1975-79 TUNE-UP PROCEDURES
Buick V6

ENGINE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

Fifth character of Vehicle Identification Number (VIN), located on plate attached to top left side of instrument panel, is the engine code letter.

VIN CODE

Application	Code
1975-77 231" 2-Bbl.	C
1978	
196" 2-Bbl. (LC9)	C
231" 2-Bbl. (LD5)	A
231" 2-Bbl. (Turbocharged)	G
231" 4-Bbl. (Turbocharged)	3
1979	
196" 2-Bbl. (LC9)	C
231" 2-Bbl. (LD5)	A
231" 2-Bbl. (LC6)	2
231" 4-Bbl. (Turbocharged) (LC8)	3

ENGINE IDENTIFICATION NUMBER

Engine sequence code, model year, plant and division are stamped on front of engine block below cylinder head and to the right of the water pump.

TUNE-UP NOTES

NOTE: In order to comply with emission standards, specifications shown on 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 of California which have an elevation above 4000 feet.

CAUTION: 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.

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

CAUTION: 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 pressure with engine at normal operating temperature, all spark plugs removed and throttle and choke valves wide open.

COMPRESSION SPECIFICATIONS

Application	Specification
Compression Ratio	8.0:1
Recommended Fuel	Unleaded (87 AKI Minimum)
Compression Pressure	100 psi Minimum
Max. 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 INSTALLATION

Application	Gap	Torque
1979 231" V6 Turbo	.040"	15 ft. lbs.
All Others	.060"	15 ft. lbs.

SPARK PLUG TYPE

Application	AC NO.
1975-76	R44SX
1977-78	
Non-Turbo	R46TSX
231" V6 Turbo	R44TSX
1979	
231" V6 Turbo	R44TS
All Others	[1] R45TSX

[1] - R46TSX or R44TSX may also be used.

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

Application	Ohms
1975-76	
All	3000-20,000
1977-79	
Up to 24" Long	30,000 Max.
Over 24" Long	50,000 Max.

DISTRIBUTOR

All models are equipped with High Energy Ignition (HEI) system and no adjustment is required.

NOTE: Turbocharged engines use a modified HEI system which is called Electronic Spark Control (ESC). The ESC system is used to control engine detonation by automatically retarding ignition timing (up to 20°) during periods of engine operation when detonation occurs.

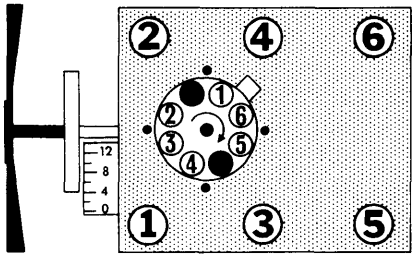

Fig. 1: 1975-79 196" & 231" (Except VIN 2) Firing Order & Timing Marks

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

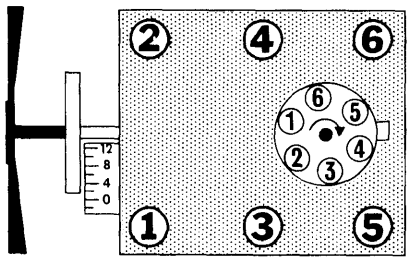

Fig. 2: 1979 231" (VIN 2) Firing Order & Timing Marks

IGNITION TIMING

NOTE: Some engines may include a magnetic timing probe socket. Insert probe into timing socket until it almost contacts vibration damper. Socket is located 9.5° ATDC. Do not use the probe location to check timing using a conventional timing light.

1) On 1975-77 models, warm engine to operating temperature and ensure air cleaner is installed. Set timing with engine at idle speed and distributor vacuum hose disconnected and plugged.
2) On 1978-79 models, ignition timing procedures will vary with vehicle model and component application. Refer to Emission Control Tune-Up Decal in engine compartment for correct adjustment procedures.

IGNITION TIMING SPECIFICATIONS (DEGREES BTDC@RPM)

Application	Man. Trans.	Auto. Trans.
1975-77	12°@600	12°@600
1978	15°@600	15°@600
1979		
196" V6	15°@800	15°@600
231" V6		
(Exc. Turbo)	15°@800	[1] 15°@600
231" V6 Turbo		15°@650

[1] – Calif. 231" V6 (VIN code "2") set timing at 580 RPM.

NOTE: For a no start condition, check connection of Pink wire at distributor cap.

HOT (SLOW) IDLE RPM

Vehicles W/O Air Conditioning – Set curb idle speed adjusting screw on low step of fast idle cam. Turn idle speed screw to obtain specified "Curb Idle" RPM. Set idle speed with anti-diesel solenoid.
Vehicle W/Air Conditioning – 1) Turn A/C off (solenoid de-energized) and place idle speed screw on low step of fast idle cam. Turn idle speed screw to obtain specified "Curb Idle" RPM.
2) Disconnect A/C compressor lead at compressor. Turn A/C on and place automatic transmission in Drive. Open throttle slightly to allow solenoid plunger to fully extend, then turn solenoid screw to obtain specified "Solenoid Energized" RPM. Reconnect compressor lead after adjustment.

