N/A + / - .5**  
**TOOT Inside (deg):**                      **37**  
**TOOT Outside (deg):**                      **32.12**  
**Rear Camber (deg):**                      -**1 + / - .75**  
**Rear Toe-In (mm):**                      **3 + / - 3**  
**Thrust Angle (deg):**                      **0 + / - .15**

---

### Wheel Alignment Specifications for this job:

<b>TECHNICIAN:</b>				
<b>SPECIFICATIONS</b>	<b>BEFORE</b>		<b>AFTER</b>	
	<b>Left</b>	<b>Right</b>	<b>Left</b>	<b>Right</b>
<b>Front Camber (deg):</b>				
<b>Front Caster (deg):</b>				
<b>Front Toe-In (mm):</b>				
<b>Rear Camber (deg):</b>				
<b>Rear Toe-In (mm):</b>				

### **Notes:**

**Notes: #1: '0' movement (left/right) for ball joints and tie rods.**

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### **Your Notes:**

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# Reference Database Application

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**Wheel Alignment Specifications for:**

TOYOTA                      ECHO  
 1999-04                      1.5L 1NZ-FE Road height Front=185mm Rear=270 with power steering

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<b>Front Camber (deg):</b>	- .58 + / - .75
<b>Front Caster (deg):</b>	1.66 + / - .75
<b>Front Toe-In (mm):</b>	0 + / - 2
<b>SAI (deg):</b>	10.08
<b>Included Angle (deg):</b>	N/A + / - .5
<b>TOOT Inside (deg):</b>	37
<b>TOOT Outside (deg):</b>	32.12
<b>Rear Camber (deg):</b>	-1 + / - .75
<b>Rear Toe-In (mm):</b>	3 + / - 3
<b>Thrust Angle (deg):</b>	0 + / - .15

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**Wheel Alignment Specifications for this job:**

<b>TECHNICIAN:</b>				
<b>SPECIFICATIONS</b>	<b>BEFORE</b>		<b>AFTER</b>	
	<b>Left</b>	<b>Right</b>	<b>Left</b>	<b>Right</b>
<b>Front Camber (deg):</b>				
<b>Front Caster (deg):</b>				
<b>Front Toe-In (mm):</b>				
<b>Rear Camber (deg):</b>				
<b>Rear Toe-In (mm):</b>				

**Notes:**

Notes: #1: '0' movement (left/right) for ball joints and tie rods.

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**Your Notes:**

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## Reference Database Application

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### Wheel Alignment Specifications for:

TOYOTA                      ECHO  
 1999-04                    1.5L 1NZ-FE Road height Front=205mm Rear=290

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<b>Front Camber (deg):</b>	-0.33 + / - 0.75
<b>Front Caster (deg):</b>	.43 + / - .75
<b>Front Toe-In (mm):</b>	0 + / - 2
<b>SAI (deg):</b>	9.53
<b>Included Angle (deg):</b>	N/A + / - .5
<b>TOOT Inside (deg):</b>	37
<b>TOOT Outside (deg):</b>	36.12
<b>Rear Camber (deg):</b>	-1 + / - .75
<b>Rear Toe-In (mm):</b>	3 + / - 3
<b>Thrust Angle (deg):</b>	0 + / - .15

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### Wheel Alignment Specifications for this job:

<b>TECHNICIAN:</b>				
<b>SPECIFICATIONS</b>	<b>BEFORE</b>		<b>AFTER</b>	
	<b>Left</b>	<b>Right</b>	<b>Left</b>	<b>Right</b>
<b>Front Camber (deg):</b>				
<b>Front Caster (deg):</b>				
<b>Front Toe-In (mm):</b>				
<b>Rear Camber (deg):</b>				
<b>Rear Toe-In (mm):</b>				

### Notes:

Notes: #1: '0' movement (left/right) for ball joints and tie rods. #2: Rough road package

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### Your Notes:

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## Reference Database Application

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**Wheel Alignment Specifications for:**

TOYOTA                      ECHO  
 1999-04                      1.5L 1NZ-FE Road height Front=205mm Rear=290 with power steering

---

**Front Camber (deg):**                      - .33 + / - .75  
**Front Caster (deg):**                      .43 + / - .75  
**Front Toe-In (mm):**                      0 + / - 2  
**SAI (deg):**                                      9.53  
**Included Angle (deg):**                      N/A + / - .5  
**TOOT Inside (deg):**                      37  
**TOOT Outside (deg):**                      36.12  
**Rear Camber (deg):**                      -1 + / - .75  
**Rear Toe-In (mm):**                      3 + / - 3  
**Thrust Angle (deg):**                      0 + / - .15

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**Wheel Alignment Specifications for this job:**

<b>TECHNICIAN:</b>				
<b>SPECIFICATIONS</b>	<b>BEFORE</b>		<b>AFTER</b>	
	<b>Left</b>	<b>Right</b>	<b>Left</b>	<b>Right</b>
<b>Front Camber (deg):</b>				
<b>Front Caster (deg):</b>				
<b>Front Toe-In (mm):</b>				
<b>Rear Camber (deg):</b>				
<b>Rear Toe-In (mm):</b>				

**Notes:**

Notes: #1: '0' movement (left/right) for ball joints and tie rods. #2: Rough road package

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**Your Notes:**

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