

# N - REMOVE/INSTALL/OVERHAUL

1993 Toyota Celica

1993 ENGINE PERFORMANCE  
Removal, Overhaul & Installation

Celica

## INTRODUCTION

Removal, overhaul and installation procedures are covered in this article. If component removal and installation is primarily an unbolt and bolt-on procedure, only a torque specification may be furnished.

**CAUTION:** When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. If vehicle is equipped with air bag(s), after disconnecting negative battery cable, wait a minimum of 2 minutes before working on vehicle.

## IGNITION SYSTEM

### DISTRIBUTOR

**NOTE:** For timing specifications and procedures, see the appropriate D - ADJUSTMENTS - 4-CYL article in this section.

Removal (Celica)

1) Disconnect negative battery cable. On 2.0L turbo 3S-GTE, remove intercooler. See TURBOCHARGER under AIR INDUCTION SYSTEM.

2) On all models, disconnect spark plug wires from spark plugs (and from ignition coil on 3S-GTE). Disconnect distributor electrical connector. Scribe relationship mark between distributor flange and cylinder head. Remove distributor hold-down bolt(s) or nut(s). Remove distributor. Remove "O" ring from distributor housing and discard.

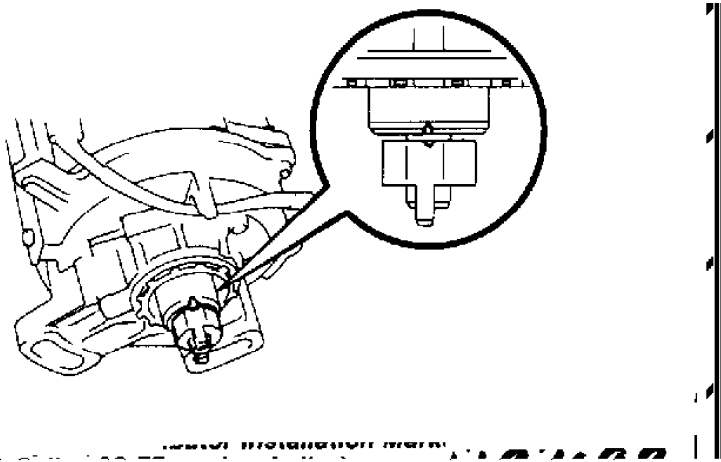


Fig. 1: Aligning Distributor Cut-Out Marks (Typical)  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Overhaul

Only distributor cap, rotor and coil are serviceable. Pick-up

coil and distributor housing assembly are replaced as a unit.

#### Installation

1) Set cylinder No. 1 to TDC of compression stroke. Coat new "O" ring with oil and install onto distributor housing. Align mark of drive coupling with groove on distributor housing. See Fig. 1.

2) Install distributor to camshaft, aligning distributor mounting flange hole slot with bolt hole on cylinder head. Snug distributor hold-down bolt/nut, but DO NOT tighten. Connect distributor wiring connector. Install spark plug wires.

3) To complete installation, reverse removal procedure. Connect negative battery cable. Start engine and set ignition timing. Tighten distributor hold-down bolt/nut(s). See TORQUE SPECIFICATIONS at the end of this article.

## FUEL SYSTEM

### FUEL SYSTEM PRESSURE RELEASE

**WARNING:** High fuel pressure may be present in fuel lines and component parts. Before opening system for testing purposes or component replacement, relieve fuel pressure. DO NOT allow fuel to flow onto engine or electrical parts. Whenever possible, release fuel pressure at fuel filter fitting.

Disconnect negative battery cable. If possible, position container under fuel fitting to be loosened. To prevent fuel spraying, use a rag to cover fuel fitting to be loosened. Slowly loosen fitting, allowing pressurized fuel to spill into container or spray into rag(s). After fuel system pressure is released, disconnect fitting and plug all openings.

### CHECKING FOR FUEL LEAKS

**NOTE:** After replacing fuel system components or performing fuel system maintenance, verify there are no fuel leaks.

Using Diagnosis Check Wire (SST09843-18020), connect Data Link Connector 1 (DLC1) terminals +B and FP. Turn ignition on, with engine off. When fuel return hose is pinched (DO NOT bend hose, as it may cause cracking), fuel pressure within high pressure line will rise to approximately 57 psi (4 kg/cm<sup>2</sup>). Pinch fuel return hose and verify there are no fuel system leaks. When inspection is completed, turn ignition off and remove diagnosis check wire from DLC1.

### COLD START INJECTOR

#### Removal & Installation (Celica 2.0L 3S-GTE)

1) Locate cold start injector under throttle body. Disconnect negative battery cable. Remove throttle body. See THROTTLE BODY. Disconnect cold start injector connector. Slowly remove cold start injector pipe 2 union bolts and 4 gaskets, using care not to spill fuel. Remove cold start injector and gasket.

2) Install cold start injector with a NEW gasket. Tighten bolts to 52 INCH lbs. (5.9 N.m). Install injector pipe, 2 union bolts and 4 NEW gaskets. Tighten union bolt to 108 INCH lbs. (12 N.m). Connect cold start injector connector and throttle body. See THROTTLE BODY. Connect negative battery cable. Check for fuel leakage. See CHECKING FOR FUEL LEAKS.

