

1983 BMW 320i

1.8L 4-CYL 1983 Engines - 1.8L 4-Cylinder

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ENGINE IDENTIFICATION

NOTE: For engine repair procedures not covered in this article, see **ENGINE OVERHAUL PROCEDURES - GENERAL INFORMATION** article in the **GENERAL INFORMATION** section.

ENGINE IDENTIFICATION

Engine identification number is located on engine block at left hand side above starter motor.

ADJUSTMENTS

VALVE CLEARANCE ADJUSTMENT

1. Adjust valves in firing order (1-3-4-2), with piston of cylinder concerned on TDC at end of compression stroke. Use a feeler gauge to measure clearance between rocker arm eccentric and tip of valve.
2. To adjust valve clearance, loosen nut of rocker eccentric and insert a rod in eccentric hole. Rotate eccentric until proper clearance is obtained, then tighten lock nut. See **Fig. 1**.

VALVE CLEARANCE ADJUSTMENT

Application	In. (mm)
Intake	.008 (.20)
Exhaust	.010 (.25)

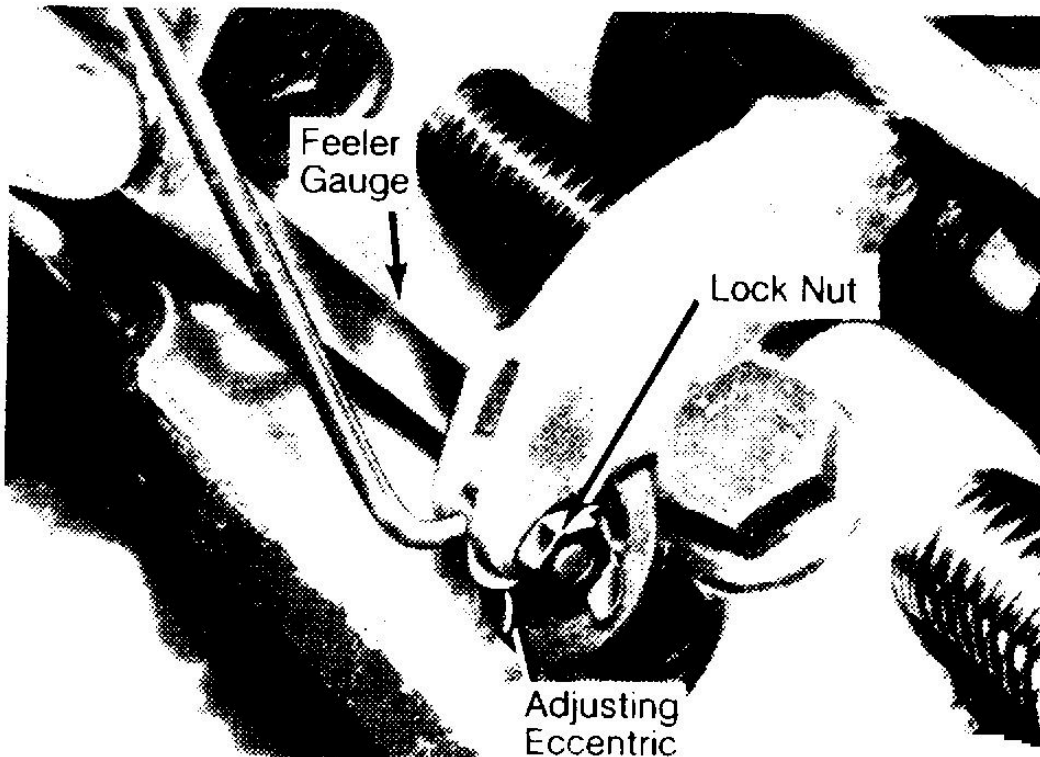


Fig. 1: Adjusting Valve Clearance

NOTE: NEVER measure or adjust valve clearance between camshaft lobe and rocker arm.

REMOVAL & INSTALLATION

MANUAL TRANSMISSION

Removal

1. Remove all upper transmission-to-engine mounting bolts. Remove exhaust pipe support bracket. Disconnect exhaust pipe at manifold. Remove front rubber coupling from transmission output flange.
2. Detach center bearing bracket from body after removing heat shield to gain access. Pull down on drive shaft at center bearing to disengage shaft from transmission flange.
3. Remove speedometer cable. Label and disconnect back-up light switch and 4th gear switch. Remove center console from transmission. Engage transmission in reverse gear, then remove selector rod.
4. Remove clutch slave cylinder and hydraulic line support bracket. Support transmission with transmission jack or stand. Remove crossmember. Remove remaining transmission mounting bolts. Remove transmission.

