TUNE-UP

ENGINE IDENTIFICATION

Engines can be identified by the third digit of the Vehicle Identification Number. VIN is located in several places on most vehicles. *See below.*

VIN Engine Codes

Application	VIN Code
250" (4.1L) 2-Bbl.	D
292" (4.8L) 1-Bbl.	T

MODEL IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

The Vehicle Identification Number (VIN) is located on a plate on the upper left part of instrument panel on all but "P" models. On "P" models, the plate is attached to the front of the dash and toe panel to the left of steering wheel. VIN also appears on vehicle identification and rating plate, (found on left door pillar or inside face of dash and toe panel) and on service parts identification sticker, located on glove compartment door of "C" and "K" models, the inner hood panel on "G" models, and on an inner body panel of "P" models.

TUNE-UP NOTES

CAUTION – *IDLE SPEED ADJUSTMENT: Procedures and specifications for idle speed adjustment must be followed exactly as outlined. See "Hot (Slow) Idle RPM" under Tune-Up.*

NOTE – *For other items affecting Tune-Up, see FUEL SYSTEMS Section or EMISSION CONTROL Section.*

NOTE – *Due to changes and corrections, always refer to Engine Tune-Up Decal in engine compartment before attempting Tune-Up. In the event of a conflict between specifications given in this manual and decal specifications, decal specifications prevail.*

CAUTION – *When performing tune-up on vehicles equipped with a catalytic converter, do not allow or create a condition of engine misfire in one or more cylinders for an extended period of time. Damage to converter from overheating may occur due to loading with unburned fuel.*

NOTE – *SERIES IDENTIFICATION: The vehicle series numbers used in this article have been abbreviated for common reference to both Chevrolet and GMC models. Chevrolet models use numerical designation as listed; GMC models are identified as follows: 10 = 1500; 20 = 2500; 30 = 3500.*

NOTE – *For tune-up purposes, "Light Duty" refers to vehicles up to 8500 lbs. "Heavy Duty" refers to vehicles exceeding 8500 lbs.*

ENGINE COMPRESSION

Compression Ratio	
250"	8.25:1
292"	8.0:1
Compression Pressure (All)	130 psi
Maximum Pressure Variation	20 psi
Recommended Fuel	Unleaded (87 AKI Minimum)

When making compression checks, disconnect ignition switch pink wire from High Energy Ignition system. With air cleaner removed and throttle and choke wide open, crank engine through at least four compression strokes.

VALVE TAPPET CLEARANCE

Hydraulic Lifters ..... One turn down from zero lash.

VALVE ARRANGEMENT

E-I-I-E-E-I-I-E-E-I-I-E

SPARK PLUGS

Gap	.035"
Torque	17-27 ft. lbs.

Spark Plug Type

Application	AC No.
250" 2-Bbl.	R46TS
292" 1-Bbl.	R44T

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 specifications, or fluctuates from infinity to any value, replace cable.

Resistance (Ohms)

Wire Length	Maximum
Under 24"	30,000 Max.
Over 24"	50,000

DISTRIBUTOR

All models are equipped with High Energy Ignition systems and no adjustments are required.

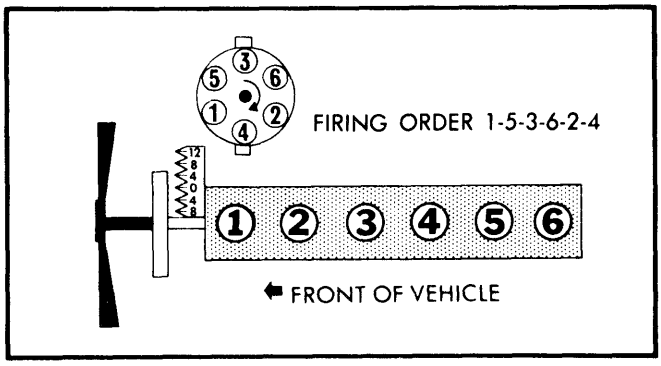

Fig. 1 250" & 292" Firing Order & Timing Mark Identification

IGNITION TIMING

NOTE – *Engines are equipped with a receptacle for magnetic probe timing equipment, located 10° ATDC. Do not use this location for timing with a conventional light.*

TUNE-UP (Cont.)