IDLE MIXTURE

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

Mixture Screw Plug Removal – 1) Remove carburetor from engine, invert carburetor and drain fuel. Place inverted carburetor on holding fixture manifold side up.

IDLE SPEED (RPM)

Application	Curb Idle	Solenoid Energized
1975		
Man. Trans.	500	800
Auto. Trans.		
Skyhawk	500	650
Apollo & Century	500	700
1976		
Man. Trans.	600	800
Auto. Trans.	600	800
1977-78		
Man. Trans.	500	800
Auto. Trans.	500	600
1979		
196" V6		
Man. Trans.	600	800
Auto. Trans.	550	670
231" V6 (Exc. Turbo)		
Man. Trans.	600	800
Auto. Trans.		
Federal	550	670
High Alt.	600	....
Calif.	[1] 600	670
231" V6 Turbo		
Riviera	600	650
All Others	650	....

[1] – Calif. 231" V6 (VIN code "2") set at 580 RPM.

2) Place a punch between the two locator marks on throttle body beneath each mixture screw plug (manifold side) and break out throttle body to gain access to plugs.
3) Use punch to drive out plugs. If plug shatters, remove loose pieces.

TACHOMETER (LEAN DROP) PROCEDURE

1975-77 Models – 1) Warm engine to operating temperature. Set idle speed. Connect a tachometer to engine. All accessories must be off and air cleaner installed.
2) Remove limiter caps. Lightly seat mixture screws. Turn out equally until engine will run. Set parking brake. Place automatic transmission in Drive or manual transmission in Neutral.
3) Back out each mixture screw equally until maximum RPM is obtained. Set high idle speed to indicated RPM in IDLE MIXTURE (RPM) table.
4) Now turn mixture screws equally clockwise to obtain lean drop RPM. Install replacement limiter caps. Reset idle speed as noted on emission control label.
5) Emission control label idle speed may not be the same as lean drop idle speed. Always use emission label specifications for adjustments. Reconnect vacuum hoses and air cleaner.

PROPANE ENRICHMENT PROCEDURES

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

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

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

4) Observe propane flow meter to ensure propane cartridge is full. With propane flowing, adjust idle speed screw to the "Enriched RPM". See PROPANE ENRICHMENT RPM (1978-79 EXCEPT 231" VIN CODE "2") table. 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 at 2000 RPM for 30 seconds. Put transmission in Drive (manual transmission in Neutral). Check idle speed. If idle speed agrees with idle speed shown on Emission Decal, idle mixture is correct. Proceed to step **8**).
6) If idle speed is too low, back mixture screws out $^1/_8$ turn at a time until correct speed is reached. If speed is too high, turn mixture screws in $^1/_8$ turn at a time until correct speed is obtained.

NOTE: It may be necessary to remove air cleaner to reach idle mixture screws. Reinstall air cleaner to check idle 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, place transmission in Neutral and accelerate engine to 2000 RPM for 30 seconds. Recheck idle speed. Idle speed should agree with specifications. 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 previous position and rerun propane idle test starting with step **2**). If idle is correct, turn engine off and remove propane tool. Connect PCV system and reconnect all other hoses.

IDLE MIXTURE (RPM)

Application	Before Lean Drop RPM	After Lean Drop RPM
1975		
Man. Trans. [1]	1100	800
Auto. Trans. [2]		
Skyhawk	730	650
Apollo & Century.	780	700
1976		
Man. Trans. [1]	1100	800
Auto. Trans. [2]	630	600
1977		
Man. Trans. [1]		
Federal	860	800
Calif. & Altitude	810	800
Auto. Trans. [2]		
Federal	640	600
Calif.	610	600

[1] – With transmission in Neutral.
[2] – With transmission in Drive.

MIXTURE CONTROL ADJUSTMENT

NOTE: The Computer Controlled Catalytic Converter (C-4) system used on the 231" VIN code "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 mixtures. 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.

1979 231" VIN Code "2" Idle Air Bleed Valve Adjustment - 1) Before adjusting 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. Check ignition timing and adjust if necessary.
3) Connect a dwell meter to lead (Light Blue) wire from mixture control solenoid in carburetor. Set dwell meter on 6-CYLINDER scale. Start engine and run at idle until normal operating temperature is reached and a varying dwell (5-10 degrees) is noted on dwell meter.

PROPANE ENRICHMENT RPM (1978-79 EXCEPT 231" VIN CODE "2")

Application	Enriched RPM
1978	
196"	
Man. Trans.	940
Auto. Trans.	640
231" 2-Bbl.	
Federal	
Man. Trans.	940
Auto. Trans.	650
Calif. & High Alt.	
Man. Trans.	880
Auto. Trans.	615
1979	
196"	
Man. Trans.	1000
Auto. Trans.	575
231" 2-Bbl.	
Federal	
Man. Trans.	1000
Auto. Trans.	575
Calif. & High Alt.	
Man. Trans.	840
Auto. Trans.	615
231" 4-Bbl. Turbo	
Riviera	600
All Others	650

NOTE: Engine must be at operating temperature to ensure the engine coolant sensor, and the oxygen sensor are both able to send correct signals to the computer.