## FUEL PUMP

#### Removal (Celica 2.0L 3S-GTE)

1) Disconnect negative battery cable. Remove gas cap from filler tube to relieve fuel tank pressure. Release fuel pressure at fuel filter. See FUEL SYSTEM PRESSURE RELEASE. In luggage compartment, locate floor service hole cover. Remove wiring protector and disconnect fuel pump and fuel sender electrical connectors at floor service hole cover.

2) Remove service hole cover. Remove screws attaching fuel sender gauge to tank and remove fuel sender gauge. Drain fuel from fuel tank into container. Raise vehicle enough to enable fuel tank removal.

3) Remove left rear wheel. Remove fuel tank plastic protector. Remove fuel tank filler pipe protector. Disconnect filler pipe from fuel tank. Disconnect fuel outlet hose, return hose and fuel evaporation hose from tank tubes. Support fuel tank and remove retaining straps. Lower tank. Remove fuel evaporation bent tube. Remove fuel pump assembly from tank.

4) Pull lower end of fuel pump (with filter) away from bracket. Remove 2 nuts securing fuel pump wires to fuel pump and disconnect wires. Disconnect fuel hose from pump and remove fuel pump. Using small blade screwdriver, remove clip retaining filter to pump.

#### Installation

1) Use NEW retaining clip to install filter. Use NEW gasket between fuel pump bracket and tank. Tighten fuel pump bracket-to-tank nuts to 26 INCH lbs. (2.9 N.m). Install fuel evaporation bent tube. Tighten fuel evaporation bent tube-to-tank retaining screws to 13 INCH lbs. (1.5 N.m). Tighten fuel evaporation bent tube-to-fuel pump bracket to 26 INCH lbs. (2.9 N.m).

2) Install fuel tank to body. Tighten fuel tank band nuts to 16 ft. lbs. (22 N.m). Install fuel hoses. Tighten outlet hose to 22 ft. lbs. (30 N.m). Install fuel sender gauge with NEW gasket. Tighten fuel sender bracket-to-tank nuts to 13 INCH lbs. (1.5 N.m). To complete installation, reverse removal procedure. Check for fuel leakage. See CHECKING FOR FUEL LEAKS.

#### Removal & Installation (Celica 1.6L 4A-FE & 2.2L 5S-FE)

1) Disconnect negative battery cable. Remove gas cap from filler tube to relieve fuel tank pressure. Remove rear seat cushion. Remove fuel pump hole cover. Disconnect fuel pump and fuel sender electrical connector. Release fuel pressure at filter. See FUEL SYSTEM PRESSURE RELEASE.

2) Disconnect fuel outlet line and fuel return line from fuel pump bracket assembly. Remove bolts securing fuel pump and bracket assembly to fuel tank. Remove fuel pump and bracket assembly from tank.

3) Remove nuts and washers retaining fuel sending unit wires. Disconnect wires. Remove screws retaining sending unit and separate sending unit from fuel pump and bracket assembly.

4) Pull lower end of fuel pump (with filter) from bracket. Remove 2 nuts securing fuel pump wires to fuel pump. Disconnect wires. Disconnect fuel hose from fuel pump. Remove fuel pump.

5) To install, reverse removal procedure. Use NEW retaining clip to install filter. Use NEW gasket between fuel pump bracket and tank. On Corolla, tighten fuel pump bracket-to-tank nuts to 34 INCH lbs. (3.8 N.m). On other models, tighten fuel pump bracket-to-tank nuts to 26 INCH lbs. (2.9 N.m). On all models, tighten fuel pump outlet line to 22 ft. lbs. (30 N.m). Check for fuel leakage. See CHECKING FOR FUEL LEAKS.

## FUEL INJECTORS & FUEL RAILS

NOTE: Install NEW grommets and "O" rings when replacing fuel injectors or reinstalling old injectors. Verify injectors rotate smoothly in injector ports and in fuel rail. If injectors do not rotate smoothly, check "O" rings for proper installation.

#### Removal (Celica 2.2L 5S-FE)

1) Disconnect negative battery cable. Release fuel pressure at fuel filter. See FUEL SYSTEM PRESSURE RELEASE. Drain engine coolant. Disconnect throttle cable(s) from throttle body. Remove air temperature sensor connector and cruise control cable clamp from air cleaner housing.

2) Loosen duct hose clamp from throttle body. Remove air cleaner cap, resonator and duct hose as an assembly. Disconnect Throttle Position Sensor (TPS) connector and Idle Air Control (IAC) valve connector from throttle body. Mark positions of all vacuum hoses connected to throttle body for reassembly purposes, and remove vacuum hoses from throttle body.

3) Remove 4 throttle body mounting bolts. Remove coolant hoses from throttle body and remove throttle body. Remove power steering vacuum hoses from tubing lines near intake manifold. Mark positions and remove 2 vacuum hoses from EVAP-Thermal Vacuum Valve (TVV) near distributor. Remove EGR temperature sensor harness connector (if equipped).

4) Mark positions and remove 2 vacuum hoses from EGR VSV near bottom of intake manifold. Remove vacuum hose from canister. Remove vacuum hoses tubing retaining clamp near bottom of intake manifold. Disconnect EGR pipe fittings. Remove EGR valve, EGR vacuum modulator and related vacuum hoses.

