

1991 Volvo 740 SE

2.3L 4-CYL & 2.3L 4-CYL TURBO 1991 Engines - 2.3L & 2.3L Turbo 4-Cylinder

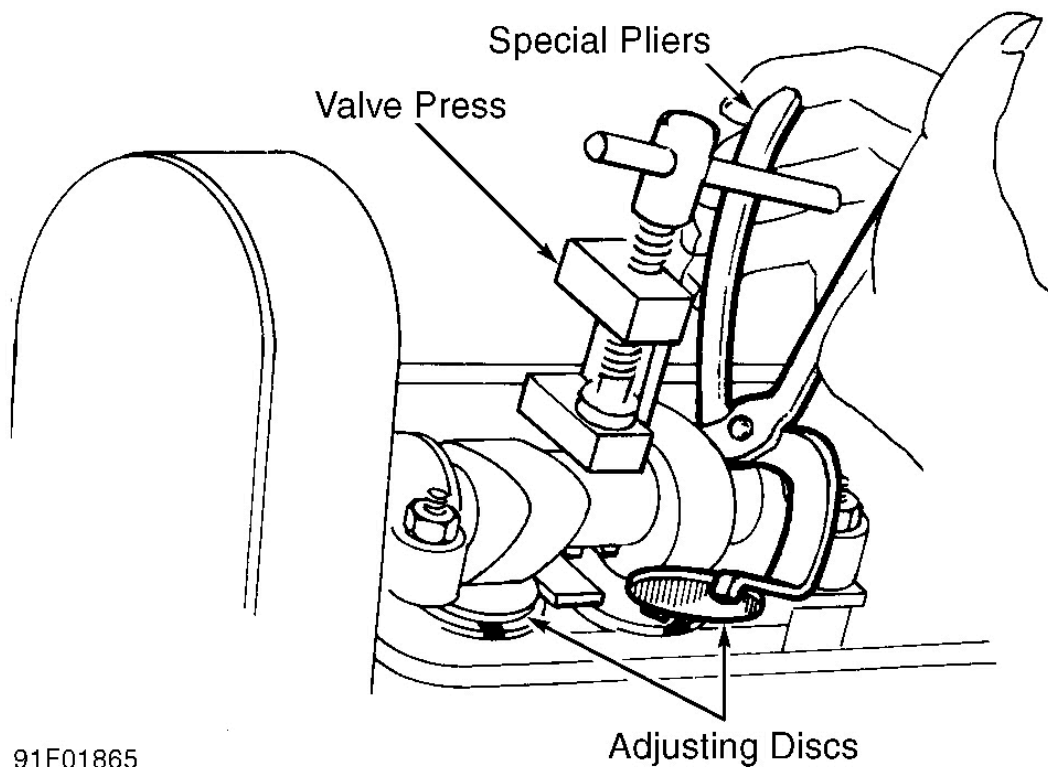


Fig. 1: Adjusting Valve Clearance

Courtesy of VOLVO CARS OF NORTH AMERICA

5. Using a micrometer, measure thickness of removed adjusting disc. Determine proper thickness for new adjusting disc by calculating the following: subtract correct clearance from original clearance previously recorded. Add difference to thickness of old adjusting disc to determine required thickness of new adjusting disc. See **VALVE CLEARANCE SPECIFICATIONS TABLE**.
6. Adjusting discs are available in thicknesses ranging from .130-.177" (3.30-4.50 mm) in increments of .002" (.05 mm). Use only NEW adjusting discs.
7. Coat adjusting discs with oil and install with thickness markings facing down. Remove valve press. Rotate crankshaft to next firing order position and repeat procedure. Firing order is 1, 3, 4 and 2.
8. When all 4 cylinders have been adjusted, rotate camshaft several revolutions and recheck valve clearance on all cylinders and readjust as required. Install valve cover and gasket.

VALVE CLEARANCE SPECIFICATIONS

Application	In. (mm)
Clearance When Checking	
Cold Engine	.012-.016 (.30-.40)
Hot Engine	.014-.018 (.35-.45)
Clearance When Adjusting	
Cold Engine	.014-.016 (.35-.40)
Hot Engine	.016-.018 (.40-.45)

REMOVAL & INSTALLATION

NOTE: For reassembly reference, label all electrical connectors, vacuum hoses and fuel lines before removal. Also place mating marks on engine hood and other major assemblies before removal.

