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

OLDSMOBILE

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.

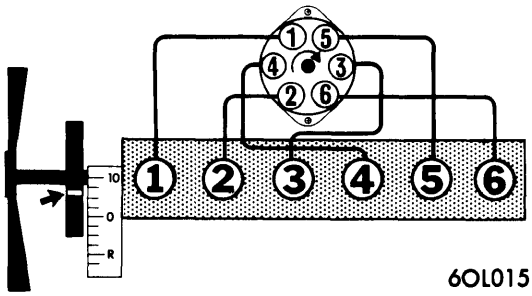
NOTE — To by-pass Starter Interlock, turn ignition "ON" and locate by-pass relay switch in engine compartment. Press and release button on relay. Engine can now be cranked or started. If ignition is turned to "OFF" or "LOCK" position, reactivation of relay button will again be required before engine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

IGNITION SYSTEM

IGNITION TIMING

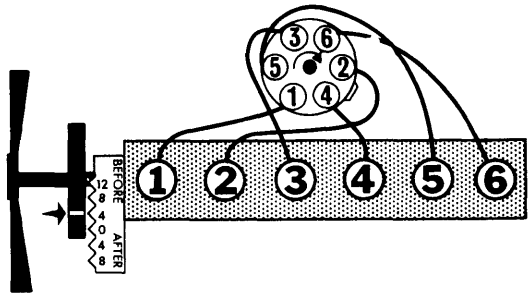
Refer to appropriate Tune-Up chart in TUNE-UP SPECIFICATIONS Section for ignition system and timing specifications.

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.



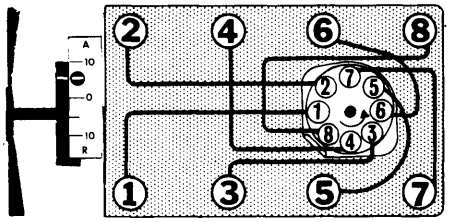
6OL015

OLDSMOBILE 250" 6 CYLINDER (1966-70)



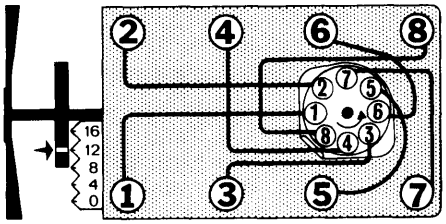
0BUO05

OLDSMOBILE
250" 6 CYLINDER (1971 & 1974)



7OL016

OLDSMOBILE 330", 350",
400", 425" & 455" V8 (1966-69)



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

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.

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

OLDSMOBILE (Cont.)

Application	Carburetor Type
250" 6 Cylinder	
1-Bbl. (1966-74)	Rochester BV & MV, Carter YF
330" V8	
2-Bbl. (1966-67)	Rochester 2GC
4-Bbl. (1966-67)	Rochester 4MV
350" V8	
2-Bbl. (1968-74)	Rochester 2GC
4-Bbl. (1968-74)	Rochester 4MC & 4MV
400" V8	
2-Bbl. (1966-69)	Rochester 2GC
4-Bbl. (1966-69)	Rochester 4MV
Three 2-Bbls. (1966)	Rochester 2G & 2GV
425" V8	
2-Bbl. (1966-67)	Rochester 2GC
4-Bbl. (1966-67)	Rochester 4MV
455" V8	
2-Bbl. (1968-74)	Rochester 2GC
4-Bbl. (1968-74)	Rochester 4MC & 4MV

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.

Slow Idle Speed Adjustment

All Models (1966-67) — *NOTE — Some vehicles are equipped with automatic air lift shock absorbers. Vacuum pump for this option must not be operating during slow idle speed adjustment.* 1) Connect suitable tachometer and/or vacuum gauge to engine. With engine running at normal operating temperature, air cleaner removed, and air conditioner "OFF" (if equipped), place automatic transmission in "D" position or manual transmission in Neutral and adjust idle screw to obtain specified RPM.

