1975-79 TUNE-UP PROCEDURES
Oldsmobile V6

ENGINE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

Engine can be identified by the fifth character of Vehicle Identification Number (VIN), located on plate attached to driver's side of instrument panel, and visible through windshield.

VIN CODE [1]

Application	Codes
1975-77	
231" V6	C
1978-79	
231" V6	A
231" V6	2

[1] - Information not available for 1975 models.

ENGINE IDENTIFICATION CODE

Engine code is stamped on right front side of engine block, near water pump. Engine code is found on labels located on both valve covers.

ENGINE CODE

Application	Codes
1975	FP, FR, FS
1976	
231" (VIN C)	FH, FI, FJ, FO
1977	
231" (VIN C)	
California	SB, SE, SI, SK, SU, SY
Federal	SA, SD, SG, SI, SW
High Altitude	SF, SM, SN
1978	
231" (VIN A)	
California	EE, EK, EL, OD, OE, OK
Federal	EA, EB, EC, ED, EH, EI, EJ, EM, EN, OA, OB, OH
High Altitude	EG, OC, OF
1979	
231" (VIN A)	NA, NB, NC, NE, NF, NG, NH, NK NJ, NL, NM, RA, RB, RC, RF, RG, RJ, RW, RY, SJ, SK, SL, SM, SO, SP, SR, SS
231" (VIN 2)	RM, RN

TUNE-UP NOTES

NOTE: In order to comply with emission standards, specifications shown on engine compartment Emission Control Tune-Up Decal must be used in all instances.

NOTE: The EPA High Altitude emission standards apply to vehicles sold in certain areas outside California which have an elevation above 4000 feet.

NOTE: Before making a compression test or cranking engine with a remote starting switch, disconnect ignition switch connector (Pink wire) from High Energy Ignition (HEI) system distributor.

CAUTION: Do not remove spark plug wires with engine running. High Energy Ignition (HEI) secondary voltage is higher than standard ignition systems and may inflict harmful electrical shock.

NOTE: Damage to HEI electronic module and/or ignition coil may result if "TACH" terminal, in distributor cap connector, is directly grounded.

ENGINE COMPRESSION

Test compression with engine warm, all spark plugs removed and throttle and choke valves wide open. If using a remote starting switch, disconnect the ignition switch connector (Pink wire) from HEI distributor.

ENGINE COMPRESSION SPECIFICATIONS

Application	Specification
Compression Ratio	8.0:1
Recommended Fuel	Unleaded (87 AKI Minimum)
Compression Pressure (Minimum)	100 psi
Maximum Variation Between Cylinders	30%

VALVE CLEARANCE

Hydraulic Lifters - Zero lash.

VALVE ARRANGEMENT

E-I-E-I-I-E - (Left Bank, Front-to-Rear),
E-I-I-E-I-E - (Right Bank, Front-to-Rear).

SPARK PLUGS

SPARK PLUG TYPE

Application	AC NO.
1975-76	
All Models	R44SX
1977-79	
All Models	R46TSX

SPARK PLUG INSTALLATION

Application	Gap	Torque
All Models	.060"	25 ft. lbs.

HIGH TENSION WIRE RESISTANCE

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

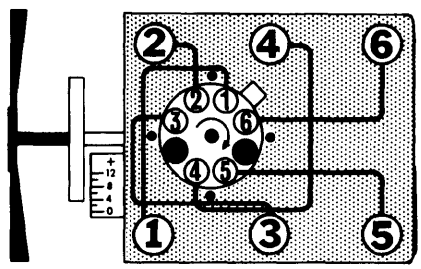
WIRE RESISTANCE

Wire Length	Ohms (Maximum)
1975-76	
0-15"	10,000
15-25"	15,000
25-35"	20,000
Over 35"	25,000
1977-79	
Under 24"	30,000
Over 24"	50,000

DISTRIBUTOR

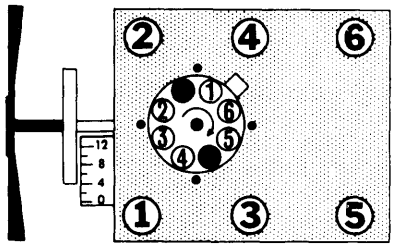
All models are equipped with High Energy Ignition system. No adjustment is required.

1975-79 TUNE-UP PROCEDURES
Oldsmobile V6 (Cont.)



