

2002 ENGINE PERFORMANCE

Basic Diagnostic Procedures - 4-Cylinder

SERVICE PRECAUTIONS

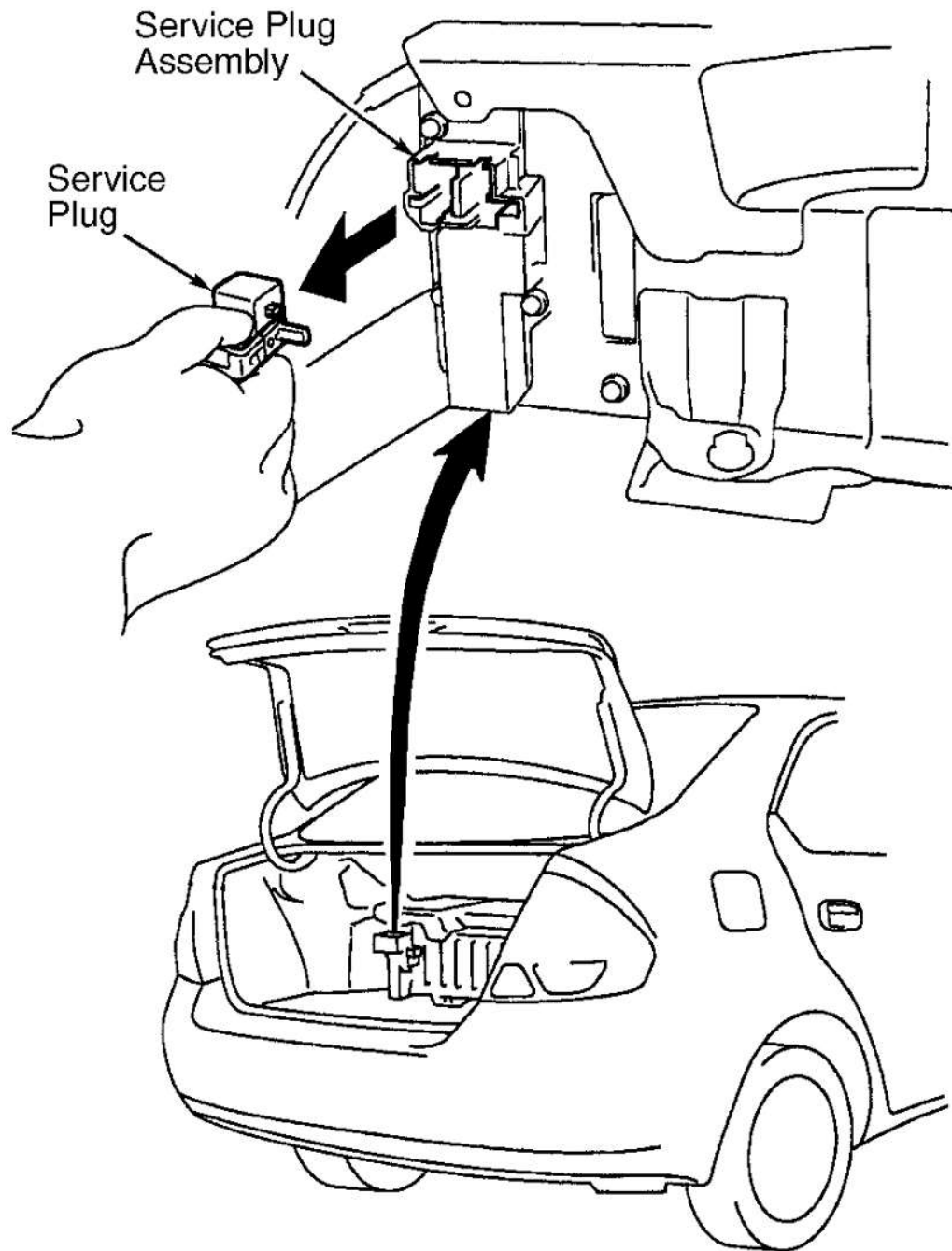
NOTE: Before performing basic diagnostic procedures, check for any related Technical Service Bulletins (TSBs).

PRIUS

WARNING: When performing any inspection or service procedure on this vehicle, ensure following service precautions are followed to prevent personal injury or death due to the extremely high voltage.

The following service precautions must be followed:

- Ensure ignition is off and ignition key is removed from ignition before performing any inspection or service procedure in engine compartment, as engine may automatically start and shut off when ignition is on and READY light is illuminated. READY light is displayed just above the shift lever position indicator on instrument cluster at center of instrument panel.
- Read all service and warning labels in engine compartment before performing any procedures in engine compartment.
- All high-voltage wiring harness connectors contain Orange connectors. DO NOT touch any wiring harness that contains Orange connectors.
- High-voltage battery and other high-voltage components may be identified by HIGH VOLTAGE caution labels on them. DO NOT touch these components.
- If necessary to inspect or service high-voltage system, ensure ignition is off. Remove service plug and wait at least 5 minutes to ensure high voltage is fully discharged before touching any high-voltage wiring harness, connectors or components. Service plug is located on service plug assembly at driver's side front corner of trunk compartment, near high-voltage battery. See **Fig. 1**. Ensure service plug is stored in a location in which no one may install service plug while technician is working on the vehicle.
- If necessary to touch any high-voltage wiring harness, connectors or components, ensure service plug is removed and battery voltage or less exists at electrical connector. Use Toyota insulated gloves when touching any high-voltage wiring harness, connectors or components. Ensure insulated gloves are dry and in good condition and that no holes exist in insulated gloves. Test by applying air pressure to insulated glove before touching any high-voltage wiring harness, connectors or components.
- DO NOT wear any metal objects while working on vehicle which may accidentally drop and cause a short circuit.
- If any high-voltage wiring harness connector is disconnected, ensure terminal on wiring harness connector is wrapped with tape to prevent wiring harness connector from contacting any surface.
- If servicing high-voltage system, place sign on roof of vehicle to indicate to other technicians that high-voltage system is being serviced.



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Fig. 1: Locating Service Plug & Service Plug Assembly (Prius)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

PROGRAMMING

POWER SUN ROOF REINITIALIZATION PROCEDURE

Camry

NOTE: Following procedure should be performed if battery is disconnected and reconnected, or battery is discharged and recharged to provide proper automatic operation and jam protection operation of power sun roof.

1. Ensure ignition is on. Depress and hold TILT UP side of power sun roof switch until power sun roof tilts all the way upward and then tilts downward a little. Power sun roof switch is located on headliner, just in front of power sun roof.
2. Check proper operation of open/closing and tilt up/down function for power sun roof using power sun roof switch. Power sun roof should operate anytime ignition is on, or for 43 seconds after ignition is off provided both front doors are closed. Power sun roof will stop operating if any front door is opened. Depressing SLIDE OPEN side of power sun roof switch for one second should open power sun roof. Depressing TILT UP side of power sun roof switch for one second should close power sun roof. To tilt power sun roof upward, depress and hold TILT UP side of power sun roof switch for one second. To tilt power sun roof downward, depress and hold SLIDE OPEN side of power sun roof switch for one second.

Celica

NOTE: Following procedure should be performed if battery is disconnected and reconnected, or battery is discharged and recharged to provide proper automatic operation and jam protection operation of power sun roof.

Close power sun roof using power sun roof switch and continue to depress power sun roof switch briefly after power sun roof is fully closed. Power sun roof switch is located on headliner, just in front of power sun roof.

INTRODUCTION

NOTE: On Camry, Camry Solara, Highlander, MR2, Prius and RAV4, an engine immobilizer system may be used. Engine immobilizer system is a theft deterrent system which disables the engine from starting by not allowing ignition system operation and fuel injector operation unless proper ignition key is used. Models equipped with engine immobilizer system may be identified by looking at the ignition key. On models equipped with engine immobilizer system the top of the ignition key is thicker than a standard ignition key, as a transponder chip is incorporated into the top of the ignition key. For additional information on system operation and testing, see appropriate ENGINE IMMOBILIZER SYSTEMS article in ACCESSORIES & EQUIPMENT.

Before proceeding with basic diagnostic service procedures, ensure testing procedure is followed, as some systems which may result in a no-start condition may cause a Diagnostic Trouble Code (DTC) to be stored in

the Engine Control Module (ECM). See TESTING PROCEDURE under SELF-DIAGNOSTIC SYSTEM in appropriate SELF-DIAGNOSTICS article.

If no-start condition still exists after checking and repairing all DTCs, perform a careful and complete visual inspection. Many problems result from mechanical breakdowns, poor electrical connections or damaged/misrouted vacuum hoses. Before condemning the computerized system, perform each test listed in this article.

NOTE: Perform all voltage tests with a Digital Volt-Ohmmeter (DVOM) with a minimum 10-megohm input impedance, unless stated otherwise in test procedure.

PRELIMINARY INSPECTION & ADJUSTMENTS

VISUAL INSPECTION

Visually inspect all electrical wiring, looking for chafed, stretched, cut or pinched wiring. Ensure electrical connectors fit tightly and are not corroded. Ensure vacuum hoses are properly routed and are not pinched or cut. See VACUUM DIAGRAMS article to verify routing and connections (if necessary). Inspect air induction system for possible vacuum leaks.

MECHANICAL INSPECTION

Compression (Camry & Camry Solara)

Warm engine to normal operating temperature before checking the compression. Ensure battery is fully charged. Disconnect electrical connectors at fuel injectors and ignition coils. Remove ignition coils and spark plugs. Using compression gauge, check compression with throttle fully open. Read compression in a short a time as possible. Ensure compression is within specification. See **COMPRESSION SPECIFICATIONS** table. Install and tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).

Compression (Celica, Corolla & ECHO)

Warm engine to normal operating temperature before checking the compression. Ensure battery is fully charged. Disconnect electrical connectors at ignition coils. Remove ignition coils and spark plugs. Using compression gauge, check compression with throttle fully open. Read compression in a short a time as possible. Ensure compression is within specification. See **COMPRESSION SPECIFICATIONS** table. On Celica and ECHO, install and tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m). On Corolla, install and tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 62 INCH lbs. (7.0 N.m).

Compression (Highlander)

Warm engine to normal operating temperature before checking the compression. Ensure battery is fully charged. Disconnect electrical connectors at fuel injectors and ignition coils. Remove ignition coils and spark plugs. Using compression gauge, check compression with throttle fully open. Read compression in a short a time as possible. Ensure compression is within specification. See **COMPRESSION SPECIFICATIONS** table. Install and tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).

Compression (MR2)

Warm engine to normal operating temperature before checking the compression. Ensure battery is fully charged. Disconnect electrical connectors at ignition coils. Remove ignition coils and spark plugs. Using compression gauge, check compression with throttle fully open. Read compression in a short a time as possible. Ensure compression is within specification. See **COMPRESSION SPECIFICATIONS** table. Install and tighten spark plugs to 19 ft. lbs. (26 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).

Compression (Prius)

WARNING: Read service precautions before proceeding with service procedure. See SERVICE PRECAUTIONS .

1. Manufacturer states procedure using Toyota hand-held tester. Warm engine to normal operating temperature. Shut engine off. Remove air cleaner assembly. Disconnect electrical connectors at ignition coils. Remove ignition coils and spark plugs.
2. Connect Toyota hand-held tester to data link connector No. 3 at driver's side of instrument panel. See **Fig. 9** . Select CRANKING MODE on Toyota hand-held tester using hand-held tester instructions.
3. Connect compression gauge. Crank the engine and note the compression. While in the CRANKING MODE, cranking speed is automatically set at 250 RPM and throttle is automatically opened to fully open position. Read compression in a short a time as possible. Ensure compression is within specification. See **COMPRESSION SPECIFICATIONS** table. Remove hand-held tester. Install and tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).

Compression (RAV4)

Warm engine to normal operating temperature before checking the compression. Ensure battery is fully charged. Disconnect electrical connectors at ignition coils. Remove ignition coils and spark plugs. Using compression gauge, check compression with throttle fully open. Read compression in a short a time as possible. Ensure compression is within specification. See **COMPRESSION SPECIFICATIONS** table. Install and tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).

Compression (Tacoma)

1. Warm engine to normal operating temperature before checking the compression. Remove intake air connector for access to spark plugs. Intake air connector fits between air cleaner hose and throttle body.
2. Disconnect electrical connectors at ignition coils. Remove ignition coils and spark plugs. Using compression gauge, check compression with throttle fully open. Read compression in a short a time as possible. Ensure compression is within specification. See **COMPRESSION SPECIFICATIONS** table. Install and tighten spark plugs to 15 ft. lbs. (20 N.m) and ignition coil retaining bolts to 66 INCH lbs. (7.5 N.m).

COMPRESSION SPECIFICATIONS

Application	Specification
Normal Compression Pressure	

Camry & Camry Solara	198 psi (13.9 kg/cm ²)
Celica	
1.8L (1ZZ-FE)	218 psi (15.3 kg/cm ²)
1.8L (2ZZ-GE)	203 psi (14.3 kg/cm ²)
Corolla	218 psi (15.3 kg/cm ²)
ECHO	213 psi (15.0 kg/cm ²)
Highlander	198 psi (13.9 kg/cm ²)
MR2	184 psi (13.0 kg/cm ²)
Prius	106 psi (7.4 kg/cm ²)
RAV4	184 psi (13.0 kg/cm ²)
Tacoma	178 psi (12.5 kg/cm ²)
Minimum Compression Pressure	
Camry & Camry Solara	142 psi (10.0 kg/cm ²)
Celica	
1.8L (1ZZ-FE) & 1.8L (2ZZ-GE)	145 psi (10.2 kg/cm ²)
Corolla	145 psi (10.2 kg/cm ²)
ECHO	156 psi (11.0 kg/cm ²)
Highlander	142 psi (10.0 kg/cm ²)
MR2	145 psi (10.2 kg/cm ²)
Prius	77 psi (5.4 kg/cm ²)
RAV4	145 psi (10.2 kg/cm ²)
Tacoma	128 psi (9.0 kg/cm ²)
Maximum Variation Between Cylinders	
Camry & Camry Solara	14 psi (1.0 kg/cm ²)
Celica	
1.8L (1ZZ-FE)	14 psi (1.0 kg/cm ²)
1.8L (2ZZ-GE)	16 psi (1.1 kg/cm ²)
Corolla, ECHO, Highlander, MR2, Prius, RAV4 & Tacoma	14 psi (1.0 kg/cm ²)

FUEL SYSTEMS

NOTE: Basic diagnosis of fuel system should begin by checking fuel pump operation and fuel pressure.

WARNING: ALWAYS release fuel pressure before disconnecting any fuel injection-related component. DO NOT allow fuel to contact engine or electrical components.

FUEL PUMP OPERATION

NOTE: Electric fuel pump operation may be checked by using Toyota hand-held tester or by applying battery voltage to the fuel pump. Fuel pump is located in the fuel tank.

Checking Fuel Pump Operation Using Toyota Hand-Held Tester (Camry)

1. Connect hand-held tester to data link connector No. 3 at driver's side of instrument panel. See **Fig. 2** . Turn ignition on. DO NOT start engine.
2. Turn hand-held tester on. Select ACTIVE TEST MODE on hand-held tester. Using hand-held tester manufacturer's instructions, operate fuel pump. Listen for fuel pump operating sound and feel for fuel pressure in fuel inlet line at end of fuel rail. Turn ignition off. Remove hand-held tester. If fuel pump operates, check fuel pressure. See **FUEL PRESSURE** .
3. If fuel pump does not operate, EFI main relay or circuit opening relay may be defective. For relay application and explanation of relay operation, see **FUEL PUMP CONTROL CIRCUIT** . For testing of EFI main relay or circuit opening relay, see appropriate relay under MODULES, MOTORS, RELAYS & SOLENOIDS in SYSTEM & COMPONENT TESTING - 4-CYLINDER article.
4. If relays are okay, check for defective fuel pump. See **CHECKING FUEL PUMP OPERATION BY APPLYING BATTERY VOLTAGE TO FUEL PUMP (CAMRY)** procedure. If fuel pump operates properly, Engine Control Module (ECM) may be defective.

NOTE: For additional testing information for fuel pump control circuit, see **FUEL PUMP CONTROL CIRCUIT** under **COMPUTERIZED ENGINE CONTROLS** in **SYSTEM & COMPONENT TESTING - 4-CYLINDER** article.

Checking Fuel Pump Operation Using Toyota Hand-Held Tester (Camry Solara & Tacoma)

1. Connect hand-held tester to data link connector No. 3 at driver's side of instrument panel. See **Fig. 3** and **Fig. 11** . Turn ignition on. DO NOT start engine.
2. Turn hand-held tester on. Select ACTIVE TEST MODE on hand-held tester. Using hand-held tester manufacturer's instructions, operate fuel pump. Listen for fuel pump operating sound and feel for fuel pressure in fuel inlet line at fuel filter. Turn ignition off. Remove hand-held tester. If fuel pump operates, check fuel pressure. See **FUEL PRESSURE** .
3. If fuel pump does not operate, EFI main relay or circuit opening relay may be defective. For relay application and explanation of relay operation, see **FUEL PUMP CONTROL CIRCUIT** . For testing of EFI main relay or circuit opening relay, see appropriate relay under MODULES, MOTORS, RELAYS & SOLENOIDS in SYSTEM & COMPONENT TESTING - 4-CYLINDER article.
4. If relays are okay, check for defective fuses, fusible links or wiring. See **WIRING DIAGRAMS** article. If fuses, fusible links and wiring are okay, check for defective fuel pump. See appropriate **CHECKING FUEL PUMP OPERATION BY APPLYING BATTERY VOLTAGE TO FUEL PUMP** procedure. If fuel pump operates properly, Engine Control Module (ECM) may be defective.

NOTE: For additional testing information for fuel pump control circuit, see **FUEL PUMP CONTROL CIRCUIT** under **COMPUTERIZED ENGINE CONTROLS** in

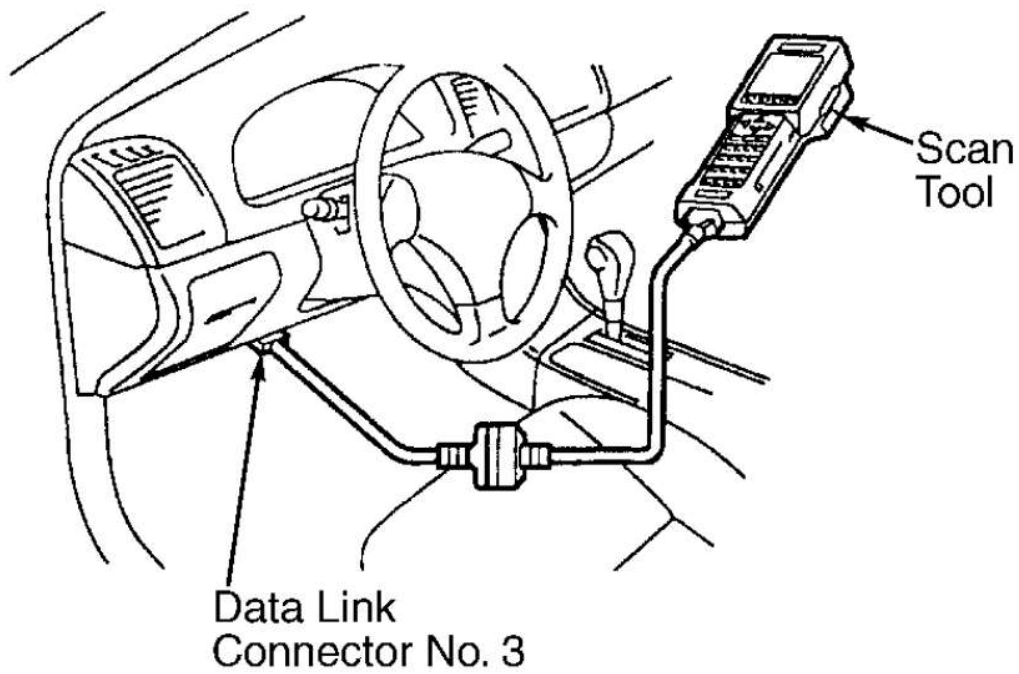
SYSTEM & COMPONENT TESTING - 4-CYLINDER article.

Checking Fuel Pump Operation Using Toyota Hand-Held Tester (Celica, Corolla, ECHO, Highlander, MR2, Prius & RAV4)

WARNING: On Prius, read service precautions before proceeding with service procedure. See SERVICE PRECAUTIONS .

1. Connect hand-held tester to data link connector No. 3 at driver's side of instrument panel. See **Fig. 4 -Fig. 10** . Turn ignition on. DO NOT start engine.
2. Turn hand-held tester on. Select ACTIVE TEST MODE on hand-held tester. Using hand-held tester manufacturer's instructions, operate fuel pump. Listen for fuel pump operating sound and feel for fuel pressure in fuel inlet pipe at end of fuel rail. Turn ignition off. Remove hand-held tester. If fuel pump operates, check fuel pressure. See FUEL PRESSURE .
3. If fuel pump does not operate, EFI main relay or circuit opening relay may be defective. For relay application and explanation of relay operation, see **FUEL PUMP CONTROL CIRCUIT** . For testing of EFI main relay or circuit opening relay, see appropriate relay under MODULES, MOTORS, RELAYS & SOLENOIDS in SYSTEM & COMPONENT TESTING - 4-CYLINDER article.
4. If relays are okay, check for defective fuses, fusible links or wiring. See WIRING DIAGRAMS article. If fuses, fusible links and wiring are okay, check for defective fuel pump. See appropriate CHECKING FUEL PUMP OPERATION BY APPLYING BATTERY VOLTAGE TO FUEL PUMP procedure. If fuel pump operates properly, Engine Control Module (ECM) may be defective.

NOTE: For additional testing information for fuel pump control circuit, see **FUEL PUMP CONTROL CIRCUIT** under **COMPUTERIZED ENGINE CONTROLS** in **SYSTEM & COMPONENT TESTING - 4-CYLINDER** article.



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Fig. 2: Locating Data Link Connector No. 3 (Camry)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

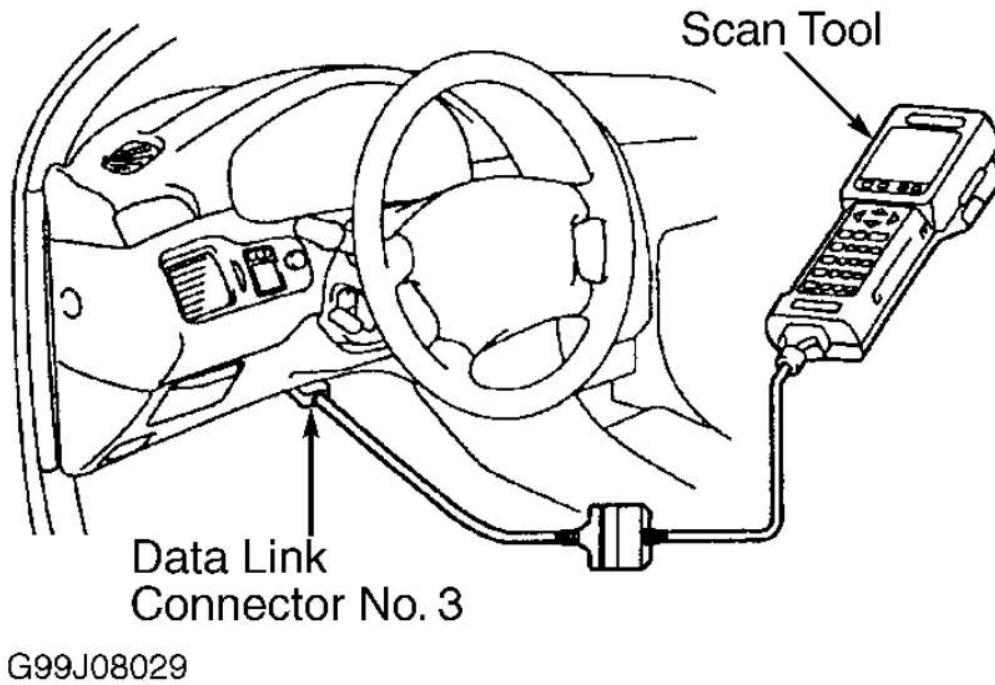


Fig. 3: Locating Data Link Connector No. 3 (Camry Solara)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

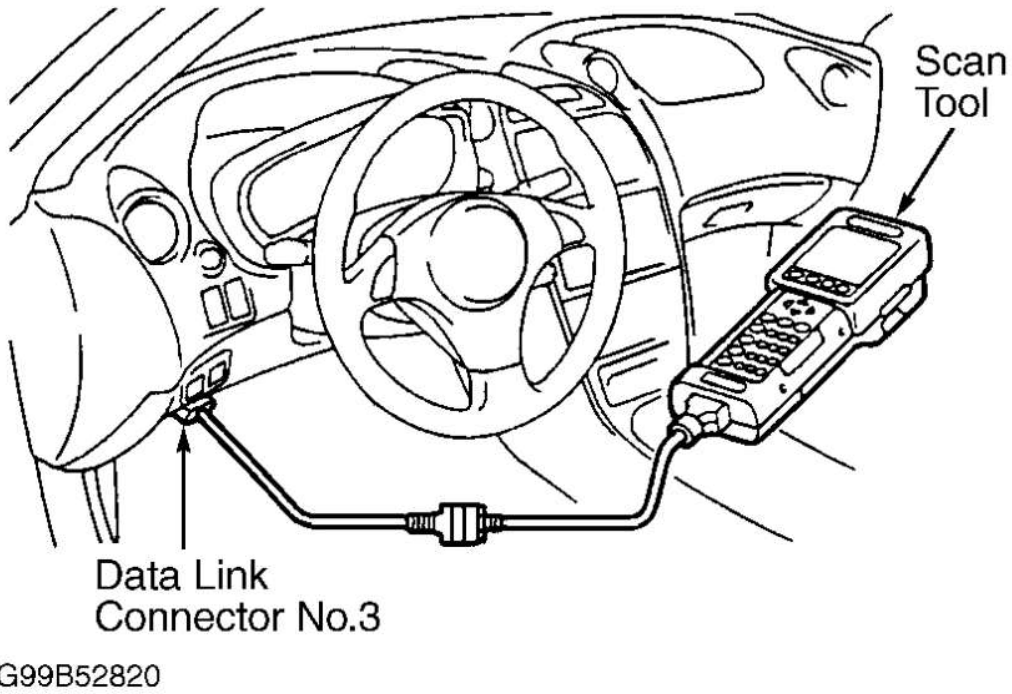


Fig. 4: Locating Data Link Connector No. 3 (Celica)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

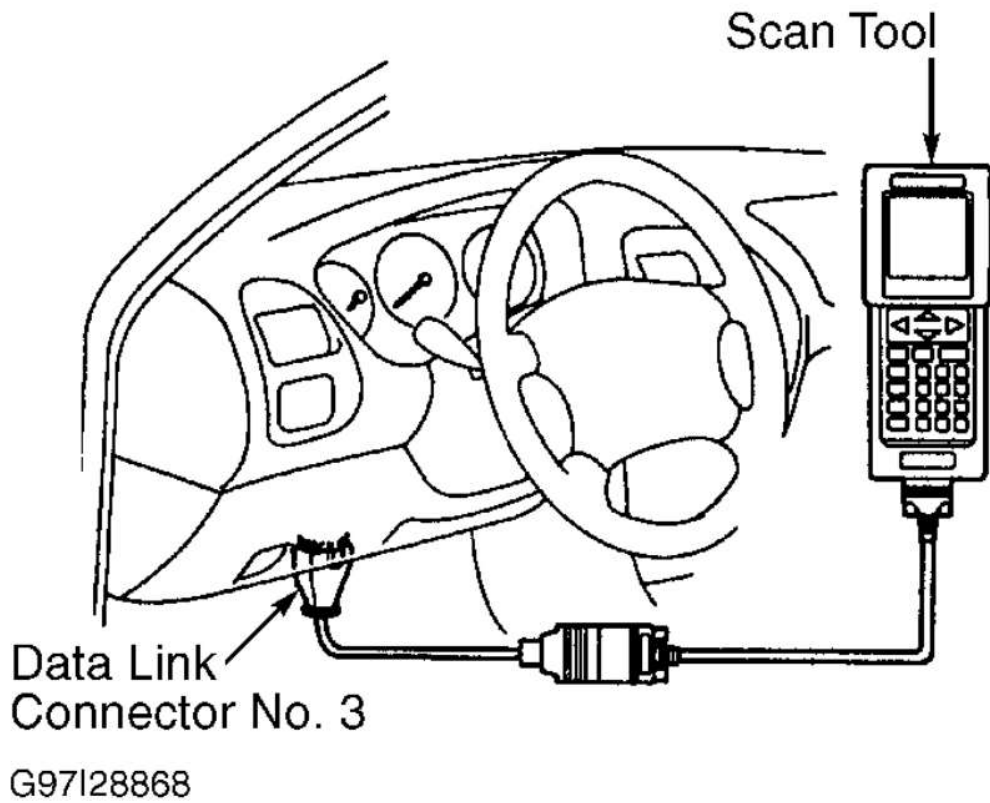


Fig. 5: Locating Data Link Connector No. 3 (Corolla)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