2) After idle RPM has stabilized, turn each idle adjusting screw in (clockwise) or out (counterclockwise) until smoothest possible idle is achieved (normally shown as highest vacuum gauge reading).

3) Turn each needle out (counterclockwise) ¼ turn, at which time both idle RPM and vacuum reading will drop off slightly. Reinstall air cleaner and, if necessary, readjust idle speed and mixture. *NOTE — When setting idle speed and mixture on vehicles equipped with factory air conditioning, idle compensator must be closed by holding lever down with suitable tool. If idle speed increases after air cleaner is reinstalled, do not reduce idle speed setting as idle compensator is open. If idle speed decreases, readjust to correct RPM.* Shut off engine and remove tachometer and/or vacuum gauge.

Slow Idle Speed RPM Specifications (1966 Models)

Application	250" 6 Cyl.	330" V8
Manual Trans.	500	600
Automatic Trans.	500	500
Air Conditioning	550	575
Air Injection Reactor (Calif.)	600	600
Air Conditioning & A.I.R. (Calif.)	650	600

Application	400" V8	425" V8
Manual Trans.	600	550
Automatic Trans.	600	500
Air Conditioning	600	575
Air Injection Reactor (Calif.)	600	500
Air Conditioning & A.I.R. (Calif.)	600	575

Slow Idle Speed RPM Specifications (1967 Models)

Application	250" 6 Cyl.	330" V8
Manual Trans.	500	600
Air Conditioning	① 500	① 600
Air Injection Reactor (Calif.)	700	650
Air Conditioning & A.I.R. (Calif.)	② 700	② 650
Automatic Trans.	500	500
Air Conditioning	① 500	② 575
Air Injection Reactor (Calif.)	700	600
Air Conditioning & A.I.R. (Calif.)	② 500	② 600

Application	400" V8	425" V8
Manual Trans.	600	550
Air Conditioning	② 600	②③ 575
Air Injection Reactor (Calif.)	650	600
Air Conditioning & A.I.R. (Calif.)	② 650	②③ 600
Automatic Trans.	550	500
Air Conditioning	② 600	②③ 575
Air Injection Reactor (Calif.)	600	500
Air Conditioning & A.I.R. (Calif.)	② 600	②③ 575

① — Set with air conditioner "ON".
② — Set with air conditioner "OFF".
③ — "Comfortron" model air conditioner set in "ON" position.

All Models (1968-69) — Before setting slow idle adjustment, bring engine to normal operating temperature. Disconnect and plug air cleaner vacuum hose at base of carburetor. Disconnect and plug vacuum advance hose at distributor. Firmly set parking brake and block drive wheels. With air conditioning "OFF" (if equipped), place automatic transmission in "D" position or manual transmission in Neutral. Check to see that choke is fully open with fast idle cam follower off cam (or on clearance step of cam for 2-Bbl. models), solenoid wire is connected (if applicable), and throttle stop screw should not be contacting throttle lever (if equipped). Proceed as follows:

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

OLDSMOBILE (Cont.)

IDLE SPEED & MIXTURE ADJUSTMENT (Cont.)

250" 6 Cylinder (1968-69) – 1) Adjust solenoid slow idle screw to obtain specified RPM. With solenoid energized (open throttle slightly to allow plunger to come out of solenoid), measure distance between end of solenoid body and solenoid screw. Distance must be 7/8" ±1/16".

2) Adjust solenoid slow idle screw and idle mixture screw alternately to obtain best idle at specified RPM with automatic transmission in "D" position or manual transmission in Neutral. *NOTE – Plug hot idle compensator hole, located in carburetor air horn, with suitable tool.*

3) Turn idle mixture screw in (clockwise) to obtain a 20-25 RPM reduction for final idle speed. Turn throttle stop screw in (clockwise) until screw contacts throttle lever.

4) Disconnect solenoid wire and adjust throttle stop screw to 400 RPM (automatic transmission in "D", manual transmission in Neutral). Do not readjust idle mixture screw. Reconnect solenoid wire.