1983 BMW 320i

1.8L 4-CYL 1983 Engines - 1.8L 4-Cylinder

Installation

To install, reverse removal procedure while noting the following: Install clutch slave cylinder with bleeder valve facing downward. When installing drive shaft, push center bearing bracket forward .08" (2.0 mm) to preload center bearing, then tighten nuts.

AUTOMATIC TRANSMISSION

Removal

1. Remove accelerator cable and detach from bracket. Remove upper transmission-to-engine mounting bolts. Remove oil filler neck and drain oil.
2. Remove exhaust pipe support bracket. Disconnect exhaust pipe at manifold. Remove speedometer cable from transmission. Remove transmission output flange bolts and detach drive shaft coupling.
3. Remove heat shield to gain access to center support bearing. Remove center bearing bracket. Pull down on drive shaft at center bearing to disengage shaft from transmission flange.
4. Remove cover from bottom of transmission. Remove drive plate-to-torque converter bolts. Remove transmission oil cooler lines. Support transmission with transmission jack or stand, then remove crossmember.
5. Remove remaining transmission mounting bolts. Lift off side cover from transmission. Insert a bar through side cover hole, and carefully pry transmission and torque converter away from engine.

Installation

To install, reverse removal procedure. Ensure that torque converter is properly positioned on drive plate. When installing drive shaft on 320i models, push center bearing bracket forward .08" (2.0 mm) to preload center bearing, then tighten nuts.

ENGINE

Removal

1. Disconnect positive and negative cables from battery. Remove transmission. Drain cooling system and disconnect hoses. Remove oil cooler lines from radiator (if equipped). Remove fan shroud and radiator.
2. If equipped, remove A/C compressor (with hoses connected) and position aside. Remove air cleaner housing. Disconnect fuel feed and return hoses from fuel distributor.
3. Remove hose from charcoal canister. Disconnect ground cable from front axle carrier. Disconnect accelerator cable from throttle valve housing. Label and disconnect all coolant and vacuum hoses from engine.
4. Label and disconnect all electrical and ignition wires between chassis and engine that might interfere with engine removal. Install lifting chain to engine.
5. With engine hoist in place, apply slight supporting tension to engine. Detach left engine mount and upper engine damper. Detach right engine mount. Remove engine from vehicle.

Installation

To install, reverse removal procedure. When filling with coolant, set heater control to "WARM" and fill radiator slowly. Bleed cooling system after engine is warm.

CYLINDER HEAD

Removal

1. Disconnect ground cable from battery. Remove air cleaner housing. Remove fuel line from cold start valve. Remove air hose from auxiliary air regulator.
2. Label and disconnect electrical connections at cylinder head and intake manifold that might interfere with cylinder head removal. Be sure to disconnect harness plug in glove box, and pull wiring through hole in engine compartment wall.
3. Drain cooling system. Disconnect all coolant hoses from cylinder head and intake manifold. Label and disconnect all vacuum hoses from intake manifold.
4. Remove cap from ignition coil. Label and disconnect primary ignition wires from coil and distributor. Remove high tension lead from distributor cap and spark plug wires from spark plugs. Remove distributor cap.

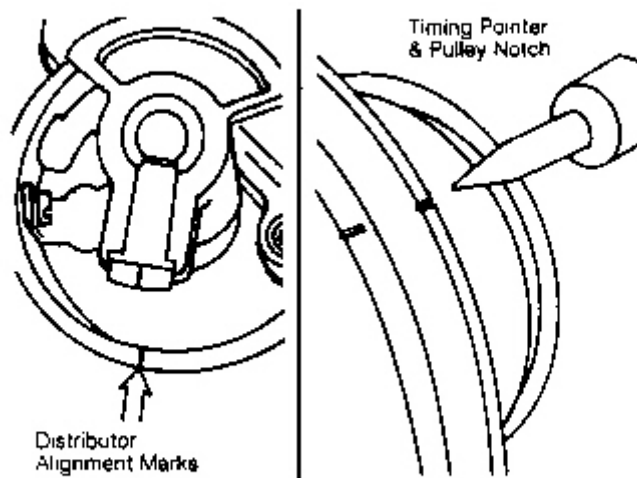


Fig. 2: Timing Mark Alignment for Setting No. 1 Piston at TDC

NOTE: DO NOT allow crankshaft to move once marks are aligned.

5. Disconnect accelerator cable. Disconnect oil dipstick tube mount. Label and disconnect fuel lines to fuel injectors. Remove rocker cover. Set No. 1 piston at TDC. Align distributor rotor with notch in distributor

1983 BMW 320i

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housing, and timing pointer with notch in damper. See **Fig. 2**.