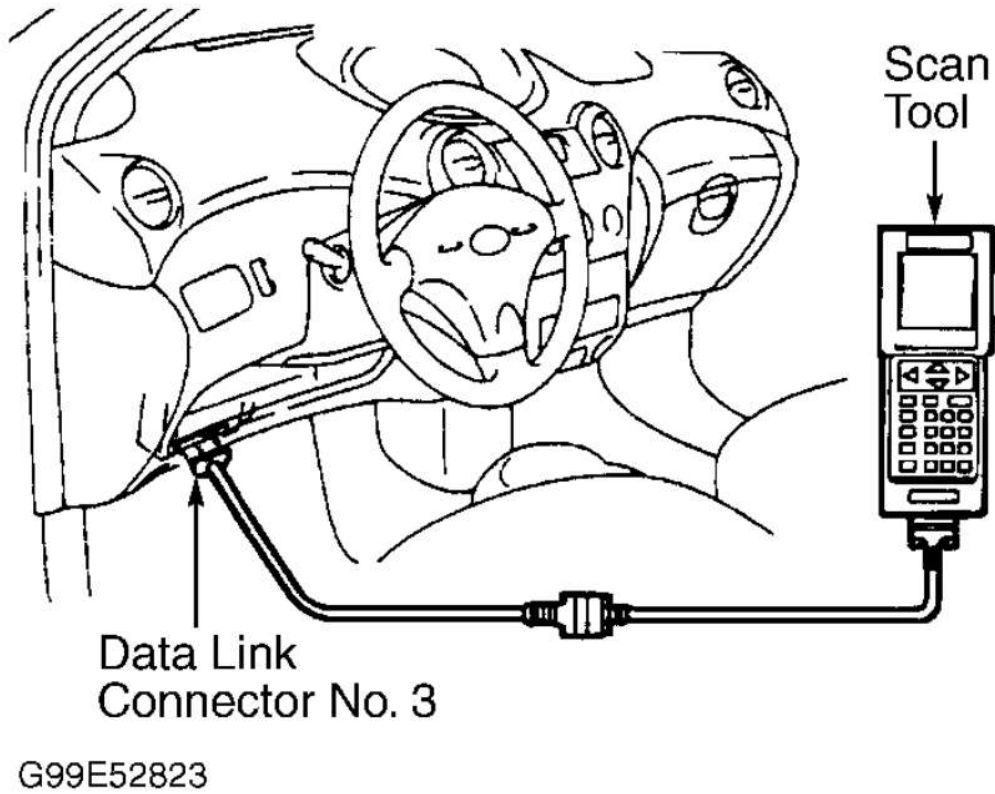
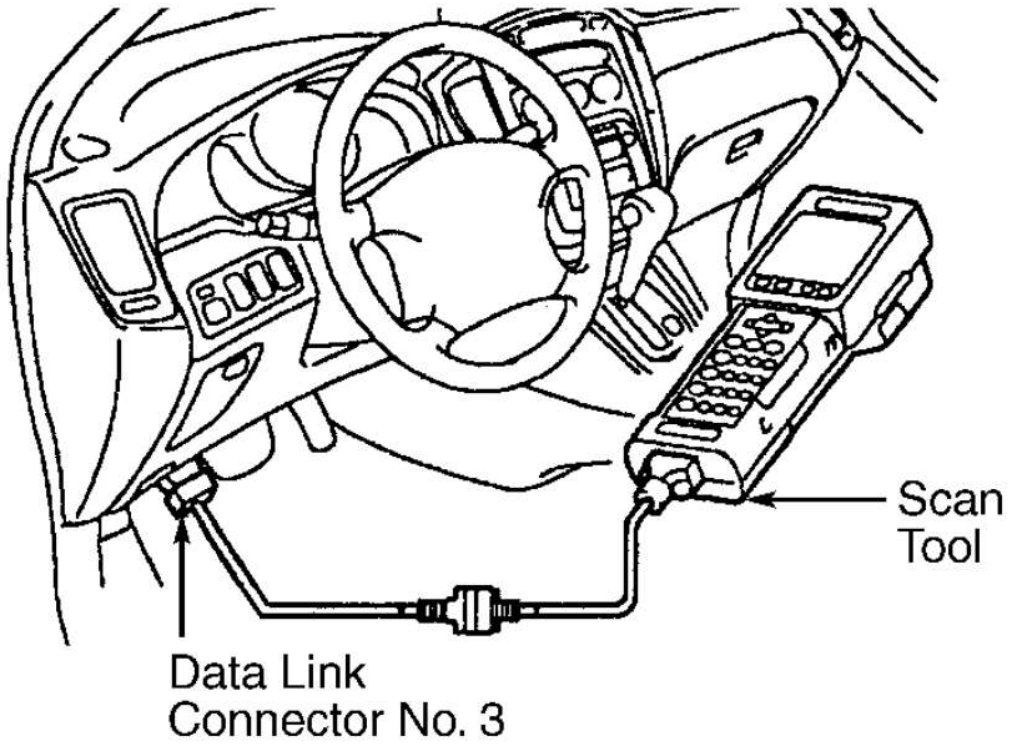


Fig. 6: Locating Data Link Connector No. 3 (ECHO)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 7: Locating Data Link Connector No. 3 (Highlander)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

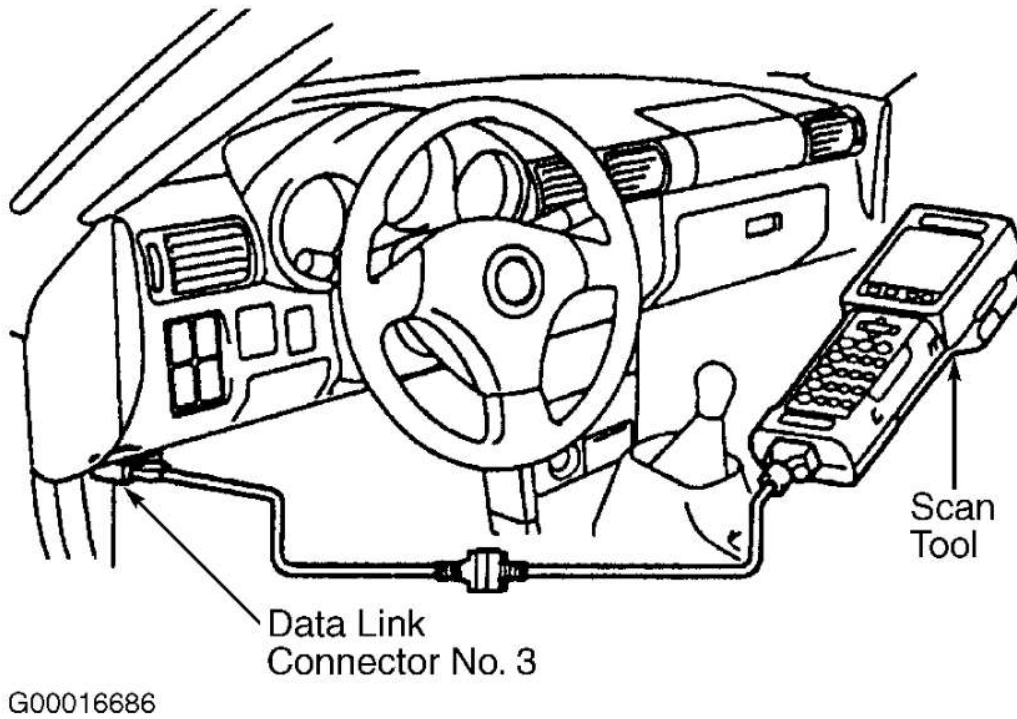


Fig. 8: Locating Data Link Connector No. 3 (MR2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

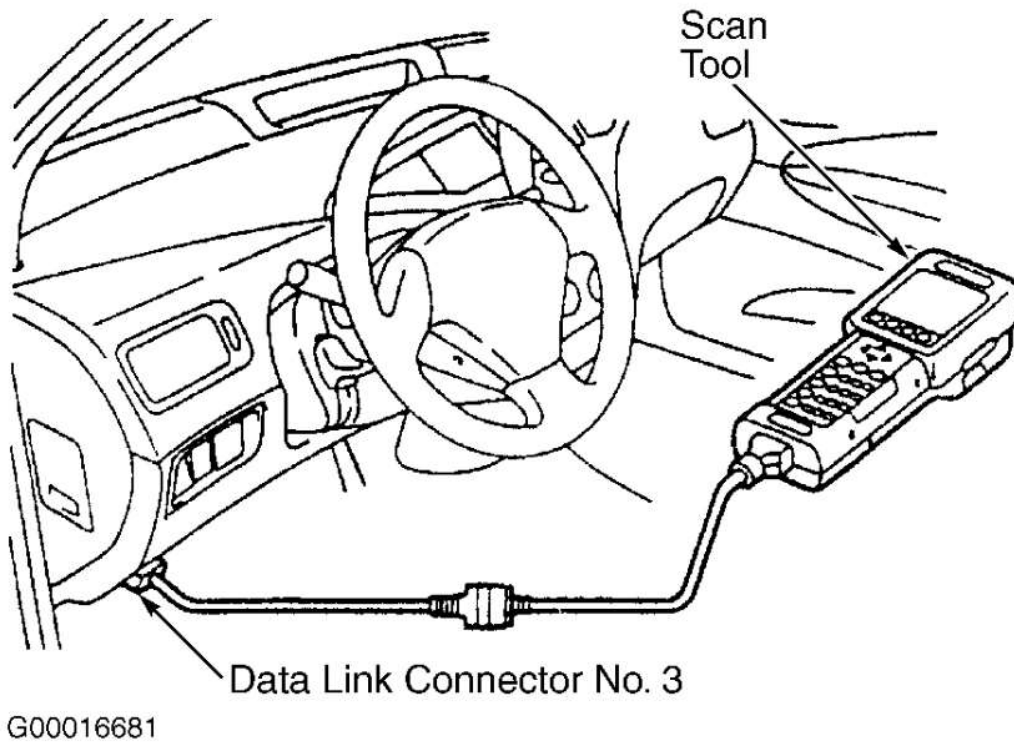
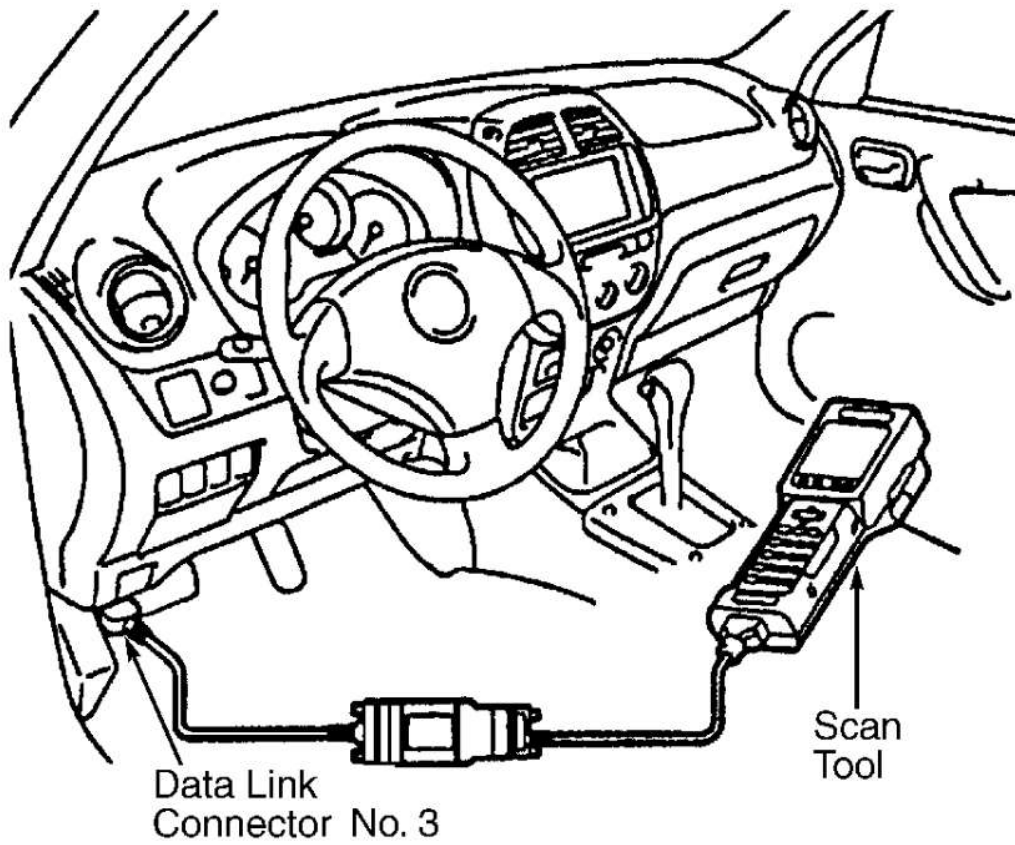


Fig. 9: Locating Data Link Connector No. 3 (Prius)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 10: Locating Data Link Connector No. 3 (RAV4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

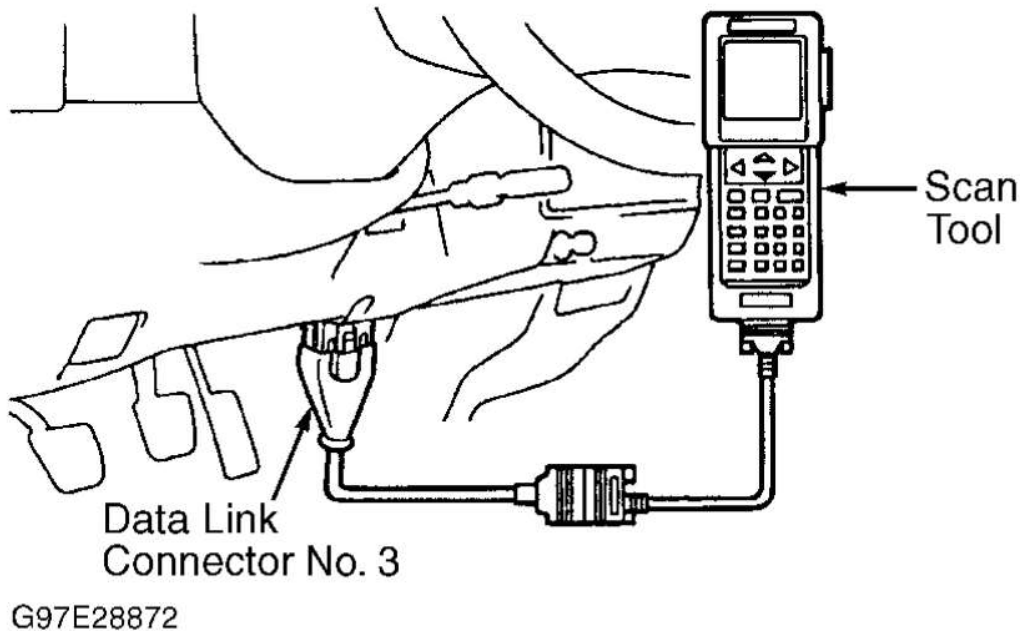


Fig. 11: Locating Data Link Connector No. 3 (Tacoma)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Checking Fuel Pump Operation By Applying Battery Voltage To Fuel Pump (Camry)

NOTE: On Camry, manufacturer lists procedure of applying battery voltage to fuel pump by removing circuit opening relay and checking fuel pump operation as well as wiring circuit to fuel pump. Also, manufacturer lists procedure for checking fuel pump operation by removing fuel pump from fuel tank and applying battery voltage directly to fuel pump. For testing of fuel pump with fuel pump removed from fuel tank, see appropriate FUEL PUMP RESISTANCE & OPERATION procedure under FUEL DELIVERY under FUEL SYSTEMS in SYSTEM & COMPONENT TESTING - 4-CYLINDER article.

1. Ensure ignition is off. Remove circuit opening relay from fuse/relay box. See **Fig. 12** . Fuse/relay box is located at driver's side front corner of engine compartment.
2. Install jumper wire between FP and +B terminals in fuse/relay box for circuit opening relay. Turn ignition on and listen for fuel pump operating sound. Turn ignition off. Remove jumper wire. Reinstall circuit opening relay.
3. If fuel pump operates, EFI main relay, wiring circuit for fuel pump and fuel pump are okay. If fuel pump does not operate with jumper wire installed, it may be necessary to check for defective fuses, fusible links, wiring or EFI main relay. See WIRING DIAGRAMS article. If necessary to check fuel pump operation, see appropriate FUEL PUMP RESISTANCE & OPERATION procedure under FUEL

DELIVERY under FUEL SYSTEMS in SYSTEM & COMPONENT TESTING - 4-CYLINDER article.

4. If fuel pump operates with jumper wire installed but does not operate with circuit opening relay installed, circuit opening relay may be defective. For relay application and explanation of relay operation, see **FUEL PUMP CONTROL CIRCUIT** . For testing of EFI main relay or circuit opening relay, see appropriate relay under MODULES, MOTORS, RELAYS & SOLENOIDS in SYSTEM & COMPONENT TESTING - 4-CYLINDER article. Engine Control Module (ECM) may be defective if fuel pump still fails to operate.

NOTE: For additional testing information for fuel pump control circuit, see FUEL PUMP CONTROL CIRCUIT under COMPUTERIZED ENGINE CONTROLS in SYSTEM & COMPONENT TESTING - 4-CYLINDER article.

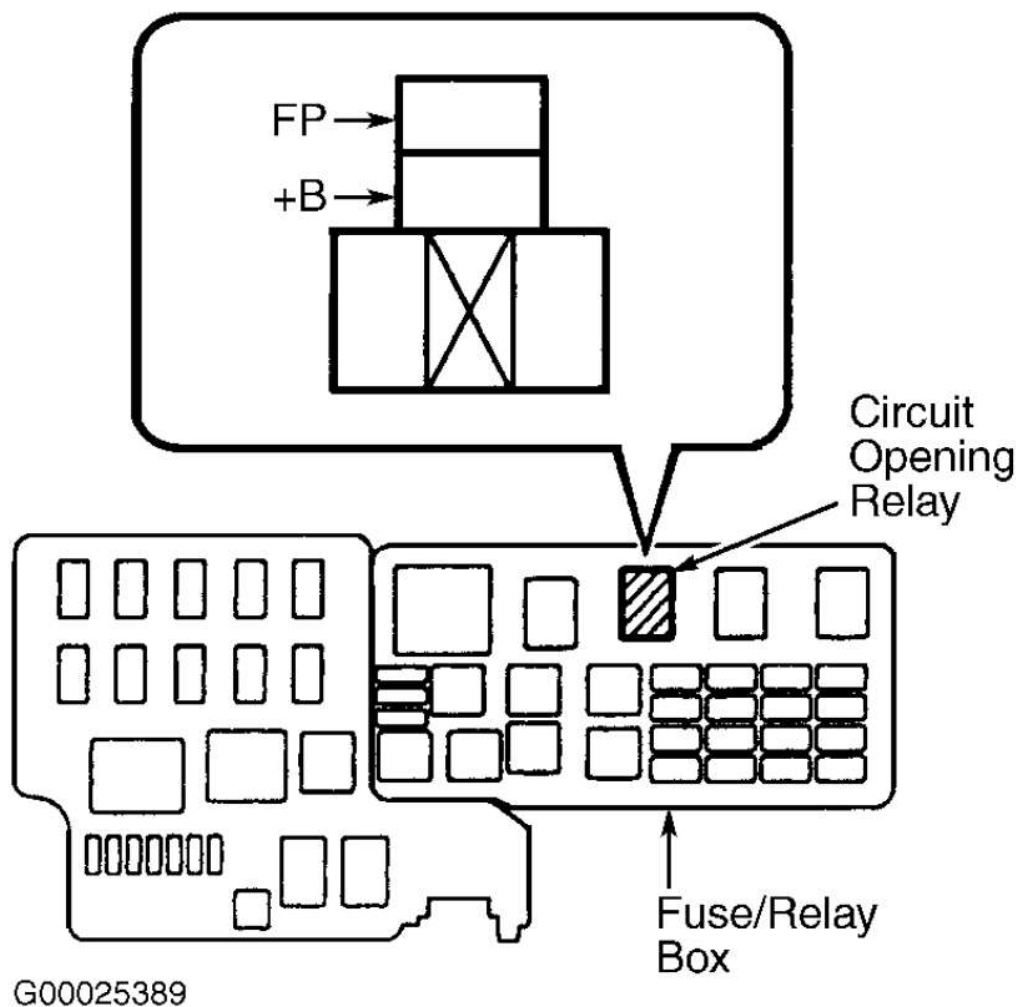


Fig. 12: Locating Circuit Opening Relay & Identifying FP & +B Cavities For Circuit Opening Relay (Camry)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Checking Fuel Pump Operation By Applying Battery Voltage To Fuel Pump (Camry Solara, Celica, Corolla, ECHO, Highlander, MR2, Prius, RAV4 & Tacoma)

WARNING: On Prius, read service precautions before proceeding with service procedure. See **SERVICE PRECAUTIONS** .

1. On Camry Solara, Celica, Corolla, ECHO and Prius, remove rear seat cushion, cover plate on floor panel and any remaining necessary covers for access to electrical connector for fuel pump.
2. On Highlander, remove driver's side and passenger's side rear seats and cover plate on floor panel for access to electrical connector for fuel pump.
3. On MR2, remove luggage compartment lids, quarter trim covers, lower trim covers and luggage compartment boxes behind driver's and passenger's seats, and cover plate on floor panel for access to electrical connector for fuel pump. See **Fig. 22** . For additional information on removal of luggage compartment components, see FUEL PUMP under FUEL SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article.
4. On RAV4, remove driver's side rear seat and cover plate on floor panel for access to electrical connector for fuel pump.
5. On Tacoma, it may be necessary to lower fuel tank for access to electrical connector for fuel pump.
6. On all models, disconnect electrical connector for fuel pump. This is electrical connector for fuel pump and fuel gauge sending unit and is located on top of fuel tank, near fuel pump.

CAUTION: When applying battery voltage to fuel pump, **DO NOT** apply battery voltage for more than 10 seconds or fuel pump may be damaged. Keep battery as far away from fuel pump as possible. Always connect jumper wires to fuel pump and then to the battery when applying battery voltage to fuel pump.

7. Connect battery voltage to specified terminals on fuel pump to operate fuel pump. See **Fig. 13 -Fig. 21** . **DO NOT** apply battery voltage to fuel pump for more than 10 seconds.
8. Listen for fuel pump operating sound. Disconnect battery voltage from fuel pump. If fuel pump operates, check fuel pressure after reinstalling components. See **FUEL PRESSURE** .
9. If fuel pump fails to operate, replace fuel pump and/or lead wire to fuel pump (if equipped). See FUEL PUMP under FUEL SYSTEMS in SYSTEM & COMPONENT TESTING - 4-CYLINDER article. On Prius, it may be necessary to replace fuel pump and fuel tank as an assembly. Consult parts department for parts availability. On all models, if fuel pump will not operate while trying to start engine, see appropriate CHECKING FUEL PUMP OPERATION USING TOYOTA HAND-HELD TESTER procedure under **FUEL PUMP OPERATION** for additional testing information.

NOTE: For additional testing information for fuel pump control circuit, see FUEL PUMP CONTROL CIRCUIT under COMPUTERIZED ENGINE CONTROLS in

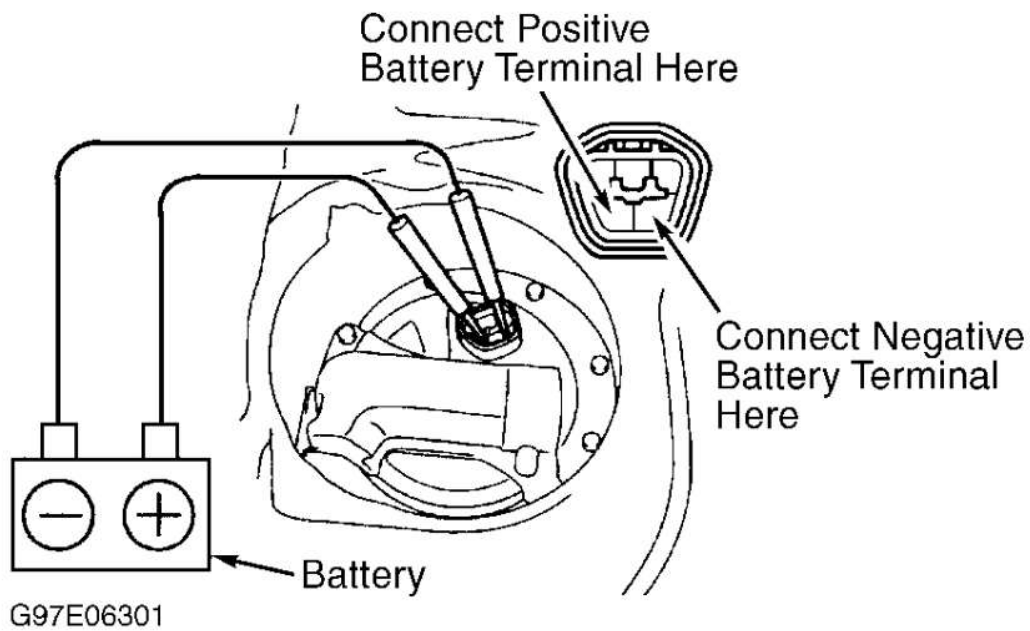
SYSTEM & COMPONENT TESTING - 4-CYLINDER article.

