

1966-74 GENERAL MOTORS EXHAUST EMISSION TUNE-UP

BUICK

DESCRIPTION

Refer to EMISSION CONTROL APPLICATIONS Section for individual systems as applied to particular combinations of vehicle model, engine, and transmission.

Several systems are used to control emissions of pollutants. Each system is designed to effect particular vehicle emission situations. In addition, specially calibrated carburetors, distributors, modified combustion chambers and valve timing are used with these systems.

SERVICE PROCEDURES

In addition to servicing an individual emission system or component, all ignition system and/or carburetor adjustments necessary must also be correctly performed.

NOTE — Due to late changes and corrections, always refer to Engine Tune-Up decal in engine compartment before beginning Tune-Up. In event of any conflict between decal specifications and given specifications, decal specifications should prevail.

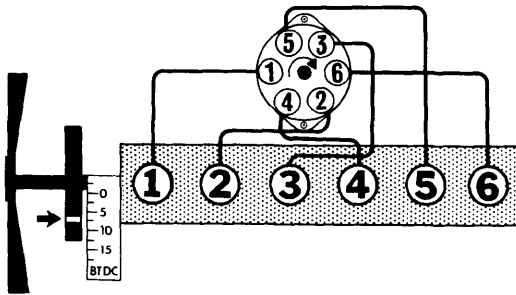
NOTE — To by-pass Starter Interlock, turn ignition "ON" and locate by-pass relay switch in engine compartment. Press and release button on relay. Engine can now be cranked or started. If ignition is turned to "OFF" or "LOCK" position, reactivation of relay button will again be required before engine can be cranked or started.

IGNITION SYSTEM

IGNITION TIMING

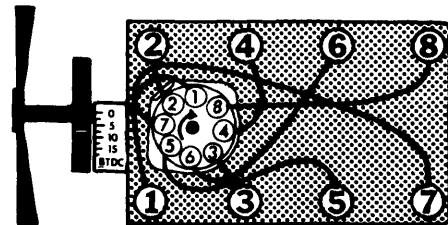
Refer to appropriate Tune-Up chart in TUNE-UP SPECIFICATIONS Section for ignition system and timing specifications.

All Engines (1966-74) — Check or adjust ignition timing with distributor cam angle correctly set, idle speed adjusted to specified RPM, and distributor vacuum line disconnected and plugged. After timing is set, reconnect vacuum line and bring idle speed to specified idle RPM.



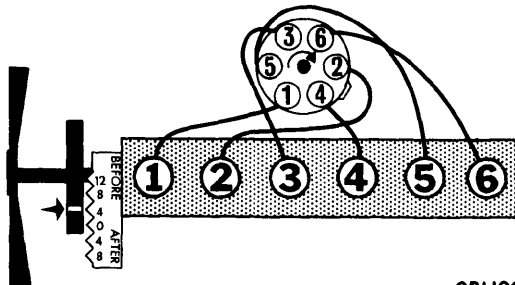
8BU001

BUICK 250" 6 CYLINDER (1968-69)



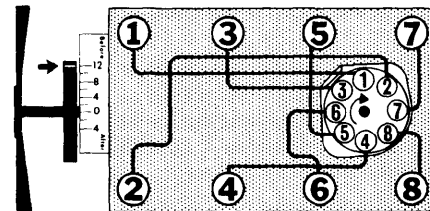
8BU003

BUICK 300", 340", 400" & 430" V8 (1966-70)



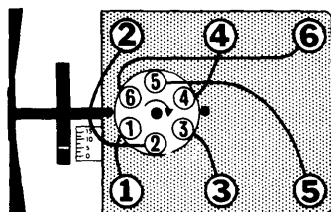
0BU005

BUICK 250" 6 CYLINDER (1971 & 1974)



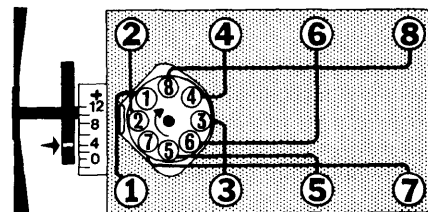
6BU004

BUICK 400", 401" & 425" V8 (1966)



6BU002

BUICK 225" V6 (1966-67)



1BU013

BUICK 350" & 455" V8 (1970-74)

1966-74 GENERAL MOTORS EXHAUST EMISSION TUNE-UP (Cont.)

BUICK (Cont.)

CARBURETION

For service procedures and specifications, refer to following individual carburetor articles in CARBURETION section, or for idle speed and mixture specifications, refer to appropriate TUNE-UP chart in TUNE-UP SPECIFICATIONS section.