5) Remove vacuum hoses from intake manifold to brake booster, vacuum sensor, and A/C magnet switch VSV connector. Remove engine ground wire from intake manifold. Disconnect knock sensor and EGR VSV harness connectors. Remove engine harness clamps from brackets on intake manifold. Remove 2 intake manifold support braces. Remove intake manifold.

6) Disconnect fuel injector harness connectors. Disconnect fuel return hose from fuel return pipe. Remove fuel inlet hose by removing pressure pulsation damper and washer gaskets.

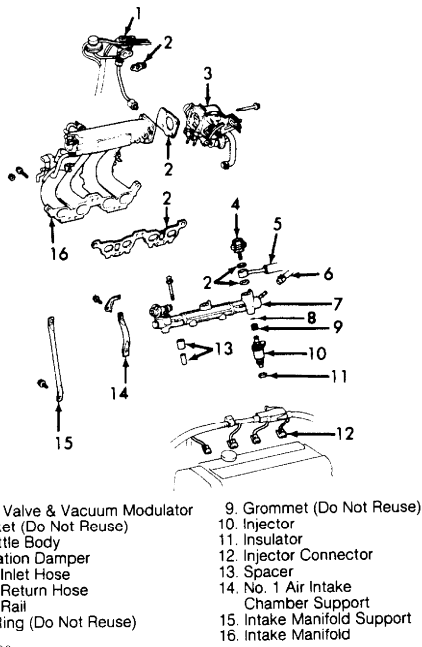
7) Remove 2 fuel rail mounting bolts. Gently twist each injector to ease removal. Remove fuel rail with 4 injectors attached, using care not to drop injectors from rail. Replace injector if dropped. Remove 4 injector insulators and 2 rail spacers from intake manifold. Remove fuel injectors from fuel rail by gently pulling. Remove pressure regulator from fuel rail. See Fig. 2.

#### Installation

1) Install NEW grommets and "O" rings onto injectors. Apply light coat of gasoline to "O" rings and install injectors to fuel rail. See Fig. 5. Install 4 NEW injector insulators and 2 rail spacers in position on cylinder head.

2) Place injectors with attached fuel rail into injector ports on cylinder head. Verify injectors rotate smoothly. If injectors do not rotate smoothly, check "O" rings for binding and for proper installation. Replace "O" ring(s) as required. Verify injector electrical connectors are positioned upward and on cam cover side of fuel rail.

3) Install fuel rail bolts. Install fuel inlet pipe and pulsation damper. To complete installation, reverse removal procedure. Tighten all nuts and bolts to specification. See TORQUE SPECIFICATIONS. Fill engine with coolant. Engine coolant capacity is 6.7 qts. (6.3L). Check for fuel leakage. See CHECKING FOR FUEL LEAKS.



- |                                 |                                      |
|---------------------------------|--------------------------------------|
| 1. EGR Valve & Vacuum Modulator | 9. Grommet (Do Not Reuse)            |
| 2. Gasket (Do Not Reuse)        | 10. Injector                         |
| 3. Throttle Body                | 11. Insulator                        |
| 4. Pulsation Damper             | 12. Injector Connector               |
| 5. Fuel Inlet Hose              | 13. Spacer                           |
| 6. Fuel Return Hose             | 14. No. 1 Air Intake Chamber Support |
| 7. Fuel Rail                    | 15. Intake Manifold Support          |
| 8. "O" Ring (Do Not Reuse)      | 16. Intake Manifold                  |

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Fig. 2: Locating Fuel Injection Components (Celica - 2.2L 5S-FE)  
 Courtesy of Toyota Motor Sales, U.S.A.