1) Install timing light with an adapter between No. 1 spark plug and No. 1 spark plug wire, or use an inductive type pickup. Do not puncture wire.

2) Check or adjust ignition engine timing with engine at normal operating temperature, distributor advance line disconnected and plugged, and automatic transmission in "D". On heavy duty vehicles, leave transmission on all models in neutral.

Ignition Timing Specifications (Degrees BTDC@RPM)

Application	Man. Trans.	Auto. Trans.
250" 2-Bbl.		
Federal	10@750	10@650
Calif.		
C20, G20 & G30	6@750	8@600
All Others	10@750	10@600
292" 1-Bbl.	8@700	8@700

HOT (SLOW) IDLE RPM

250" (2SE 2-Bbl.) – 1) With engine at normal operating temperature, vacuum advance line disconnected and plugged at distributor, automatic transmission in "D" and solenoid energized, connect tachometer to engine. Choke should be open and air conditioning "OFF". Disconnect and plug EGR valve hose, canister purge hose, and canister purge valve signal hose.

2) Set parking brake and check timing. Reconnect distributor vacuum advance hose. Open throttle slightly to allow solenoid plunger to fully extend. Turn solenoid screw in end of solenoid to adjust "Curb Idle" RPM speed to specifications (solenoid still energized).

3) De-energize solenoid and turn idle speed screw to set "Base Idle" RPM speed to specifications. Reconnect solenoid electrical lead.

292" (1ME 1-Bbl.) – 1) With engine at normal operating temperature, air cleaner installed, choke open and air conditioning "OFF", and fast idle cam follower off steps of fast idle cam, connect a tachometer to engine.

2) Disconnect and plug vacuum advance hose at distributor. Start engine and adjust timing to specification. Reconnect distributor vacuum hose. Disconnect and plug canister purge hose and canister purge valve signal hose.

Slow Idle Speed (RPM)

Application	Curb Idle	Base Idle
250" 2-Bbl.		
Federal		
Man. Trans.	750	450
Auto. Trans.	650	450
Calif.		
Man. Trans.	750	425
Auto. Trans.	600	425
292" 1-Bbl.		
All Models	700	.....

3) With transmission in neutral, adjust idle speed using idle speed screw. Connect hose from external vacuum source (hand pump) to throttle return control. Apply 20 in. Hg vacuum and check that idle speed is 1500 RPM. If not, adjust by turning plunger. Remove test equipment and reconnect hoses.

IDLE MIXTURE

NOTE – *Idle mixture should be adjusted only after major carburetor overhaul, throttle body replacement, or failure of emissions test.*

PROPANE ENRICHMENT PROCEDURE
250" 2-BBL. MODELS

1) Set parking brake and block drive wheels. On vehicles equipped with vacuum parking brake release, disconnect and plug hose at brake. With engine at normal operating temperature, air conditioning "OFF", and vacuum advance hoses disconnected and plugged at distributor, connect tachometer to engine.

2) Set timing to specifications and reconnect vacuum advance hose. Set idle speed to specifications. Disconnect crankcase ventilation tube from air cleaner. Using tool J-26911 (or equivalent), insert hose with rubber stopper (from propane valve) into ventilation tube opening in air cleaner. Be sure propane cartridge is vertical.

3) With engine idling in "D" or neutral, open propane supply control valve slowly. Add propane until engine speed begins to drop from over-richness. Note maximum engine speed.

NOTE – *If rich speed drop cannot be obtained, check for empty propane cartridge.*

4) Engine speed should rise above normal idle by amount specified. If so, mixture is correct. Proceed to step **7**).

5) If speed is not within specifications, remove idle mixture screw plugs. (On 2SE, carburetor must be removed and punch driven through bottom of throttle body to remove plug.) Seat screws, then back out until engine just runs. Place transmission in "D", then back out screw slowly until maximum idle speed is reached. Then set idle to enriched idle specification.

6) Turn each mixture screw in (clockwise) 1/8 turn at a time until idle speed reaches specification. Recheck enriched speed with propane. If not within specification, repeat steps **5**) and **6**), beginning with shift lever placement. Then, check and adjust fast idle speed.