Fig. 13: Checking Fuel Pump Operation (Camry Solara)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

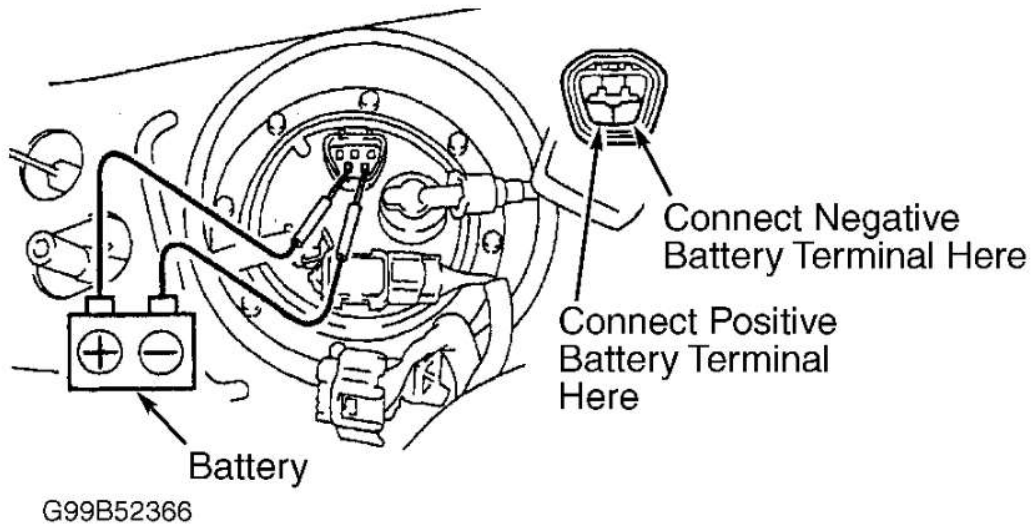


Fig. 14: Checking Fuel Pump Operation (Celica)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

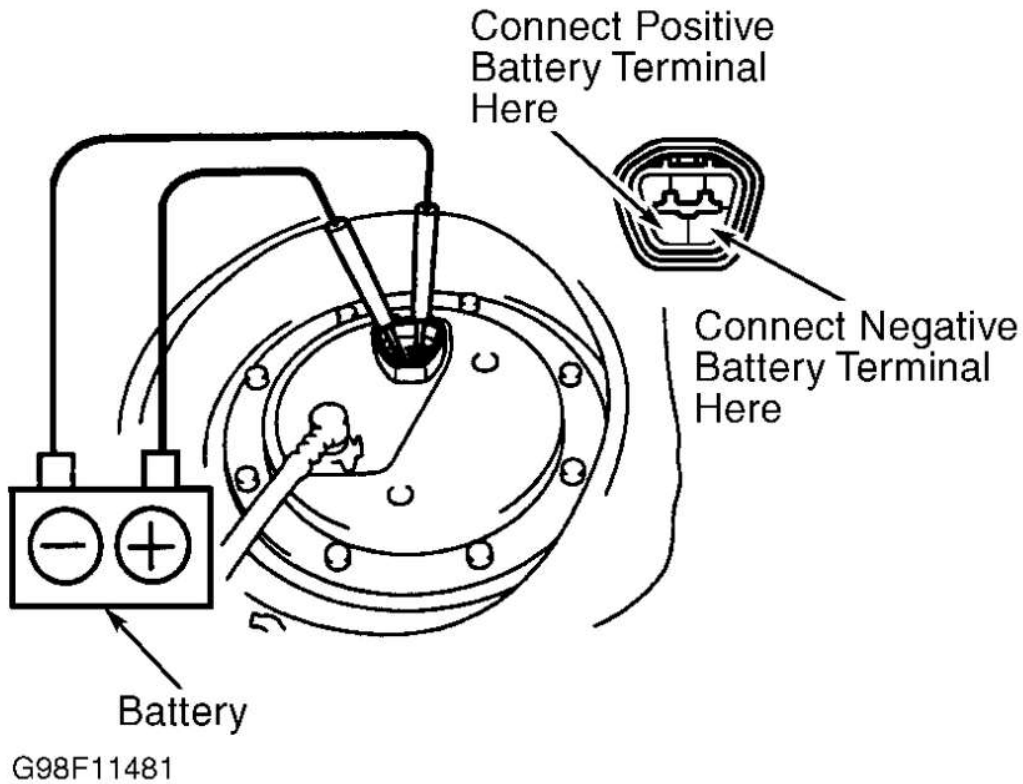


Fig. 15: Checking Fuel Pump Operation (Corolla)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

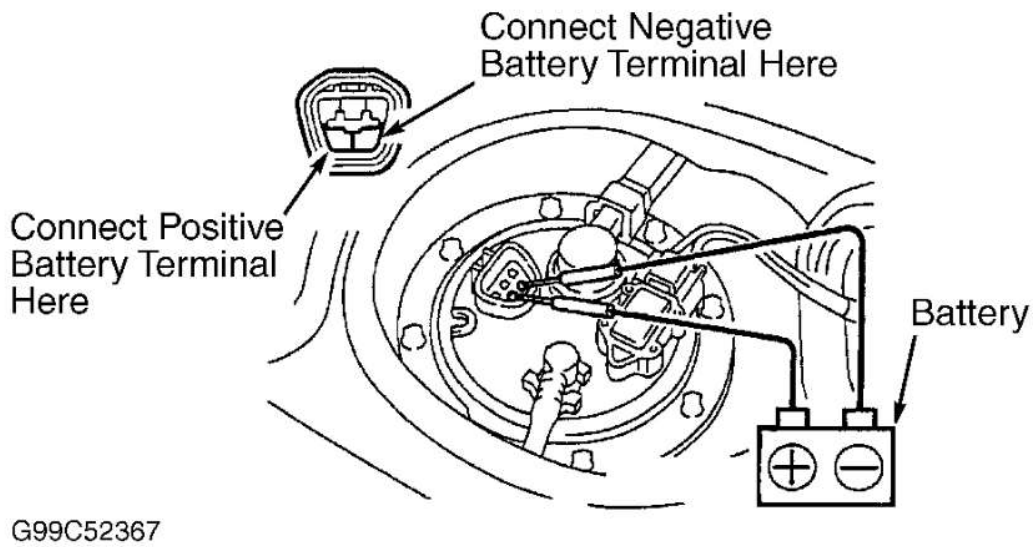
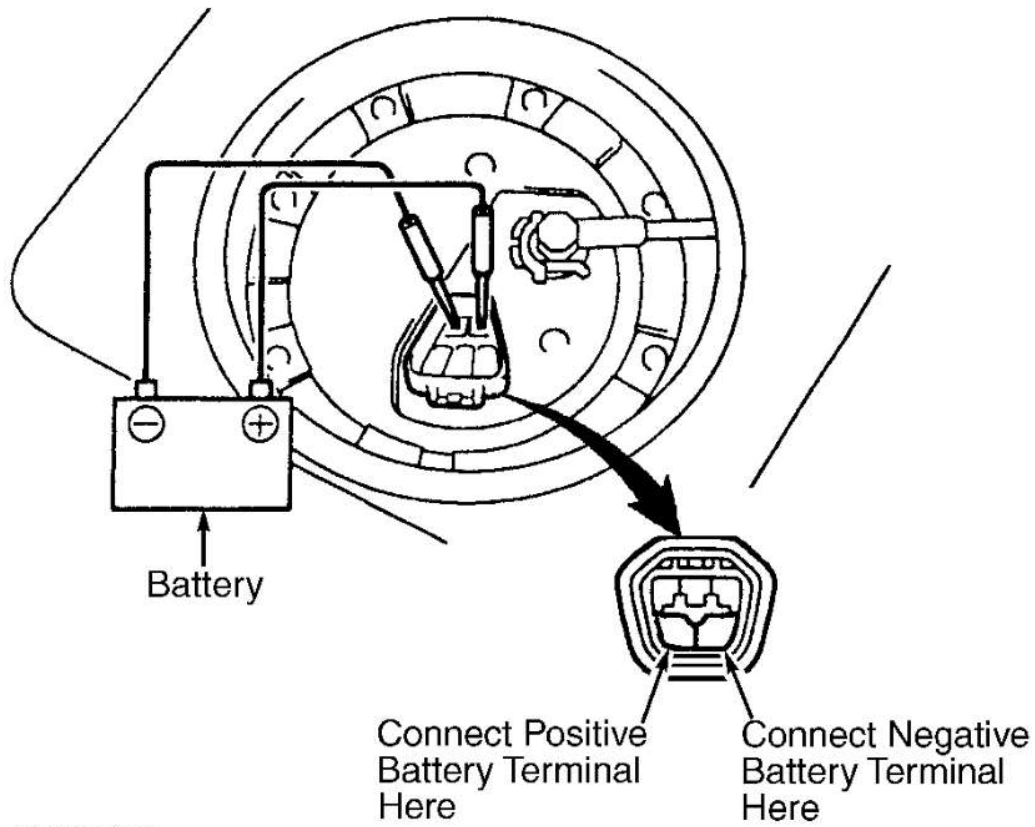


Fig. 16: Checking Fuel Pump Operation (ECHO)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 17: Checking Fuel Pump Operation (Highlander)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

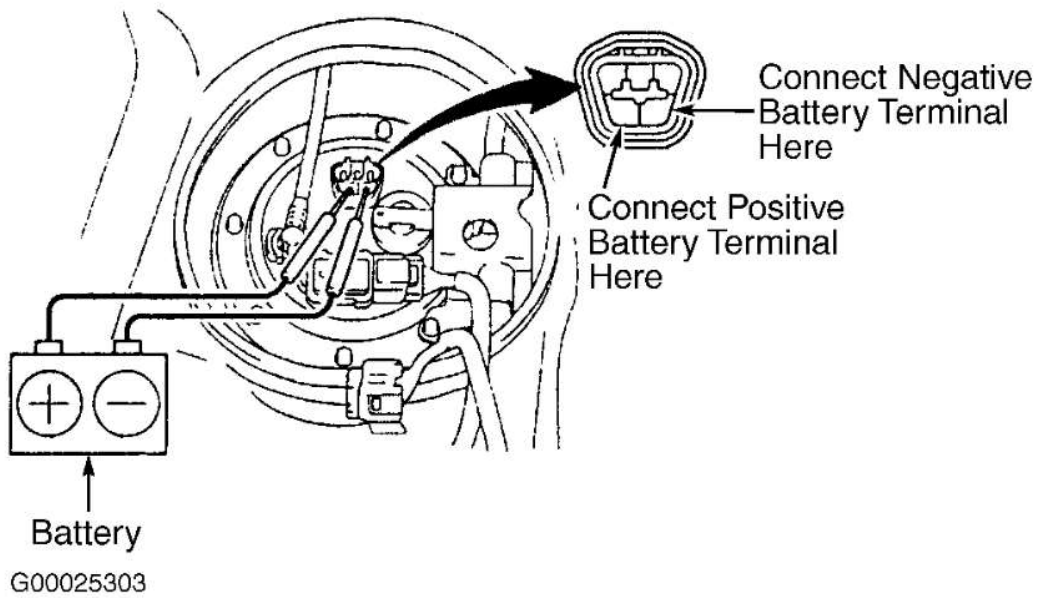


Fig. 18: Checking Fuel Pump Operation (MR2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

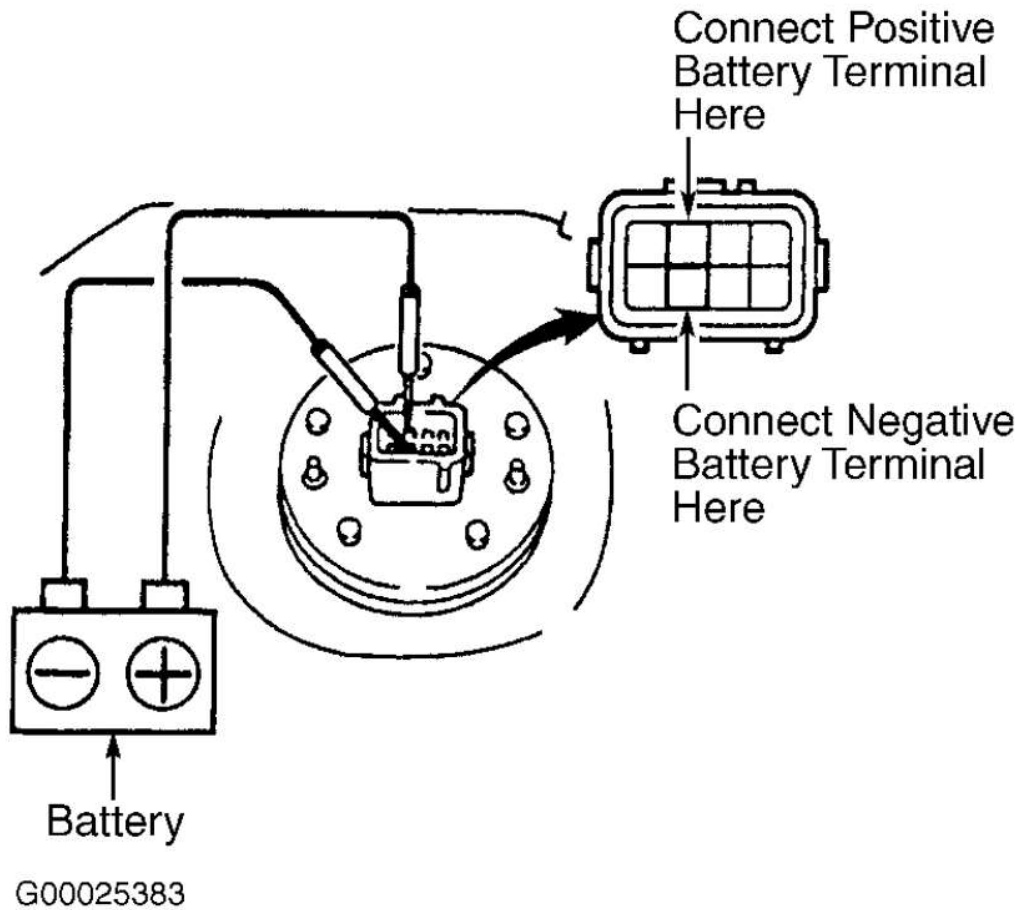


Fig. 19: Checking Fuel Pump Operation (Prius)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

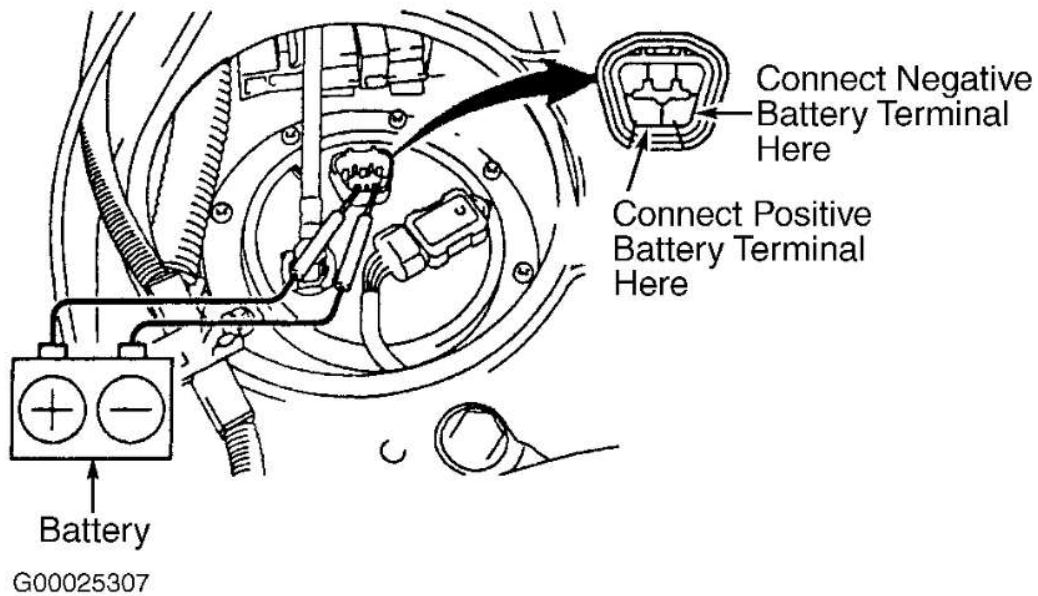


Fig. 20: Checking Fuel Pump Operation (RAV4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

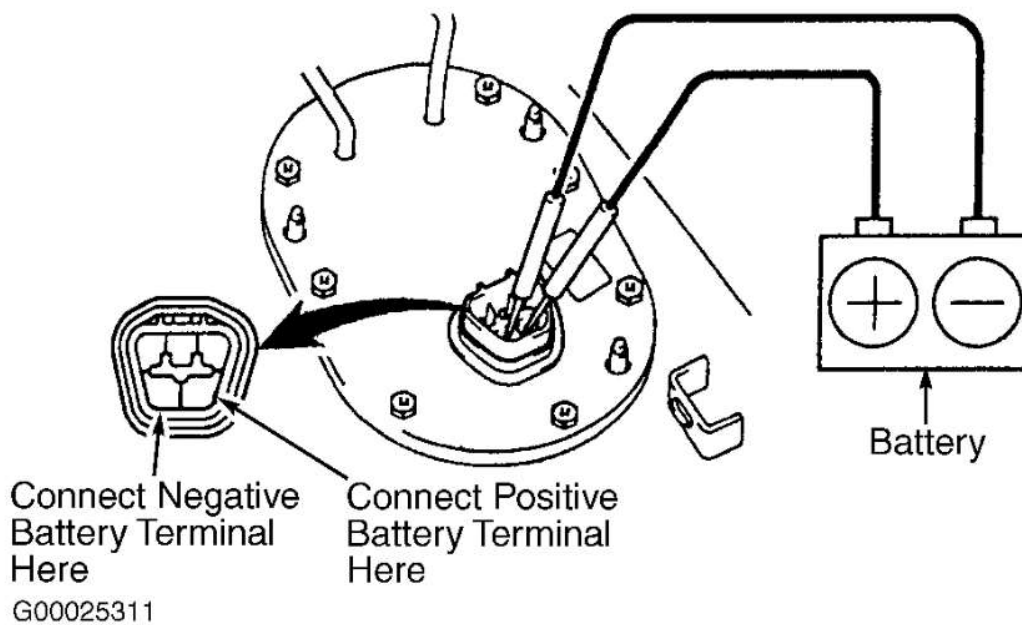
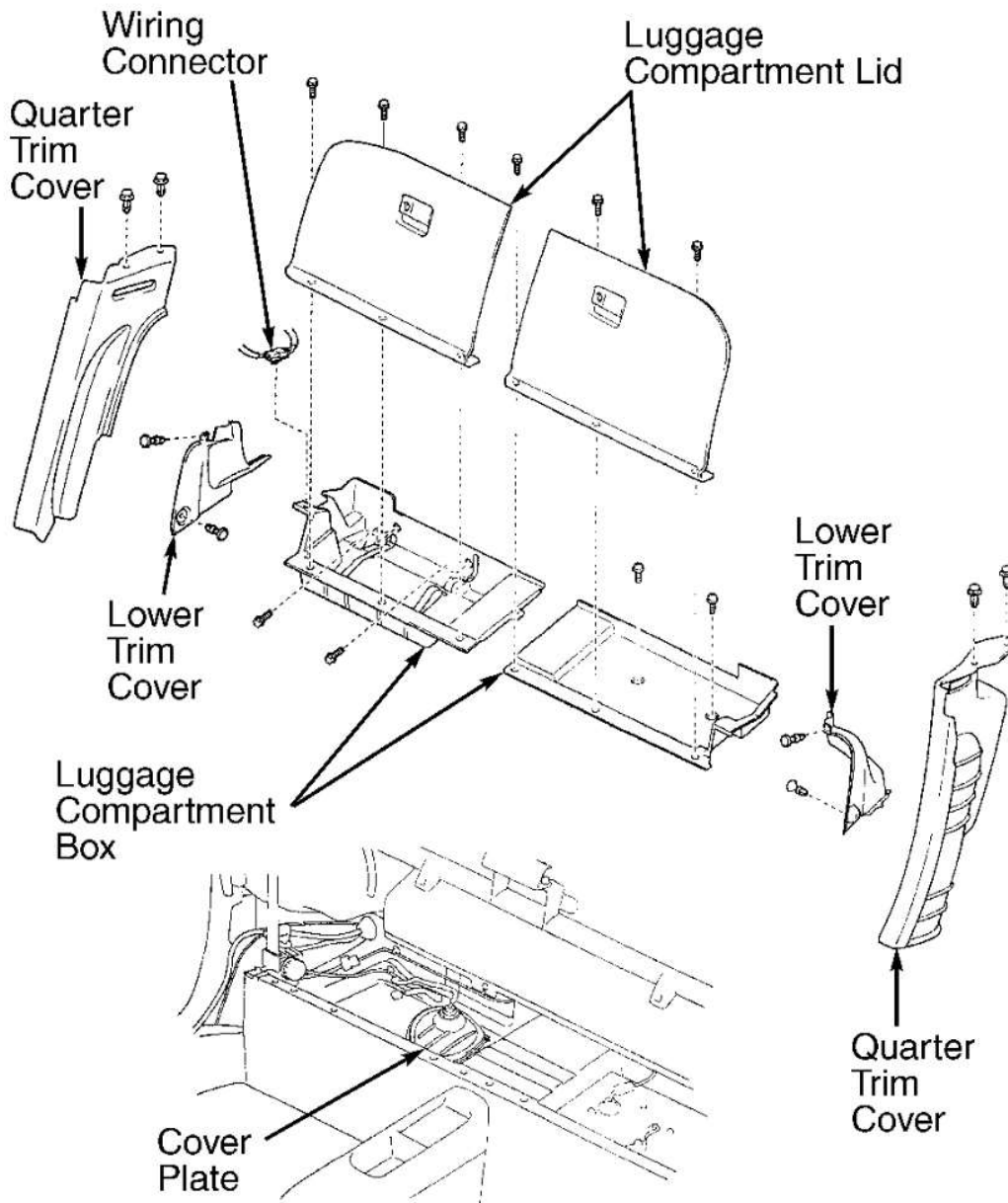


Fig. 21: Checking Fuel Pump Operation (Tacoma)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 22: Locating Luggage Compartment Components (MR2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

FUEL SYSTEM PRESSURE RELEASE

Camry

1. Ensure ignition is off. Remove circuit opening relay from fuse/relay box. See **Fig. 12** . Fuse/relay box is located at driver's side front corner of engine compartment.
2. Start engine and allow engine to idle until engine stalls. Attempt to start engine again to ensure engine will not start. Turn ignition off. Disconnect negative battery cable. Remove fuel tank cap to release any pressure from fuel tank.
3. Place suitable container under fuel line connection. Cover fuel line connection with shop towel. Slowly loosen or disconnect fuel line connection, allowing fuel pressure to be released. Once fuel pressure is released, fuel system components may be serviced.
4. Reinstall circuit opening relay and negative battery cable. Start engine and check operation of Malfunction Indicator Light (MIL) on instrument panel with engine running. MIL is displayed as engine icon on instrument panel. It may be possible that Diagnostic Trouble Code (DTC) P0171 may have been stored in Engine Control Module (ECM) and MIL may be illuminated with engine running due to the lean condition caused by operating engine with circuit opening relay removed. If MIL is illuminated, DTCs must be cleared from ECM. See CLEARING DIAGNOSTIC TROUBLE CODES under SELF-DIAGNOSTIC SYSTEM in appropriate SELF-DIAGNOSTICS article.

NOTE: It may be possible that power sun roof may not operate properly after battery was disconnected. If power sun roof does not operate properly, perform appropriate power sun roof reinitialization procedure. See appropriate **POWER SUN ROOF REINITIALIZATION PROCEDURE** under **PROGRAMMING**.

Camry Solara, Celica, Corolla, ECHO, Highlander, MR2, Prius, RAV4 & Tacoma

WARNING: On Prius, read service precautions before proceeding with service procedure. See **SERVICE PRECAUTIONS** .

1. On all models, disconnect electrical connector for fuel pump. See **FUEL PUMP ELECTRICAL CONNECTOR LOCATION** table. This is electrical connector for fuel pump and fuel gauge sending unit. Electric fuel pump is located in the fuel tank.

FUEL PUMP ELECTRICAL CONNECTOR LOCATION

Application	Connector Location
Camry Solara, Celica, Corolla, ECHO & Prius	Under Cover Plate, Below Rear Seat Cushion
Highlander	Under Cover Plate, Below Driver's Side & Passenger's Side Rear Seats
MR2	Under Cover Plate, Below Luggage Compartment Boxes Behind The Seats
RAV4	Under Cover Plate, Below Driver's Side Rear Seat
Tacoma	On Top Of Fuel Tank, At Fuel Pump

2. Start engine and allow engine to idle until engine stalls. Turn ignition off. Disconnect negative battery cable.
3. Place suitable container under fuel line connection. Cover fuel line connection with shop towel. Slowly loosen or disconnect fuel line connection, allowing fuel pressure to be released. Once fuel pressure is released, fuel system components may be serviced. Reinstall electrical connector for fuel pump and negative battery cable.

NOTE: On Celica, it may be possible that power sun roof may not operate properly after battery was disconnected. If power sun roof does not operate properly, perform appropriate power sun roof reinitialization procedure. See appropriate **POWER SUN ROOF REINITIALIZATION PROCEDURE** under **PROGRAMMING**.

FUEL PRESSURE

Camry

1. Ensure battery is fully charged. Release fuel pressure. See **FUEL SYSTEM PRESSURE RELEASE** . Disconnect negative battery cable.
2. Purchase fuel pipe (part No. 23901-28130) from parts department. Remove fuel pipe connector from end of NEW fuel pipe. See **Fig. 23** .
3. Remove fuel pipe clamp from end of fuel pipe at fuel pipe fitting. Perform STEP 1 in illustration. See **Fig. 24** . Ensure area around fuel pipe and disconnect fitting is clean.

CAUTION: Use care when disconnecting fuel pipe, as some residual fuel pressure may still exist in the fuel system.

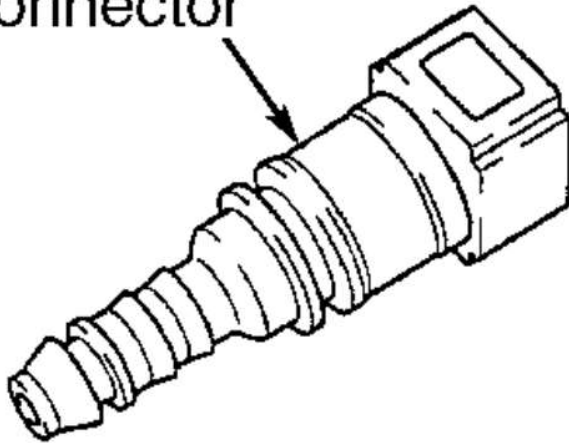
4. Depress both tabs and pull fuel pipe with disconnect fitting from fuel pipe fitting. Perform STEP 2 in illustration. See **Fig. 24** . Install Adapter (SST 09268-41250) and hose with fuel pressure gauge from Fuel Pressure Gauge Set (SST 09268-45014) with fuel pipe connector between fuel pipe and fuel pipe fitting. See **Fig. 25** . Ensure hose, fuel pipe and fuel pipe connector are properly connected. Install fuel pipe clamp.
5. Install negative battery cable. Connect Toyota hand-held tester to data link connector No. 3 at driver's side of instrument panel. See **Fig. 2** . Turn ignition on. DO NOT start engine.
6. Turn hand-held tester on. Select ACTIVE TEST MODE on hand-held tester. Using hand-held tester manufacturer's instructions, operate fuel pump and note fuel pressure. If hand-held tester is not available, fuel pump may also be activated by removing circuit opening relay and connecting battery voltage to wiring circuit for fuel pump. See **CHECKING FUEL PUMP OPERATION BY APPLYING BATTERY VOLTAGE TO FUEL PUMP (CAMRY)** under FUEL PUMP OPERATION. Fuel pressure should be 44-50 psi (3.1-3.5 kg/cm²).
7. If fuel pressure is within specification, go to next step. If fuel pressure exceeds specification, replace fuel pressure regulator mounted on fuel pump in the fuel tank. See FUEL PRESSURE REGULATOR under FUEL SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. If fuel pressure is less than specified, check for leaking fuel hoses or connections, restricted fuel filter, defective

fuel pump or defective fuel pressure regulator.

8. Turn ignition off. Remove hand-held tester. Start engine and allow engine to idle. Note fuel pressure with engine idling. Fuel pressure should be 44-50 psi (3.1-3.5 kg/cm²).
9. Shut engine off and note fuel pressure. Fuel pressure should remain at least 21 psi (1.5 kg/cm²) for a minimum of 5 minutes. If fuel pressure is within specification and holds as specified, go to next step. If fuel pressure is not within specification or does not hold as specified, check for defective fuel pump, fuel injector or fuel pressure regulator.
10. Release fuel pressure. Disconnect negative battery cable. Remove adapter, hose, fuel pressure gauge and fuel pipe connector.
11. Install fuel pipe on fuel pipe fitting. Pull on fuel pipe to ensure fuel pipe is properly locked on fuel pipe fitting. Reinstall fuel pipe clamp. Install negative battery cable. Check for fuel leaks by activating the fuel pump by using hand-held tester or by removing circuit opening relay and connecting battery voltage to wiring circuit for fuel pump.

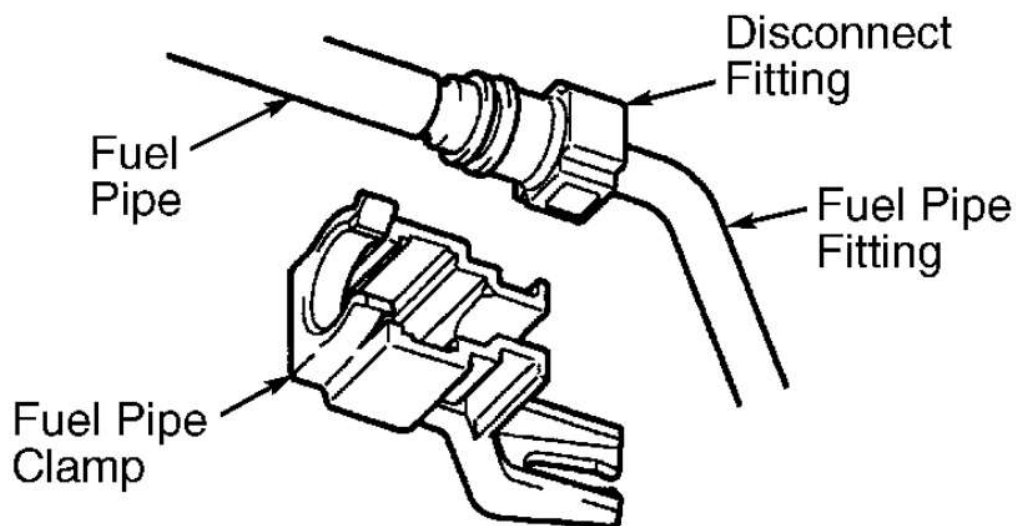
NOTE: It may be possible that power sun roof may not operate properly after battery was disconnected. If power sun roof does not operate properly, perform appropriate power sun roof reinitialization procedure. See appropriate **POWER SUN ROOF REINITIALIZATION PROCEDURE** under **PROGRAMMING**.