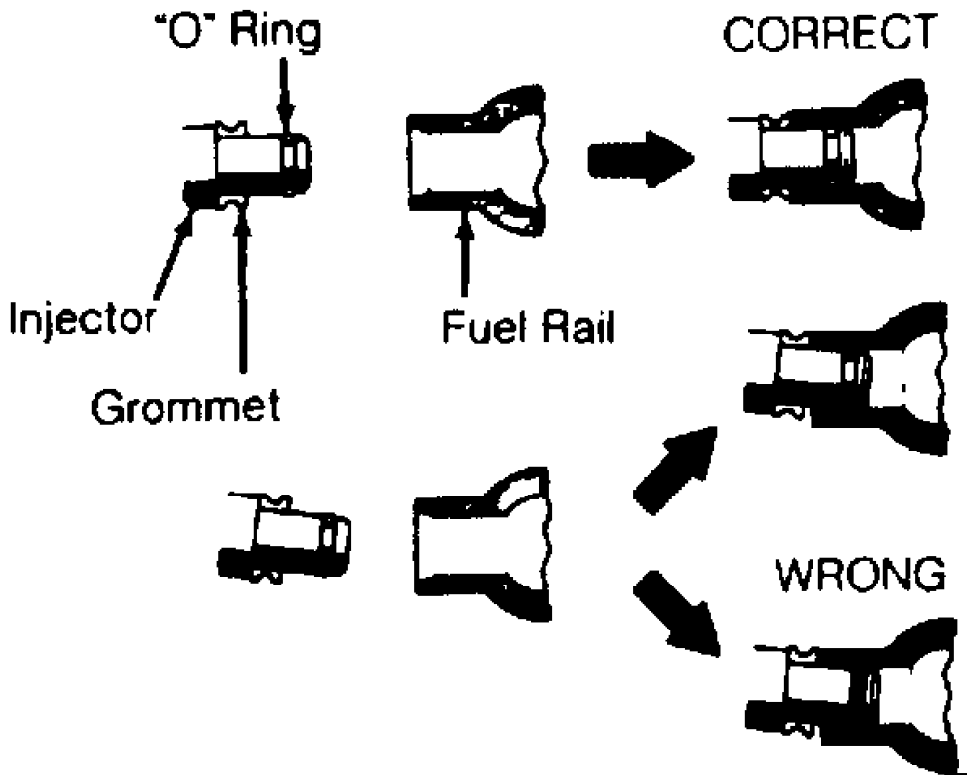


Fig. 3: Proper Injector Installation Into Fuel Rail (Typical)  
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

Removal (Celica 1.6L 4A-FE)

- 1) Disconnect negative battery cable. Disconnect vacuum hose

and fuel return hose from fuel pressure regulator. Release fuel pressure. See FUEL SYSTEM PRESSURE RELEASE.

2) Disconnect fuel inlet pipe from fuel rail by removing fuel pipe union bolt and 2 washer gaskets. Disconnect fuel injector harness connectors. Remove 2 fuel rail mounting bolts and carefully lift fuel rail with injectors attached.

3) Remove 4 insulators and 2 fuel rail spacers from cylinder head. Pull injectors from fuel rail. Remove "O" ring and grommet from each fuel injector.

#### Installation

1) Install NEW grommet to each fuel injector. Apply a light coat of gasoline to NEW "O" ring and install onto injector. Apply a light coat of gasoline to "O" ring on injector to ease installation into fuel rail.

2) Install fuel injectors into fuel rail by turning/twisting fuel injector from left to right in order to bottom injector into fuel rail. See Fig. 3. Place 4 NEW insulators and 2 NEW spacers into position on cylinder head. Insert fuel rail/injector assembly into insulators on cylinder head. Verify fuel injectors rotate smoothly in insulators.

3) Position fuel injector electrical connectors upward. Install fuel rail mounting bolts and tighten to 11 ft. lbs. (15 N.m). Connect fuel inlet hose to fuel rail using 2 NEW washer gaskets. Tighten fuel inlet pipe union bolt to 22 ft. lbs. (30 N.m).

4) Connect fuel injector connectors. Connect fuel return hose and vacuum hose to fuel pressure regulator. Connect negative battery cable. Check for fuel leakage. See CHECKING FOR FUEL LEAKS.

#### Removal (Celica 2.0L 3S-GTE)

1) Disconnect negative battery cable. Drain coolant from engine. Remove intercooler and throttle body. See THROTTLE BODY. Remove charcoal canister. Remove EGR VSV and vacuum modulator. Remove EGR valve and pipe. Remove cold start injector fuel pipe and cold start injector. See COLD START INJECTOR.

2) Remove air hose and coolant hoses by-pass pipe. Disconnect injector connectors. Disconnect engine wiring harness from intake manifold. Disconnect fuel pressure regulator vacuum hose. Release fuel pressure at filter, and remove fuel inlet hose. See FUEL SYSTEM PRESSURE RELEASE. Disconnect fuel return hose from pressure regulator.

3) Remove 3 bolts retaining fuel rail to intake manifold. Remove fuel rail with attached fuel injectors. Note position of 3 mounting spacers for reassembly reference. Remove 3 mounting spacers and any remaining injector insulators from intake manifold. Disconnect fuel inlet hose pipe and one mounting bolt from fuel rail.

4) Remove 4 small bolts retaining fuel injector cover to fuel rail. Apply gasoline to both ends of injector to ease removal from fuel rail. Pull injectors from rail. Loosen lock nut, and remove fuel pressure regulator from fuel rail.

#### Installation

1) Apply light coat of gasoline to NEW "O" rings and install 2 "O" rings to each injector. Install each injector into fuel rail so injector electrical connector is opposite injector cover bolt hole. See Fig. 4.

2) Install fuel pressure regulator to fuel rail using hand pressure to fully bottom unit into rail. Turn regulator counterclockwise until vacuum pipe aligns with rail and fuel return pipe is 180 degrees from fuel rail. Tighten lock nut to 22 ft. lbs. (30 N.m).

3) Install NEW insulator to each injector and install injector cover. Tighten 4 cover bolts to 69 INCH lbs. (7.8 N.m). Connect fuel inlet pipe to fuel rail. Tighten fuel pipe union bolt to

22 ft. lbs. (30 N.m), and fuel line mounting bolt to 69 INCH lbs. (7.8 N.m).

4) Install NEW insulator to each injector bottom. Position 3 fuel rail mounting spacers to intake manifold. Install fuel rail, with attached injectors, into intake manifold injector recesses. Install 3 fuel rail mounting bolts and tighten to 14 ft. lbs. (19 N.m).