7) Turn off engine. Remove propane tool, connect crankcase ventilation tube and reconnect all vacuum hoses.

Propane Enriched RPM

Application	Man. Trans.	Auto. Trans.
250" 2-Bbl.		
Federal	0-150	0-50
Calif.		
C & G10	0-250	0-50
G20 & G30	0-200	.....

TUNE-UP (Cont.)

TACHOMETER LEAN DROP PROCEDURE
292" 1-BBL. MODELS

1) Set parking brake and block drive wheels. Remove air cleaner for access to carburetor, but keep vacuum hoses connected. Disconnect and plug other hoses as directed on Emission Control Tune-Up decal in engine compartment.

2) With engine at normal operating temperature, choke open, air conditioning "OFF", connect a tachometer to engine. Disconnect and plug distributor vacuum advance hose. Check ignition timing and adjust if necessary. Reconnect vacuum advance hose.

3) Using care not to bend idle mixture screw, remove limiter cap from screw. Lightly seat mixture screw, then back out just enough so engine will run. Place transmission in neutral.

4) Back out mixture screw slowly until maximum idle speed is obtained. Adjust idle speed screw so enriched RPM is 0-75 RPM faster than idle speed. Turn mixture screw in until specified idle RPM is reached. Reconnect all hoses and install air cleaner, then recheck idle speed.

COLD (FAST) IDLE RPM

1) Check or adjust fast idle speed with engine at normal operating temperature and choke valve open. Disconnect and plug distributor and EGR vacuum line. Leave air cleaner installed.

2) On 292" 1-Bbl. engines, adjust curb idle speed with idle speed screw. Place cam follower tang on high step of fast idle cam.

NOTE – *On 292" 1-Bbl. engines with manual choke (smooth contour cam surface), rotate fast idle cam clockwise to its farthest "UP" position.*

3) Support lever with pliers and bend tang in or out to obtain specified fast idle RPM on 292" engines.

4) On 250" 2-Bbl. engines, adjust curb idle speed with solenoid screw in end of solenoid. Place fast idle screw on high step of fast idle cam and turn screw in or out to obtain specified RPM.

Fast Idle Speed (RPM)

Application	RPM
250" 2-Bbl.	
Man. Trans.	2000
Auto. Trans.	2200
292" 2-Bbl.	2400

AUTOMATIC CHOKE

All choke caps are retained with rivets and are non-adjustable.

FUEL PUMP PRESSURE & VOLUME

For pressure test, pinch off fuel return line (if equipped), connect pressure gauge to fuel line at carburetor, and hold pressure gauge at level of pump outlet. For vacuum test, disconnect fuel line at carburetor, install hose on line and route gas back to tank.

Pressure (At Idle)	4.5-6.0 psi
Volume (At Cranking Speed)	1 pt. in 30 seconds or less

MANIFOLD HEAT CONTROL VALVE

Check valve for freedom of movement and lubricate with a suitable solvent (GM Manifold Heat Control Valve Solvent).

NOTE – *Do not lubricate manifold heat control valve unless engine is cold.*

EMISSION CONTROL

See appropriate article in EMISSION CONTROL Section.

GENERAL SERVICING

IGNITION

DISTRIBUTOR

Delco	High Energy Ignition

Other Data & Specifications – *See Tune-Up and Delco distributors in ELECTRICAL Section.*

IGNITION COIL

Resistance	
Primary (at 80°F)	0.4-0.5 ohms
Secondary (at 80°F)	6,000-30,000 ohms
Current Draw	
Engine Stopped	0.1-0.2 amps.
Engine Idling	0.5-1.5 amps.
***Coil* Output**	
***At all* engine speeds**	30 KV Min.

IGNITION PICKUP COIL

Resistance	500-1500 ohms

FUEL SYSTEMS

CARBURETOR

Application	Model
250"	Rochester 2SE 2-Bbl.
292"	Rochester 1ME 1-Bbl.

Other Data & Specifications – *See Tune-Up and Rochester Carburetors in FUEL SYSTEMS Section.*

ELECTRICAL

BATTERY

12 Volt – Negative Ground.

GENERAL SERVICING (Cont.)