Fuel Pipe
Connector

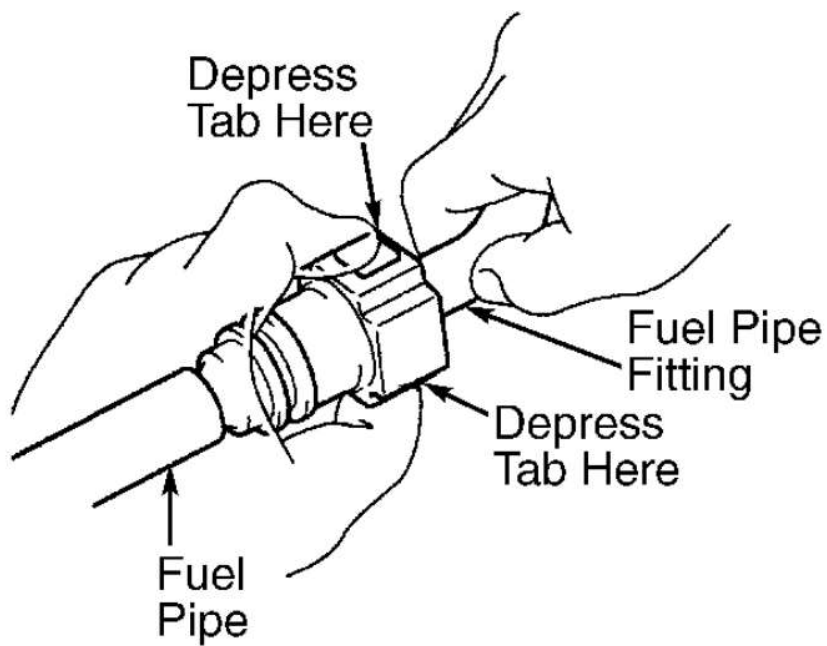


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Fig. 23: Identifying Fuel Pipe Connector (Camry, ECHO, Highlander, Prius & RAV4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



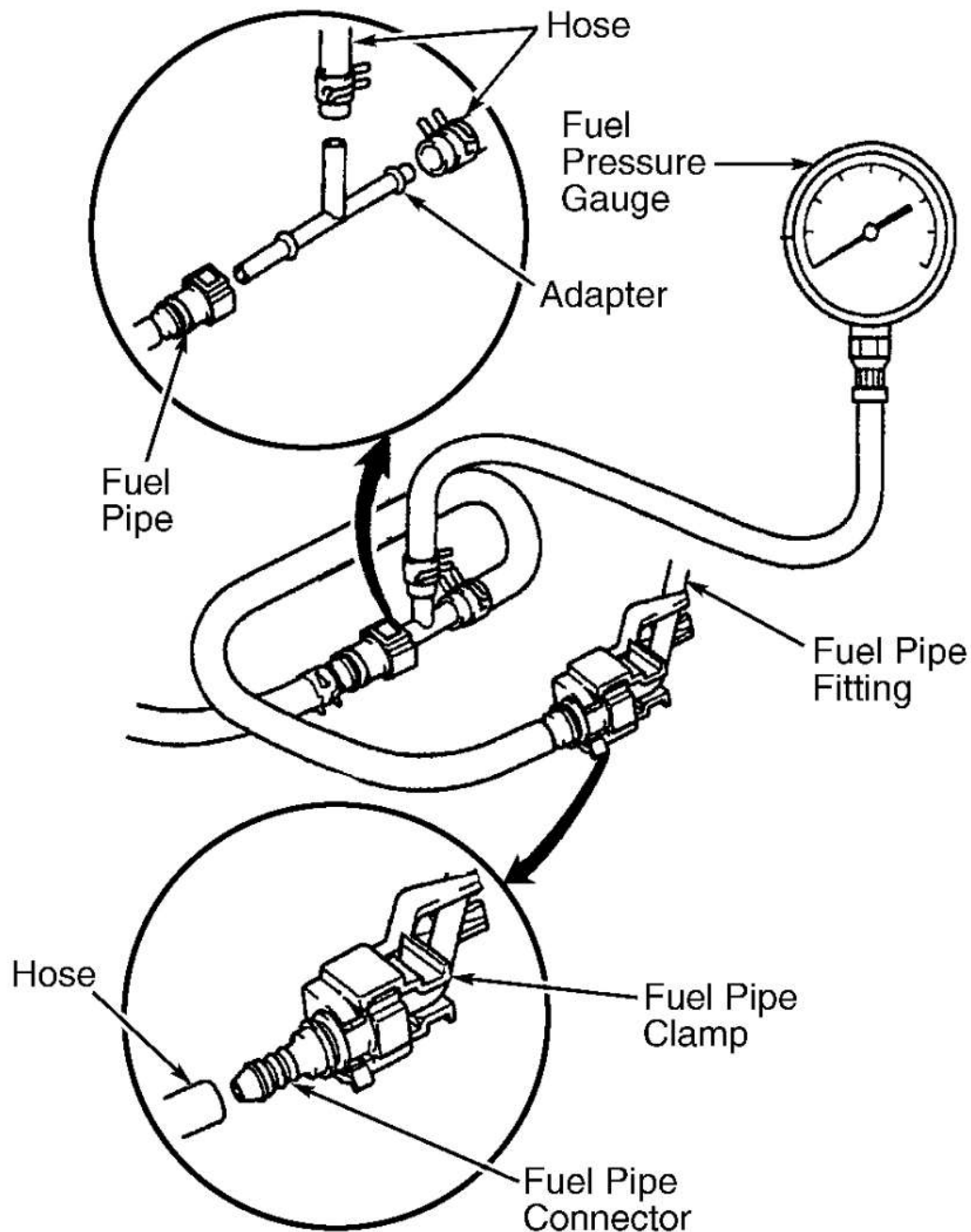
STEP 1



STEP 2

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Fig. 24: Locating Fuel Pipe Clamp & Disconnecting Fuel Pipe From Fuel Pipe Fitting (Camry)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G00020815

Fig. 25: Installing Fuel Pressure Gauge (Camry & Highlander)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Camry Solara

1. Ensure battery is fully charged. Release fuel pressure. See **FUEL SYSTEM PRESSURE RELEASE** . Disconnect negative battery cable.
2. Purchase fuel pipe (part No. 23901-22070) from parts department. This is the fuel pipe that attaches to top of fuel filter. Remove fuel pipe connector from end of NEW fuel pipe. See **Fig. 26** .
3. Remove fuel pipe clamp from fuel pipe at fuel filter. Perform STEP 1 in illustration. See **Fig. 27** . Ensure area around fuel pipe and fuel filter is clean.

CAUTION: Use care when disconnecting fuel pipe from fuel filter, as some residual fuel pressure may still exist in the fuel system.

4. Depress both sides of retainer and pull fuel pipe with disconnect fitting from fuel filter. Perform STEP 2 in illustration. See **Fig. 27** .
5. Install Adapter (SST 09268-41250), hose and fuel pressure gauge from Fuel Pressure Gauge Set (SST 09268-45014) with fuel pipe connector between fuel pipe and fuel filter. See **Fig. 28** . Ensure hose, fuel pipe and fuel pipe connector are properly connected.
6. Reinstall negative battery cable. Connect Toyota hand-held tester to data link connector No. 3 at driver's side of instrument panel. See **Fig. 3** . Turn ignition on. DO NOT start engine.
7. Turn hand-held tester on. Select ACTIVE TEST MODE on hand-held tester. Using hand-held tester manufacturer's instructions, operate fuel pump and note fuel pressure. If hand-held tester is not available, fuel pump may also be activated by connecting battery voltage to specified terminals on fuel pump. See **Fig. 13** . Fuel pressure should be 44-50 psi (3.1-3.5 kg/cm²).
8. If fuel pressure is within specification, go to next step. If fuel pressure exceeds specification, replace fuel pressure regulator mounted on fuel pump in the fuel tank. See FUEL PRESSURE REGULATOR under FUEL SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. If fuel pressure is less than specified, check for leaking fuel hoses or connections, restricted fuel filter, defective fuel pump or defective fuel pressure regulator.
9. Turn ignition off. Remove hand-held tester. Start engine and allow engine to idle. Note fuel pressure with engine idling. Fuel pressure should be 44-50 psi (3.1-3.5 kg/cm²).
10. Shut engine off and note fuel pressure. Fuel pressure should remain at least 21 psi (1.5 kg/cm²) for a minimum of 5 minutes. If fuel pressure is within specification and holds as specified, go to next step. If fuel pressure is not within specification or does not hold as specified, check for defective fuel pump, fuel injector or fuel pressure regulator.
11. Release fuel pressure. Disconnect negative battery cable. Remove adapter, hose, fuel pressure gauge and fuel pipe connector.

CAUTION: DO NOT reuse old retainer when installing fuel pipe on fuel filter. Always use a NEW retainer.

12. Apply light coat of engine oil on tip of fuel pipe on fuel filter to allow for ease of disconnect fitting and

fuel pipe installation. Using NEW retainer, install fuel pipe on fuel filter until "click" sound is heard. DO NOT reuse old retainer. Pull on fuel pipe to ensure fuel pipe is properly locked on fuel filter.

13. Reinstall fuel pipe clamp. Install negative battery cable. Check for fuel leaks by activating the fuel pump by using hand-held tester or connecting battery voltage to fuel pump.

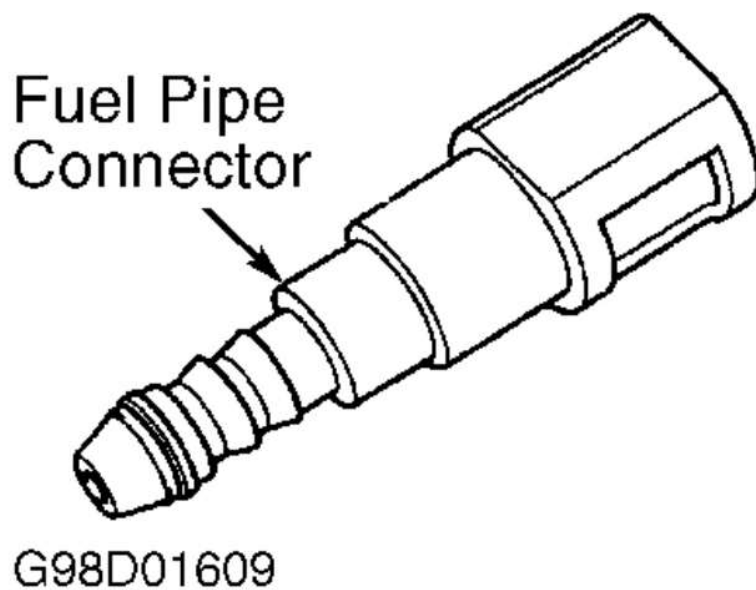
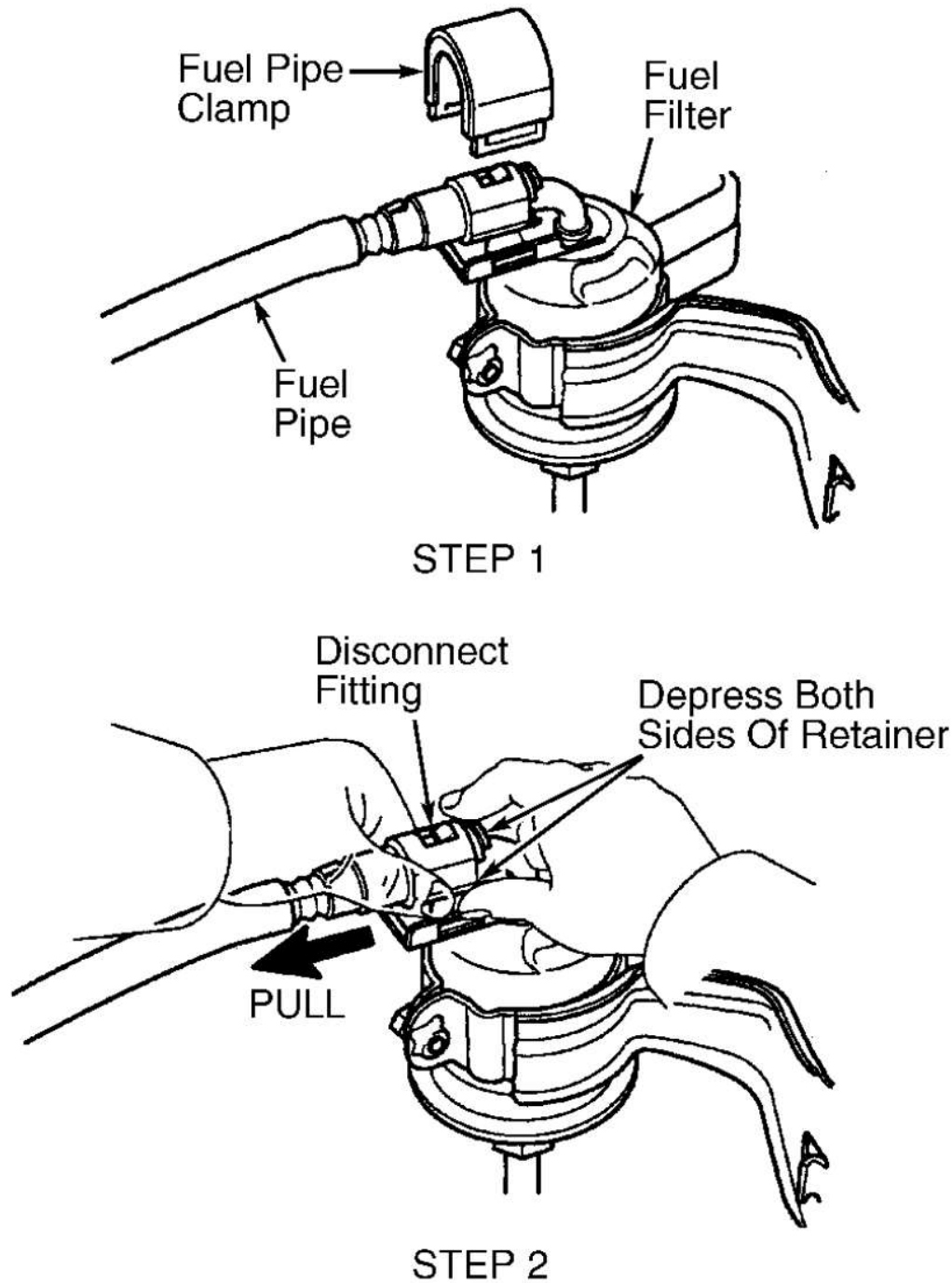


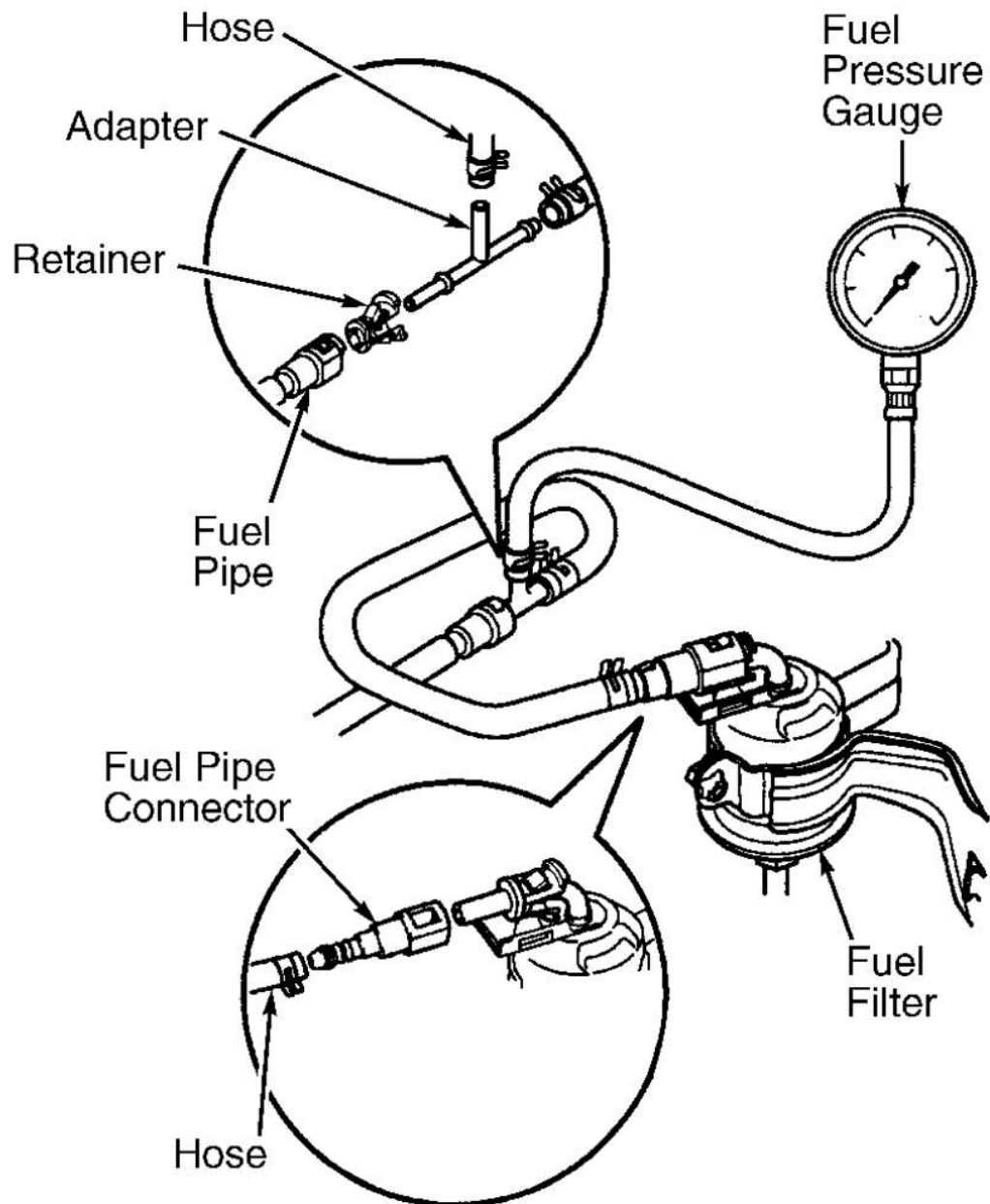
Fig. 26: Identifying Fuel Pipe Connector (Camry Solara, Celica, Corolla & MR2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 27: Disconnecting Fuel Pipe From Fuel Filter (Camry Solara)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G00025422

Fig. 28: Installing Fuel Pressure Gauge (Camry Solara)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Celica, Corolla, ECHO & MR2

1. Ensure battery is fully charged. Release fuel pressure. See **FUEL SYSTEM PRESSURE RELEASE** . Disconnect negative battery cable.
2. Purchase appropriate fuel pipe from parts department. See **FUEL PIPE IDENTIFICATION** table. Remove fuel pipe connector from end of NEW fuel pipe. See **Fig. 23** and **Fig. 26** .

FUEL PIPE IDENTIFICATION

Application	Fuel Pipe Part No.
Celica	
1.8L 1ZZ-FE	23901-22100
1.8L 2ZZ-GE	23271-88600
Corolla	23901-22010
ECHO	23901-21020 Or 23901-22010
MR2	23901-22070

3. Remove fuel pipe clamp from end of fuel pipe at end of fuel rail. Perform STEP 1 in illustration. See **Fig. 29 -Fig. 32** . Ensure area around fuel pipe and disconnect fitting is clean.

CAUTION: Use care when disconnecting fuel pipe, as some residual fuel pressure may still exist in the fuel system.

4. Depress both sides of retainer and pull fuel pipe with disconnect fitting from fuel pipe fitting. Perform STEP 2 in illustration. See **Fig. 29 -Fig. 32** .
5. Install Adapter (SST 09268-41250) and hose with fuel pressure gauge from Fuel Pressure Gauge Set (SST 09268-45014) with fuel pipe connector between fuel pipe and fuel pipe fitting. See **Fig. 33** . Ensure hose, fuel pipe and fuel pipe connector are properly connected.
6. Install negative battery cable. Connect Toyota hand-held tester to data link connector No. 3 at driver's side of instrument panel. See **Fig. 4** , **Fig. 5** , **Fig. 6** and **Fig. 8** . Turn ignition on. DO NOT start engine.
7. Turn hand-held tester on. Select ACTIVE TEST MODE on hand-held tester. Using hand-held tester manufacturer's instructions, operate fuel pump and note fuel pressure. If hand-held tester is not available, fuel pump may also be activated by connecting battery voltage to specified terminals on fuel pump. See **Fig. 14** , **Fig. 15** , **Fig. 16** and **Fig. 18** . Fuel pressure should be 44-50 psi (3.1-3.5 kg/cm²).
8. If fuel pressure is within specification, go to next step. If fuel pressure exceeds specification, replace fuel pressure regulator mounted on fuel pump in the fuel tank. See FUEL PRESSURE REGULATOR under FUEL SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. If fuel pressure is less than specified, check for leaking fuel hoses or connections, restricted fuel filter, defective fuel pump or defective fuel pressure regulator.
9. Turn ignition off. Remove hand-held tester. Start engine and allow engine to idle. Note fuel pressure with engine idling. Fuel pressure should be 44-50 psi (3.1-3.5 kg/cm²).
10. Shut engine off and note fuel pressure. Fuel pressure should remain at least 21 psi (1.5 kg/cm²) for a minimum of 5 minutes. If fuel pressure is within specification and holds as specified, go to next step. If fuel pressure is not within specification or does not hold as specified, check for defective fuel pump, fuel

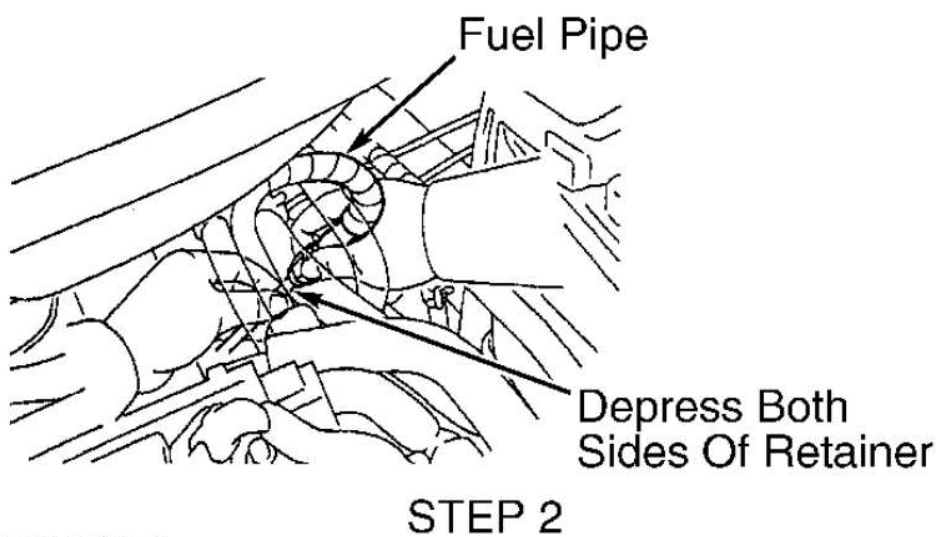
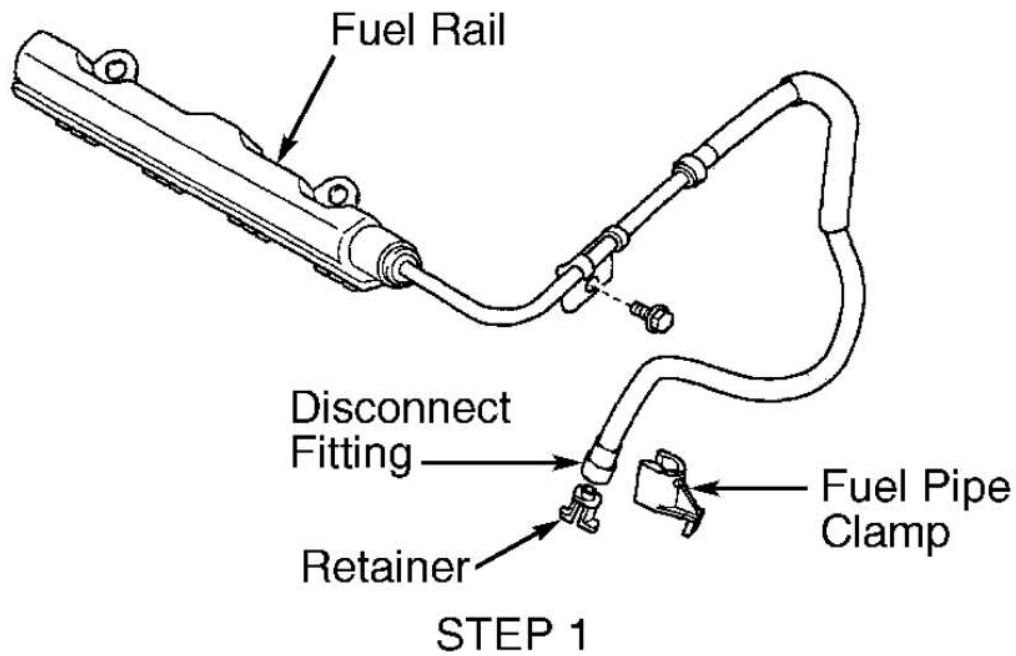
injector or fuel pressure regulator.

11. Release fuel pressure. Disconnect negative battery cable. Remove adapter, hose, fuel pressure gauge and fuel pipe connector.

CAUTION: DO NOT reuse old retainer when installing fuel pipe on fuel pipe fitting. Always use a NEW retainer.

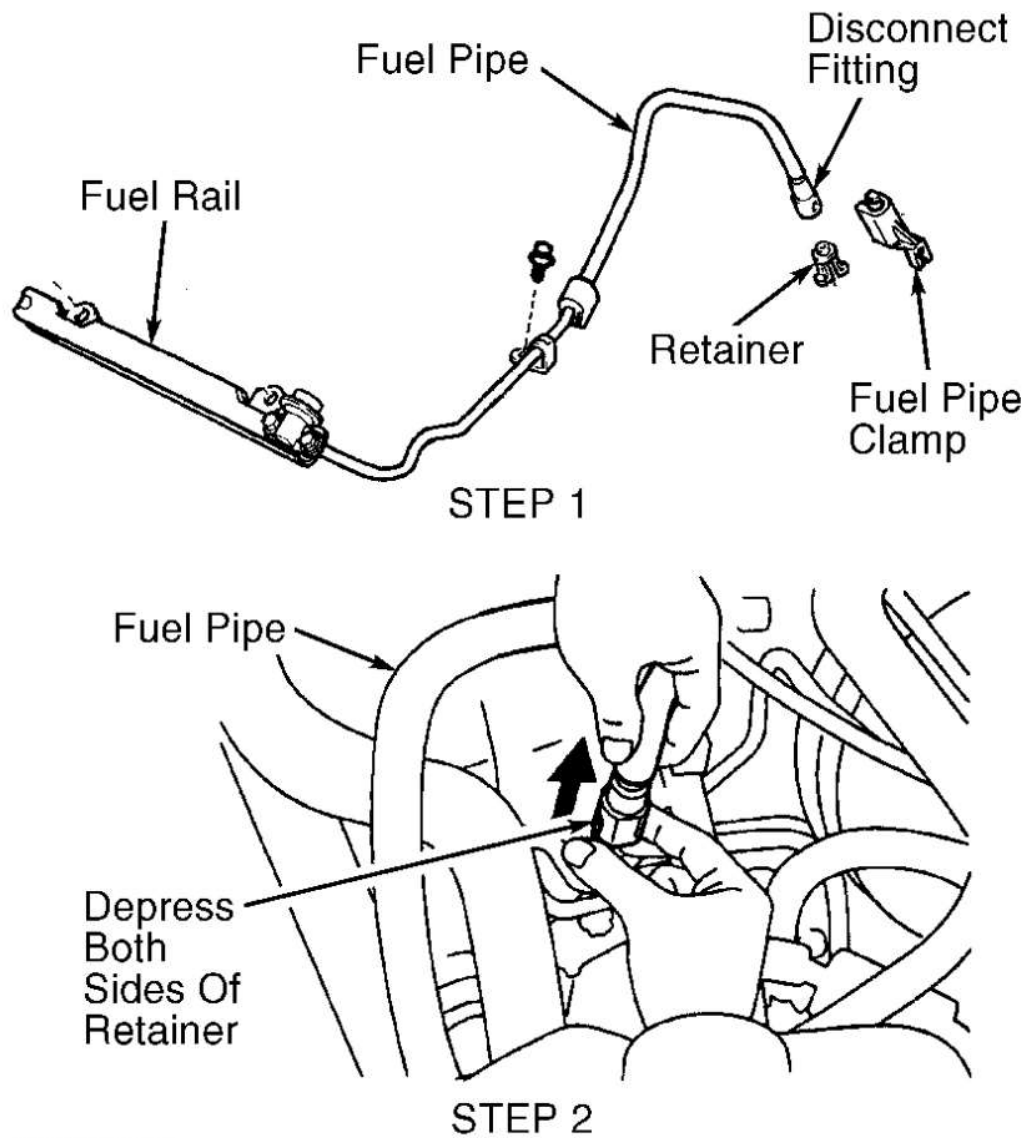
12. Apply light coat of engine oil on tip of fuel pipe fitting to allow for ease of disconnect fitting and fuel pipe installation. Using NEW retainer, install fuel pipe on fuel pipe fitting until "click" sound is heard. DO NOT reuse old retainer. Pull on fuel pipe to ensure fuel pipe is properly locked on fuel pipe fitting.
13. Reinstall fuel pipe clamp. Install negative battery cable. Check for fuel leaks by activating the fuel pump by using hand-held tester or connecting battery voltage to fuel pump.