Firing Order 1-6-5-4-3-2 ◆ FRONT OF VEHICLE

Fig. 1: 231" (VIN C) Firing Order & Timing Marks



Firing Order 1-6-5-4-3-2 ◆ FRONT OF VEHICLE

Fig. 2: 231" (VIN A & 2) Firing Order & Timing Marks

IGNITION TIMING

NOTE: Some engines incorporate a magnetic timing probe hole for use with special electronic timing equipment. Refer to equipment manufacturer's instructions for correct procedures.

1975-77 Models - Remove air cleaner and plug manifold vacuum fitting. Disconnect and plug distributor vacuum advance hose. Adjust ignition timing at specified RPM and automatic transmission in Drive.

1978-79 Models - Ignition timing procedures will vary with vehicle model and component application. See Emission Control Tune-Up Decal in engine compartment for correct adjustment procedures.

IGNITION TIMING SPECIFICATIONS (DEGREES BTDC@RPM)

Application	Auto. Trans.	Man. Trans.
1975-76		
All Models	12@650	12@800
1977		
All Models	12@600	12@600
1978-79		
All Models	[1] 15@600	15@800

[1] - Set timing at 580 RPM on 1979 VIN 2 engine.

NOTE: Some 1977 V6 engine, power steering equipped models may experience a no start condition. This condition may be caused by a poor ground connection from power steering pump bracket to cylinder head mounting bolt. Replace existing bolt with cadmium bolt or install star washer to correct condition.

HOT (SLOW) IDLE RPM

1975-76 Models - 1) With engine at normal operating temperature, remove air cleaner. Disconnect air cleaner vacuum hose at intake manifold and plug fitting. Set parking brake and block drive wheels.
2) With choke open, A/C off, disconnect and plug EGR valve and vapor canister hoses at carburetor. Adjust ignition timing to specifications, leaving vacuum hose to distributor connected.
3) Adjust idle stop solenoid screw to obtain solenoid energized RPM with manual transmission in Neutral or automatic transmission in Drive. Then adjust idle speed screw to obtain specified curb idle speed (solenoid de-energized) with manual transmission in Neutral or automatic transmission in Drive.

1977 Models - 1) With engine at normal operating temperature, set parking brake and block drive wheels. Disconnect and plug distributor vacuum advance hose and EGR valve vacuum hose. Disconnect emission hose from air cleaner.
2) With ignition timing properly adjusted, choke open, A/C off and air cleaner installed, disconnect idle speed solenoid wire on manual transmission models.
3) Place automatic transmission in Drive or manual transmission in Neutral. Adjust carburetor idle speed screw to obtain specified curb idle speed. On manual transmission models, reconnect idle speed solenoid and adjust solenoid energized idle speed.
4) On models with A/C idle speed-up solenoid, place transmission in Park or Neutral. Disconnect A/C compressor clutch lead and turn A/C on. Adjust idle speed-up solenoid to solenoid energized idle speed.

1978-79 Models - 1) Idle speed adjustment procedures will vary with vehicle model and component application. See Emission Control Tune-Up Decal in engine compartment for adjustment preparations, then proceed as follows:
2) On models without A/C or idle speed solenoid, place idle speed screw on low step of fast idle cam. Adjust idle speed screw to obtain specified curb idle RPM.
3) On models without A/C but with idle speed solenoid, energize solenoid and open throttle slighlty to allow solenoid plunger to fully extend. Adjust solenoid screw to obtain specified solenoid energized RPM. Disconnect electrical lead at solenoid. With solenoid de-energized, adjust idle speed screw to obtain specified curb idle RPM.
4) On models with A/C, turn idle speed screw to obtain specified curb idle RPM. Disconnect A/C compressor clutch lead at compressor. Turn A/C on to energize idle speed solenoid. Place automatic transmission in Drive. Open throttle slightly to allow solenoid plunger to fully extend. Adjust idle speed solenoid screw to obtain specified solenoid energized RPM. Reconnect A/C compressor clutch lead.

IDLE SPEED (RPM) SPECIFICATIONS

Application	Curb Idle	Solenoid Energized
1975		
Man. Trans.	600	800
Auto. Trans.	600	500
1976		
Man. Trans.	600	800
Auto. Trans.	600	...
1977		
Man. Trans.	600	800
Auto. Trans.	600	670
1978		
California	600	670
Federal		
Man. Trans.	800	800
Auto. Trans.	600	670
High Altitude	600	...
1979		
California		
Man. Trans.	600	800
Auto. Trans.	[1] 600	...
Federal		
Man. Trans.	600	800
Auto. Trans.	550	670
High Altitude	600	...

[1] - Set at 580 RPM on VIN 2 engine.