Application	Reserve Capacity	Cranking Amps
Standard		
250"	60 minutes	275
292"	80 minutes	350
Optional	100 minutes	430

STARTER

Delco ..... Overrunning Clutch

Free Speed Voltage
- 250" ..... 9 at 5500-10,500 RPM
- 292" ..... 9 at 3500-6000 RPM

Free Speed Amperage①
- 250" ..... 50-80 at 5500-10,500 RPM
- 292" ..... 50-80 at 3500-6000 RPM

① – Includes solenoid.

Other Data & Specifications – *See Delco Starters in ELECTRICAL Section.*

ALTERNATOR

Delco ..... Integral Regulator

Application	Rated Amp. Output
Standard	
250"	37
292"	
G20, G30 & "P" Models	42
All Others	37
Optional (All)	61, 80

Other Data & Specifications – *See Delco Alternators in ELECTRICAL Section.*

ALTERNATOR REGULATOR

Delco – Nonadjustable, integral with alternator.

Operating Voltage @85° ..... 12.5-15.5 volts

Other Data & Specifications – *See Delco Alternators and Regulators in ELECTRICAL Section.*

ENGINE

INTAKE MANIFOLD TIGHTENING

Tighten intake manifold-to-exhaust manifold bolts to 45 ft. lbs. and manifold-to-cylinder head bolts to 40 ft. lbs.

BELT ADJUSTMENT

Tension (Lbs.) Using Strand Tension Gauge

Application	New Belt	①Used Belt
Air Conditioning	135-145	90-100
All Others	120-130	70-80

① – One that has been rotated at least one complete revolution of the engine pulley.

FILTERS & CLEANERS

Filter-Cleaner	Service Interval (Miles) Light Duty	Heavy Duty
Oil Filter	①	①
Air Cleaner	30,000	12,000
Fuel Filter	15,000	12,000
Auto. Trans. Filter	100,000	24,000
PCV Filter	②	②
PCV Valve (Check)	15,000	12,000
PCV Valve (Replace)	30,000	24,000
Canister Filter	30,000	24,000

① – At first oil change, then every second change.
② – Located in air cleaner. Replace whenever air cleaner element is changed.

CAPACITIES (EXCEPT COOLING)

Application	Quantity
Crankcase	
250"	①4.0 qts.
292"	①5.0 qts.
Automatic Transmission (Dexron)	
THM 350	
Overhaul	10.0 qts.
Refill	6.0 pts.
THM 400	
Overhaul	11.0 qts.
Refill	7.0 pts.
Manual Transmission (SAE 80W-90)	
3-Speed	3.0 pts.
4-Speed	4.0 qts.
Transfer Case (SAE 10W-30)	5.0 pts.
Front Axle (SAE 80W-90)	5.0 pts.
Rear Axle (SAE 80W-90)	②
Power Take-Off (SAE 80W-90)	5.0 qts.
Fuel Tank	
G Models	
Standard	22 gals.
Optional	33 gals.
C & K Models (Exc. Short W.B.)	
Main Tank, Right Side	20 gals.
Auxiliary Tank, Left Side	20 gals.
C & K Models (Short W.B.)	
Standard	16 gals.
Auxiliary	16 gals.
Suburban & Utility	
Standard	25 gals.
Optional	31 gals.
P10	22 gals.
P20 & P30	24 gals.
Suburban & Blazer	
Standard	25 gals.
Optional	31 or 40 gals.
P Models	
Standard	30 gals.
Optional	40 gals.

① – Add one quart with filter change.
② – Fill to bottom of filler hole.

GENERAL SERVICING (Cont.)

CAPACITIES (COOLING)

Application	Quantity (Qts.)
250" Engine	
C10 & K10	
Auto. Trans. with A/C	15.5
All Others	15.0
C20 with A/C	15.5
C20 without A/C	15.0
G10, G20 & G30	17.0
292" Engine	
C20 with A/C	15.5
C20 without A/C	15.0
C30 & K30 with A/C	15.0
C30 & K30 without A/C	14.5
P10, P20 & P30	13.5