5) Reconnect all vacuum hoses, and reinstall air cleaner, making sure hot air adapter and ventilation tube are connected and seated properly.

350", 400", & 455" V8, 2-Bbl. Carb. (1968-69) – 1) Adjust throttle stop screw and idle mixture screws alternately to gain best idle at specified RPM in "D" (automatic transmission) or Neutral (manual transmission). Hot idle compensator should be held closed using suitable tool (air conditioned vehicles only).

2) Turn idle screw to obtain 10-15 RPM reduction with each screw. Final idle speed drop should total 20-30 RPM.

3) Unplug and reconnect all vacuum hoses. Reinstall air cleaner while making sure hot air adapter and ventilator tube are connected and seated properly.

350", 400", & 455" V8, 4-Bbl. Carb. (1968-69) – 1) Hold hot idle compensator closed using suitable tool. Adjust throttle stop screw and idle mixture screws alternately to obtain specified idle. *NOTE – On 400" engine with manual transmission (without W-30 air induction system option), disconnect distributor vacuum advance hose from Thermostatic Vacuum Switch. Disconnect vacuum hose at carburetor and connect to distributor nipple on Thermostatic Vacuum Switch. Connect distributor vacuum hose directly to carburetor before making slow idle adjustment. Reconnect hoses to proper positions after idle adjustment is completed.*

2) Turn idle screws in (clockwise) to achieve 10 to 15 RPM reduction with each idle screw. Total reduction in idle speed should be 20-30 RPM.

3) Turn each idle screw out (counterclockwise) 1/4 turn (except 400" manual transmission model set at 725 RPM). Reconnect all hoses and reinstall air cleaner, making sure hot air adapter and ventilator tube are reconnected and seated properly. Recheck slow idle with air cleaner on carburetor.

Slow Idle Speed RPM Specifications (1968-69)

Application	Man. Trans.	Auto. Trans.
1968 Models		
250" 6 Cyl.	725	575
350" V8	675	575
400" V8	① 725	① 575
455" V8	675	575
1969 Models		
250" 6 Cyl.	775	625
350" V8	② 675	575
400" V8	① 750	① 575
455" V8		575

① – 442 Model W-30 air induction system option, set at 750 RPM (1968), or 800-850 RPM (1969).
② – W-31 air induction system option, set at 800-850 RPM (1969).

All Models (1970) – All vehicles utilize same initial preparation for slow idle adjustment. Bring engine to normal operating temperature. Remove air cleaner, disconnect and plug distributor vacuum advance hose at distributor. Set parking brake firmly and block drive wheels. Stop engine and turn air conditioner "OFF". Place automatic transmission in "D" position, or manual transmission in Neutral. Check to see that choke is fully open with fast idle cam follower in suitable position. Solenoid wire is to be connected, and throttle stop screw should not touch throttle lever. *NOTE – Idle mixture screws have been preset at factory for best economy and idle quality. Do not adjust unless absolutely necessary.*

250" 6 Cylinder (1970) – If rough idle or stalling occurs, check engine for possible vacuum leaks. If rough idle still persists, proceed as follows:

1) Shut engine off, turn mixture screw in (clockwise) to a lightly seated position, then turn out (counterclockwise) four full turns. Adjust solenoid slow idle adjusting screw to obtain specified RPM.

2) Open throttle slightly to allow plunger to come out of solenoid. With solenoid thus energized, measure distance between end of solenoid body and end of solenoid screw. Distance must be 7/8" ±1/16", adjust if necessary.

3) Turn mixture in (clockwise) until engine speed is to specified RPM. Plug hot idle compensator hole (located in air horn of carburetor) using suitable tool.

4) Adjust throttle stop screw in (clockwise) until screw contacts throttle lever. Disconnect solenoid wire and adjust throttle stop screw to 400 RPM with automatic transmission in "D" position, or manual transmission in Neutral. Do not readjust idle mixture screw.