4) Adjust curb idle speed. With engine idling, observe dwell reading. If within, or varying between 10-50 degree range (ideal is 25-35 degree range), no further adjustment is necessary. If dwell does not vary and/or falls outside of the 10-50 degree range, see DIAGNOSTIC CIRCUIT CHECK and SYSTEM PERFORMANCE CHECK flow charts of GM C-4 article in the COMPUTERIZED ENGINE CONTROLS section.
5) If dwell meter varies between 10-24 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. Restart engine and allow to idle before adjusting. 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 as close to 30 degrees as possible.

CAUTION: Perform this step carefully. The idle air bleed valve is very sensitive in controlling air/fuel mixture 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 degree range, it will be necessary to remove carburetor to gain access to the plugs covering the idle mixture needles and adjust the idle mixture as follows:

NOTE: See MIXTURE SCREW PLUG REMOVAL in this article for removal of plugs covering idle mixture needles.

1979 231" VIN Code "2" Idle Mixture Adjustment - 1) With idle mixture needle plugs removed, turn each idle mixture needle inward until lightly seated. Back out each mixture needle $4^1/_2$ 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 25-35 degrees. If unable to achieve varying dwell and specified limits, turn each

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

mixture needle out an additional 1/2 turn. Then, reset idle air bleed valve to obtain dwell limit specifications.

3) 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

1975-76 All - 1) Remove air cleaner. Check that choke valve and rod move freely and cold (fast) idle is adjusted. Position cam follower on low step of fast idle cam and against shoulder of next step.

2) Turn fast idle screw one turn in and move screw to 2nd step. Insert a .08" gauge between choke valve and air horn. If necessary, bend choke tang so that choke valve contacts gauge.

1977-78 2-Bbl. - No adjustment is provided.

1978 4-Bbl. & 1979 - Disconnect and plug hose at EGR valve. Position cam follower on step specified on Emission Control Tune-Up Decal. Turn fast idle screw to obtain specified RPM.

FAST IDLE RPM

Application	RPM
1978	2500
1979	
196" & 231" 2-Bbl.	2200
231" 4-Bbl. Turbo	2500

NOTE: Some 1978 Federal models with V6 engines may develop cold driveability problems such as stalling or rough running. This may be caused by the auxiliary vacuum break opening too soon. To correct this, install a thermal vacuum valve (3031518) to rear of air cleaner housing.

To install thermal vacuum valve, remove air cleaner and drill a 3/4" hole at rear of housing. Locate hole about 2-6" to right side of rear center (passenger side). Install thermal vacuum valve and secure in place with retainer clip (497548).

Remove hose between auxiliary vacuum break and vacuum source. Connect a new 11" hose between auxiliary vacuum break and OUTBOARD fitting on thermal vacuum valve. Connect another 11" hose between INBOARD fitting and vacuum source. Install air cleaner.

AUTOMATIC CHOKE

Loosen choke cover retaining screws. Position fast idle cam follower on highest step of fast idle cam. Rotate cover and coil assembly counterclockwise until choke valve just closes. Align index mark on cover with specified mark on choke housing. Tighten cover screws.

AUTOMATIC CHOKE SETTING

Application	Setting
1975	
Skyhark	[1] 1NL
All Others	[1] INDEX
1976-78	[2] 1NR
1979	
196"	2NR
231" (Exc. Turbo)	
High Alt.	1NR
All Others	[3] 2NR
231" Turbo	1NR

[1] - 1NR for Federal models with auto. trans.
[2] - Index for turbo engines with 4-Bbl.
[3] - 1NR for Calif. Skylark and LeSabre with auto. trans.

FUEL PUMP

Skyhawk - An electric fuel pump is located in fuel tank.

All Others - 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.

FUEL PUMP SPECIFICATIONS

Application	Specification
Pressure	
Skyhawk (at 12.6 volts)	3.0-4.5 psi
All Others	
196" & 231" (Exc. Turbo)	3.0 psi
231" Turbo	5.0 psi
Volume (At Idle)	1 pint in 30 sec.

IGNITION

DISTRIBUTOR

Delco-Remy - High Energy Ignition.

NOTE: Module must be replaced as a unit. A liberal coat of silicone grease MUST be applied to surface on which module will be mounted.

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

IGNITION COIL

Application	Specification
Resistance	
Primary (At 75°F)	.1-1.0 ohm
Secondary (At 75°F)	6000-30,000 ohms
Current Draw	
Engine Stopped	.25 amps
Engine Idling	.5-1.5 amps
Coil Output	
At all engine speeds	25-35 KV

CARBURETION

CARBURETORS

Application	Model
1975-76 231" 2-Bbl.	2GC
1977 231" 2-Bbl.	2GE
1978	
196" & 231" 2-Bbl.	2GC
231" 2-Bbl. Turbocharged	M2ME
321" 4-Bbl. Turbocharged	M4ME
1979	
196" 2-Bbl.	Rochester M2ME
231" 2-Bbl.	
VIN Code "A"	Rochester M2ME
VIN Code "2"	Rochester E2ME
231" 4-Bbl. Turbo	Rochester M4ME

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

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