Application	Carburetor Type
250" 6 Cylinder	
1-Bbl. (1968-74) ①	Rochester MV
225" V6	
2-Bbl. (1966-67).....	Rochester 2GC
300" V8	
2-Bbl. (1966-67).....	Rochester 2G, 2GC
340" V8	
2-Bbl. (1966-67).....	Rochester 2G, 2GC
4-Bbl. (1966-67).....	Carter AFB
350" V8	
2-Bbl. (1968-74).....	Rochester 2GV
4-Bbl. (1968-74).....	Rochester 4MV
400" V8	
4-Bbl. (1966-69).....	Rochester 4MC, 4MV, & Carter AFB
401" V8	
4-Bbl. (1966).....	Carter AFB, Rochester 4GC
425" V8	
4-Bbl. (1966).....	Rochester 4MC
Two 4-Bbl. (1966).....	Carter AFB
430" V8	
4-Bbl. (1967-69).....	Rochester 4MV
455" V8	
4-Bbl. (1970-74).....	Rochester 4MV
① — No 6 Cylinder engines produced for 1972 and 1973.	

IDLE SPEED & MIXTURE ADJUSTMENT

NOTE — Correct mixture for emission compliance and idle quality are pre-set by manufacturer. Following procedures should only be used when normal tune-up activities fail to give satisfactory idle performance at specified air/fuel ratio or CO level, or after major carburetor overhaul or component replacement.

All Engines (1966-74) — Check and adjust timing to specifications in Tune-Up section. Connect suitable tachometer. With engine running at normal operating temperature, air cleaner installed, air conditioner on "OFF" position (if equipped), and transmission in Neutral, proceed as follows:

All Models (1966-67) — 1) Check PCV valve before making any adjustments to carburetor as valve will noticeably affect air/fuel ratio at idle. Remove air cleaner and connect suitable tachometer or vacuum gauge to engine, bring engine to normal operating temperature.

2) On vehicles with automatic transmissions, block front wheels, set parking brake firmly and place transmission lever in "D" position. Adjust throttle stop screw to set idle speed at

500 RPM (1966 model 400", 401", & 425" engines) or 550 RPM (1966 model 225", 300", 340", and all 1967 model engines). Add 50 RPM for air conditioning or air injection reactor.

3) Make sure idle stop switch is closed by disconnecting at switch connector. If idle speed does not decrease; switch was not closed. Adjust switch as necessary, then readjust idle speed to specifications.

4) If carburetor is equipped with hot idle compensating valve, press finger on valve to make certain valve was closed. If idle speed drops, valve was open. Readjust idle speed and mixture while checking to see that valve remains closed.

5) Adjust idle mixture needles one at a time. Turn needle(s) to obtain highest tachometer or vacuum gauge reading. Then slowly turn needle(s) in (clockwise) to lean out mixture until tachometer reading drops 20 RPM, or until vacuum gauge reading drops ½ inch. Note direction of needle slot, then turn needle(s) out (counterclockwise) exactly ¼ turn to a richer setting and observe tachometer or vacuum gauge. If reading has not returned to maximum, carefully turn needle(s) out (counterclockwise) ⅛ turn at a time until maximum reading is just regained. **NOTE** — Vehicles equipped with Air Injection Reactor should be adjusted to lean side of best idle to keep hydrocarbon and carbon dioxide emissions to a minimum.

6) If either needle setting is changed much, always recheck other needle setting as they affect each other directly. If idle speed is now too fast; reduce speed to specifications and recheck mixture adjustment.

CAUTION — Any vehicle equipped with Automatic Level Control device should have vacuum operated compressor disconnected during engine idle adjustment. To disconnect compressor, remove vacuum hose at compressor tank end and plug with suitable object.

All Models (1968-70) — 1) Air cleaner must be left in place while making idle speed and mixture adjustments. Positive Crankcase Ventilator system should also be in good operating condition as either of these items will noticeably affect air/fuel ratio at idle speed.

2) Connect suitable tachometer to engine. Start engine and bring to normal operating temperature. **CAUTION** — Idle speed and mixture adjustments cannot be made satisfactorily with engine abnormally hot. Engines equipped with hot idle compensator valve or thermo vacuum switch must be at normal operating temperature in order to have these devices in proper working position for engine. If carburetor is equipped with hot idle compensator valve, press a finger on valve or in valve passage to check for closure. If idle speed now drops, valve is open; either carburetor temperature is too high or valve is defective, one or both of above conditions makes proper idle adjustment impossible. To ensure that thermo vacuum switch does not shift distributor vacuum over to full manifold vacuum due to excessive engine temperature, always remove and plug vacuum hose from distributor while adjusting idle.