6. Remove upper front cover. Using care (because of strong spring pressure), remove timing chain tensioner plug, spring and piston. Remove 4 camshaft sprocket attaching bolts and remove sprocket.
7. Disconnect exhaust support bracket. Disconnect exhaust pipe from manifold. Remove cylinder head bolts in reverse sequence of tightening. See **Fig. 3**. Remove cylinder head with intake manifold attached.

Inspection

Cylinder head may be machined a maximum of .012" (.30 mm). Original height of cylinder head is 5.075-5.083" (128.9-129.1 mm) as measured from engine block mating surface to valve cover surface. If cylinder head is machined, use a .012" (.30 mm) oversize head gasket.

Installation

1. Clean all gasket mating surfaces. Measure distance dowel sleeve (installation guide) projects above cylinder head mounting surface. See **Fig. 4**. Maximum projection should not exceed .197" (5.00 mm).
2. Remove any oil in cylinder head bolt blind holes. Oil in holes may result in incorrect head bolt tightening and possible cylinder head or block damage. Clean cylinder head bolts. Clean threads in block.
3. Lubricate head bolt threads and bottom of bolt heads with engine oil. Using new head gasket, install cylinder head. Tighten head bolts in 3 steps. Repeat 3rd step for final tightening. See **Fig. 3**.

1983 BMW 320i

1.8L 4-CYL 1983 Engines - 1.8L 4-Cylinder

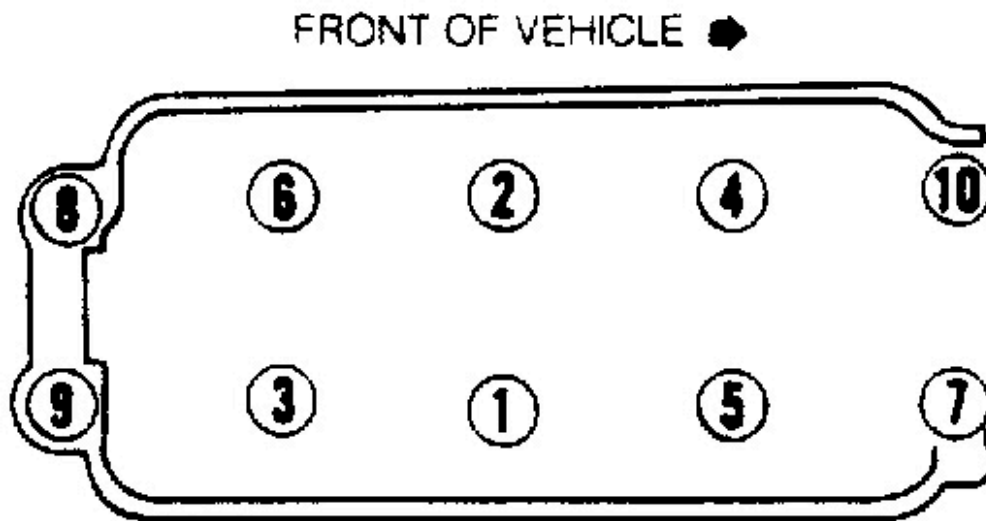


Fig. 3: Cylinder Head Tightening Sequence

NOTE: Tighten head bolts in 3 steps, then repeat 3rd step. Retighten head bolts (cold) at 1000 miles.

4. Install remaining components in reverse order of removal. Ensure valve timing is correct. Adjust valves. At 1000 miles, check torque of head bolts with engine cold. If necessary further tighten head bolts.