5) Connect fuel return hose and vacuum hose to pressure regulator. Install wiring harness to intake manifold and position to mounting bolts on timing belt cover. Connect Gray colored injector connectors to No. 2 and 4 injectors. Connect Brown colored injector connectors to No. 1 and 3 injectors.

6) To complete installation, reverse removal procedure. Tighten all nuts and bolts to specification. See TORQUE SPECIFICATIONS. After installation complete check for fuel leaks. See CHECKING FOR FUEL LEAKS.

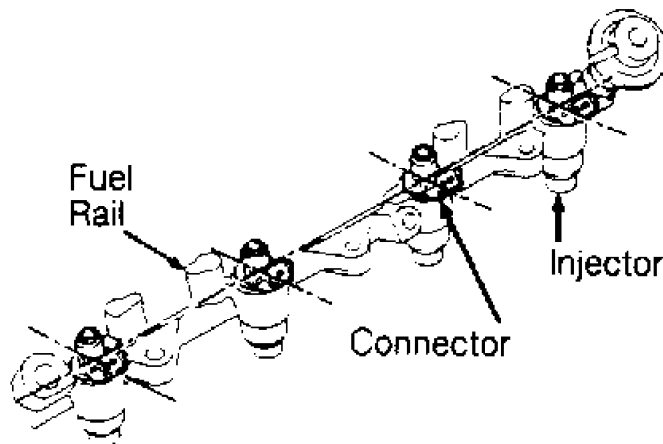


Fig. 4: Positioning Injector Connectors (Celica 3S-GTE)  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

## OXYGEN (O<sub>2</sub>) & SUB-OXYGEN SENSORS

**NOTE:** To ease removal of O<sub>2</sub> sensor and/or its mounting bolts from exhaust pipe/manifold, it may be necessary to apply penetrating oil to threads. Also to ease O<sub>2</sub> sensor removal, run engine a few minutes to heat exhaust system to about 120°F (48°C).

### Removal

1) Turn engine off. Disconnect O<sub>2</sub> sensor electrical connector. Remove 2 mounting bolts/nuts and remove O<sub>2</sub> sensor from manifold/pipe. Some O<sub>2</sub> and sub-oxygen sensors screw into exhaust

manifold or header pipe in front of converter.

2) When removing an O2 sensor that will be reused, protect its permanent pigtail from damage by using proper socket wrench (if required). After removal, verify sensor tip is free of contaminants. Replace sensor as required. DO NOT use cleaning solvents on sensor tip.

#### Installation

Before installing O2 sensor, apply anti-seize compound or silicone to O2 sensor threads or to mounting bolt threads. Screw O2 sensor into exhaust, or install gasket and O2 sensor using mounting bolts.

### FUEL PRESSURE REGULATORS

**NOTE:** If component removal and installation is primarily an unbolt and bolt-on procedure, only a torque specification may be furnished. See TORQUE SPECIFICATIONS.

#### Removal & Installation (Celica 2.2L 5S-FE & 1.6L 4A-FE)

1) Disconnect negative battery cable. To remove pressure regulator from fuel rail, it is not necessary to remove intake manifold. Disconnect vacuum hose from pressure regulator. Release fuel pressure at fuel filter. See FUEL SYSTEM PRESSURE RELEASE.

2) Position cloth under pressure regulator fuel return pipe fitting. On 4A-FE, release hose clamp and remove fuel return hose. On 5S-FE, remove fuel return hose union bolt and 2 washer gaskets. On all models, remove 2 mounting bolts, and remove pressure regulator from fuel rail.

3) To install pressure regulator, apply light coat of gasoline to NEW "O" ring and install onto pressure regulator. Carefully insert pressure regulator into fuel rail, and verify pressure regulator and "O" ring are properly seated to rail. On 4A-FE, install mounting bolts and tighten to 82 INCH lbs. (9.3 N.m). On 5S-FE, install mounting bolts and tighten to 48 INCH lbs. (5.4 N.m).

4) On 4A-FE, install fuel return hose and tighten hose clamp. On 5S-FE, install fuel return hose and union bolt with 2 NEW washer gaskets. Tighten union bolt to 14 ft. lbs. (19 N.m). On all models, connect vacuum hose. Check for fuel leakage. See CHECKING FOR FUEL LEAKS.

#### Removal & Installation (Celica 2.0L 3S-GTE)

1) To replace pressure regulator, remove fuel injector fuel rail. See FUEL INJECTORS & FUEL RAILS. After removing fuel rail, loosen lock nut and unscrew pressure regulator from fuel rail.

2) To install, fully loosen lock nut on pressure regulator. Apply light coat of gasoline to NEW "O" ring and install onto pressure regulator. Install pressure regulator completely into fuel rail.

3) Turn pressure regulator counterclockwise until its fuel return pipe faces 180 degrees away from fuel rail and vacuum pipe aligns with fuel rail. Tighten lock nut to 22 ft. lbs. (30 N.m). To complete installation, see appropriate installation procedure under FUEL INJECTORS & FUEL RAILS. Check for fuel leakage. See CHECKING FOR FUEL LEAKS.

### THROTTLE BODY

#### Removal & Installation (Celica 1.6L 4A-FE & 2.2L 5S-FE)

1) Disconnect negative battery cable. Drain engine coolant. Disconnect throttle cable (A/T) and accelerator cable from throttle body linkage.