NOTE: On Celica, it may be possible that power sun roof may not operate properly after battery was disconnected. If power sun roof does not operate properly, perform power sun roof reinitialization procedure. See appropriate POWER SUN ROOF REINITIALIZATION PROCEDURE under PROGRAMMING.



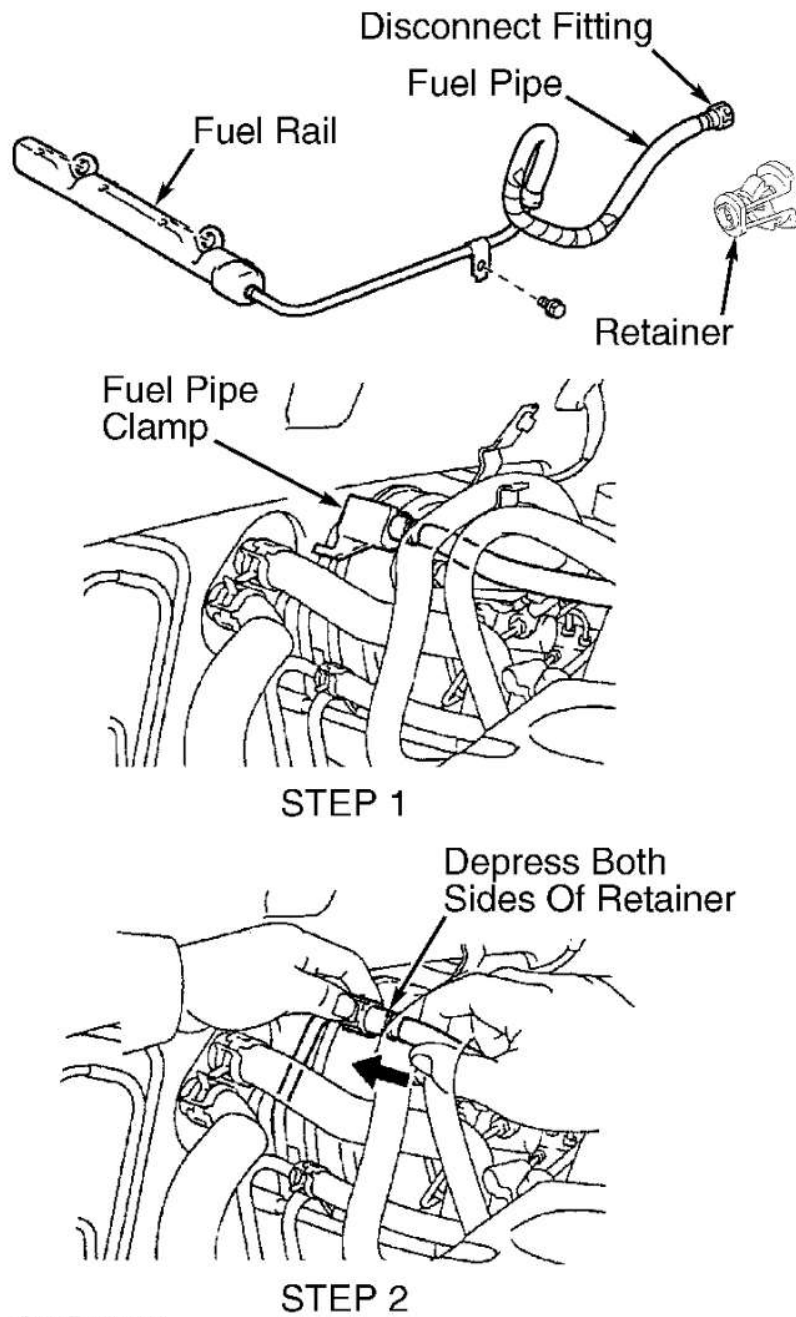
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Fig. 29: Locating Fuel Pipe Clamp & Disconnecting Fuel Pipe From Fuel Pipe Fitting (Celica)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



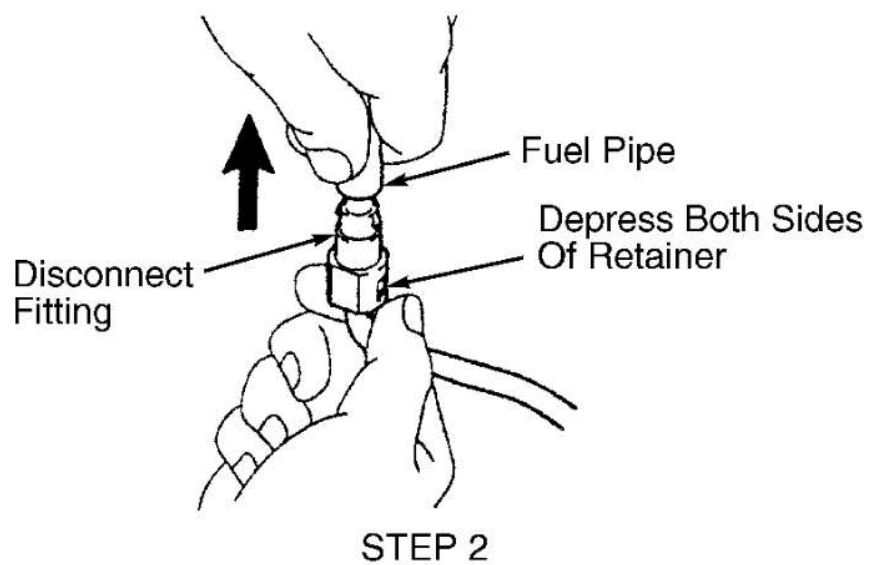
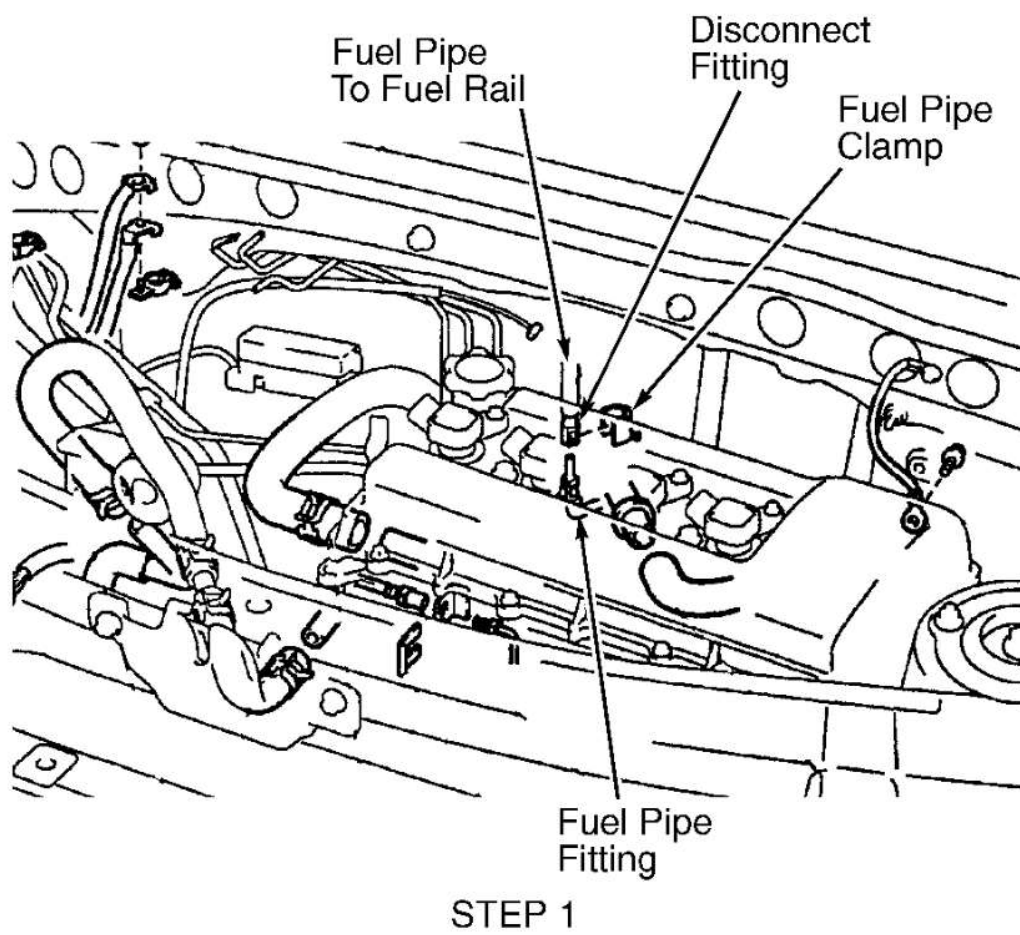
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Fig. 30: Locating Fuel Pipe Clamp & Disconnecting Fuel Pipe From Fuel Pipe Fitting (Corolla)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



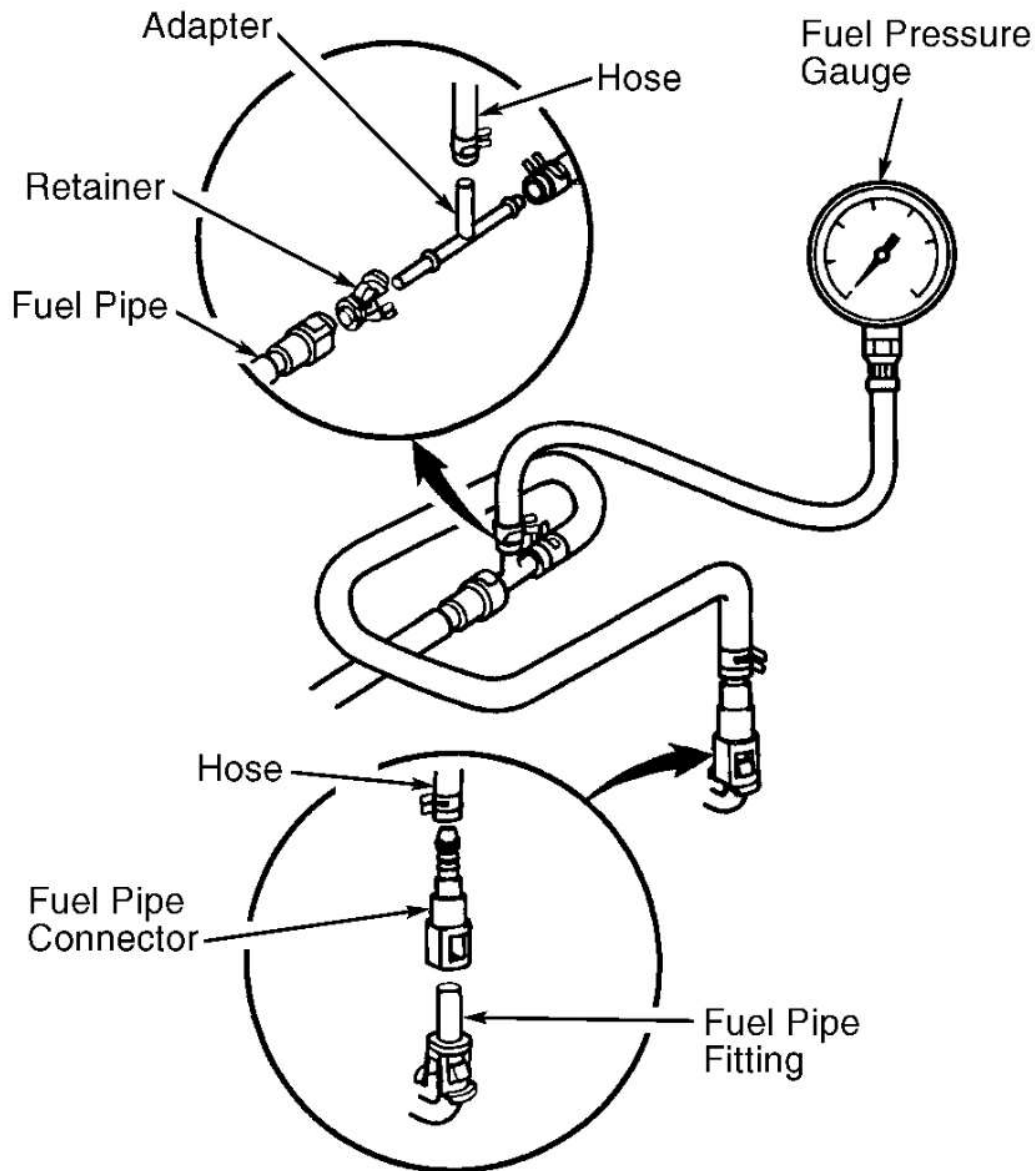
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Fig. 31: Locating Fuel Pipe Clamp & Disconnecting Fuel Pipe From Fuel Pipe Fitting (ECHO)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G00020882

Fig. 32: Locating Fuel Pipe Clamp & Disconnecting Fuel Pipe From Fuel Pipe Fitting (MR2)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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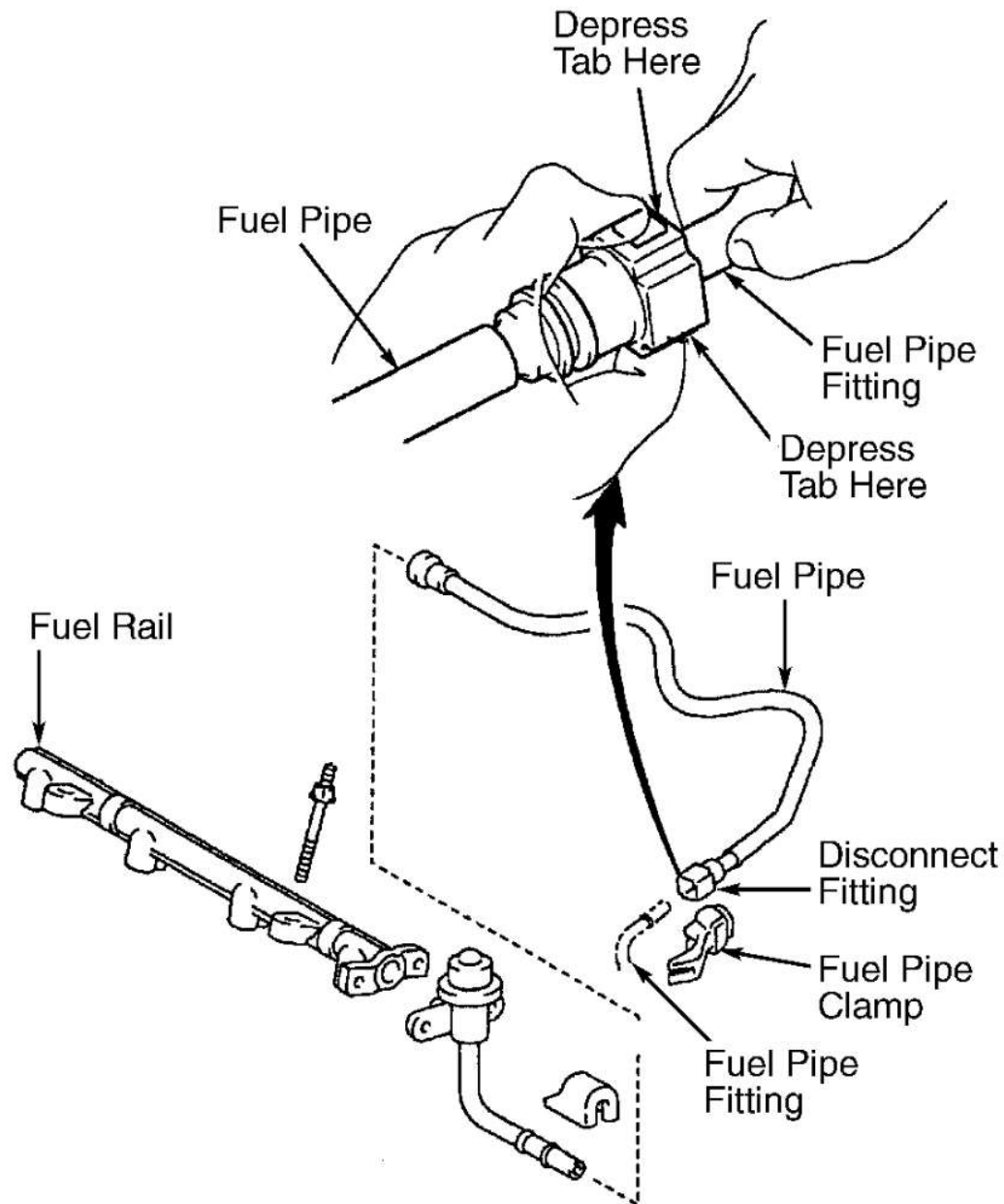
Fig. 33: Installing Fuel Pressure Gauge (Celica, Corolla, ECHO, MR2, Prius & RAV4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Highlander & RAV4

1. Ensure battery is fully charged. Release fuel pressure. See **FUEL SYSTEM PRESSURE RELEASE** . Disconnect negative battery cable.
2. Purchase fuel pipe (part No. 23901-28070 for Highlander or 23901-22110 for RAV4) from parts department. Remove fuel pipe connector from end of NEW fuel pipe. See **Fig. 23** .
3. Remove fuel pipe clamp from end of fuel pipe at fuel pipe fitting. See **Fig. 34** and **Fig. 35** . Ensure area around fuel pipe and disconnect fitting is clean.

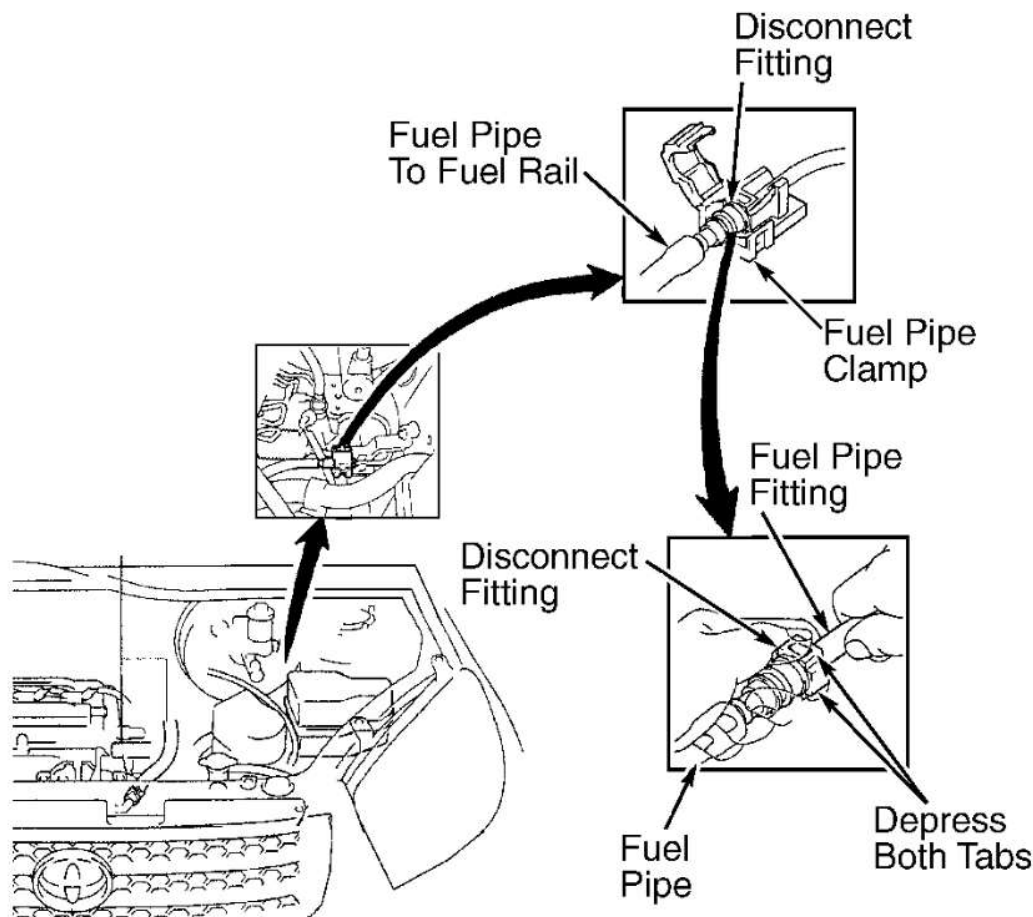
CAUTION: Use care when disconnecting fuel pipe, as some residual fuel pressure may still exist in the fuel system.

4. Depress both tabs and pull fuel pipe with disconnect fitting from fuel pipe fitting. See **Fig. 34** and **Fig. 35** . Install Adapter (SST 09268-41250) and hose with fuel pressure gauge from Fuel Pressure Gauge Set (SST 09268-45014) with fuel pipe connector between fuel pipe and fuel pipe fitting. See **Fig. 25** and **Fig. 33** . Ensure hose, fuel pipe and fuel pipe connector are properly connected. Install fuel pipe clamp.
5. Install negative battery cable. Connect Toyota hand-held tester to data link connector No. 3 at driver's side of instrument panel. See **Fig. 7** and **Fig. 10** . Turn ignition on. DO NOT start engine.
6. Turn hand-held tester on. Select ACTIVE TEST MODE on hand-held tester. Using hand-held tester manufacturer's instructions, operate fuel pump and note fuel pressure. If hand-held tester is not available, fuel pump may also be activated by connecting battery voltage to specified terminals on fuel pump. See **Fig. 17** and **Fig. 20** . Fuel pressure should be 44-50 psi (3.1-3.5 kg/cm²).
7. If fuel pressure is within specification, go to next step. If fuel pressure exceeds specification, replace fuel pressure regulator mounted on fuel pump in the fuel tank. See FUEL PRESSURE REGULATOR under FUEL SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. If fuel pressure is less than specified, check for leaking fuel hoses or connections, restricted fuel filter, defective fuel pump or defective fuel pressure regulator.
8. Turn ignition off. Remove hand-held tester. Start engine and allow engine to idle. Note fuel pressure with engine idling. Fuel pressure should be 44-50 psi (3.1-3.5 kg/cm²).
9. Shut engine off and note fuel pressure. Fuel pressure should remain at least 21 psi (1.5 kg/cm²) for a minimum of 5 minutes. If fuel pressure is within specification and holds as specified, go to next step. If fuel pressure is not within specification or does not hold as specified, check for defective fuel pump, fuel injector or fuel pressure regulator.
10. Release fuel pressure. Disconnect negative battery cable. Remove adapter, hose, fuel pressure gauge and fuel pipe connector.
11. Install fuel pipe on fuel pipe fitting. Pull on fuel pipe to ensure fuel pipe is properly locked on fuel pipe fitting. Reinstall fuel pipe clamp. Install negative battery cable. Check for fuel leaks by activating the fuel pump by using hand-held tester or connecting battery voltage to fuel pump.



G00020894

Fig. 34: Locating Fuel Pipe Clamp & Disconnecting Fuel Pipe From Fuel Pipe Fitting (Highlander)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G00011392

Fig. 35: Locating Fuel Pipe Clamp & Disconnecting Fuel Pipe From Fuel Pipe Fitting (RAV4)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Prius

WARNING: Read service precautions before proceeding with service procedure. See SERVICE PRECAUTIONS .

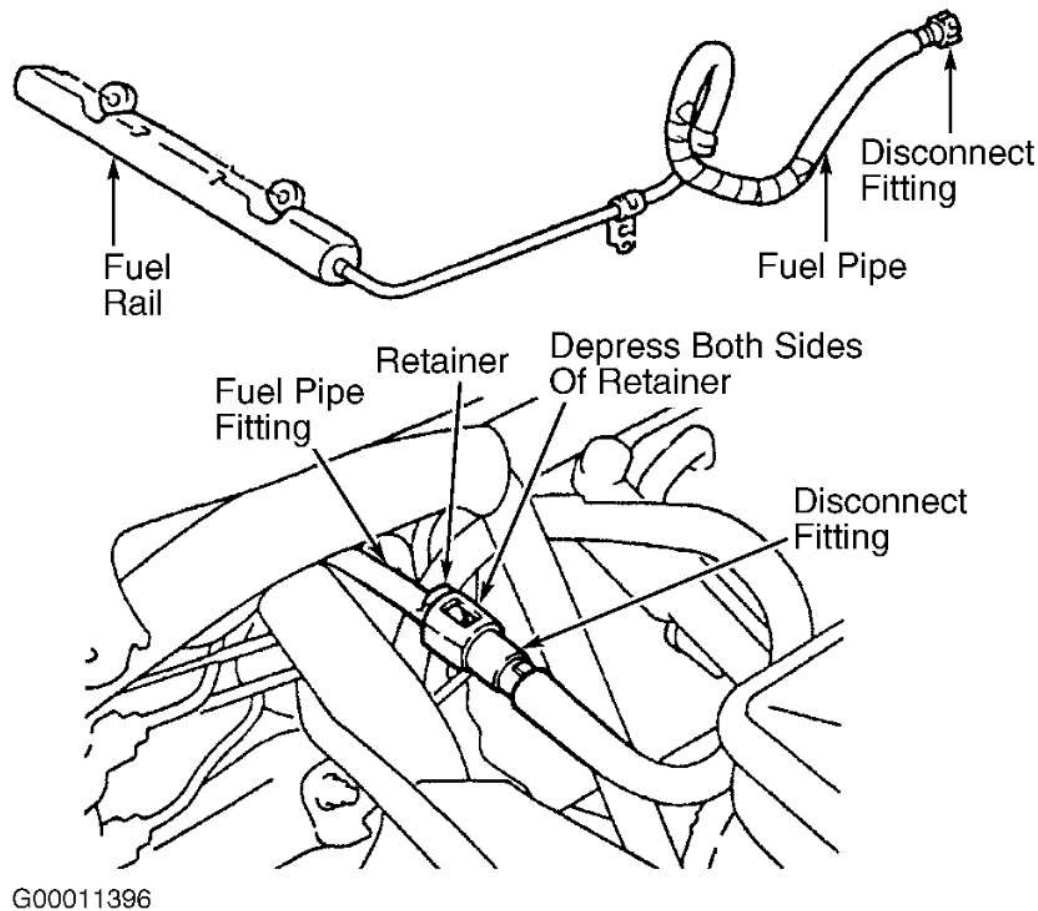
1. Ensure battery is fully charged. Release fuel pressure. See FUEL SYSTEM PRESSURE RELEASE . Disconnect negative battery cable.
2. Purchase fuel pipe (part No. 23901-21020) from parts department. Remove fuel pipe connector from end of NEW fuel pipe. See **Fig. 23** .
3. Ensure area around fuel pipe at end of fuel rail and disconnect fitting is clean. See **Fig. 36** .

CAUTION: Use care when disconnecting fuel pipe, as some residual fuel pressure may still exist in the fuel system.