1966-74 GENERAL MOTORS EXHAUST EMISSION TUNE-UP (Cont.) BUICK (Cont.)

IDLE SPEED & MIXTURE ADJUSTMENT (Cont.)

3) On automatic transmission equipped vehicles, block front wheels, set parking brake firmly, and place transmission shift lever in "D" position. **CAUTION** — *Any vehicle equipped with Automatic Level Control has a vacuum regulator valve which shuts off all vacuum to air compressor during engine idle, preventing compressor from operating and upsetting engine idle. Feel compressor with hand; if operating, malfunction must be repaired before adjusting engine idle.*

4) Adjust idle mixture screws, one at a time, to obtain highest tachometer reading. After reading is reached using mixture needles, readjust throttle stop screw as required to obtain 20 RPM faster than specified idle. Next turn each mixture needle in (clockwise) to lean mixture as required to reduce engine speed 10 RPM. This reduces idle speed to the recommended RPM.

5) On 6 cylinder engines, adjust solenoid plunger screw to set specified idle speed, stop engine. Turn mixture screw in (clockwise) until screw contacts seat lightly, then turn screw back out (counterclockwise) four full turns. Disconnect and plug distributor vacuum line, start engine and set ignition timing. Readjust solenoid screw to achieve 830 RPM (manual transmission in Neutral) or 630 RPM (automatic transmission in "D"). Adjust mixture screw in (clockwise) to gain specified idle speed. Reconnect vacuum line. **NOTE** — *This method of adjusting idle mixture must be used on all vehicles to keep hydrocarbon and carbon monoxide emissions to a minimum.*

6) Adjust fast idle speed on all two-barrel and four-barrel carburetors. Fast idle must be adjusted after slow (curb) idle speed and mixture have been adjusted. Automatic transmission equipped vehicles are adjusted on low step of the fast idle cam in "D" position to 650 RPM. Manual transmission vehicles are adjusted on low cam step to 720 RPM with transmission in Neutral position.

6 Cylinder Models (1971) — 1) Connect suitable tachometer to engine, start engine and bring to normal operating temperature. Disconnect and plug distributor vacuum line, set ignition timing and stop engine.

2) Turn mixture screw in (clockwise) until screw seats lightly against seat, then back screw out (counterclockwise) four full turns. Start engine and adjust idle mixture screw and idle speed screw to give best idle at 530 RPM (automatic transmission) or 625 RPM (manual transmission). Lastly, turn in (clockwise) idle mixture screw to achieve best idle at 500 RPM (automatic transmission) or 550 RPM (manual transmission) without touching idle speed screw.

3) Check CEC (Combination Emission Control) valve adjustment, connect distributor vacuum hoses, and install red service idle needle limiter caps on mixture screw.

V8 Models (1971-73) — 1) Connect suitable tachometer to engine. Start engine and bring to normal operating temperature. Disconnect and plug distributor vacuum line, set ignition timing. Set parking brake after blocking drive wheels and place transmission selector lever in "D", or gearshift lever in Neutral.

2) Open throttle sufficiently to allow solenoid to extend and contact throttle lever pad in idle position. Adjust solenoid set screw to obtain specified RPM, reposition solenoid bracket if additional movement is required.

3) Disconnect solenoid wire to disengage solenoid. Adjust carburetor idle screw to obtain specified RPM. Reconnect solenoid wire.

4) Adjust idle mixture needles, one at a time, to gain highest tachometer reading. After highest reading is obtained using mixture screws, readjust solenoid set screw and mixture screws as required to gain 50 RPM faster than specified idle. Then turn each mixture needle in (clockwise) to lean mixture and reduce engine speed 25 RPM. This reduces idle speed to recommended RPM.

5) Adjust fast idle speed on all four-barrel carburetors. Fast idle must be adjusted after slow (curb) idle speed and mixture have been adjusted. Automatic transmission vehicles are set on low step of fast idle cam (transmission in "D") to 620 RPM (1971) or 700 RPM (1972-73). Manual transmission vehicles are adjusted on low cam step to 720 RPM (1971) or 820 RPM (1972-73 350") and 920 RPM (1972-73 455").

6) Reconnect distributor vacuum hose. Install "red" service idle needle limiter caps on mixture screws.