2) Disconnect air intake temperature sensor connector and cruise control cable from air cleaner. Loosen air cleaner hose clamp



at throttle body. Remove air cleaner cap, resonator and air cleaner hose as one assembly.

3) Disconnect TPS connector. On 1.6L 4A-FE, remove accelerator bracket from throttle body. On 2.2L 5S-FE, disconnect ISC valve connectors. On all models, disconnect PCV valve hose from throttle body. Label and disconnect emission control vacuum hoses from throttle body.

4) Remove throttle body mounting bolts. Remove air hose and 2 coolant by-pass hoses from throttle body. Remove throttle body. Note position of throttle body gasket for reassembly reference.

5) To install, reverse removal procedure. Tighten all nuts and bolts to specification. See TORQUE SPECIFICATIONS. Throttle body bolts are 2 different lengths. Install 2 shorter bolts in top holes of throttle body. Check for fuel leakage. See CHECKING FOR FUEL LEAKS.

#### Removal & Installation (Celica 2.0L 3S-GTE)

1) Disconnect negative battery cable. Drain coolant from engine. Disconnect accelerator cable from throttle linkage. Remove intercooler cool air inlet by removing 7 retaining clips. Remove 3 bolts retaining intercooler top protector. Remove 2 intercooler mounting bolts and 2 air hose clamps. Remove intercooler.

2) Remove 4 bolts retaining throttle body intake air connector. Remove intake air connector support bracket. Disconnect throttle position sensor and Idle Air Control (IAC) valve connectors. Remove accelerator cable bracket. Label and disconnect emission control vacuum hoses and PCV hose from throttle body.

3) Remove 4 throttle body mounting bolts. Lift throttle body enough to disconnect No. 1 air tube hose and 2 coolant by-pass hoses. Remove throttle body. Note position of throttle body gasket for reassembly reference.

4) To install, reverse removal procedure. Tighten all nuts and bolts to specification. See TORQUE SPECIFICATIONS. Check for fuel leakage. See CHECKING FOR FUEL LEAKS.

## **AIR INDUCTION SYSTEM**

### **VARIABLE INDUCTION SYSTEM**

#### Removal & Installation (Celica 2.0L Turbo 3S-GTE)

1) Disconnect negative battery cable. Disconnect volume airflow meter connector. Disconnect air cleaner hose from volume airflow meter. Remove air cleaner cap and volume airflow meter assembly. Pry off lock plates. Remove bolt, 4 nuts, volume airflow meter and gasket from air cleaner cap.

2) To install, reverse removal procedure using a NEW volume airflow meter gasket. Connect negative battery cable.

### **TURBOCHARGER**

#### Removal (Celica 2.2L 3S-GTE)

1) Disconnect negative battery cable. Remove engine undercovers. Drain coolant. Remove air cleaner. Remove suspension lower crossmember (connecting lower "A" arms). Remove front exhaust pipe. Support engine, remove front engine lower mount and bracket, and center crossmember.

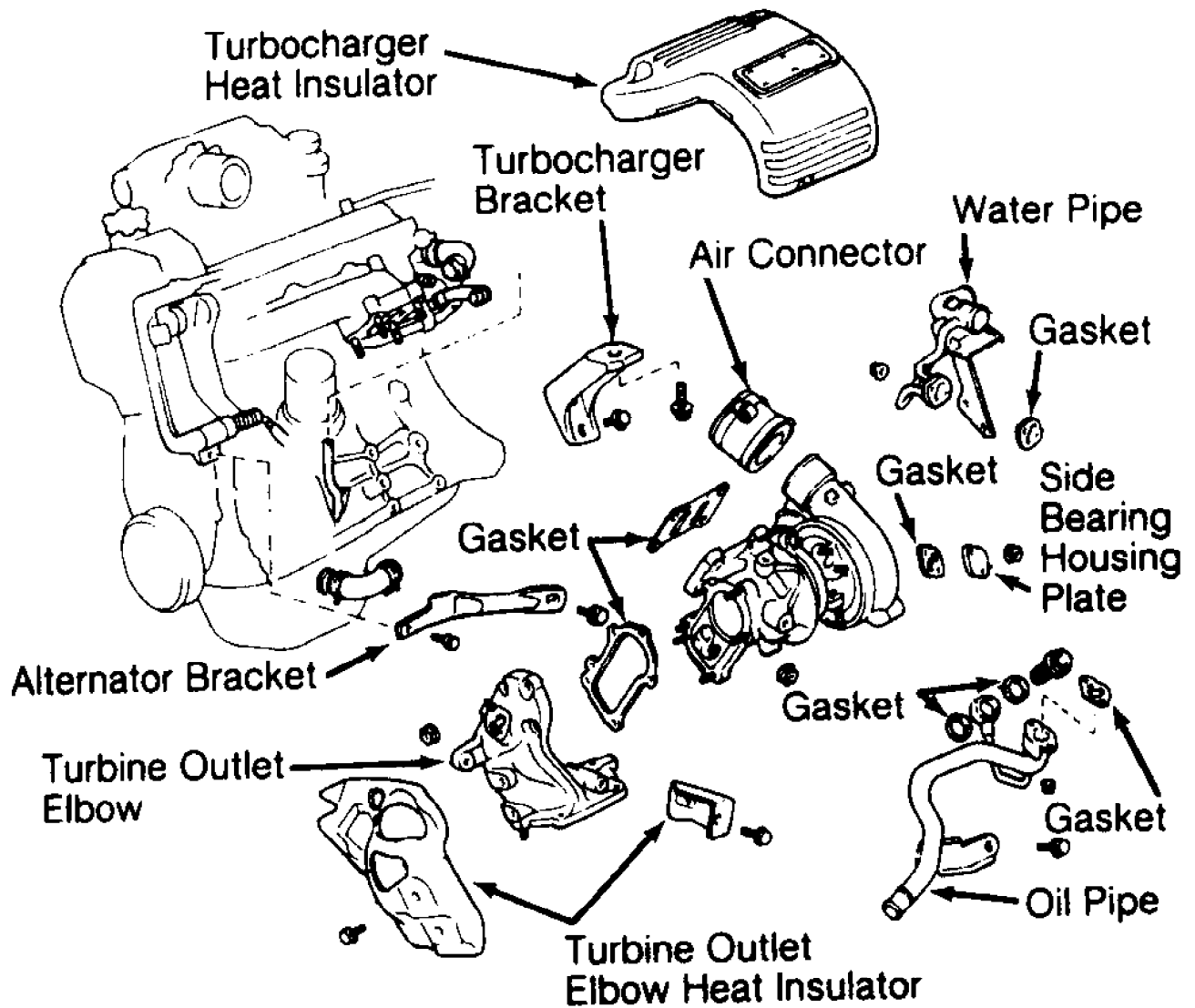
2) Without disconnecting hydraulic line, remove clutch slave cylinder. Remove alternator and bracket. Remove idler pulley bracket and A/C compressor (without disconnecting lines). Remove 3-way catalytic converter. Remove catalytic converter from turbine outlet elbow. See Fig. 5.

