1974-79 TUNE-UP PROCEDURES
BMW 6-Cylinder

Bavaria, 3.0 CS, 3.0 Si, 528i, 530i, 633CSi, 733i

ENGINE IDENTIFICATION

Engine identification number is located at rear of engine block, above starter.

MODEL IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

Number is stamped on vehicle identification plate, which is located on top, left side of instrument panel and visible through windshield. Number also appears on the support plate of the right-hand wheel arch, at rear of engine compartment.

ENGINE COMPRESSION

Check compression pressure with battery fully charged, engine at normal operating temperature, throttle fully open, and engine at cranking speed.

NOTE: On 528i models, deactivate the fuel injection system by pulling connection "1" at the coil prior to making compression test.

COMPRESSION SPECIFICATIONS

Application	Pressure
Bavaria, 3.0 CS, 3.0 Si, 528i, 530i & 630CSi	
Good	Above 156 psi (11 kg/cm²)
Normal	142-156 psi (10-11 kg/cm²)
Poor	Below 142 psi (10 kg/cm²)
633CSi & 733i	
Good	Above 142 psi (10 kg/cm²)
Normal	121-142 psi (8.5-10 kg/cm²)
Poor	Below 121 (8 kg/cm²)

VALVE CLEARANCE

With engine cold, loosen nut on rocker arm and adjust position of eccentric cam to obtain proper clearance. Adjust valves in firing order sequence at TDC of compression stroke. Use feeler gauge to measure clearance between rocker arm eccentric and valve stem.

VALVE ADJUSTMENT SEQUENCE

Adjust Valves Of Cylinder Number	When Valves Overlap At Cylinder Number
1	6
5	2
3	4
6	1
2	5
4	3

VALVE CLEARANCE

Application	Clearance In. (mm)
Bavaria & 3.0 CS Intake & Exhaust	.012-.014 (.30-.37)
All Others Intake & Exhaust	.010-.012 (.25-.30)

VALVE ARRANGEMENT

Right Side - All Exhaust.
Left Side - All Intake.

SPARK PLUGS

SPARK PLUG SPECIFICATIONS

Application	Specification
Gap	.024-.028" (.6-.7 mm)
Torque	18-22 ft. lbs. (24-30 N.m)

SPARK PLUG TYPE

Application	Champion No.
1974-76 Models	N9Y
1977-79 Models	N10Y

HIGH TENSION WIRE RESISTANCE

Carefully remove ends of wire from spark plug and distributor. Using an ohmmeter, check resistance of wire while gently twisting wire. If resistance is not to specification, or fluctuates from infinity to any value, replace wire.

HIGH TENSION WIRE RESISTANCE

Application	Resistance (Ohms)
All Models	25,000-30,000

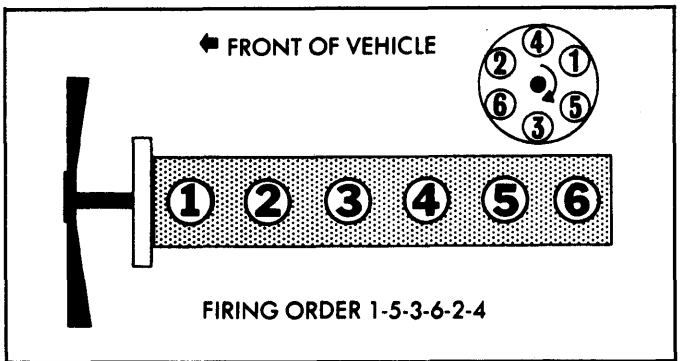

Fig. 1: Bavaria, 3.0 Series & 530i Firing Order & Distributor Rotation

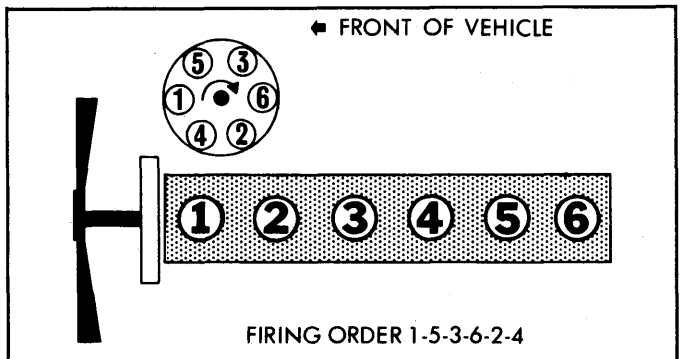

Fig. 2: 528i, 633CSi & 733i Firing Order & Distributor Rotation

DISTRIBUTOR

The Bavaria, 3.0 Series, 530i and 630CSi models use Bosch single point distributor. All 528i, 633CSi and 733i models use Bosch breakerless ignition system.

DISTRIBUTOR SPECIFICATIONS

Application	Specification
528i, 633CSi & 733i	
Air Gap	.014-.027" (.35-.69 mm)
Dwell Angle (Non-Adjustable)	32-50°
Bavaria, 3.0 CS, 3.0 Si, 530i & 630CSi	
Point Gap	.014-.016" (.35-.40 mm)
Dwell Angle	35-41°
Breaker Arm Spring Tension	18-22 oz. (500-630 g)
Condenser Capacity	.18-.22 mfd.