4. Depress both sides of retainer and pull fuel pipe with disconnect fitting from fuel pipe fitting. See **Fig. 36**.
5. Install Adapter (SST 09268-41250) and hose with fuel pressure gauge from Fuel Pressure Gauge Set (SST 09268-45014) with fuel pipe connector between fuel pipe and fuel pipe fitting. See **Fig. 33**. Ensure hose, fuel pipe and fuel pipe connector are properly connected.
6. Install negative battery cable. Connect Toyota hand-held tester to data link connector No. 3 at driver's side of instrument panel. See **Fig. 9**. Turn ignition on. DO NOT start engine.
7. Turn hand-held tester on. Select ACTIVE TEST MODE on hand-held tester. Using hand-held tester manufacturer's instructions, operate fuel pump and note fuel pressure. If hand-held tester is not available, fuel pump may also be activated by connecting battery voltage to specified terminals on fuel pump. See **Fig. 19**. Fuel pressure should be 44-50 psi (3.1-3.5 kg/cm²).
8. If fuel pressure is within specification, go to next step. If fuel pressure exceeds specification, fuel pressure regulator is defective. Fuel pressure regulator is mounted on fuel pump in the fuel tank. It may be necessary to replace fuel pressure regulator, fuel pump and fuel tank as an assembly. Consult parts department for parts availability. If fuel pressure is less than specified, check for leaking fuel hoses or connections or defective fuel pump.
9. Turn ignition off. Remove hand-held tester. Start engine and allow engine to idle. Note fuel pressure with engine idling. Fuel pressure should be 44-50 psi (3.1-3.5 kg/cm²).
10. Shut engine off and note fuel pressure. Fuel pressure should remain at least 21 psi (1.5 kg/cm²) for a minimum of 5 minutes. If fuel pressure is within specification and holds as specified, go to next step. If fuel pressure is not within specification or does not hold as specified, check for defective fuel pump or defective fuel injector.
11. Release fuel pressure. Disconnect negative battery cable. Remove adapter, hose, fuel pressure gauge and fuel pipe connector.

CAUTION: DO NOT reuse old retainer when installing fuel pipe on fuel pipe fitting. Always use a NEW retainer.

12. Apply light coat of engine oil on tip of fuel pipe fitting to allow for ease of disconnect fitting and fuel pipe installation. Using NEW retainer, install fuel pipe on fuel pipe fitting until "click" sound is heard. DO NOT reuse old retainer. Pull on fuel pipe to ensure fuel pipe is properly locked on fuel pipe fitting.
13. Install negative battery cable. Check for fuel leaks by activating the fuel pump by using hand-held tester or connecting battery voltage to fuel pump.



G00011396

Fig. 36: Locating Fuel Pipe, Disconnect Fitting & Disconnecting Fuel Pipe From Fuel Pipe Fitting (Prius)

Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

Tacoma

1. Ensure battery is fully charged. Release fuel pressure. See **FUEL SYSTEM PRESSURE RELEASE** . Disconnect negative battery cable.
2. Note location for fuel pressure gauge installation on fuel rail. See **Fig. 37** . Fuel pressure gauge is installed at firewall end of fuel rail, between fuel rail and fuel inlet pipe. Cover union bolt at fuel rail with shop towel. Remove union bolt with gaskets, and disconnect fuel inlet pipe from fuel rail.
3. Install fuel pressure gauge from Fuel Pressure Gauge Set (SST 09268-45014) with gaskets, fuel inlet pipe and union bolt on fuel rail. See **Fig. 37** . Tighten union bolt to 21 ft. lbs. (29 N.m).
4. Reinstall negative battery cable. Connect Toyota hand-held tester to data link connector No. 3 at driver's side of instrument panel. See **Fig. 11** . Turn ignition on. DO NOT start engine.
5. Turn hand-held tester on. Select ACTIVE TEST MODE on hand-held tester. Using hand-held tester

manufacturer's instructions, operate fuel pump and note fuel pressure. If hand-held tester is not available, fuel pump may also be activated by connecting battery voltage to specified terminals on fuel pump. See **Fig. 21** . Fuel pressure should be 38-44 psi (2.7-3.1 kg/cm²).

6. If fuel pressure is within specification, go to next step. If fuel pressure exceeds specification, replace fuel pressure regulator mounted on fuel rail. See FUEL PRESSURE REGULATOR under FUEL SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. If fuel pressure is less than specified, check for leaking fuel hoses or connections, restricted fuel filter, defective fuel pump or defective fuel pressure regulator.
7. Turn ignition off. Remove hand-held tester. Start engine and allow engine to idle. Note fuel pressure with engine idling.
8. Check vacuum hose routing for fuel pressure regulator mounted on fuel rail to determine if fuel pressure regulator is vacuum controlled. If vacuum hose is connected to engine vacuum and not vented to the air cleaner assembly, fuel pressure regulator is vacuum controlled. If vacuum hose is vented to air cleaner assembly and not to engine vacuum, fuel pressure regulator is not vacuum controlled. On models with vacuum controlled fuel pressure regulator, fuel pressure should be 31-37 psi (2.2-2.6 kg/cm²) with engine idling and vacuum applied, and 38-44 (2.7-3.1 psi 2.7-3.1 kg/cm²) without vacuum with engine idling. On models without vacuum controlled fuel pressure regulator, fuel pressure should be 38-44 psi (2.7-3.1 kg/cm²) with engine idling. On all models, if fuel pressure is within specification, go to next step. If fuel pressure is not within specification, check for defective vacuum hose (vacuum controlled fuel pressure regulator) or fuel pressure regulator.
9. Shut engine off and note fuel pressure. Fuel pressure should remain at least 21 psi (1.5 kg/cm²) for a minimum of 5 minutes. If fuel pressure is within specification and holds as specified, go to next step. If fuel pressure is not within specification or does not hold as specified, check for defective fuel pump, fuel injector or fuel pressure regulator.
10. Release fuel pressure. Disconnect negative battery cable. Remove fuel pressure gauge. Using NEW gaskets, reinstall fuel inlet pipe on fuel rail. Tighten union bolt to 21 ft. lbs. (29 N.m). Install negative battery cable. Check for fuel leaks by activating the fuel pump by using hand-held tester or connecting battery voltage to fuel pump.

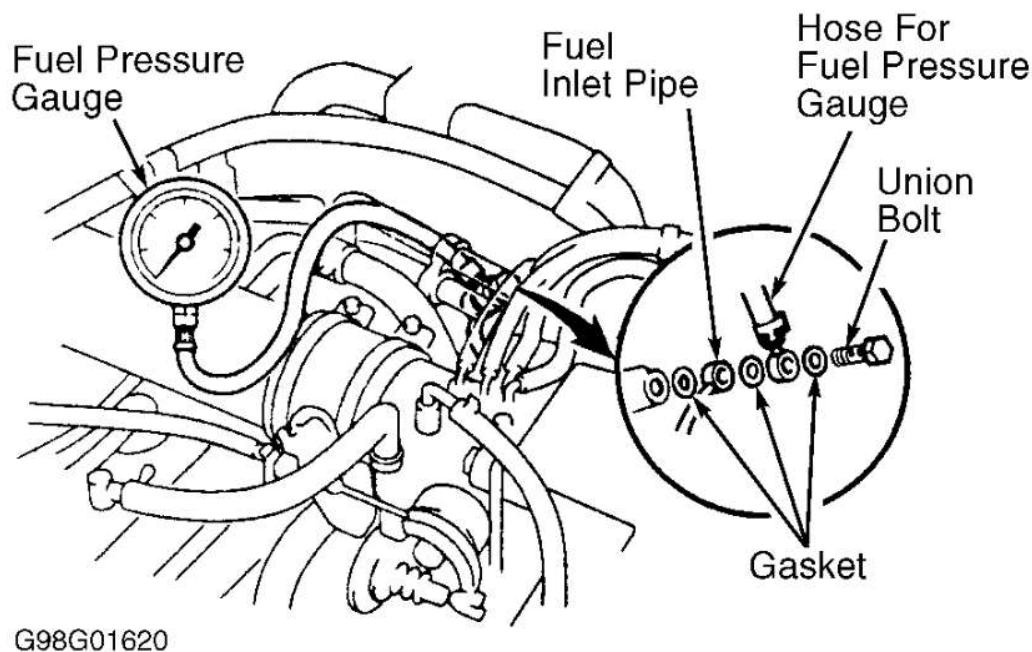


Fig. 37: Installing Fuel Pressure Gauge (Tacoma)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

FUEL PUMP CONTROL CIRCUIT

NOTE: For information on testing relays and fuel system components, see **SYSTEM & COMPONENT TESTING - 4-CYLINDER** article. Circuit opening relay may also be identified by appropriate illustration in **SYSTEM & COMPONENT TESTING - 4-CYLINDER** article. For complete wiring circuit of electrical components on a specific model, see **WIRING DIAGRAMS** article.

NOTE: For additional testing information for fuel pump control circuit, see **FUEL PUMP CONTROL CIRCUIT** under **COMPUTERIZED ENGINE CONTROLS** in **SYSTEM & COMPONENT TESTING - 4-CYLINDER** article.

Circuit Opening Relay (Camry)

Circuit opening relay controls fuel pump circuit. When EFI main relay is energized, it provides battery voltage to one side of circuit opening relay. When ignition is turned on, voltage is supplied through IG2 fuse to other side of circuit opening relay. When proper input signals are delivered to Engine Control Module (ECM), circuit opening relay ground circuit is grounded at ECM terminal FC. Circuit opening relay then provides voltage to fuel pump for fuel pump operation. For circuit opening relay location, see **CIRCUIT OPENING RELAY LOCATION** table.

Circuit Opening Relay (Camry Solara & Highlander)

Circuit opening relay controls fuel pump circuit. When EFI main relay is energized, it provides battery voltage to one side of circuit opening relay. When ignition is turned on, voltage is supplied through IGN fuse to other side of circuit opening relay. When proper input signals are delivered to Engine Control Module (ECM), circuit opening relay ground circuit is grounded at ECM terminal FC. Circuit opening relay then provides voltage to fuel pump for fuel pump operation. For circuit opening relay location, see **CIRCUIT OPENING RELAY LOCATION** table.

Circuit Opening Relay (Celica, ECHO & Prius)

Circuit opening relay controls fuel pump circuit. When EFI main relay is energized, it provides battery voltage to both sides of circuit opening relay. When proper input signals are delivered to Engine Control Module (ECM), circuit opening relay ground circuit is grounded at ECM terminal FC. Circuit opening relay then provides voltage to fuel pump for fuel pump operation. For circuit opening relay location, see **CIRCUIT OPENING RELAY LOCATION** table.

Circuit Opening Relay (Corolla)

Circuit opening relay controls fuel pump circuit. When EFI main relay is energized, it provides battery voltage to both sides of circuit opening relay. EFI main relay may also be referred to as EFI relay or F-HTR relay. When proper input signals are delivered to Engine Control Module (ECM), circuit opening relay ground circuit is grounded at ECM terminal FC. Circuit opening relay then provides voltage to fuel pump for fuel pump operation. For circuit opening relay location, see **CIRCUIT OPENING RELAY LOCATION** table.

Circuit Opening Relay (MR2)

Circuit opening relay controls fuel pump circuit. When EFI main relay is energized, it provides battery voltage to one side of circuit opening relay. When ignition is turned on, voltage is supplied from ignition switch to other side of circuit opening relay. When proper input signals are delivered to Engine Control Module (ECM), circuit opening relay ground circuit is grounded at ECM terminal FC. Circuit opening relay then provides voltage to fuel pump for fuel pump operation. For circuit opening relay location, see **CIRCUIT OPENING RELAY LOCATION** table.

Circuit Opening Relay (RAV4)

Circuit opening relay controls fuel pump circuit. When EFI main relay is energized, it provides battery voltage to one side of circuit opening relay. When ignition is turned on, voltage is supplied to other side of circuit opening relay from IG2 fuse. When proper input signals are delivered to Engine Control Module (ECM), circuit opening relay ground circuit is grounded at ECM terminal FC. Circuit opening relay then provides voltage to fuel pump for fuel pump operation. For circuit opening relay location, see **CIRCUIT OPENING RELAY LOCATION** table.

Circuit Opening Relay (Tacoma)

Circuit opening relay controls fuel pump circuit. When EFI main relay is energized, it provides battery voltage to one side of circuit opening relay. When ignition is turned on, voltage is supplied through IGN fuse to other side of circuit opening relay. When proper input signals are delivered to Engine Control Module (ECM), circuit

opening relay ground circuit is grounded at ECM terminal FC. Circuit opening relay then provides voltage to fuel pump for fuel pump operation. For circuit opening relay location, see **CIRCUIT OPENING RELAY LOCATION** table.

CIRCUIT OPENING RELAY LOCATION ⁽¹⁾

Application	⁽²⁾ Location
Camry & Camry Solara	In Fuse/Relay Box At Driver's Side Front Corner Of Engine Compartment
Celica	In Fuse/Relay Box At Driver's Side Front Corner Of Engine Compartment, Just In Front Of Strut Tower
Corolla	Center Relay In Relay Box Behind Driver's Side Kick Panel
ECHO	In Fuse/Relay Box Behind Driver's Side Of Instrument Panel
Highlander	In Relay Box Just Above Driver's Side Kick Panel
MR2	In Relay Box On Firewall At Driver's Side Front Corner Of Engine Compartment
Prius & RAV4	In Fuse/Relay Box At Driver's Side Front Corner Of Engine Compartment
Tacoma	Behind Lower Instrument Panel Cover, Next To Driver's Side Of Steering Column
(1) Circuit opening relay may be marked as CIR OPN relay.	
(2) Circuit opening relay may also be identified by appropriate illustration in SYSTEM & COMPONENT TESTING - 4-CYLINDER article.	

EFI Main Relay (Camry & Camry Solara)

EFI main relay may also be referred to as EFI relay. EFI fuse supplies constant battery voltage to one side of EFI main relay. EFI main relay is energized by MREL terminal of Engine Control Module (ECM). When EFI main relay is energized, EFI main relay provides battery voltage to circuit opening relay, +B terminal of ECM and various other electrical components. For EFI main relay location, see **EFI MAIN RELAY LOCATION** table.

EFI Main Relay (Celica)

EFI main relay may also be referred to as EFI relay. EFI fuse supplies constant battery voltage to one side of EFI main relay. EFI main relay is energized by MREL terminal of Engine Control Module (ECM). When EFI main relay is energized, EFI main relay provides battery voltage to circuit opening relay, +B terminal of ECM, EFI No. 1 and 2 fuses, and various other electrical components. For EFI main relay location, see **EFI MAIN RELAY LOCATION** table.

EFI Main Relay (Corolla)

EFI main relay may also be referred to as EFI relay or F-HTR relay. EFI fuse supplies constant battery voltage to one side of EFI main relay. EFI fuse may also be referred to as F-HTR fuse. When ignition is turned on, voltage is supplied through IGN fuse to other side of EFI main relay. EFI main relay is then energized and provides battery voltage to circuit opening relay, +B terminal of Engine Control Module (ECM) and various other electrical components. For EFI main relay location, see **EFI MAIN RELAY LOCATION** table.

EFI Main Relay (ECHO)

EFI main relay may also be referred to as EFI relay. EFI fuse supplies constant battery voltage to one side of EFI main relay. When ignition is turned on, voltage is supplied to other side of EFI main relay. EFI main relay is then energized and provides battery voltage to circuit opening relay, +B terminal of Engine Control Module (ECM) and various other electrical components. For EFI main relay location, see **EFI MAIN RELAY LOCATION** table.

EFI Main Relay (Highlander)

EFI main relay may also be referred to as EFI relay. EFI fuse supplies constant battery voltage to one side of EFI main relay. EFI main relay is energized by MREL terminal of Engine Control Module (ECM). When EFI main relay is energized, EFI main relay provides battery voltage to circuit opening relay, +B terminal of ECM and various other electrical components. For EFI main relay location, see **EFI MAIN RELAY LOCATION** table.

EFI Main Relay (MR2)

EFI main relay may also be referred to as EFI relay. EFI No. 1 fuse supplies constant battery voltage to one side of EFI main relay. EFI main relay is energized by MREL terminal of Engine Control Module (ECM). When EFI main relay is energized, EFI main relay provides battery voltage to circuit opening relay, +B terminal of ECM and various other electrical components. For EFI main relay location, see **EFI MAIN RELAY LOCATION** table.

EFI Main Relay (Prius)

EFI main relay may also be referred to as EFI relay. EFI fuse supplies constant battery voltage to one side of EFI main relay. EFI main relay is energized by MREL terminal of Engine Control Module (ECM). When EFI main relay is energized, EFI main relay provides battery voltage to circuit opening relay, +B terminal of ECM and various other electrical components. For EFI main relay location, see **EFI MAIN RELAY LOCATION** table.

EFI Main Relay (RAV4)

EFI main relay may also be referred to as EFI relay. EFI No. 2 fuse supplies constant battery voltage to one side of EFI main relay. EFI main relay is energized by MREL terminal of Engine Control Module (ECM). When EFI main relay is energized, EFI main relay provides battery voltage to circuit opening relay, A/F heater relay, +B terminal of ECM and various other electrical components. For EFI main relay location, see **EFI MAIN RELAY LOCATION** table.

EFI Main Relay (Tacoma)

EFI main relay may also be referred to as EFI relay. EFI fuse supplies constant battery voltage to one side of EFI main relay. When ignition is turned on, voltage is supplied through IGN fuse to other side of EFI main relay. EFI main relay is then energized and provides battery voltage to circuit opening relay, +B terminal of Engine Control Module (ECM) and various other electrical components. For EFI main relay location, see **EFI MAIN RELAY LOCATION** table.

EFI MAIN RELAY LOCATION

Application	Location
Camry & Camry Solara	In Fuse/Relay Box At Driver's Side Front Corner Of Engine Compartment
Celica, Corolla ECHO & Highlander	In Fuse/Relay Box At Driver's Side Front Corner Of Engine Compartment, Just In Front Of Strut Tower
MR2	In Relay Box On Firewall At Driver's Side Front Corner Of Engine Compartment
Prius, RAV4 & Tacoma	In Fuse/Relay Box At Driver's Side Front Corner Of Engine Compartment

IGNITION SYSTEMS

NOTE: All models use a distributorless ignition system.

SPARK TEST

NOTE: On Camry, Camry Solara, Highlander, MR2 and RAV4, an engine immobilizer system may be used. When performing spark test, it may be necessary to substitute or replace Engine Control Module (ECM). On models with engine immobilizer system, if ECM is replaced, ECM must be programmed with proper ignition key code for engine immobilizer system. Models equipped with engine immobilizer system may be identified by looking at the ignition key. On models equipped with engine immobilizer system, the top of the ignition key is thicker than a standard ignition key, as a transponder chip is incorporated into the top of the ignition key. For programming procedures, see **COMPUTER RELEARN PROCEDURES** article in **GENERAL INFORMATION**, or appropriate **ENGINE IMMOBILIZER SYSTEMS** article in **ACCESSORIES & EQUIPMENT**.

Camry, Camry Solara Celica, Corolla & ECHO

1. Remove No. 2 cylinder head cover located on top of engine, above ignition coils and valve cover. Disconnect electrical connectors at ignition coils located on top of valve cover. Remove retaining bolts and ignition coils from valve cover. Remove spark plugs. Install spark plug on each ignition coil. Reinstall electrical connectors on ignition coils.

CAUTION: To prevent gasoline from being injected, electrical connectors should be disconnected from fuel injectors. **DO NOT** crank engine for longer than 5 seconds when checking for spark.

2. Disconnect electrical connectors at fuel injectors. Ground spark plugs against cylinder block. Crank engine and check for spark. Spark test is based on the assumption that spark plugs are okay. If spark does not exist, go to next step. If spark exists, reinstall components. On Camry and Camry Solara, tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m). On Celica and ECHO, install and tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m). On Corolla, install and tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 62 INCH lbs. (7.0 N.m).

3. Check ignition coil electrical connections. If electrical connections are okay, go to next step. If electrical connections are defective, repair as necessary and recheck for spark.
4. Install different ignition coil on spark plug and recheck for spark. If spark still does not exist, go to next step. If spark now exists with different ignition coil, replace original ignition coil. Reinstall components. On Camry and Camry Solara, tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m). On Celica and ECHO, install and tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m). On Corolla, install and tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 62 INCH lbs. (7.0 N.m).
5. Turn ignition on. Using voltmeter, check for battery voltage at ignition coil positive terminal. See **IGNITION COIL POSITIVE TERMINAL IDENTIFICATION** table. If battery voltage exists, go to next step. If battery voltage does not exist, check wiring between ignition switch and ignition coil. See WIRING DIAGRAMS article.

NOTE: On Celica, it may be necessary to check operation of IG2 relay by using wiring diagram. See WIRING DIAGRAMS article. IG2 fuse supplies constant battery voltage to one side of IG2 relay. When ignition is turned on, voltage is supplied from ignition switch to other side of IG2 relay and IG2 relay is then energized. When IG2 relay is energized, IG2 relay provides battery voltage to ignition coils and fuel injectors. IG2 fuse and IG2 relay are located in fuse/relay box at driver's side front corner of engine compartment, just in front of strut tower.

IGNITION COIL POSITIVE TERMINAL IDENTIFICATION

Application	Wire Color
Camry & Camry Solara	Black/Red
Celica	Black
Corolla	Black/White
ECHO	Black/Red

6. Check resistance of camshaft position sensor. See **CAMSHAFT POSITION SENSOR** . If camshaft position sensor resistance is within specification, go to next step. If camshaft position sensor resistance is not within specification, replace camshaft position sensor. See CAMSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article.
7. Check resistance of crankshaft position sensor. See **CRANKSHAFT POSITION SENSOR** . If crankshaft position sensor resistance is within specification, go to next step. If crankshaft position sensor resistance is not within specification, replace crankshaft position sensor. See CRANKSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article.
8. Check ignition IGT signal from Engine Control Module (ECM) to ignition coil. If ignition IGT signal from ECM is defective, Diagnostic Trouble Code (DTC) P1300, P1305, P1310 or P1315 will be set in ECM memory to indicate an ignitor circuit malfunction. See TESTING PROCEDURE under SELF-DIAGNOSTIC SYSTEM in appropriate SELF-DIAGNOSTICS article for retrieving of DTCs.
9. If ignition IGT signal is okay, substitute another ignition coil and recheck system operation. If ignition IGT signal is defective, check wiring between ECM and ignition coil. See **ENGINE CONTROL**

MODULE LOCATION table. See WIRING DIAGRAMS article. If wiring is defective, repair wiring as necessary and recheck system operation. If wiring is okay, substitute another ECM and recheck system operation. Reinstall components. On Camry and Camry Solara, tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m). On Celica and ECHO, install and tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m). On Corolla, install and tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 62 INCH lbs. (7.0 N.m).

Highlander

1. Check for any Diagnostic Trouble Codes (DTC). See TESTING PROCEDURE under SELF-DIAGNOSTIC SYSTEM in appropriate SELF-DIAGNOSTICS article for retrieving of DTCs. If no DTCs exist, go to next step. If any DTCs exist, perform service procedure for DTC.
2. Remove No. 2 cylinder head cover located on top of engine, above ignition coils and valve cover. Disconnect electrical connectors at ignition coils located on top of valve cover. Remove retaining bolts and ignition coils from valve cover. Remove spark plugs. Install spark plug on each ignition coil. Reinstall electrical connectors on ignition coils.

CAUTION: To prevent gasoline from being injected, electrical connectors should be disconnected from fuel injectors. DO NOT crank engine for longer than 2 seconds when checking for spark.

3. Disconnect electrical connectors at fuel injectors. Ground spark plugs against cylinder block. Crank engine and check for spark. If spark exists only at some spark plugs and not at other spark plugs, go to next step. If spark does not exist at any spark plug, go to step 5. If spark exists at all spark plugs, reinstall components. Tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).
4. Install substitute spark plug for spark plug which did not fire and recheck for spark. If spark now exists, replace original spark plug. If spark still does not exist, replace ignition coil. Reinstall components. Tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).
5. Install substitute spark plugs and recheck for spark. If spark now exists, replace original spark plugs. If spark still does not exist, replace ignition coil that does not produce spark. Reinstall components. Tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).

MR2

1. Remove suspension upper braces. Suspension upper brace fits between firewall and top of each strut tower. Remove No. 2 cylinder head cover located on top of engine, above ignition coils and valve cover. Disconnect electrical connectors at ignition coils mounted on valve cover. Remove retaining bolts and ignition coils from valve cover. Remove spark plugs. Install spark plug on each ignition coil. Reinstall electrical connectors on ignition coils.

CAUTION: To prevent gasoline from being injected, electrical connectors should be disconnected from fuel injectors. DO NOT crank engine for longer than 5 seconds when checking for spark.

2. Disconnect electrical connectors at fuel injectors. Ground spark plugs against cylinder block. Crank engine and check for spark. Spark test is based on the assumption that spark plugs are okay. If spark does not exist, go to next step. If spark exists, reinstall components. Tighten spark plugs to 19 ft. lbs. (26 N.m), ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m) and suspension upper brace nuts to 59 ft. lbs. (80 N.m).
3. Check ignition coil electrical connections. If electrical connections are okay, go to next step. If electrical connections are defective, repair as necessary and recheck for spark.
4. Install different ignition coil on spark plug and recheck for spark. If spark still does not exist, go to next step. If spark now exists with different ignition coil, replace original ignition coil. Reinstall components. Tighten spark plugs to 19 ft. lbs. (26 N.m), ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m) and suspension upper brace nuts to 59 ft. lbs. (80 N.m).
5. Turn ignition on. Using voltmeter, check for battery voltage at ignition coil positive terminal (Black/Red wire). If battery voltage exists, go to next step. If battery voltage does not exist, check wiring between IG2 relay and ignition coil. See **WIRING DIAGRAMS** article. IG2 fuse supplies constant battery voltage to one side of IG2 relay. When ignition is turned on, voltage is supplied from ignition switch to other side of IG2 relay and IG2 relay is then energized. When IG2 relay is energized, IG2 relay provides battery voltage to ignition coils and fuel injectors. If necessary to check operation of IG2 relay, see **IG2 RELAY** under **MODULES, MOTORS, RELAYS & SOLENOIDS** in **SYSTEM & COMPONENT TESTING - 4-CYLINDER** article. IG2 fuse is located in fuse/relay box at driver's side rear corner of engine compartment, just in front of strut tower. IG2 relay is located in relay box on firewall at driver's side front corner of engine compartment.
6. Check resistance of camshaft position sensor. See **CAMSHAFT POSITION SENSOR** . If camshaft position sensor resistance is within specification, go to next step. If camshaft position sensor resistance is not within specification, replace camshaft position sensor. See **CAMSHAFT POSITION SENSOR** under **IGNITION SYSTEMS** in **REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER** article.
7. Check resistance of crankshaft position sensor. See **CRANKSHAFT POSITION SENSOR** . If crankshaft position sensor resistance is within specification, go to next step. If crankshaft position sensor resistance is not within specification, replace crankshaft position sensor. See **CRANKSHAFT POSITION SENSOR** under **IGNITION SYSTEMS** in **REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER** article.
8. Check ignition IGT signal from Engine Control Module (ECM) to ignition coil. If ignition IGT signal from ECM is defective, Diagnostic Trouble Code (DTC) P1300, P1305, P1310 or P1315 will be set in ECM memory to indicate an ignitor circuit malfunction. See **TESTING PROCEDURE** under **SELF-DIAGNOSTIC SYSTEM** in appropriate **SELF-DIAGNOSTICS** article for retrieving of DTCs.
9. If ignition IGT signal is okay, substitute another ignition coil and recheck system operation. If ignition IGT signal is defective, check wiring between ECM and ignition coil. See **ENGINE CONTROL MODULE LOCATION** table. See **WIRING DIAGRAMS** article. If wiring is defective, repair wiring as necessary and recheck system operation. If wiring is okay, substitute another ECM and recheck system operation. Reinstall components. Tighten spark plugs to 19 ft. lbs. (26 N.m), ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m) and suspension upper brace nuts to 59 ft. lbs. (80 N.m).

Prius

WARNING: Read service precautions before proceeding with service procedure. See **SERVICE PRECAUTIONS** .

1. Remove air cleaner assembly for access to ignition coils located on top of valve cover. Disconnect electrical connectors at ignition coils. Remove retaining bolts and ignition coils from valve cover. Remove spark plugs. Install spark plug on each ignition coil. Reinstall electrical connectors on ignition coils.

CAUTION: To prevent gasoline from being injected, electrical connectors should be disconnected from fuel injectors. DO NOT crank engine for longer than 5 seconds when checking for spark.