6 Cylinder Models (1974) — 1) **NOTE** — *Preferred procedure for this application is Lean Drop Method. Set parking brake firmly and block drive wheels. Disconnect fuel tank vent hose from vapor canister. Disconnect and plug distributor advance vacuum hose at vacuum advance unit.*

2) Bring engine to normal operating temperature, with air conditioner "OFF" (if equipped), and air cleaner installed. Place gear lever in "D" (automatic transmission) or Neutral (manual transmission).

3) Cut off tab on mixture cap using suitable side cutter pliers. Adjust idle RPM to higher of two specified idle speeds (with idle stop solenoid energized and extended). Equally richen (turn counterclockwise) mixture screws until maximum idle speed is reached. Reset speed if necessary to higher specified idle speed.

4) Turn mixture screws in (clockwise) to lean mixture until lower specified idle speed is reached. Connect fuel tank vent hose and distributor advance hose.

V8 Models (1974) — 1) **NOTE** — *Preferred procedure for this application is CO Meter Method. Set parking brake firmly and block drive wheels. Disconnect evaporative emission hose from air cleaner. Disconnect and plug distributor vacuum hose at vacuum advance unit, disconnect and plug EGR vacuum hose at EGR valve.*

2) Adjust idle speed and mixture with engine at normal operating temperature, air conditioner "OFF" (if equipped), air cleaner installed and gear lever in "D" (automatic transmission) or Neutral (manual transmission). **NOTE** — *CO meter must be capable of low level, accurate readings. Meter should be accurate within $\pm 0.1\%$ CO in setting range specified. Meter scale should have divisions of 0.2% CO or less.*

Exhaust Emission Systems

1966-74 GENERAL MOTORS EXHAUST EMISSION TUNE-UP (Cont.)

BUICK (Cont.)

IDLE SPEED & MIXTURE ADJUSTMENT (Cont.)

3) Connect CO meter to exhaust system tailpipe. Set idle speed to specified RPM. Turn each idle mixture cap in equal amounts until idle CO is at or below 0.3%. DO NOT remove caps. Reset idle speed if necessary with air cleaner in place.

4) Reconnect evaporative emission hose. EGR vacuum hose, and distributor vacuum advance hose.

NOTE — If idle CO level is still too high due to inadequate adjustment range with mixture caps installed, or if carburetor has been disassembled, or a major repair is necessary, following procedure may be used. DO NOT use procedure if idle CO is at or below 0.3%. Cut off tab on mixture caps, avoid any damage to mixture screws. Turn each idle mixture screw in equal amounts from rich stop until idle CO is at or below 0.3%. Reset idle speed if necessary. Reconnect evaporative emission hose, EGR vacuum hose, and distributor advance vacuum hose.

V8 Models (1974) — 1) *NOTE* — Alternate procedure for adjustment is Lean Drop Method. Set parking brake firmly and block drive wheels. Disconnect evaporative emission hose from air cleaner, and disconnect and plug distributor advance vacuum hose at vacuum advance unit. Disconnect and plug EGR vacuum hose at EGR valve.

2) Bring engine to normal operating temperature. With air conditioner "OFF" (if equipped), air cleaner installed, and gear lever in "D" (automatic transmission) or Neutral (manual transmission), adjust idle RPM to specified speed.

3) Cut off tab on mixture caps, avoid damaging mixture screws. Equally richen (turn counterclockwise) mixture screws until maximum idle speed is achieved. Reset speed if necessary with idle solenoid screw to gain 70 RPM above specified idle speed for all 455" engines and 60 RPM above specified idle speed for all 350" engines.

4) Equally lean (turn clockwise) mixture screws until specified idle speed is achieved (idle stop solenoid energized). Reset curb idle speed if necessary. Reconnect evaporative emission hose, EGR vacuum hose, and distributor vacuum advance hose.

Buick Idle Speed RPM Specifications (1966-74)

Engine Application	① Auto. Trans.	Man. Trans.
1966 ②		
225", 300", & 340".....	550.....	550
400", 401", & 425".....	500.....	500
1967 ②		
All Engines.....	550.....	550
1968		
250".....	500.....	700
350".....	550.....	700
400".....	600.....	700
430".....	550.....	
1969		
250".....	500.....	700
350" & 400".....	600.....	700
430".....	550.....	
1970		
250".....	600.....	750
350" & 455".....	600.....	700
1971		
250".....	500.....	550
350".....	600.....	800
455".....	600.....	700
1972 & 1973		
350" & 455".....	500.....	600
1974		
250".....	③ 650/600.....	③ 1100/950
350" & 455".....	650.....	650

① — With transmission in "D" position.

② — Add 50 RPM for air conditioner or Air Injection Reactor.

③ — RPM using Lean Drop Method. Adjust RPM to highest of two figures.