1974-79 TUNE-UP PROCEDURES
BMW 6-Cylinder (Cont.)

IGNITION TIMING

1) Check and adjust timing with engine at normal operating temperature and distributor vacuum hoses disconnected. Connect timing light, start engine and increase engine speed to specified timing RPM.
2) Steel ball embedded in flywheel, long pin on automatic transmission equipped models, should line up with pointer attached to hole in flywheel housing. *See Fig. 3.*
3) Loosen distributor clamp, turn distributor until proper timing is achieved and tighten clamp. Connect distributor vacuum hoses and set idle speed to specified RPM.

IGNITION TIMING SPECIFICATIONS

Application	RPM	Specifications
528i	2400	22°BTDC
633CSi & 733i		
Federal	2400	22°BTDC
California	2750	22°BTDC
All Others		
Federal	1700	22°BTDC
California	2700	22°BTDC

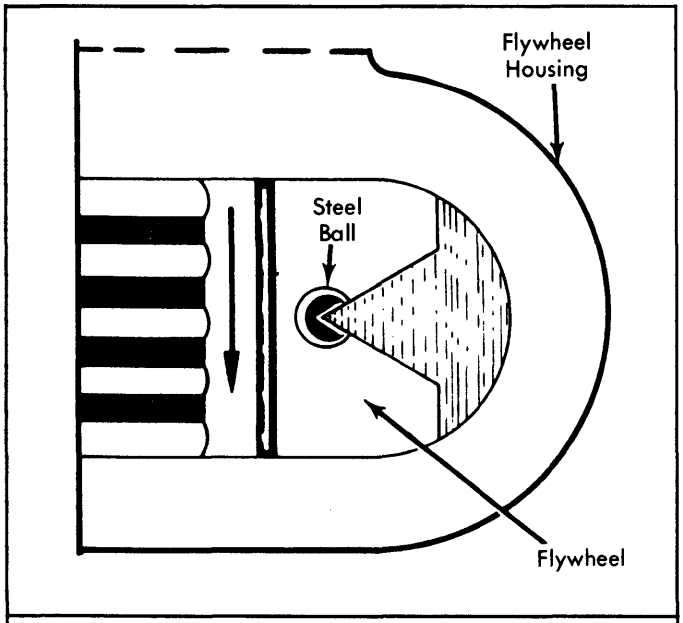

Fig. 3: Ignition Timing Mark Location

IDLE SPEED & MIXTURE

Bavaria & 3.0 CS - 1) Ensure engine is at normal operating temperature. Remove air filter and check ignition timing and dwell angle. Connect exhaust gas analyzer, tachometer and carburetor synchronizer to vehicle.
2) Before synchronizing carburetors, adjust CO% level to 2 percent. If uncorrected idle does not exceed 1000 RPM, CO% level should be reduced. Using synchronizer, adjust by-pass adjustment screw on both carburetors to obtain an equal airflow. DO NOT alter setting of first stage throttle plate.
3) Adjust idle mixture to specifications at each exhaust manifold. Each manifold has an opening for sampling exhaust gases, which is covered by a copper bolt.
4) Reinstall air cleaner and adjust mixture to lean best idle at specified CO% level. Check idle CO% level at tailpipe once more. Disconnect vacuum hose from dashpot.
5) Operate throttle linkage to increase speed to 2500 RPM, then gradually decrease throttle opening until dashpot set screw is contacted. Speed at this point should be 1650-1700 RPM. If necessary, loosen dashpot clamp and turn dashpot to obtain correct RPM setting.

3.0 Si - 1) Ensure engine is at normal operating temperature, air filter is in good condition, ignition timing and valve clearance adjusted to specification. Connect tachometer to engine.
2) Adjust idle speed to specified RPM by turning adjustment screw located on throttle housing. Turn potentiometer on control unit clockwise to increase CO% level, counterclockwise to decrease CO% level until specified CO% level is obtained. Recheck idle speed and CO% level and adjust as necessary.
528i - 1) Ensure engine is at normal operating temperature, air filter is in good condition, ignition timing and valve clearance adjusted to specification. Connect tachometer to engine.
2) Disconnect charcoal canister-to-throttle housing hose, but DO NOT plug openings. Remove plug from CO test plug hole at rear of exhaust manifold and install Exhaust Gas Pick-Up Attachment (13 0 070) into hole.
3) Connect exhaust gas analyzer to pick-up attachment. Set idle speed to specified RPM by turning adjustment screw located below the throttle butterfly switch. Read and record CO% value.
4) Disconnect Green wire from wiring harness at rear of right fender. This disconnects the oxygen sensor and prevents the sensor circuitry from compensating for an incorrect CO adjustment.
5) Idle CO% value should not change when oxygen sensor is disconnected. If it does, correct by turning CO adjusting screw in lower side of air flow meter. Repeat adjustment procedure until CO% value does not change when sensor is disconnected.