1975-79 TUNE-UP PROCEDURES
Oldsmobile V6 (Cont.)

IDLE MIXTURE

NOTE: Idle mixture screws on 1979 Rochester carburetors are covered by hardened steel plugs. Manufacturer recommends plug removal and idle mixture adjustment only after major carburetor overhaul, throttle body replacement or emissions failures.

MIXTURE SCREW PLUG REMOVAL

1) Remove carburetor from engine, invert carburetor and drain fuel. Place carburetor on holding fixture with manifold side up.
2) Place a punch between the 2 locator marks on throttle body beneath mixture screw plug (manifold side) and break out throttle body to gain access to plug.
3) Use punch to drive out mixture screw plug. If hardened steel plug shatters, remove loose pieces.
4) Repeat steps **2)** and **3)** to remove remaining plug (if equipped).

TACHOMETER (LEAN DROP) PROCEDURE

1975 Models - 1) With engine at normal operting temperature, disconnect vapor canister hose from air cleaner. Disconnect and plug distributor vacuum advance hose and EGR valve vacuum hose. Turn A/C off (if equipped).
2) With air cleaner installed, place automatic transmission in Drive. Set idle speed to specified solenoid energized RPM. Turn idle mixture screws out equally, until maximum RPM is obtained.
3) Reset idle speed (if required) using idle stop solenoid screw to 80 RPM above specified idle RPM. Now turn idle mixture screws in equally, until specified idle speed RPM is obtained.

1976 Models - 1) With engine at normal operting temperature, disconnect vapor canister hose from air cleaner. Disconnect and plug distributor vacuum advance hose and EGR valve vacuum hose. Turn A/C off (if equipped).
2) With air cleaner installed, place automatic transmission in Drive. Set idle speed to specified solenoid energized RPM (manual transmission) or curb idle RPM (automatic transmission).
3) Cut tabs off limiter caps using care not to damage mixture screws. Turn idle mixture screws out equally, until maximum RPM is obtained. Reset idle speed to specified before lean drop RPM.
4) Now turn idle mixture screws in equally, until specified idle speed RPM is obtained. On manual transmission models, reset curb idle RPM with solenoid de-energized.

1977 Models - 1) Set parking brake and block drive wheels. Remove air cleaner to access carburetor, but keep vacuum hoses connected. Disconnect and plug other hoses as directed in Emission Control Tune-Up Decal under hood. Disconnect and plug vacuum hose to level control compressor (if equipped).
2) Ensure engine is at normal operating temperature, choke is fully open, and A/C off (if equipped). Disconnect and plug distributor advance hose. Check ignition timing and adjust if necessary. Reconnect vacuum advance hose.
3) Using care not to bend idle mixture screws, remove limiter caps from idle mixture screws (if equipped). Lightly seat idle mixture screws, then back out just enough so engine will run.
4) Place automatic transmission in Drive or manual transmission in Neutral. Back out (richen) idle mixture screws until maximum idle speed is obtained. Next, adjust idle speed screw until higher RPM reading is obtained.
5) Turn idle mixture screw in (lean) until lower RPM reading is obtained. Adjust idle speed screw to obtain specified curb idle speed. Reconnect all hoses and install air cleaner.

IDLE MIXTURE RPM SPECIFICATIONS

Application	Higher RPM	Lower RPM
1976 [1]		
Man. Trans.		[2] 1100
Auto. Trans.		600
1977		
California		
Man. Trans.	810	800
Auto. Trans.	610	600
Federal		
Man. Trans.	860	800
Auto. Trans.	640	600
High Altitude		
Man. Trans.	810	800
Auto. Trans.	610	600

[1] - Before lean drop RPM on 1976 models.
[2] - With solenoid energized.

PROPANE ENRICHMENT PROCEDURE

All 1978-79 Models, Except 1979 231" (VIN 2) - 1) With engine at normal operating temperature, choke fully open and A/C off (if equipped), set parking brake and block drive wheels. Disconnect and plug hoses as directed by Emission Control Tune-Up Decal under hood.
2) Connect tachometer to engine. Disconnect vacuum advance hose and set timing to specification. Reconnect vacuum advance hose. Disconnect crankcase ventilation tube from air cleaner. Insert hose with rubber stopper (J-26911) from propane valve into positive crankcase ventilation tube opening in air cleaner.
3) Propane cartridge must be in a vertical position. Slowly open propane control valve until maximum engine speed is reached with transmission in Drive (Neutral for manual transmission).

NOTE: Too much propane will cause engine speed to drop.