3) Remove intercooler cool air inlet by removing 7 retaining clips. Remove 3 bolts retaining intercooler top protector. Remove 2

intercooler mounting bolts and 2 air hose clamps. Remove intercooler. Remove 3 bolts retaining turbocharger heat insulator.

4) Remove dipstick. Remove oxygen sensor. Remove turbocharger turbine outlet elbow heat insulators. Remove turbocharger vacuum hose and 3 coolant hoses. Remove turbocharger-to-block bracket. Remove turbo top oil pipe nuts and remove return oil pipe hose from turbocharger. Remove 4 nuts retaining turbocharger and remove turbocharger. Remove turbo top oil pipe and turbo coolant pipe from turbo. Remove side bearing housing plate and turbine outlet elbow.

NOTE: Check for oil sludge in oil pipes. Replace pipes if necessary.



## 90C19762

Fig. 5: Exploded View Of Turbocharger (Celica 3S-GTE )  
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

Inspection

1) Using finger pressure on impeller shaft, ensure turbine

wheel/shaft assembly turns smoothly. If impeller wheel will not turn or drags when turned, replace turbocharger assembly.

2) To check axial shaft play, insert dial indicator into intake side and place dial indicator needle on shaft end. Axial (forward-and-backward) shaft play should be .0051" (.13 mm) or less. If play is not as specified, replace turbocharger assembly.

3) To check radial shaft play, insert dial indicator needle into turbo oil outlet hole and into hole in spacer bearing to touch impeller shaft. Set dial indicator against center of impeller shaft. Radial (up-and-down) play should be .0071" (.18 mm) or less. If play is not as specified, replace turbocharger assembly.

#### Installation

1) To install turbocharger, reverse removal procedure. Use NEW gaskets and "O" rings. Tighten all bolts and nuts to specification. See TORQUE SPECIFICATIONS.

2) After installing turbocharger and before installing intercooler air duct, using a funnel, slowly pour one ounce (30 cc) of clean oil into turbo oil inlet. Turn impeller wheel shaft by hand to circulate oil onto bearings. Complete installation procedures and fill cooling system. Check engine oil level. Start engine and check for leaks.

## TORQUE SPECIFICATIONS

### CAM POSITION SENSOR & DISTRIBUTOR TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Distributor Hold-Down Bolt	
1.6L 4A-FE & 2.2L 5S-FE .....	14 (19)
2.0L 3S-GTE .....	29 (39)

### FUEL INJECTION TORQUE SPECIFICATIONS (CELICA 1.6L 4A-FE)

Application	Ft. Lbs. (N.m)
Fuel Pressure Regulator Fuel Pipe Bolt .....	14 (19)
Fuel Pump Outlet Pipe Union Bolt .....	22 (30)
Fuel Rail Inlet Pipe Union Bolt .....	22 (30)
Fuel Rail-To-Cylinder Head Bolt .....	11 (15)
Throttle Body-To-Intake Manifold Bolt .....	16 (22)
	INCH Lbs. (N.m)
Fuel Pressure Regulator-To-Fuel Rail .....	82 (9.3)
Fuel Pump Housing Bracket-To-Tank Nuts .....	26 (2.9)