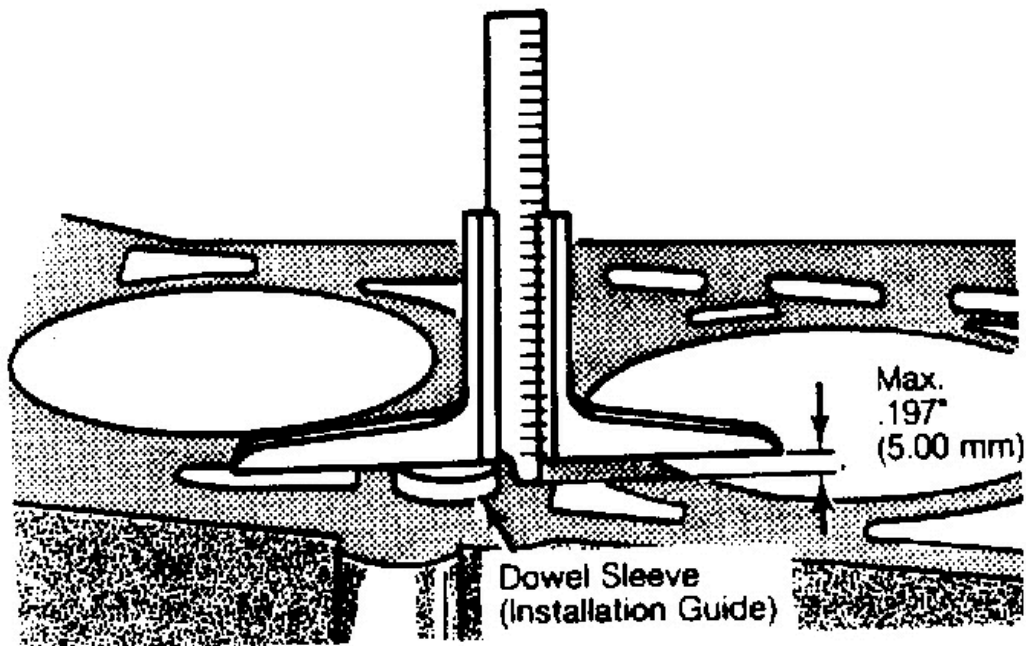


Fig. 4: Measuring Dowel Sleeve Projection Above Cylinder Block

NOTE: Ensure cylinder block deck surface is clean and free from nicks or burrs.

ENGINE FRONT COVERS

Removal (Upper Cover)

Remove rocker cover. Disconnect air injection pipe from exhaust manifold. Remove upper front cover attaching bolts. Remove, clean, and inspect cover.

Installation

1. Fill 2 holes in lower front cover (where it junctions with the cylinder head) with sealing compound. Using a new gasket, install front cover.
2. Install attaching bolts. Loosely tighten attaching bolts to lower front cover. Tighten bolts that attach front cover to cylinder head. Tighten bolts that attach upper front cover to lower front cover last.

Removal (Lower Cover)

1. Disconnect battery ground cable. Remove water pump. Remove upper front cover. Using care (because of strong spring pressure), remove timing chain tensioner plug, spring and piston.

1983 BMW 320i

1.8L 4-CYL 1983 Engines - 1.8L 4-Cylinder

2. Disconnect wires from alternator. Remove alternator, mounting bracket and adjusting bracket.
3. Remove oil filter adapter housing. Remove air pump, mounting bracket and adjusting bracket. Remove lifting eye from lower cover. Remove flywheel cover and lock flywheel in place. Remove crankshaft damper.
4. Remove attaching bolts from lower cover and front of oil pan. Loosen remaining oil pan bolts. Carefully separate oil pan gasket from timing case cover with knife blade. Remove lower cover.

Installation

Apply gasket sealer to gaskets. Install lower front cover and remaining components in reverse order of removal. Ensure that chain tensioner take-up land is in oil pocket.

FRONT COVER OIL SEAL

Removal & Installation

1. Remove fan housing from radiator. Loosen alternator and remove drive belt. Remove flywheel cover and lock flywheel in place. Remove damper. Carefully pry seal from recess in cover.
2. Lubricate seal lip with oil. Use seal installing tool to press in seal flush.

TIMING CHAIN & SPROCKETS

Removal

1. Remove distributor cap. Set No. 1 piston at TDC. Align distributor rotor with notch in distributor housing, and timing pointer with notch in damper/pulley. See **Fig. 2**. **DO NOT** allow crankshaft to move.
2. Remove upper and lower timing case covers. Remove camshaft sprocket. Remove circlip and unscrew pivot pin until chain guide rests on cylinder head gasket. Remove timing chain from sprocket and crankshaft.
3. Remove chain guide by pulling down and swinging to the right. Remove chain from guide.
4. If crankshaft sprocket removal is necessary, remove oil pan. Remove oil pump sprocket and drive chain. Remove Woodruff key from crankshaft. Using a puller, remove crankshaft sprocket.

Installation

1. If removed, crankshaft sprocket must be heated before installation. Install Woodruff key, crankshaft sprocket, oil pump drive chain, and oil pump sprocket.
2. Oil pump drive chain has correct tension if chain gives under slight thumb pressure midway between sprockets. Two drive chains are available for tension adjustment. If proper tension cannot be obtained with either drive chain, shims are available for installation between oil pump and cylinder block.
3. Install timing chain, camshaft sprocket and remaining components in reverse order of removal. Note that dowel pin bore in camshaft flange must be positioned downward. Notch in camshaft flange must face upward and align with cast tab on cylinder head.

VALVE TIMING