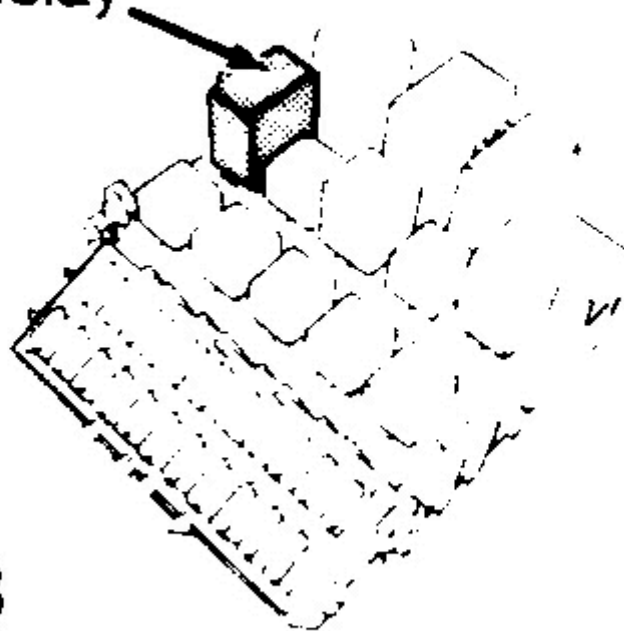
FUEL PRESSURE RELEASE

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

Fuel Pump Pressure Release

1. Remove fuel injection system relay. On 240, relay is located under right side of instrument panel. On 740 and 940, relay is located behind ash tray in center console. See **Fig. 2**.
2. Crank engine for at least 5 seconds. If engine starts, let it run until it dies. Before disconnecting any lines, cover fuel line connector with shop towel to absorb any fuel left in line. With ignition key removed from ignition switch, reconnect relay.

Fuel Injection System Relay



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Fig. 2: Locating Fuel Injection System Relays
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ENGINE

Removal

1. Remove hood and disconnect negative battery cable. Drain coolant and engine oil. Remove distributor cap. Disconnect coolant hoses. Remove radiator, fan shroud, air intake hoses and air cleaner assembly.
2. Remove power steering pump and A/C compressor with hoses attached. Disconnect vacuum hoses, electrical connections, coolant hoses and control cables at engine.
3. Remove fuel tank cap to relieve fuel tank pressure. See **FUEL PRESSURE RELEASE** under REMOVAL & INSTALLATION. Remove fuel lines.
4. Raise and support vehicle. Remove splash shield located below engine. Disconnect exhaust pipe at exhaust manifold or turbo. Remove exhaust pipe support bracket.
5. On 240 with M/T, remove gearshift boot, gearshift lever retaining bolts and bracket. Remove gearshift lever. On 240 with A/T, disconnect control cable/linkages, noting locations.
6. On 740 and 940, remove rubber boot and snap ring at base of gearshift lever, pin and remove gearshift (M/T models) or disconnect control cable (A/T) models.
7. On all models, disconnect electrical connections and speedometer pick-up at differential. Remove drive shaft. Support transmission and remove transmission crossmember. Remove engine mount bolts. Remove engine and transmission assembly.

Installation

1. To install, reverse removal procedure. Fill fluid levels and adjust control cables.
2. On 240 with M/T, place gearshift in 1st gear. Adjust clearance between bracket and gearshift lever to .020-.059" (.51-1.49 mm). Recheck clearance in 2nd gear. Adjust as necessary.

INTAKE MANIFOLD

Removal

1. Disconnect negative battery cable. Remove air intake hoses at throttle body. Disconnect necessary electrical connections, control cables and vacuum hoses.
2. Remove fuel tank cap to relieve fuel tank pressure. See **FUEL PRESSURE RELEASE** under REMOVAL & INSTALLATION. Remove fuel lines. Remove intake manifold retaining nuts and intake manifold.

Installation

To install, reverse removal procedure using new gaskets. Tighten bolts to specification. See **TORQUE SPECIFICATIONS**. If fuel rail and injectors were removed, install components using new "O" rings. Coat "O" rings with petroleum jelly before installation.

EXHAUST MANIFOLD

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NOTE: Remove turbo before removing exhaust manifold (if necessary).

Removal

1. Disconnect negative battery cable. On turbo models, remove air delivery and intake hoses from turbo. Drain cooling system. Remove coolant lines, oil lines and vacuum hoses at turbo.
2. On all models, disconnect exhaust pipe. Remove manifold retaining nuts and exhaust manifold.

Installation

1. To install, reverse removal procedure using new gaskets. If gaskets are marked with letters UT, marked side must face away from cylinder head.
2. On turbo models, if turbo was removed, apply Thread Sealant (1161078-9) to turbo retaining bolts and install using new lock plates. Tighten in a crisscross pattern.
3. Pour clean engine oil into turbo before installing oil supply line. When installing exhaust pipe on turbo, if studs were removed from turbo, apply Thread Sealant (1161035-9) to studs before installing into turbo housing.

CYLINDER HEAD

CAUTION: DO NOT rotate crankshaft or camshaft when timing belt is removed or, valves may contact the pistons.