2. Disconnect electrical connectors at fuel injectors. Ground spark plugs against cylinder block. Crank engine and check for spark. Spark test is based on the assumption that spark plugs are okay. If spark does not exist, go to next step. If spark exists, reinstall components. Tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).
3. Check ignition coil electrical connections. If electrical connections are okay, go to next step. If electrical connections are defective, repair as necessary and recheck for spark.
4. Install different ignition coil on spark plug and recheck for spark. If spark still does not exist, go to next step. If spark now exists with different ignition coil, replace original ignition coil. Reinstall components. Tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).
5. Turn ignition on. Using voltmeter, check for battery voltage at ignition coil positive terminal (Black/White wire). If battery voltage exists, go to next step. If battery voltage does not exist, check wiring between IG2 relay and ignition coil. See **WIRING DIAGRAMS** article. AM2 fuse supplies constant battery voltage to one side of IG2 relay. When ignition is turned on, voltage is supplied from ignition switch to other side of IG2 relay and IG2 relay is then energized. When IG2 relay is energized, IG2 relay provides battery voltage to ignition coils and fuel injectors. If necessary to check operation of IG2 relay, consult wiring diagram for relay testing. See **WIRING DIAGRAMS** article. AM2 fuse and IG2 relay are located in fuse/relay box at driver's side front corner of engine compartment.
6. Check resistance of camshaft position sensor. See **CAMSHAFT POSITION SENSOR** . If camshaft position sensor resistance is within specification, go to next step. If camshaft position sensor resistance is not within specification, replace camshaft position sensor. See **CAMSHAFT POSITION SENSOR** under **IGNITION SYSTEMS** in **REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER** article.
7. Check resistance of crankshaft position sensor. See **CRANKSHAFT POSITION SENSOR** . If crankshaft position sensor resistance is within specification, go to next step. If crankshaft position sensor resistance is not within specification, replace crankshaft position sensor. See **CRANKSHAFT POSITION SENSOR** under **IGNITION SYSTEMS** in **REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER** article.
8. Check ignition IGT signal from Engine Control Module (ECM) to ignition coil. If ignition IGT signal from ECM is defective, Diagnostic Trouble Code (DTC) P1300, P1305, P1310 or P1315 will be set in ECM memory to indicate an ignitor circuit malfunction. See **TESTING PROCEDURE** under **SELF-DIAGNOSTIC SYSTEM** in appropriate **SELF-DIAGNOSTICS** article for retrieving of DTCs.
9. If ignition IGT signal is okay, substitute another ignition coil and recheck system operation. If ignition IGT signal is defective, check wiring between ECM and ignition coil. See **ENGINE CONTROL MODULE LOCATION** table. See **WIRING DIAGRAMS** article. If wiring is defective, repair wiring as necessary and recheck system operation. If wiring is okay, substitute another ECM and recheck system operation. Reinstall components. Tighten spark plugs to 13 ft. lbs. (18 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).

RAV4

1. Remove air cleaner assembly for access to ignition coils located on top of valve cover. Disconnect electrical connectors at ignition coils. Remove retaining bolts and ignition coils from valve cover. Remove spark plugs. Install spark plug on each ignition coil. Reinstall electrical connectors on ignition coils.

CAUTION: To prevent gasoline from being injected, electrical connectors should be disconnected from fuel injectors. **DO NOT** crank engine for longer than 5 seconds when checking for spark.

2. Disconnect electrical connectors at fuel injectors. Ground spark plugs against cylinder block. Crank engine and check for spark. Spark test is based on the assumption that spark plugs are okay. If spark does not exist, go to next step. If spark exists, reinstall components. Tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).
3. Check ignition coil electrical connections. If electrical connections are okay, go to next step. If electrical connections are defective, repair as necessary and recheck for spark.
4. Install different ignition coil on spark plug and recheck for spark. If spark still does not exist, go to next step. If spark now exists with different ignition coil, replace original ignition coil. Reinstall components. Tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil retaining bolts to 80 INCH lbs. (9.0 N.m).
5. Turn ignition on. Using voltmeter, check for battery voltage at ignition coil positive terminal (Black/White wire). If battery voltage exists, go to next step. If battery voltage does not exist, check wiring between IG2 relay and ignition coil. See **WIRING DIAGRAMS** article. IGN fuse supplies constant battery voltage to one side of IG2 relay. When ignition is turned on, voltage is supplied from ignition switch, through IG2 fuse and to other side of IG2 relay and IG2 relay is then energized. When IG2 relay is energized, IG2 relay provides battery voltage to ignition coils and fuel injectors. If necessary to check operation of IG2 relay, see **IG2 RELAY** under **MODULES, MOTORS, RELAYS & SOLENOIDS** in **SYSTEM & COMPONENT TESTING - 4-CYLINDER** article. IGN fuse and IG2 relay are located in fuse/relay box at driver's side front corner of engine compartment. IG2 fuse is located in fuse box behind driver's side of instrument panel.
6. Check resistance of camshaft position sensor. See **CAMSHAFT POSITION SENSOR**. If camshaft position sensor resistance is within specification, go to next step. If camshaft position sensor resistance is not within specification, replace camshaft position sensor. See **CAMSHAFT POSITION SENSOR** under **IGNITION SYSTEMS** in **REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER** article.
7. Check resistance of crankshaft position sensor. See **CRANKSHAFT POSITION SENSOR**. If crankshaft position sensor resistance is within specification, go to next step. If crankshaft position sensor resistance is not within specification, replace crankshaft position sensor. See **CRANKSHAFT POSITION SENSOR** under **IGNITION SYSTEMS** in **REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER** article.
8. Check ignition IGT signal from Engine Control Module (ECM) to ignition coil. If ignition IGT signal from ECM is defective, Diagnostic Trouble Code (DTC) P1300, P1305, P1310 or P1315 will be set in ECM memory to indicate an ignitor circuit malfunction. See **TESTING PROCEDURE** under **SELF-DIAGNOSTIC SYSTEM** in appropriate **SELF-DIAGNOSTICS** article for retrieving of DTCs.
9. If ignition IGT signal is okay, substitute another ignition coil and recheck system operation. If ignition IGT signal is defective, check wiring between ECM and ignition coil. See **ENGINE CONTROL**

MODULE LOCATION table. See **WIRING DIAGRAMS** article. If wiring is defective, repair wiring as necessary and recheck system operation. If wiring is okay, substitute another ECM and recheck system operation. Reinstall components. Tighten spark plugs to 14 ft. lbs. (19 N.m) and ignition coil bolts to 80 INCH lbs. (9.0 N.m).

Tacoma

1. Remove necessary components for access to ignition coils located on top of valve cover. Disconnect electrical connectors at ignition coils. Remove retaining bolts and ignition coils from valve cover. Remove spark plugs. Install spark plug on each ignition coil. Reinstall electrical connectors on ignition coils.

CAUTION: To prevent gasoline from being injected, DO NOT crank engine for longer than 2 seconds when checking for spark.

2. Ground spark plugs against cylinder block. Crank engine and check for spark. Spark test is based on the assumption that spark plugs are okay. If spark does not exist, go to next step. If spark exists, reinstall components. Tighten spark plugs to 15 ft. lbs. (20 N.m) and ignition coil retaining bolts to 66 INCH lbs. (7.5 N.m).
3. Check ignition coil electrical connections. If electrical connections are okay, go to next step. If electrical connections are defective, repair as necessary and recheck for spark.
4. Install different ignition coil on spark plug and recheck for spark. If spark still does not exist, go to next step. If spark now exists with different ignition coil, replace original ignition coil. Reinstall components. Tighten spark plugs to 15 ft. lbs. (20 N.m) and ignition coil retaining bolts to 66 INCH lbs. (7.5 N.m).
5. Turn ignition on. Using voltmeter, check for battery voltage at ignition coil positive terminal (Black/Red wire). If battery voltage exists, go to next step. If battery voltage does not exist, check Black/Red wire between ignition switch and ignition coil. See **WIRING DIAGRAMS** article.
6. Check resistance of camshaft position sensor. See **CAMSHAFT POSITION SENSOR**. If camshaft position sensor resistance is within specification, go to next step. If camshaft position sensor resistance is not within specification, replace camshaft position sensor. See **CAMSHAFT POSITION SENSOR** under **IGNITION SYSTEMS** in **REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER** article.
7. Check resistance of crankshaft position sensor. See **CRANKSHAFT POSITION SENSOR**. If crankshaft position sensor resistance is within specification, go to next step. If crankshaft position sensor resistance is not within specification, replace crankshaft position sensor. See **CRANKSHAFT POSITION SENSOR** under **IGNITION SYSTEMS** in **REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER** article.
8. Check ignition IGT signal from Engine Control Module (ECM) to ignition coil. If ignition IGT signal from ECM is defective, Diagnostic Trouble Code (DTC) P1300, P1305, P1310 or P1315 will be set in ECM memory to indicate an ignitor circuit malfunction. See **TESTING PROCEDURE** under **SELF-DIAGNOSTIC SYSTEM** in appropriate **SELF-DIAGNOSTICS** article for retrieving of DTCs.
9. If ignition IGT signal is okay, substitute another ignition coil and recheck system operation. If ignition IGT signal is defective, check wiring between ECM and ignition coil. See **ENGINE CONTROL MODULE LOCATION** table. See **WIRING DIAGRAMS** article. If wiring is defective, repair wiring as necessary and recheck system operation. If wiring is okay, substitute another ECM and recheck system operation. Reinstall components. Tighten spark plugs to 15 ft. lbs. (20 N.m) and ignition coil retaining

bolts to 66 INCH lbs. (7.5 N.m).

ENGINE CONTROL MODULE LOCATION

Model	(1) Location
Camry & Camry Solara	Behind Glove Box
Celica	In Engine Compartment, Below Cover, Just In Front Of Battery, Next To Driver's Side Strut Tower
Corolla	Behind Stereo On Instrument Panel, Just In Front Of Center Console
ECHO & Highlander	Behind Glove Box
MR2	On Inside Of Firewall, Directly Behind Driver's Seat & Luggage Compartment
Prius	Behind Glove Box
RAV4	Near Passenger's Side Kick Panel, Just Below Instrument Panel
Tacoma	Behind Glove Box
(1) For illustration of ECM location, see THEORY & OPERATION article.	

CAMSHAFT POSITION SENSOR

Camry, Camry Solara, ECHO & Highlander

1. Camshaft position sensor may also be referred to Variable Valve Timing (VVT) sensor. Disconnect electrical connector at camshaft position sensor. Camshaft position sensor is located on end of cylinder head at flywheel end of engine, just at end of intake camshaft. See **Fig. 38** and **Fig. 39** . Using ohmmeter, check resistance between electrical terminals on camshaft position sensor.
2. Ensure camshaft position sensor resistance is within specification. See **CAMSHAFT POSITION SENSOR RESISTANCE** table. Replace camshaft position sensor if resistance is not within specification. See CAMSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. Reinstall electrical connector on camshaft position sensor.

Celica & Corolla

1. Camshaft position sensor may also be referred to Variable Valve Timing (VVT) sensor. Disconnect electrical connector at camshaft position sensor. Camshaft position sensor is located just above intake manifold on cylinder head, at flywheel end of engine. See **Fig. 40** and **Fig. 41** . Using ohmmeter, check resistance between electrical terminals on camshaft position sensor.
2. Ensure camshaft position sensor resistance is within specification. See **CAMSHAFT POSITION SENSOR RESISTANCE** table. Replace camshaft position sensor if resistance is not within specification. See CAMSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. Reinstall electrical connector on camshaft position sensor.

MR2

1. Camshaft position sensor may also be referred to Variable Valve Timing (VVT) sensor. Camshaft position sensor is located just above intake manifold on cylinder head, at flywheel end of engine. See **Fig. 42**.
2. Manufacturer recommends removing camshaft position sensor from cylinder head before checking the resistance. Remove camshaft position sensor. See CAMSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article.
3. Using ohmmeter, check resistance between electrical terminals on camshaft position sensor. Ensure camshaft position sensor resistance is within specification. See **CAMSHAFT POSITION SENSOR RESISTANCE** table. Replace camshaft position sensor if resistance is not within specification. Reinstall camshaft position sensor.

Prius & RAV4

WARNING: On Prius, read service precautions before proceeding with service procedure. See **SERVICE PRECAUTIONS**.

1. Camshaft position sensor may also be referred to Variable Valve Timing (VVT) sensor. Disconnect electrical connector at camshaft position sensor. Camshaft position sensor is located on end of cylinder head at flywheel end of engine. See **Fig. 43** and **Fig. 44**. Using ohmmeter, check resistance between electrical terminals on camshaft position sensor.
2. Ensure camshaft position sensor resistance is within specification. See **CAMSHAFT POSITION SENSOR RESISTANCE** table. Replace camshaft position sensor if resistance is not within specification. See CAMSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. Reinstall electrical connector on camshaft position sensor.

Tacoma

1. Disconnect electrical connector at camshaft position sensor. Camshaft position sensor is located on cylinder head, just in front of intake manifold. See **Fig. 45**. Using ohmmeter, check resistance between electrical terminals on camshaft position sensor.
2. Ensure camshaft position sensor resistance is within specification. See **CAMSHAFT POSITION SENSOR RESISTANCE** table. Replace camshaft position sensor if resistance is not within specification. See CAMSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. Reinstall electrical connector on camshaft position sensor.

CAMSHAFT POSITION SENSOR RESISTANCE

Application	Ohms
Camry, Camry Solara, Celica, Corolla, Highlander, MR2, RAV4 & Tacoma	
Cold ⁽¹⁾	835-1400
Hot ⁽²⁾	1060-1645
ECHO & Prius	
Cold ⁽¹⁾	1630-2740

Hot (2)

2065-3225

(1) Cold is with temperature of 14-122°F (-10-50°C).

(2) Hot is with temperature of 122-212°F (50-100°C).

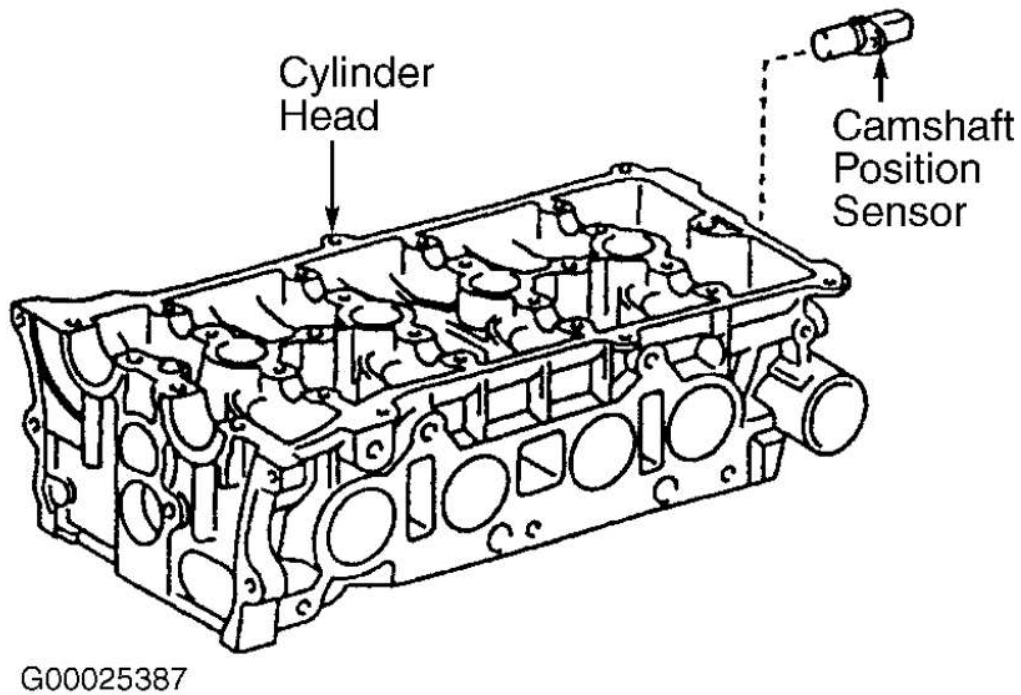


Fig. 38: Locating Camshaft Position Sensor (Camry, Camry Solara & Highlander)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

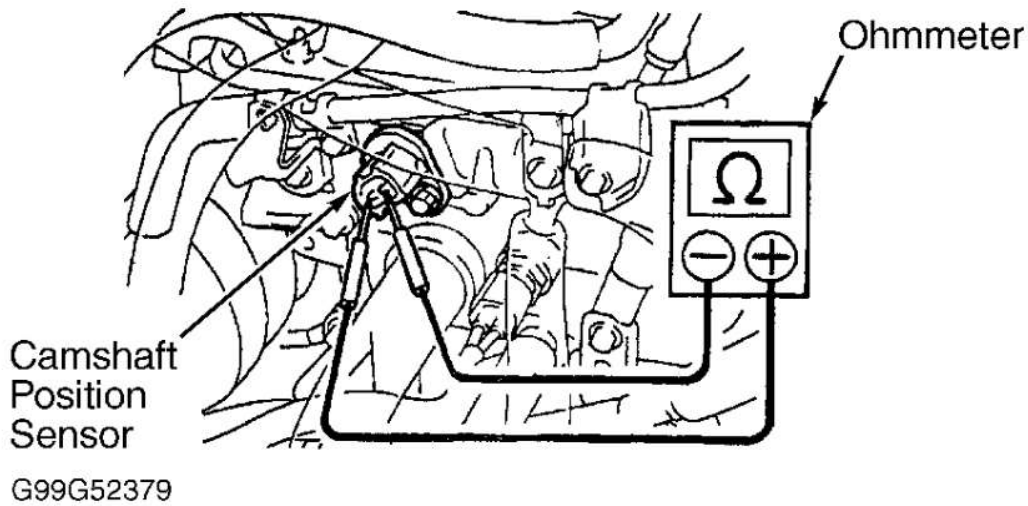


Fig. 39: Locating & Testing Camshaft Position Sensor (ECHO)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

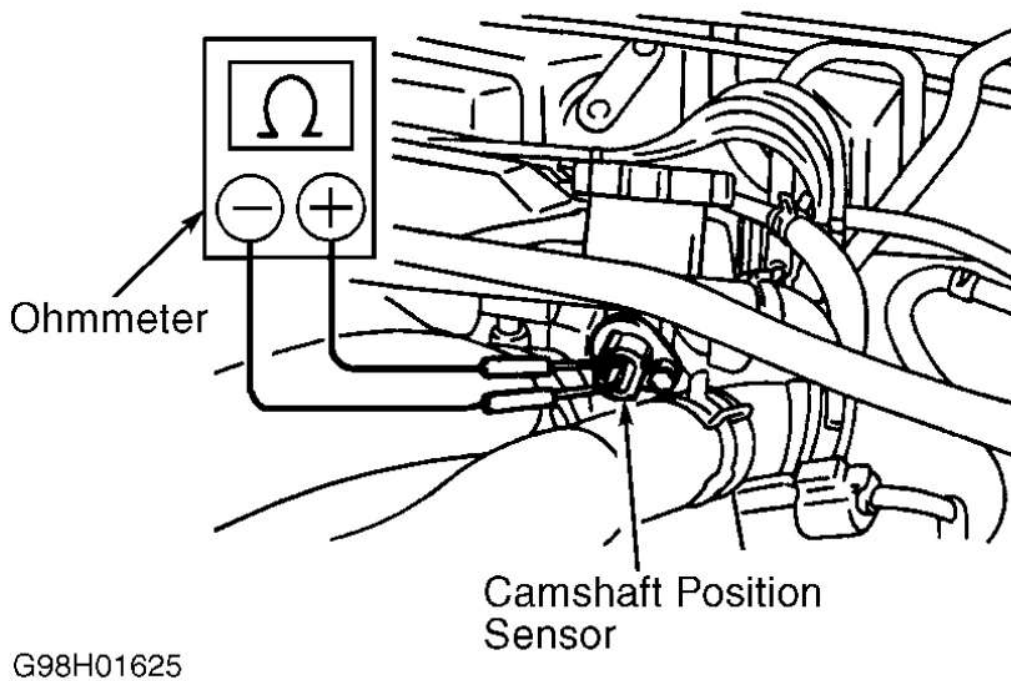


Fig. 40: Locating & Testing Camshaft Position Sensor (Celica 1.8L 1ZZ-FE & Corolla)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

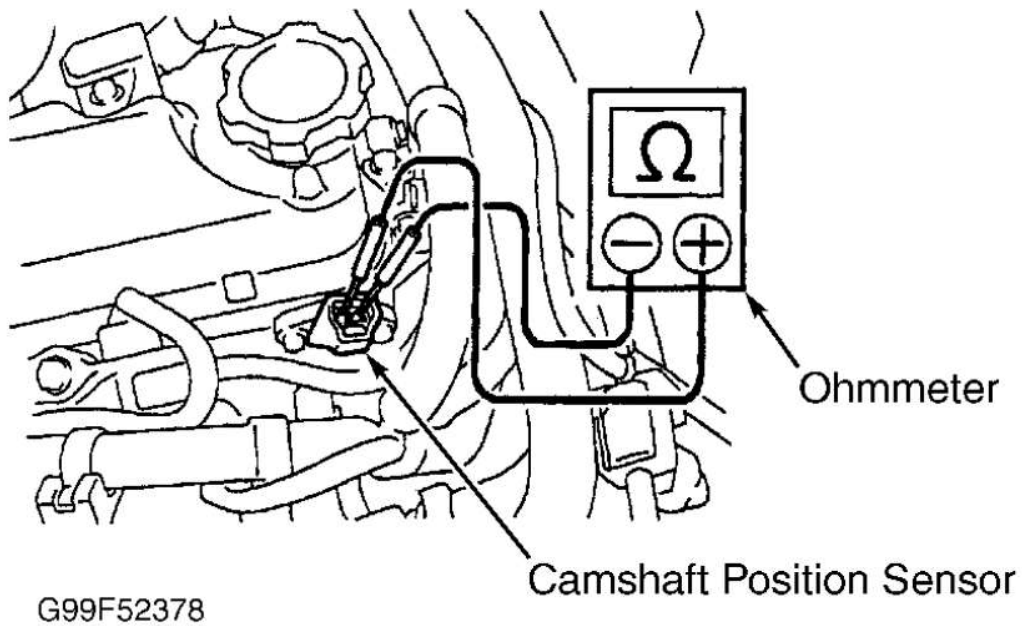
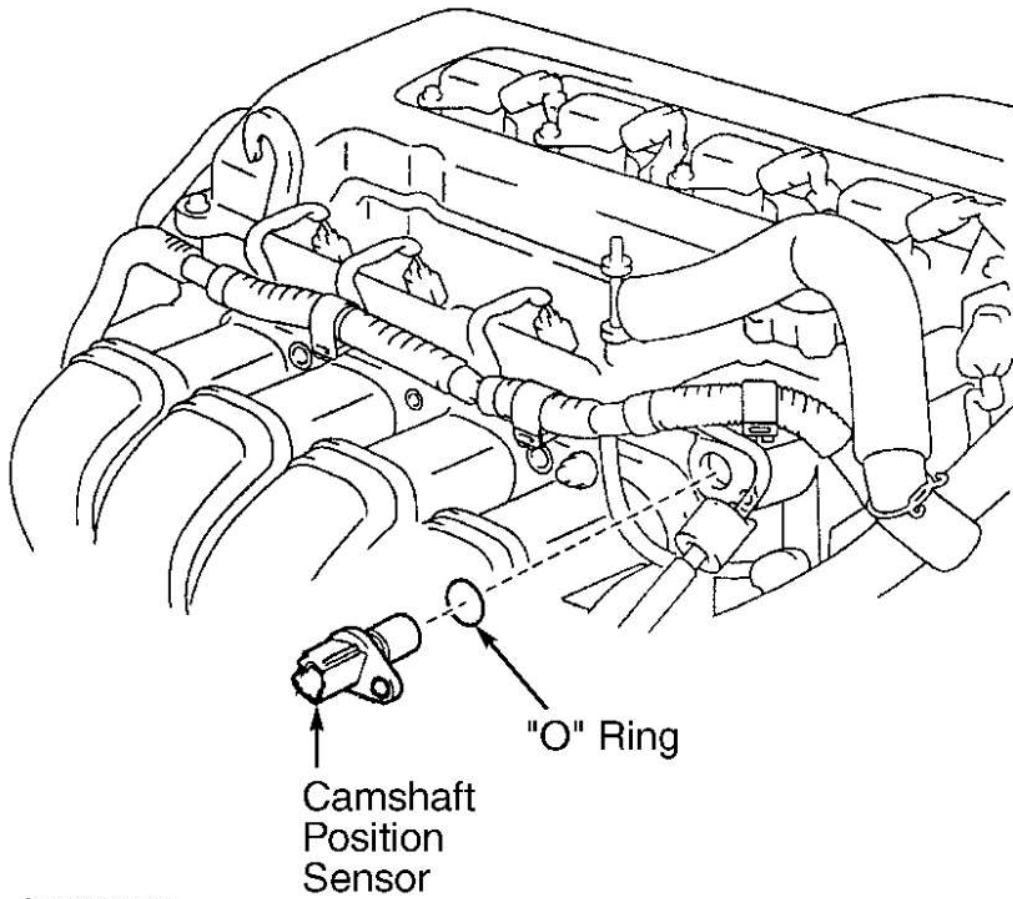


Fig. 41: Locating & Testing Camshaft Position Sensor (Celica 1.8L 2ZZ-GE)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



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Fig. 42: Locating Camshaft Position Sensor (MR2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

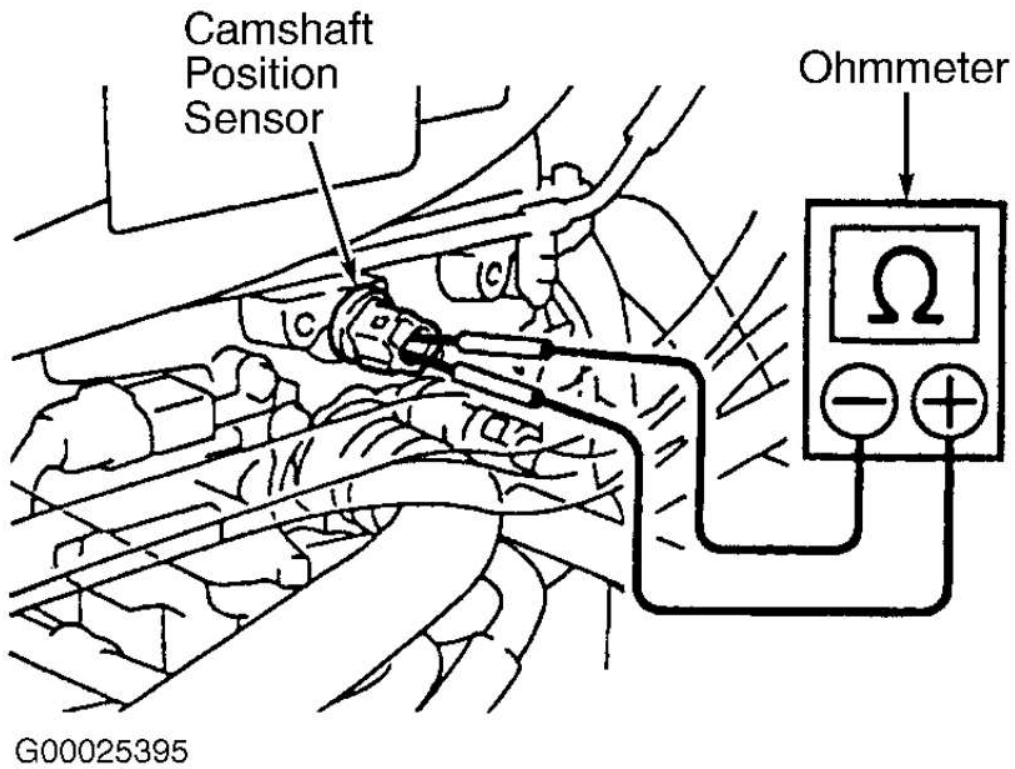


Fig. 43: Locating & Testing Camshaft Position Sensor (Prius)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