### FUEL INJECTION TORQUE SPECIFICATIONS (CELICA 2.0L 3S-GTE)

Application	Ft. Lbs. (N.m)
Fuel Filter Outlet Hose Pipe Union Bolt .....	22 (30)
Fuel Inlet Hose Pipe Union Bolt .....	22 (30)
Fuel Pressure Regulator-To-Fuel Rail Nut .....	22 (30)
Fuel Rail-To-Cylinder Head Bolts (3) .....	14 (19)
Fuel Tank Outlet Line Fitting .....	22 (30)
Fuel Tank Support Straps .....	16 (22)
Intake Air Connector Support Bracket-To-Throttle Body Bolt .....	14 (19)

Throttle Body-To-Air Intake Chamber Bolt (1) ..... 14 (19)

INCH Lbs. (N.m)

Cold Start Injector Fuel Pipe Union Bolt ..... 108 (12)

Cold Start Injector-To-Air Intake Chamber Bolt ..... 52 (5.9)

Fuel Inlet Hose Bracket-To-

Fuel Rail Mounting Bolt ..... 69 (7.8)

Fuel Pump Bracket-To-Tank Nuts ..... 26 (2.9)

Fuel Rail Injector Cover Bolts (3) ..... 69 (7.8)

Fuel Sender Bracket-To-Tank Nuts ..... 13 (1.5)

Intake Air Connector Bracket-To-Cylinder Head Nut .... 69 (7.8)

(1) - Throttle body bolts are 2 different lengths. Install  
2 shorter bolts in top holes of throttle body.

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#### FUEL INJECTION TORQUE SPECIFICATIONS (CELICA 2.2L 5S-FE)

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Application	Ft. Lbs. (N.m)
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Air Intake Chamber

Cylinder Head Mounting Bolts ..... 14 (19)

Support Bracket Bolts

12-mm Bolts ..... 16 (22)

14-mm Bolts ..... 31 (42)

EGR Valve Pipe Union Nut ..... 43 (59)

Fuel Pressure Regulator Fuel Pipe Union Bolt ..... 14 (19)

Fuel Pump Outlet Pipe Union Bolt ..... 22 (30)

Fuel Rail Inlet Pipe Pulsation Damper ..... 25 (34)

Throttle Body-To-Intake Manifold ..... 14 (19)

INCH Lbs. (N.m)

EGR Valve Mounting Nut ..... 115 (13)

Fuel Pressure Regulator-To-Fuel Rail ..... 48 (5.4)

Fuel Pump Housing Bracket-To-Tank Nuts ..... 26 (2.9)

Fuel Rail-To-Cylinder Head Bolts ..... 115 (13)

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#### FUEL PUMP TORQUE SPECIFICATIONS

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Application	INCH (N.m)
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Fuel Pump Bracket Retaining Screws ..... 35 (3.9)

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#### THROTTLE BODY TORQUE SPECIFICATIONS

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Application	Ft. Lbs. (N.m)
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Celica

1.6L 4A-FE ..... 16 (22)

2.0L 3S-GTE (1) (2) ..... 14 (19)

2.2L 5S-FE ..... 14 (19)

- (1) - Throttle body bolts are 2 different lengths. Install 2 shorter bolts in top holes of throttle body.
- (2) - For intake air connector support bracket bolts and nuts, tighten bolts to 14 ft. lbs. (19 N.m) and tighten nuts to 69 INCH lbs. (7.8 N.m). For intake air connector bolts, tighten bolts to 14 ft. lbs. (19 N.m).
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TURBOCHARGER TORQUE SPECIFICATIONS (CELICA 3S-GTE)

Application	Ft. Lbs. (N.m)
A/C Compressor Bracket Bolts .....	20 (27)
Alternator Bolts	
12 mm .....	14 (19)
14 mm .....	38 (52)
Alternator Support Bracket Bolts	
Lower Alternator Bracket Bolt .....	29 (39)
Turbine Outlet Elbow Bolt .....	32 (43)
Bottom Oil Pipe	
Oil Pipe Bracket-To-Block Bolt .....	32 (43)
Oil Pipe-To-Block Union Bolt .....	38 (51)
Oil Pipe-To-Turbocharger Nuts .....	13 (17)
Catalytic Converter Support Bracket (2) Bolts .....	43 (59)
Catalytic Converter-To-Turbocharger Bolts .....	22 (30)
Engine Mounting Brackets & Crossmembers	
Engine Mount Through-Bolts .....	64 (87)
Front Engine Mount-To-Engine Bolts .....	57 (77)
Lower Crossmember-To-Engine Mount Bolts (4) .....	54 (73)
Lower Crossmember-To-Frame Bolts .....	38 (52)
Exhaust Pipe-To-Converter Nuts .....	46 (62)
Oxygen Sensor Bolts .....	33 (44)
Turbine Outlet Elbow Nut .....	47 (64)
Turbocharger Bracket Bolt	
Bracket-To-Block .....	43 (59)
Bracket-To-Turbo .....	51 (69)
Turbo-To-Exhaust Manifold Nuts .....	47 (64)
	INCH Lbs. (N.m)
Air Cleaner Bracket Bolt .....	108 (12)
Side Bearing Housing Plate .....	97 (11)
Top Oil Pipe Nuts .....	108 (12)
Turbocharger Water Pipe Nuts & Bolts .....	97 (11)