Removal

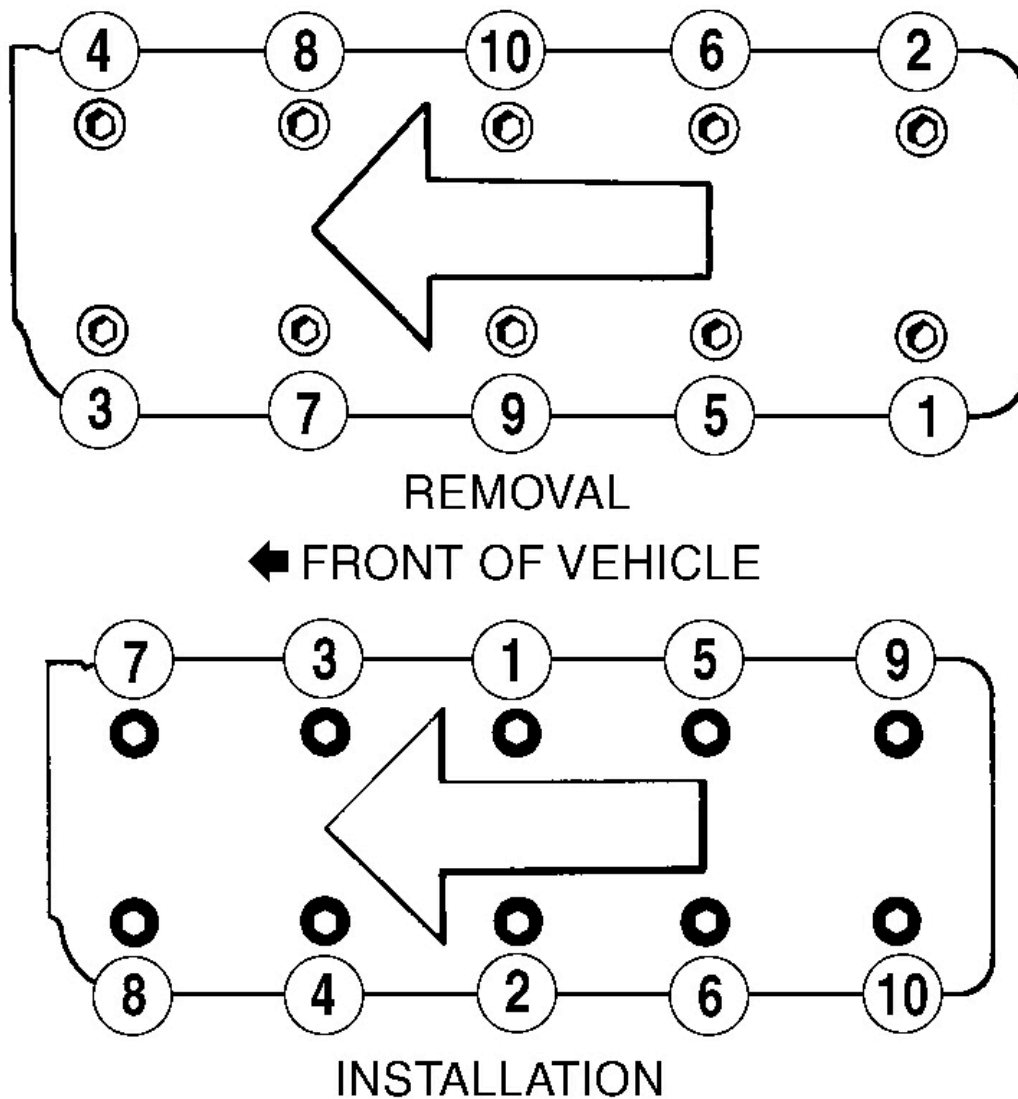
1. Drain cooling system at radiator and cylinder block. Disconnect negative battery cable. Remove intake manifold and exhaust manifold. See **INTAKE MANIFOLD** and **EXHAUST MANIFOLD** under **REMOVAL & INSTALLATION**.
2. Remove all drive belts and water pump pulley. Remove fan, preheater hose (below fan shroud) and fan shroud. Remove timing belt cover.
3. Using center bolt on crankshaft, rotate crankshaft so mark on camshaft pulley aligns with timing mark on inner timing belt cover, and crankshaft pulley mark aligns with TDC mark on timing belt cover.
4. Loosen belt tensioner nut one turn. Pull on timing belt to compress belt tensioner spring. Tighten belt tensioner nut. Install a 3-mm drill bit through hole of belt tensioner bolt to lock tensioner spring in place.
5. Note location of timing belt on camshaft sprocket. Remove timing belt from camshaft sprocket.