IDLE SPEED & CO% LEVEL SPECIFICATIONS

Application	Idle RPM	CO%
1974		
All Models	900-1000	Below 2.0
1975-78		
All Models	850-1050	1.5-3.0
1979		
528i	850-1050	0.2-0.8
633CSi & 733i	850-1050	1.5-3.0

530i & 630CSi - 1) Ensure engine is at normal operating temperature, air filter is in good condition, ignition timing and valve clearance adjusted to specification. Disconnect collector-to-charcoal canister, but DO NOT plug openings.
2) Disconnect and plug air injection hose. Connect tachometer to engine. Adjust idle speed to specified RPM by turning adjustment screw located below the throttle butterfly switch.
3) Remove plug from airflow sensor. Use Wrench (13 1 060) to turn by-pass air screw in airflow sensor until specified CO% level is obtained. Reinstall airflow sensor plug. Reconnect all hoses.
633CSi & 733i - 1) Disconnect hose from throttle housing-to-charcoal canister, but DO NOT plug throttle housing port or hose. Disconnect air injection hose from air pump. Adjust engine speed to specified RPM by turning adjusting screw located below throttle butterfly switch.
2) Adjust CO% value to specifications by turning the adjusting screw in the lower side of the air flow meter. Turning adjusting screw clockwise increases CO% value, turning it counterclockwise decreases CO% value.

COLD (FAST) IDLE RPM

Bavaria & 3.0 CS - 1) With engine at normal operating temperature, carburetors synchronized and air cleaner removed, disconnect linkage at rear carburetor.
2) Close choke valve by hand until there is a .094" (2.4 mm) gap between carburetor wall and choke valve. Automatic choke is now in stage 2. Release choke valve and start engine without depressing accelerator pedal.
3) Fast idle speed should be 1400 RPM. To adjust fast idle speed, turn engine off and turn adjustment screw (located in choke housing) clockwise to increase speed or counterclockwise to decrease speed.
4) Repeat procedure for front carburetor. Reconnect linkage at rear carburetor and set choke on both carburetors to stage 2. Release

1974-79 TUNE-UP PROCEDURES
BMW 6-Cylinder (Cont.)

choke valves and start engine without depressing accelerator pedal. Fast idle should be 1800-2000 RPM.

AUTOMATIC CHOKE SETTING

Bavaria & 3.0 CS - Notch on choke housing must line up with projection on choke body.

FUEL PUMP

1974 FUEL PUMP SPECIFICATIONS

Application	Specification
Pressure (At 4000 RPM)	3.3-5.0 psi (.21-.25 kg/cm²)
Volume (At 1000 RPM)	1.1 pts. in 30 seconds

1975-76 FUEL PUMP SPECIFICATIONS

Application	Specification
Pressure	
530i	32.3-38.3 psi (2.3-2.7 kg/cm²)
3.0 Si	28.5-31.3 psi (2.0-2.2 kg/cm²)
Volume	
530i	1.9 pts. in 30 seconds
3.0 Si	1.6 pts. in 30 seconds

1977 FUEL PUMP SPECIFICATIONS

Application	Specification
Pressure	
530i	32.3-38.3 psi (2.3-2.7 kg/cm²)
630CSi	43 psi (3.0 kg/cm²)
Volume	
530i	1.9 pts. in 30 seconds
630CSi	1.75 pts. in 30 seconds

1978 FUEL PUMP SPECIFICATIONS

Application	Specification
Pressure	43 psi (3.0 kg/cm²)
Volume	1.7 pints in 30 seconds

1979 FUEL PUMP SPECIFICATIONS

Application	Specification
Pressure	33.4-39.2 psi (2.3-2.7 kg/cm²)
Volume	1.9 pints in 30 seconds

EXHAUST EMISSION SYSTEMS

See appropriate articles in EXHAUST EMISSION SYSTEMS section.

IGNITION SYSTEM

DISTRIBUTOR

Vehicles may use Bosch single point distributors or Bosch Breakerless Ignition system.

Other Data & Specifications - See Bosch Single Point Distributor and Bosch Breakerless Ignition System article in DISTRIBUTORS & IGNITION SYSTEMS section.

IGNITION COIL

IGNITION COIL SPECIFICATIONS

Application	Specification
Primary	
3.0 Si, 530i & 630CSi	1.7-2.1 Ohms
All Other Models	0.4 Ohms

FUEL SYSTEMS

CARBURETORS

CARBURETORS

Application	Model
1974	
All Models	Zenith 35/40 INAT

Other Data & Specifications - See appropriate Zenith Carburetor article in FUEL SYSTEMS section.

FUEL INJECTION

All 1975-78 models are equipped with Bosch Electronic Fuel Injection. All 1979 models are equipped with Bosch Air Flow Controlled (AFC) Fuel Injection. In addition to the AFC system, the 528i incorporates an oxygen sensor feedback system which controls fuel injection in accordance with engine and driving needs.

Other Data & Specifications - See Bosch AFC or Bosch Electronic Fuel Injection articles in FUEL SYSTEMS section.