5) Reconnect solenoid wire. Unplug and reconnect distributor vacuum advance hose to distributor. Unplug and reconnect air cleaner hose. Reinstall air cleaner, unplug hot idle compensator. Make sure hot air adapter and ventilation tube are connected and seated properly.

350" & 455" V8, 2-Bbl. Carburetor (1970) – 1) Set fast idle adjusting screw on clearance step of cam, adjust idle speed to specified RPM. Idle mixture screw is set at factory, if rough idle persists, proceed to next step.

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

OLDSMOBILE (Cont.)

IDLE SPEED & MIXTURE ADJUSTMENT (Cont.)

2) Turn both idle screws in (clockwise) until lightly seated, then back out six full turns. Start engine and adjust throttle screw to 620 RPM for all automatic transmission applications, and 800 RPM for all manual transmission 350" models, or 720 RPM for all 455" manual transmission applications.

3) Turn each mixture screw in (clockwise) by ¼ turn increments until specified idle RPM is obtained.

4) Unplug distributor vacuum advance hose and reconnect to distributor, unplug and reconnect air cleaner vacuum hose at intake manifold. Reinstall air cleaner, making sure hot air adapter and ventilation tube are connected and seated properly.

350" & 455" V8, 4-Bbl. Carburetor (1970) – 1) Set fast idle adjustment screw off cam. Adjust idle speed to specified RPM. Idle mixture screw is factory set. Proceed to next step if rough idle persists.

2) Turn both idle screws in (clockwise) until lightly seated, then turn out six full turns (except 350" standard models with automatic or standard transmissions which require only four full turns). Start engine and adjust throttle screw to achieve idle RPM of approximately 25-75 RPM above slow idle specifications.

3) Turn each mixture screw in (clockwise) by ¼ turn increments until specified slow idle speed RPM is obtained.

4) Unplug and reconnect distributor vacuum advance hose to distributor. Unplug and reconnect air cleaner vacuum hose at intake manifold. Reinstall air cleaner, making certain that hot air adapter and ventilation tube are connected and seated properly.

Slow Idle Speed RPM Specifications (1970)

Application	Man. Trans.	Auto. Trans.
250" 6 Cylinder		
1-Bbl.	750	600
350" V8		
2-Bbl.	750	575
4-Bbl.	② 650	① 575
455" V8		
2-Bbl.	675	575
4-Bbl.		
"A" Body	750	③④ 600
"B" & "C" Body		⑤ 575
Toronado		600

① – 625 RPM with W-31 air induction system option.
② – 750 RPM with W-31 air induction system option.
③ – 650 RPM with W-30 air induction system option.
④ – Vista Cruiser set at 575 RPM.
⑤ – 600 RPM with W-33 police engine option.

All Models (1971-72) – 1) Bring engine to normal operating temperature. Disconnect and plug carburetor hose from vapor canister. Disconnect and plug vacuum advance hose at distributor.

2) Set dwell and timing at specified RPM with air conditioner "OFF" (if equipped). Adjust idle mixture by first removing limiter caps, turn each screw until screw is lightly seated, then back out (counterclockwise) six full turns.

3) Connect suitable accurate CO meter, recheck and set idle if necessary, then turn each mixture screw in (clockwise) by equal amounts to achieve specified CO reading at recommended RPM.

4) Temporarily place air cleaner on engine and recheck CO level, adjust mixture screws if necessary, then recheck idle speed. Install new limiter caps and unplug and reconnect vacuum hoses to vapor canister and distributor.

NOTE – For Combination Emission Control Valve adjustment on 6 Cylinder models, follow instructions as given in Step One, then manually extend CEC Valve plunger to contact throttle lever. Adjust plunger length to obtain 650 RPM with automatic transmission or 850 RPM with manual transmission (set with plunger extended). If CEC solenoid on carburetor is used to set engine idle or is adjusted out of specified limits, a decrease in engine braking may result.