CAUTION: DO NOT allow timing belt to come off of crankshaft sprocket. DO NOT rotate crankshaft or camshaft when timing belt is removed, or valves may contact the pistons. See **TIMING BELT under **REMOVAL & INSTALLATION**.**

6. If removing camshaft sprocket, use Holder (5034) and remove sprocket retaining bolt. Remove sprocket and spacer washer. Note direction of spacer washer installation.
7. Remove spark plug wires and distributor cap. Remove cylinder head bolts in proper sequence, and remove cylinder head. See **Fig. 3**.

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Fig. 3: Cylinder Head Bolt Removal & Installation Sequence

Courtesy of VOLVO CARS OF NORTH AMERICA

Inspection

Inspect cylinder head for warpage at deck surface. Resurface cylinder head if warpage exceeds specification. Cylinder head height must be within specification. See **CYLINDER HEAD** in ENGINE SPECIFICATIONS.

CAUTION: Replace cylinder head bolts if stretched or used more than 5 times. When in doubt, replace cylinder head bolts.

Installation

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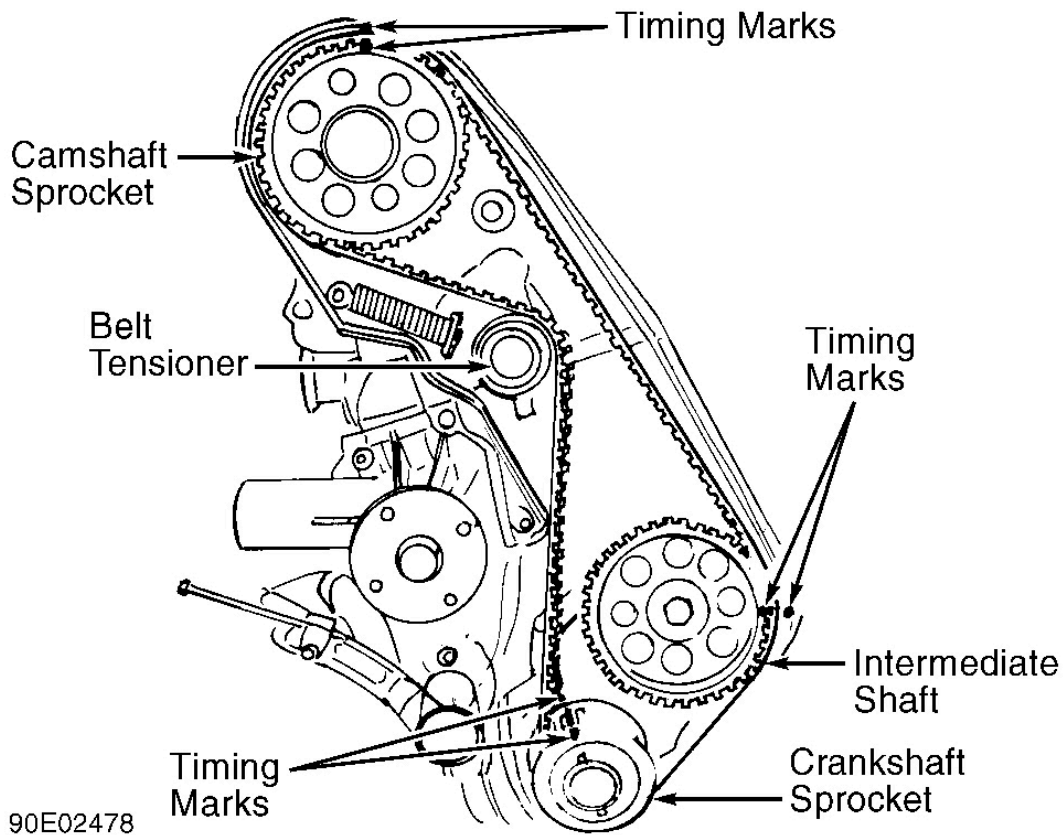


Fig. 4: Aligning Timing Marks

Courtesy of VOLVO CARS OF NORTH AMERICA

Inspection

Check belt teeth for cracks, damage or oil contamination. Inspect all sprockets for damage. Check belt tensioner for roughness in rotation. Replace components if damaged.

Installation

1. Install belt tensioner if previously removed. Ensure all timing marks align. See **Fig. 4**.
2. Outer side of timing belt has 2 lines, which should fit toward crankshaft marks. Install belt over crankshaft sprocket first, then over intermediate shaft. Stretch belt on tension side and fit over camshaft sprocket. Slide back of belt onto belt tensioner.
3. Loosen nut on belt tensioner to permit spring tension to act against drive belt. Tighten belt tensioner nut. Ensure timing marks align. To install remaining components, reverse removal procedure.

CAUTION: Readjust timing belt when engine reaches normal operating temperature.

4. Warm engine to normal operating temperature. Remove plug from front timing belt cover. Loosen belt tensioner bolt one turn and allow belt tensioner spring to apply pressure on timing belt. This