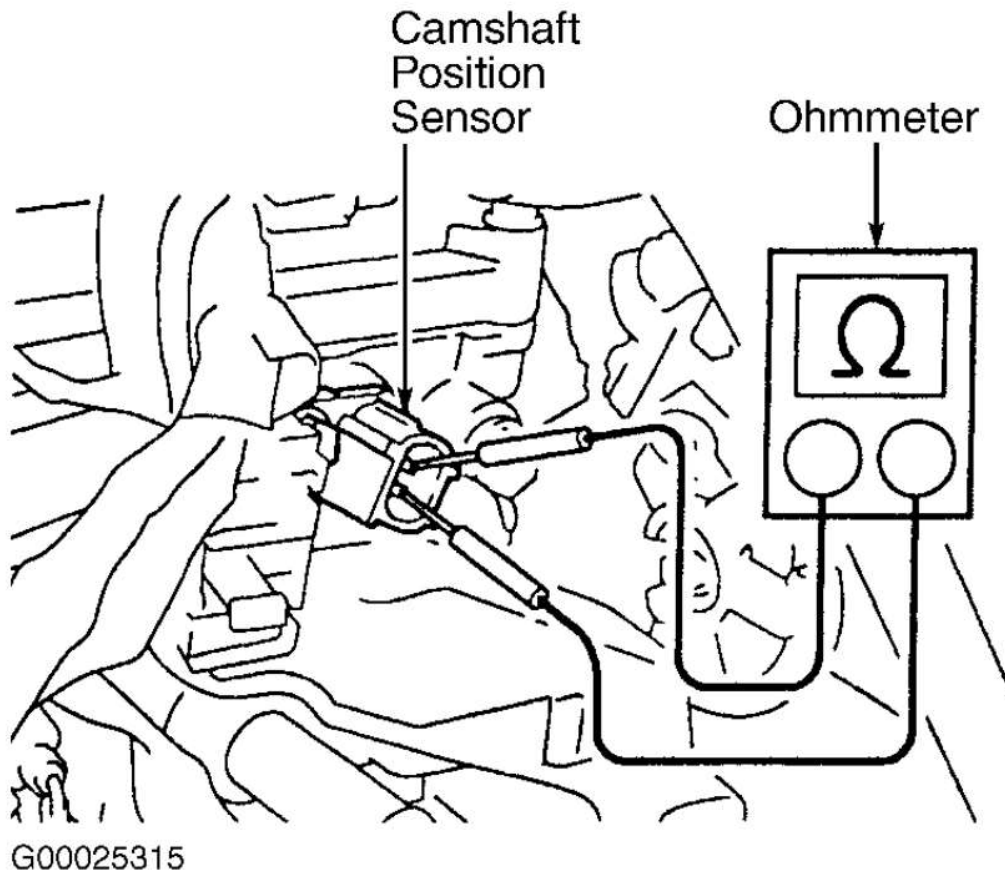


Fig. 44: Locating & Testing Camshaft Position Sensor (RAV4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

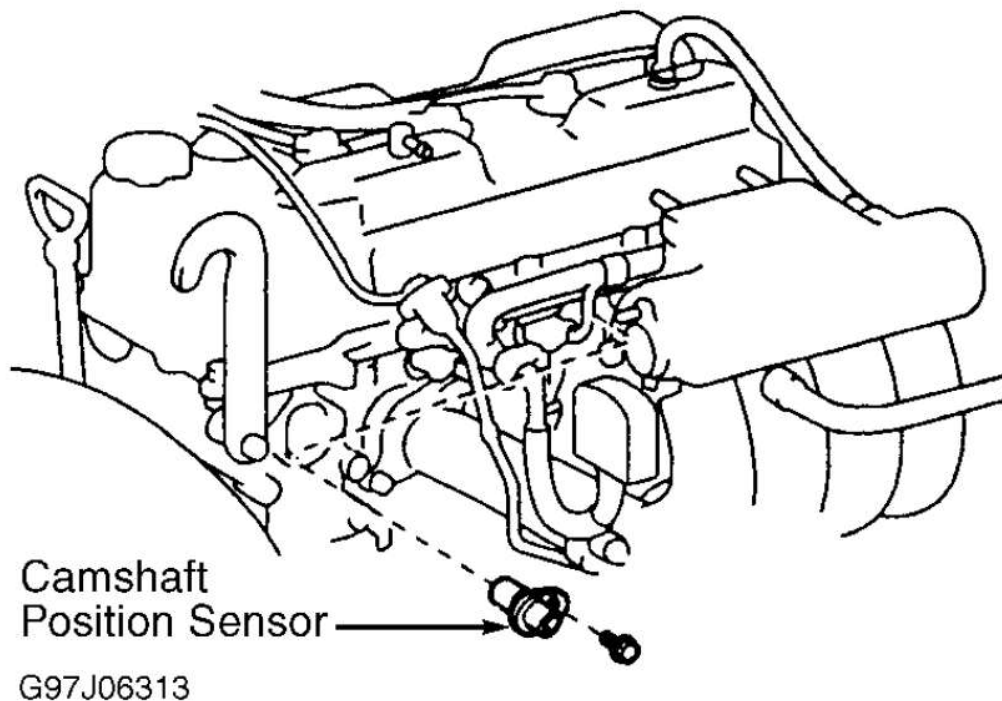


Fig. 45: Locating Camshaft Position Sensor (Tacoma)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

CRANKSHAFT POSITION SENSOR

Camry, Camry Solara & Highlander

1. Disconnect crankshaft position sensor electrical connector at crankshaft position sensor. Crankshaft position sensor is located on front of timing chain cover. See **Fig. 46**.
2. Using ohmmeter, check resistance between electrical terminals on crankshaft position sensor electrical connector. Ensure crankshaft position sensor resistance is within specification. See **CRANKSHAFT POSITION SENSOR RESISTANCE** table. Replace crankshaft position sensor if resistance is not within specification. See CRANKSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. Reinstall crankshaft position sensor electrical connector.

Celica & Corolla

1. Crankshaft position sensor is located on front of engine, near crankshaft pulley. See **Fig. 47**.
2. Manufacturer recommends removing crankshaft position sensor before checking the resistance. Manufacturer states intake manifold must be removed for removal of crankshaft position sensor. Remove

crankshaft position sensor. See CRANKSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article.

3. Using ohmmeter, check resistance between electrical terminals on crankshaft position sensor. Replace crankshaft position sensor if resistance is not within specification. See **CRANKSHAFT POSITION SENSOR RESISTANCE** table. Reinstall crankshaft position sensor.

ECHO

1. Remove passenger's side engine cover for access to crankshaft pulley. Disconnect crankshaft position sensor electrical connector at crankshaft position sensor. Crankshaft position sensor is located on front of engine, near crankshaft pulley. See **Fig. 48** .
2. Using ohmmeter, check resistance between electrical terminals on crankshaft position sensor. Ensure crankshaft position sensor resistance is within specification. See **CRANKSHAFT POSITION SENSOR RESISTANCE** table. Replace crankshaft position sensor if resistance is not within specification. See CRANKSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. Reinstall crankshaft position sensor electrical connector.

MR2

1. Remove lower front engine cover. Remove A/C compressor for access to crankshaft position sensor. It may be necessary to discharge A/C system for removal of A/C compressor. Crankshaft position sensor is located on front of timing chain cover, near crankshaft pulley. See **Fig. 49** .
2. Disconnect crankshaft position sensor electrical connector. Using ohmmeter, check resistance between electrical terminals on crankshaft position sensor electrical connector. Ensure crankshaft position sensor resistance is within specification. See **CRANKSHAFT POSITION SENSOR RESISTANCE** table. Replace crankshaft position sensor if resistance is not within specification. See CRANKSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. Reinstall crankshaft position sensor electrical connector and A/C compressor. Tighten A/C compressor retaining bolts to 18 ft. lbs. (24 N.m). Install lower front engine cover.

Prius

WARNING: Read service precautions before proceeding with service procedure. See **SERVICE PRECAUTIONS** .

1. Remove passenger's side engine cover for access to crankshaft pulley. Disconnect crankshaft position sensor electrical connector at crankshaft position sensor. Crankshaft position sensor is located on front of engine, near crankshaft pulley. See **Fig. 50** .
2. Using ohmmeter, check resistance between electrical terminals on crankshaft position sensor. Ensure crankshaft position sensor resistance is within specification. See **CRANKSHAFT POSITION SENSOR RESISTANCE** table. Replace crankshaft position sensor if resistance is not within specification. See CRANKSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. Reinstall crankshaft position sensor electrical connector and passenger's side engine cover.

RAV4

1. Disconnect crankshaft position sensor electrical connector located near front of engine. See **Fig. 51** . Crankshaft position sensor is located on timing chain cover, near crankshaft pulley.
2. Using ohmmeter, check resistance between electrical terminals on crankshaft position sensor electrical connector. Ensure crankshaft position sensor resistance is within specification. See **CRANKSHAFT POSITION SENSOR RESISTANCE** table. Replace crankshaft position sensor if resistance is not within specification. See CRANKSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article. Reinstall crankshaft position sensor electrical connector.

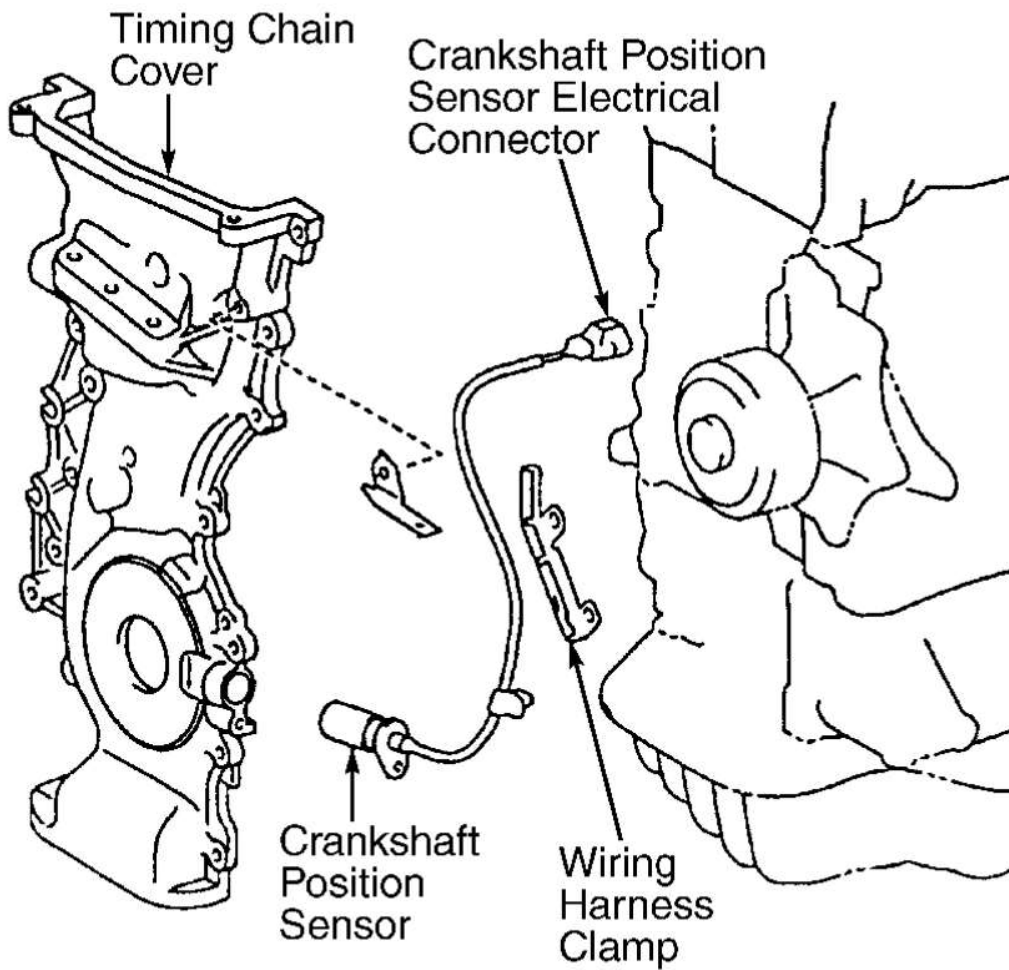
Tacoma

1. Crankshaft position sensor is located near crankshaft pulley, just above oil pan on driver's side of engine. See **Fig. 52** .
2. Manufacturer recommends removing crankshaft position sensor before checking the resistance. See CRANKSHAFT POSITION SENSOR under IGNITION SYSTEMS in REMOVAL, OVERHAUL & INSTALLATION - 4-CYLINDER article.
3. Using ohmmeter, check resistance between NE- and NE+ terminals on crankshaft position sensor. See **Fig. 52** . Replace crankshaft position sensor if resistance is not within specification. See **CRANKSHAFT POSITION SENSOR RESISTANCE** table. Reinstall crankshaft position sensor.

CRANKSHAFT POSITION SENSOR RESISTANCE

Application	Ohms
Camry & Camry Solara	
Cold ⁽¹⁾	985-1600
Hot ⁽²⁾	1265-1890
Celica & Corolla	
Cold ⁽¹⁾	1630-2740
Hot ⁽²⁾	2065-3225
ECHO & Highlander	
Cold ⁽¹⁾	985-1600
Hot ⁽²⁾	1265-1890
MR2	
Cold ⁽¹⁾	1630-2740
Hot ⁽²⁾	2065-3225
Prius & RAV4	
Cold ⁽¹⁾	985-1600
Hot ⁽²⁾	1265-1890
Tacoma	
Cold ⁽¹⁾	1630-2740
Hot ⁽²⁾	2065-3225

- (1) Cold is with temperature of 14-122°F (-10-50°C).
(2) Hot is with temperature of 122-212°F (50-100°C).



G00015620

Fig. 46: Locating Crankshaft Position Sensor (Camry, Camry Solara & Highlander)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

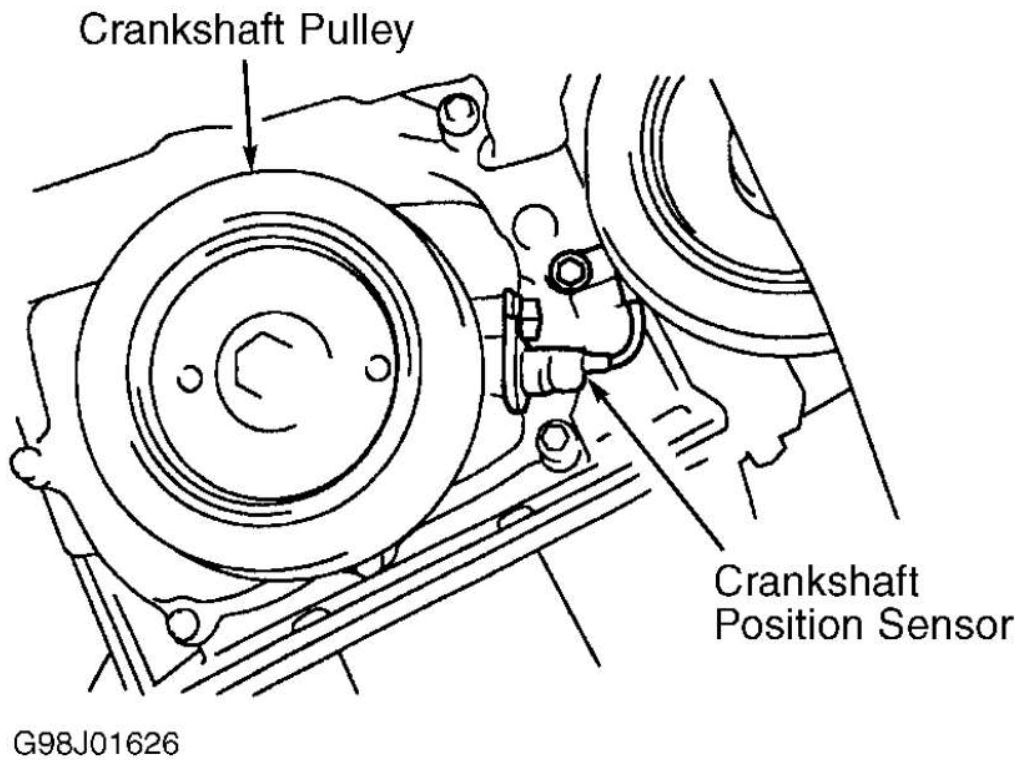


Fig. 47: Locating Crankshaft Position Sensor (Celica & Corolla)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

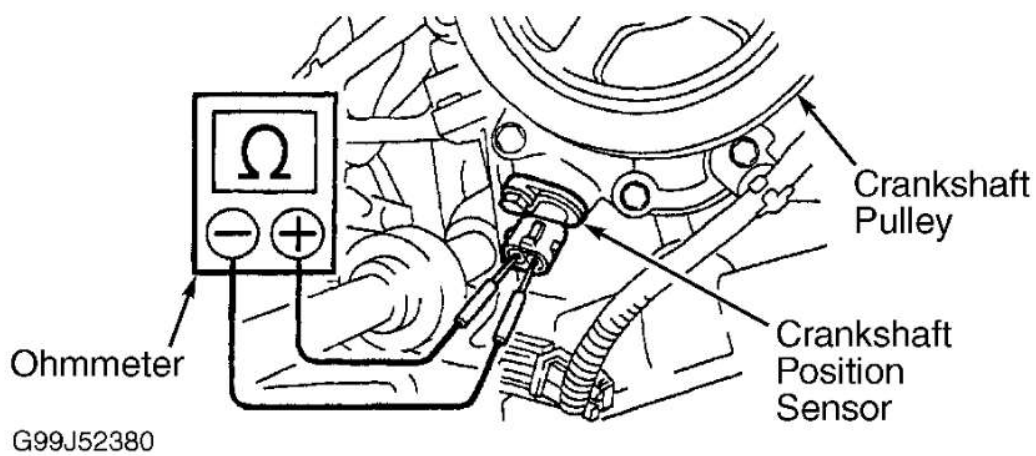


Fig. 48: Locating & Checking Crankshaft Position Sensor (ECHO)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

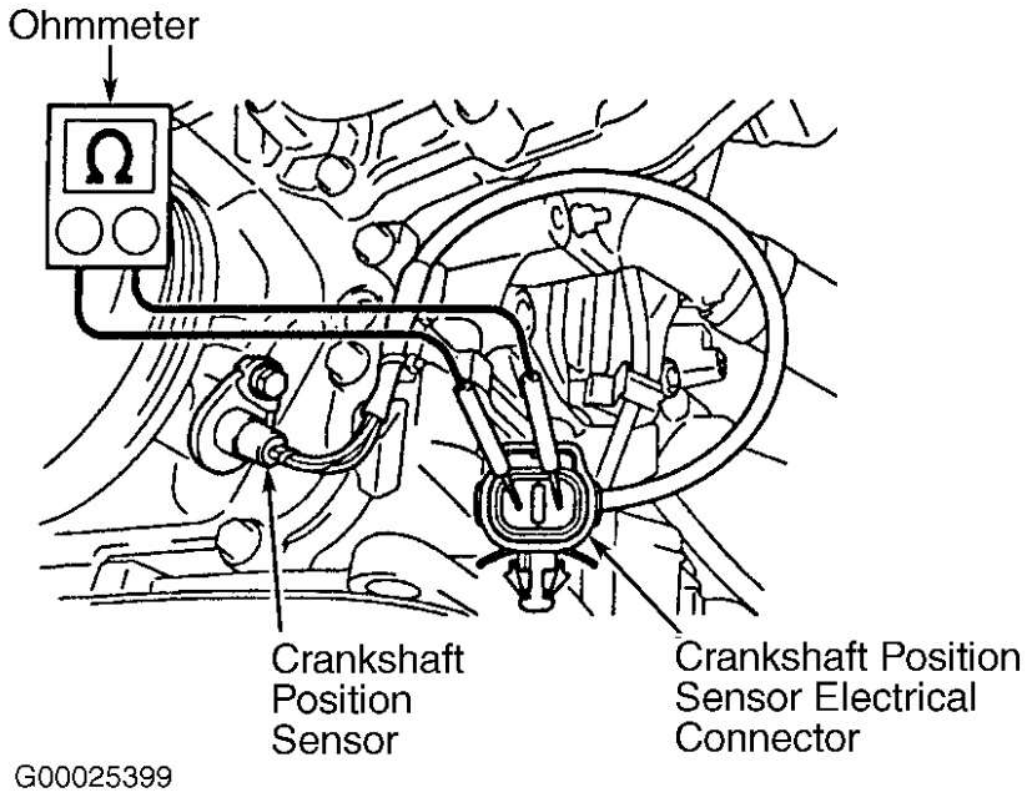


Fig. 49: Locating & Checking Crankshaft Position Sensor (MR2)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

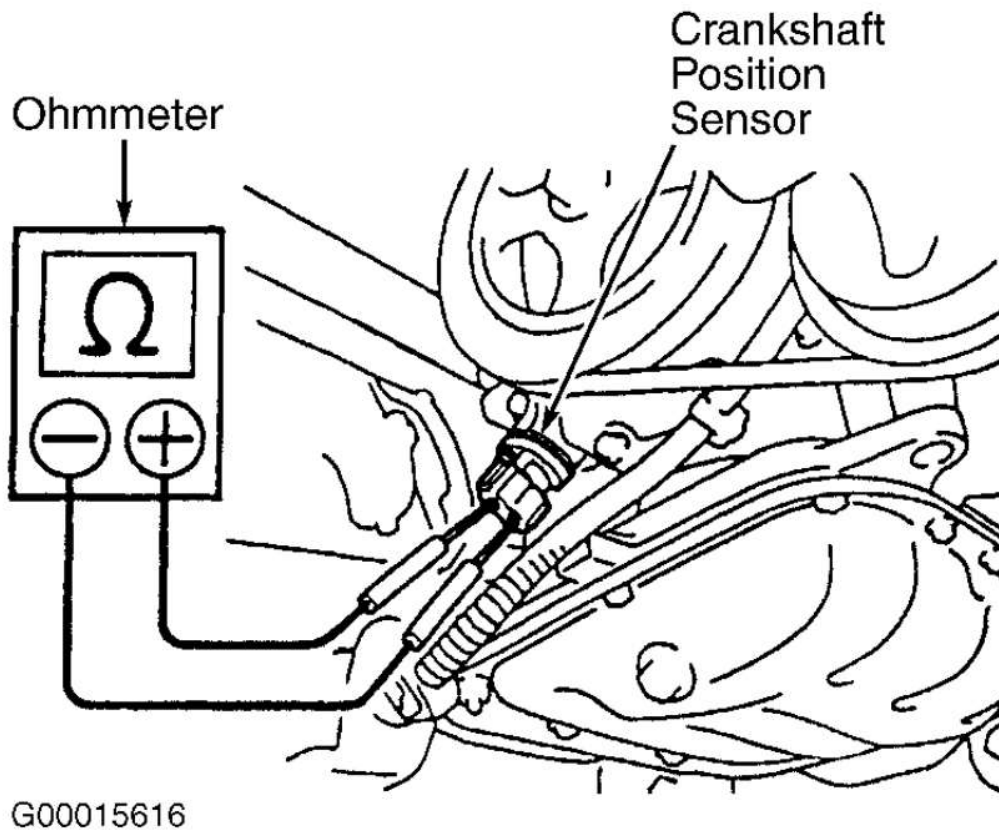
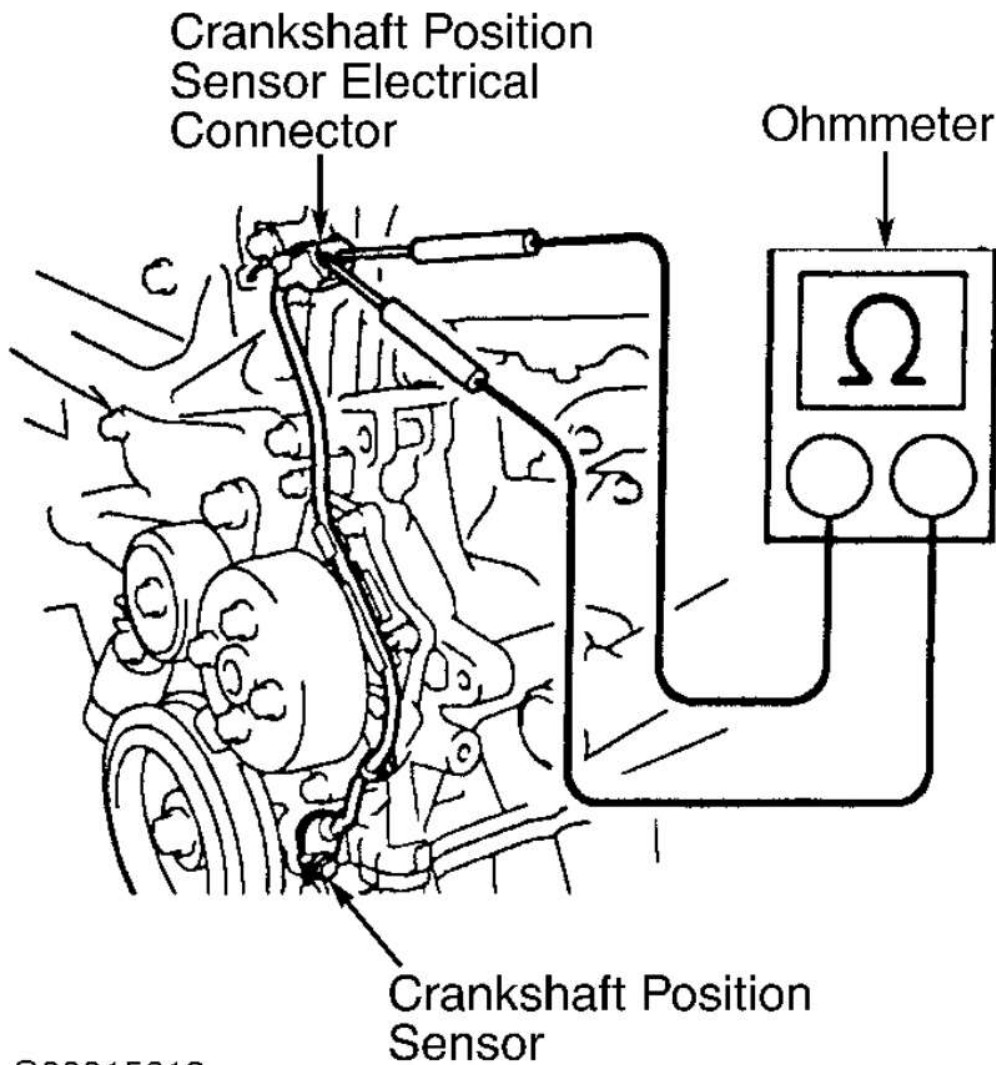


Fig. 50: Locating & Checking Crankshaft Position Sensor (Prius)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.



G00015612

Fig. 51: Locating & Checking Crankshaft Position Sensor (RAV4)
Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

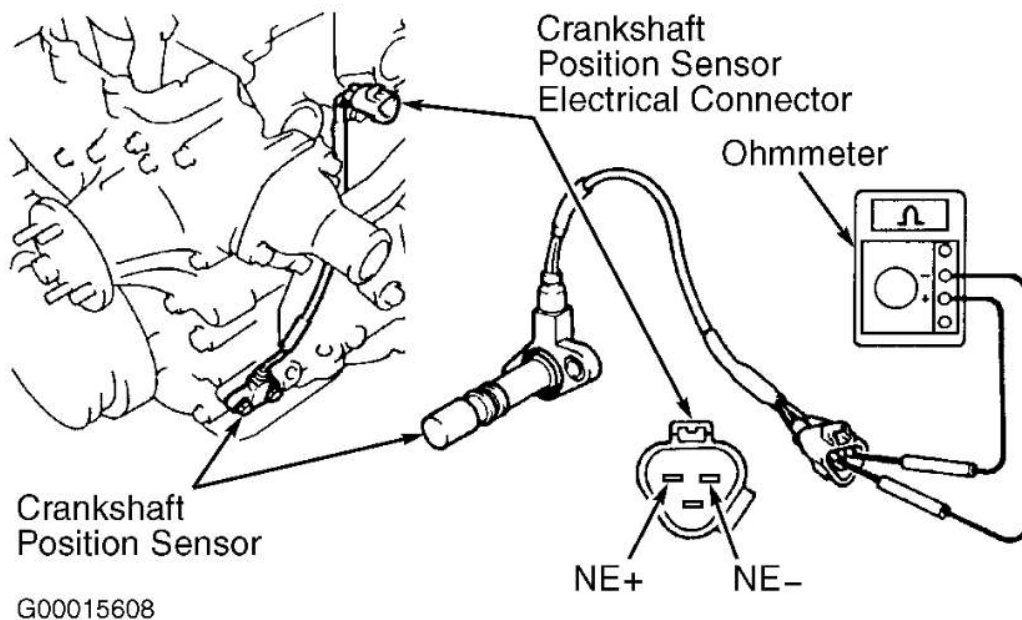


Fig. 52: Locating & Checking Crankshaft Position Sensor (Tacoma)
 Courtesy of TOYOTA MOTOR SALES, U.S.A., INC.

IGNITION COIL RESISTANCE

All Models

Ignition coil testing procedure and resistance are not available from manufacturer.

IDLE SPEED & IGNITION TIMING

Ensure idle speed and ignition timing are set to specification. For adjustment procedures, see ON-VEHICLE ADJUSTMENTS - 4-CYLINDER article.

SUMMARY

If no faults were found while performing BASIC DIAGNOSTIC PROCEDURES, proceed to appropriate SELF-DIAGNOSTICS article. If no hard diagnostic trouble codes are found in self-diagnostics, proceed to TROUBLE SHOOTING - NO CODES article for diagnosis by symptom (i.e., ROUGH IDLE, NO START, etc.) or intermittent diagnostic procedures.