4) Observe propane flow meter to ensure propane cartridge is full. With propane flowing, adjust idle speed screw to the enriched RPM. Readjust propane flow to be certain of maximum engine speed and adjust idle speed if necessary.
5) Turn off propane. Place transmission in Neutral and run engine at 2,000 RPM for 30 seconds. Place transmission in Drive (Neutral for manual transmission). Check idle speed. If idle speed is as shown on Emission Control Tune-Up Decal, idle mixture is correct, proceed to step **8)**.
6) If idle speed is too low, carefully remove cap(s) from mixture screw(s) and back screw(s) out 1/8 turn at a time until specified speed is reached. If speed is too high, turn mixture screw(s) in 1/8 turn at a time until specified speed is reached.

NOTE: It may be necessary to remove air cleaner to reach idle mixture screws. Reinstall air cleaner to check speed.

7) Turn propane on again to check maximum engine idle speed. If speed is different from specification, readjust idle speed screw to enriched RPM with propane flowing. Turn off propane and accelerate engine to 2,000 RPM for 30 seconds and recheck idle speed. Idle speed should be to specification, if not repeat procedure starting with step **6)**.
8) If idle is unusually rough, turn mixture screws in until lightly seated. Back screws out equally to average previous position and repeat propane idle test starting with step **2)**. If idle is correct, turn engine off and remove propane set. Connect positive crankcase ventilation and reconnect all other hoses.

1975-79 TUNE-UP PROCEDURES
Oldsmobile V6 (Cont.)

PROPANE ENRICHED RPM SPECIFICATIONS

Application	Enriched RPM
1978	
California & High Altitude	
Man. Trans.	880
Auto. Trans.	615
Federal	
Man. Trans.	940
Auto. Trans.	650
1979	
California	
Man. Trans.	840
Auto. Trans.	615
Federal	
Man. Trans.	1000
Auto. Trans.	575

MIXTURE CONTROL ADJUSTMENT PROCEDURE

NOTE: The Computer Controlled Catalytic Converter System (C-4 System) used on the 1979 231" (VIN 2) engine, is sensitive to any change in mixture control adjustment which, if improperly set, can impair the ability of the system to maintain precise control of carburetor air/fuel mixture. Because of this, the previously used propane enrichment method of idle mixture adjustment may not be used when adjusting carburetors with the "C-4" system.
The following mixture control adjustment procedure should never be performed unless diagnosis indicates the carburetor to be the cause of a driver performance complaint or emission failure, or critical parts such as air horn, float bowl, throttle body, needle and seat, or float are replaced.

Idle Air Bleed Valve Adjustment, 1979 231" (VIN 2) Only - 1) Before adjusting the idle air bleed valve, mixture control solenoid adjustment must be checked and corrected as necessary. See ROCHESTER E2ME 2-BBL. CARBURETOR article in FUEL SYSTEMS section.
2) To adjust idle air bleed valve, set parking brake and block drive wheels. Disconnect and plug hoses as directed on Emission Control Tune-Up Decal in engine compartment. Check ignition timing and adjust if necessary.
3) Connect a dwell meter to lead wire from mixture control solenoid in carburetor, then set dwell meter on 6-cylinder scale. Start engine and run at idle until normal operating temperature is reached and a varying dwell is noted on dwell meter.

NOTE: It is absolutely essential that engine is operated for a sufficient length of time to ensure the engine coolant sensor, and the oxygen sensor in the exhaust, are at full operational temperature.

4) Adjust curb idle speed, if necessary. With engine idling, observe dwell reading. If within, or varying between 25-35 degree range, no further adjustment is necessary. If dwell does not vary and/or falls outside the 10-50 degree range, see DIAGNOSTIC CIRCUIT CHECK flow chart of GM C-4 article in the COMPUTERIZED ENGINE CONTROLS section.
5) If dwell meter varies between 10-24 degrees or 36-49 degrees, ensure no other causes of a rich or lean condition such as mechanical problems, weak ignition, poor fuel quality, vacuum leaks, flooding carburetor, emission control devices, PCV, canister purge control, etc. are present. If no other problems are found, perform the following:
6) With engine off, remove staking around plug covering idle air bleed valve and remove plug. Using a screwdriver that fully fits slot in valve, slowly turn valve up or down until dwell reading varies and falls within the 25-35 degree range, attempting to be at or as close to 30 degrees as possible.

CAUTION: Perform this step carefully. The idle air bleed valve is very sensitive in controlling air/fuel ratios and the valve should be turned only in 1/8 turn increments.