Final Idle RPM Specifications (1971)

Application	Final Idle RPM	CO % at Idle
250" 6 Cylinder		
Auto. Trans.	① 500	1.0
Man. Trans.	① 550	1.0
350" V8, 2-Bbl.		
Auto. Trans.	600	0.6
Man. Trans.	750	0.6
350" V8, 4-Bbl.		
Auto. Trans.	600	0.3
Man. Trans.	750	0.3
455" V8, 2-Bbl.		
Auto. Trans.	600	0.6
Man. Trans.	750	0.6
455" V8, 4-Bbl.		
Auto. Trans.	② 650	0.3
Man. Trans.	750	0.3

① – Air conditioned vehicles, turn air "OFF" and set idle at 575 RPM for automatic transmission or 600 RPM for manual transmission.
② – 442 model with air conditioning and/or W-30 air induction system option, set idle at 600 RPM.

Final Idle RPM Specifications (1972)

Application	① Final Idle RPM	CO % at Idle
350" V8, 2-Bbl.		
Auto. Trans.	650	0.3
Man. Trans.	750	0.3
350" V8, 4-Bbl.		
Auto. Trans.	650	0.3
Man. Trans.	750	0.3
455" V8, 4-Bbl.		
Auto. Trans.	650	0.3
Man. Trans.	② 750	0.3

① – Set with solenoid or vacuum actuator energized.
② – 1000 RPM if equipped with W-30 air induction system option.

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

OLDSMOBILE (Cont.)

IDLE SPEED & MIXTURE ADJUSTMENT (Cont.)

All Models (1973) – 1) With engine at normal operating temperature, disconnect and plug carburetor hose from vapor canister. Remove idle limiter caps.

2) Turn idle mixture screw in (clockwise) until screws are lightly seated, then back out (counterclockwise) six full turns each. Connect suitable tachometer and CO meter.

3) With engine idling and transmission in "D" (automatic) or Neutral (manual), and solenoid energized, adjust each mixture screw equally until specified reading is obtained.

4) Temporarily install air cleaner and check CO reading which must remain within limits. Remove air cleaner and make any necessary adjustments.

5) Disconnect solenoid wire. Check RPM and CO readings, reconnect solenoid wire. Install new limiter caps, reinstall air cleaner and unplug and reconnect hose from carburetor to vapor canister.

Idle Speed Specifications (1973)

Application	① Idle Speed RPM	CO % at Idle
250" 6 Cylinder, 1-Bbl.		
Auto. Trans.	600/450	0.3
Man. Trans.	700/450	0.3
350" V8, 2-Bbl.		
Auto. Trans.	700/550	0.3
Man. Trans.		0.3
350" V8, 4-Bbl.		
Auto. Trans.	650/550	0.3
Man. Trans.	1100/600	0.3
455" V8, 4-Bbl.		
Auto. Trans.	650/550	0.3
Man. Trans.	1000/750	0.3

① – Higher RPM; Solenoid energized. Lower RPM; solenoid de-energized.

All Models (1974) – *NOTE – Idle mixture screws have been preset and capped at factory. In event of major carburetor overhaul or when poor idle quality exists after performing basic tune-up check, idle mixture may be adjusted. To properly set idle mixture to achieve smoothest idle while maintaining emission levels within Federal standards prescribed by law, following procedures must be followed.*

FINAL IDLE SPEED METHOD

250" 6 Cylinder, Preferred Method (1974) – 1) Set parking brake firmly and block drive wheels. Disconnect fuel tank vent hose from vapor canister. Disconnect and plug distributor vacuum hose at vacuum advance unit.

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

3) Cut off tab on mixture cap using suitable pliers. Adjust idle RPM to specifications with idle stop solenoid energized and extended.

4) Equally richen (turn counterclockwise) mixture screws until maximum idle speed is reached. Reset idle speed if necessary.

5) Equally lean (turn clockwise) mixture screws until final idle speed RPM is reached. Unplug and reconnect distributor vacuum advance hose and fuel tank vent hose.