7) If after performing this adjustment, the dwell reading does not vary and is not within the 25-35 range range, it will be necessary to remove carburetor to gain access to the plugs covering the idle mixture needles and adjust the idle mixture. See MIXTURE SCREW PLUG REMOVAL under IDLE MIXTURE in this article.

NOTE: See Mixture Screw Plug Removal in this article for removal of plugs covering idle mixture needles.

Idle Mixture Adjustment, 1979 231" (VIN 2) Only - 1) With idle mixture needle plugs removed, turn each idle mixture needle inward until lightly seated. Then, back out each mixture needle 2 1/2 turns.
2) Reinstall carburetor (without air cleaner and gasket). Start engine, run until fully warm, and repeat IDLE AIR BLEED VALVE ADJUSTMENT UNTIL dwell reading is varying and within specified limits.
3) If unable to achieve varying dwell and specified range, turn each mixture needle out an additional 1/2 turn. Then, reset idle air bleed valve to obtain dwell limit specifications.
4) If necessary, reset curb idle speed and fast idle speed to specifications. Disconnect dwell meter and tachometer. Unplug and reconnect vacuum hoses. Reinstall air cleaner and gasket.

COLD (FAST) IDLE RPM

1975 Models - Place fast idle cam follower on low step of fast idle cam, against shoulder of next highest step. Adjust fast idle to specifications with manual transmission in Neutral or automatic transmission in Drive.

1976-77 Models - No adjustment is necessary as cold (fast) idle RPM adjustment is automatically set when hot (slow) idle RPM adjustment is made.

1978-79 Models - With engine at normal operating temperature, disconnect and plug hose at EGR valve. Position cam follower on cam step specified on Emission Control Tune-Up Decal and turn fast idle screw to obtain specified RPM.

COLD (FAST) IDLE RPM

Application	RPM
1975	
All Models	1800
1978	
All Models	1850
1979	
All Models	2200

AUTOMATIC CHOKE

Set idle speed screw on highest step of cam, loosen choke cover retaining screws and align marks on cover and housing as specified.

AUTOMATIC CHOKE SETTING

Application	Setting
1975	
Federal (Auto. Trans.)	1NR
All Others	1NL
1976-78	
All Models	1NR
1979	
California	
Man. Trans.	1NR
Auto. Trans.	2NR
Federal	2NR
High Altitude	1NR

1975-79 TUNE-UP PROCEDURES
Oldsmobile V6 (Cont.)

NOTE: Some 1977 V6 engine, automatic transmission equipped models may exhibit stalling and/or stumbling after start up. To correct these conditions on pre-November 1976 produced models, automatic choke may be indexed 2 notches richer than production setting (3 notches rich total). After November 1976, a new choke thermostat will be phased into production with part No. (10756150) stamped on choke cover. Set new chokes to 1 notch rich as these units are calibrated to compensate for richer setting required.

FUEL PUMP

Make all tests at specified RPM with fuel vapor return hose pinched off (if equipped). Connect pressure gauge to fuel line at carburetor and hold gauge at level of carburetor inlet. Starfire models use an electric fuel pump.

FUEL PUMP SPECIFICATIONS

Application	Specification
Pressure	
Starfire (At 12.6 volts)	3.0-4.5 psi
All Others (At Idle)	5.5-6.5 psi
Volume (At Idle)	One pint in 30 seconds.

IGNITION

DISTRIBUTOR

All models use Delco-Remy High Energy Ignition System. Module must be replaced as a unit. A liberal coat of silicone grease MUST be applied to the surface on which module will be mounted.

Other Data & Specifications - Also see Delco Ignition Systems in DISTRIBUTORS & IGNITION SYSTEMS section.

IGNITION COIL

IGNITION COIL SPECIFICATIONS

Application	Specification
Primary Resistance (at 75°F)	[1] 0-1.0 Ohms
Secondary Resistance (at 75°F)	6000-30,000 Ohms
Coil Output (Minimum)	[2] 25,000-35,000

[1] - Resistance is 0.4-0.5 ohm on 1976-77 models.
[2] - Replace if below 25,000 volts.

CARBURETION

CARBURETORS

Application	Model
1975-76	
All Models	Rochester 2GC 2-Bbl.
1977-78	
All Models	Rochester 2GE 2-Bbl.
1979	
231" (VIN A)	Rochester M2ME 2-Bbl.
231" (VIN 2)	Rochester E2ME 2-Bbl.

Other Data & Specifications - Also see Rochester Carburetors in FUEL SYSTEMS section.