V8 Engines, Alternate Method (1974) – 1) Bring engine to normal operating temperature. Remove air cleaner and disconnect and plug air cleaner vacuum hose at intake manifold. Check to see that choke is fully open, turn air conditioning (if equipped) "OFF".

2) Set parking brake firmly and block drive wheels. Disconnect carburetor hoses from vapor canister, distributor, and EGR valve. Plug all hoses.

3) Set dwell and set timing at specified RPM. Cut tabs off idle mixture screw caps. Connect accurate vacuum gauge to intake manifold.

4) Place automatic transmission in "D" position and adjust solenoid (while energized) to obtain 680 RPM. *NOTE – Motor homes, ambulances, and hearse vehicles require adjustment at speed screw to obtain 600 RPM with automatic transmission in "D" position.*

5) Equally richen (turn counterclockwise) mixture screws until maximum idle speed is achieved. Note manifold vacuum reading. If mixture screws are apparently out of balance, or carburetor has been overhauled, lightly seat mixture screws, then back out (counterclockwise) four full turns, (motor homes, ambulances, and hearse vehicles, set idle speed to 650 RPM in "D" position).

6) Equally lean (turn clockwise) mixture screws until idle speed is 650 RPM (idle stop solenoid energized) or 600 RPM for motor homes, ambulances or hearse vehicles. Manifold vacuum reading should not be reduced by more than 2 in. Hg from reading obtained in step 5). If reading is reduced more than 2 in. Hg, repeat procedure.

7) With automatic transmission in "PARK" position (all vehicles except motor homes, ambulances, and hearse vehicles), set carburetor screw (idle stop solenoid de-energized) to 550 RPM.

8) Unplug and reconnect distributor, canister, and EGR valve hoses (reconnect only distributor and canister hoses on motor homes, ambulances, and hearse vehicles). Idle CO should be 0.2%.

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

IDLE SPEED & MIXTURE ADJUSTMENT (Cont.)

EXHAUST GAS ANALYZER METHOD

NOTE — CO meter must be capable of low level, accurate readings. Meter should be accurate within ±0.1% CO in the setting range specified. Meter scale should have divisions of 0.2% CO or less.

V8 Engines, Preferred Method (1974) — 1) Bring engine to normal operating temperature. Remove air cleaner, disconnect and plug air cleaner vacuum hose at intake manifold. Check to see that choke is open, turn air conditioner (if equipped) to "OFF" position.

2) Set parking brake firmly and block drive wheels. Disconnect and plug carburetor hoses from vapor canister and distributor. Connect CO meter to exhaust system tail pipe.

3) Set idle speed to specified RPM. Turn each idle mixture cap in equal amounts (maximum adjustment is ½ turn with 4-Bbl.) until idle CO is at or below 0.2%. Reset idle speed, if necessary, with air cleaner in place.

4) Unplug and reconnect carburetor hoses from vapor canister and distributor vacuum advance. Install air cleaner and reconnect vacuum hose.

250" 6 Cylinder, Alternate Method (1974) — 1) Prepare vehicle as outlined in steps 1) and 2) for V8 engines, Preferred Method. Set idle speed RPM to specifications with idle stop solenoid energized and extended.

2) If idle CO is 0.3% or less, and engine idles smoothly, no further adjustment is required. If idle CO exceeds 0.3%, proceed to next step.

3) Turn each idle mixture cap in (clockwise) equal amounts until idle CO is at or below 0.3%. Do not remove caps. Reset to specified RPM with air cleaner in place, and idle stop solenoid energized and extended.

4) Unplug and reconnect distributor vacuum advance hose and reconnect fuel tank vent hose to vapor canister. Remove CO meter from exhaust system tailpipe.

Slow Idle Speed RPM Specifications

Application	Solenoid Energized	Solenoid De-Energized
250" 6 Cylinder		
Auto. Trans.	600	450
Man. Trans.	700	450
V8 Engines		
Auto. Trans.	① 650	② 550

① — Transmission in "D" position.
② — Transmission in "PARK" position.