

## TUNE-UP

### ENGINE IDENTIFICATION

#### VEHICLE IDENTIFICATION NUMBER CODE

Engine can be identified by the fourth digit of the Vehicle Identification Number (VIN), which is stamped on a plate attached to top left corner of instrument panel.

#### VIN Engine Code

Application	Code
2.5L (151") 2-Bbl. ....	B

#### ENGINE IDENTIFICATION NUMBER CODE

Engine code is part of a number stamped on a machined pad at left front corner of cylinder block, adjacent to cylinder head. On engines built for sale in Georgia and Tennessee, engine code is stamped on a pad at left rear of engine block.

#### Engine Identification Code

Application	Man. Trans.	Auto. Trans.
2.5L 4-Cyl.		
Eagle		
Federal (All) .....	X4P .....	X4Y
Calif. (All) .....	X4Z .....	X4K
Concord & Spirit		
Federal		
With A/C .....	X4M .....	
Without A/C .....	X4L .....	
Calif. (All) .....	X4Z .....	
Nationwide		
With A/C .....		X4T
Without A/C .....		X4S

### 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.

**CAUTION** — When performing tune-up on vehicles equipped with catalytic converters, do not allow or create a condition of engine misfire in more than 1 cylinder for an extended period of time. Damage to converter may occur due to loading converter with unburned air/fuel mixture.

### ENGINE COMPRESSION

Compression Ratio .....	8.2:1
Compression Pressure .....	140 psi @ 160 RPM

### VALVE CLEARANCE

Hydraulic Lifters	
2.5L .....	Zero Lash

### VALVE ARRANGEMENT

I-E-I-E-E-I-E-I (Front to rear)

### SPARK PLUGS

Application	Gap (In.)	Torque Ft. Lbs. (N·m)
2.5L .....	.060 .....	7-15 (10-20)

### Spark Plug Type

Application	AC No.
2.5L .....	R44TSX

### HIGH TENSION WIRE RESISTANCE

Do not puncture spark plug wires with any type of probe. Remove spark plug wire and check resistance using an ohmmeter.

#### Resistance (Ohms)

Wire Length	Minimum	Maximum
0-15" .....	3000 .....	10,000
15-25" .....	4000 .....	15,000
25-35" .....	6000 .....	20,000
Over 35" .....	8000 .....	25,000

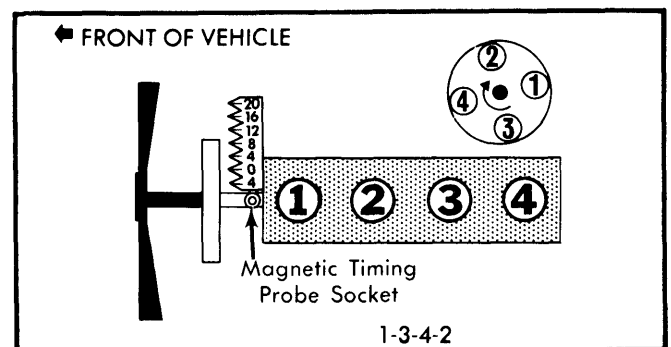
### DISTRIBUTOR

All models are equipped with a Delco High Energy Ignition system and no adjustments are required.

### IGNITION TIMING

Check or adjust ignition timing with engine at normal operating temperature and distributor vacuum advance hose disconnected (if equipped). Always refer to Emission Label for latest procedures and specifications.

**NOTE** — Magnetic probe socket is mounted 9.5° ATDC. When using this magnetic socket, timing equipment is calibrated to compensate for this different location.



**Fig. 1 2.5L Firing Order and Timing Marks**

TUNE-UP (Cont.)

Ignition Timing Specifications  
(Degrees BTDC@RPM)

Idle Speed RPM

Application	①Man. Trans.	①Auto. Trans.
2.5L 4-Cyl.		
Federal		
Concord & Spirit ..	10@800-1000 .....	10@600-800
Eagle .....	12@800-1000 .....	12@600-800
Calif.		
All Models .....	8@800-1000 .....	8@600-800
High Altitude		
All Model .....	15@800-1000 .....	15@600-800

Application	Man. Trans.	Auto. Trans.
2.5L 4-Cyl.		
With A/C		
Solenoid & A/C On .....	1250 .....	950
Solenoid & A/C Off .....	900 .....	700
Without A/C		
Solenoid On .....	900 .....	700
Solenoid Off .....	500 .....	500

① — On non A/C models, set with solenoid activated. On A/C models, set with A/C switch OFF and solenoid deactivated.

IDLE MIXTURE

**NOTE** — The following idle mixture adjustment procedures are not required for normal tune-up procedures and should not be adjusted unless idle mixture screw is being replaced during a complete carburetor overhaul. Mixture screws are covered by a plug from the factory.

HOT (SLOW) IDLE RPM

**NOTE** — Do not idle engine for over 3 minutes at a time. If idle adjustment is not completed within 3 minutes, run engine at 2000 RPM for 1 minute before continuing; repeat as necessary.

On all carburetors, connect a tachometer to ignition coil or to pigtail wire connector above heater blower motor. Make sure ignition timing is correct. Disconnect deceleration valve and canister purge hoses, then plug hoses. Remove air cleaner.

**2SE Carburetors Only** — 1) If vehicle is equipped with A/C, adjust idle speed screw to obtain specified RPM. Turn A/C on and open throttle momentarily to make sure solenoid is fully extended. Adjust solenoid idle speed screw to obtain specified RPM. Turn A/C off.

2) If vehicle is not equipped with A/C, adjust solenoid idle speed screw with solenoid energized to obtain specified RPM. Disconnect solenoid wire connector and adjust idle speed to slow idle RPM.

**E2SE Carburetor Only** — 1) Insert dwell meter positive probe into terminal 6 and negative probe into terminal 13 of diagnostic connector. Turn meter switch to the 6-Cyl. scale.

**NOTE** — The electronic fuel control system must be in the closed-loop mode during idle speed adjustment. When engine is at normal operating temperature, fuel control system should be in the closed-loop operation.

2) Dwell meter should oscillate between the 10 to 50 degree range with a maximum 15° needle movement. If idle speed adjustment is necessary, remove carburetor and knock out hardened steel plug covering idle screw. Reinstall carburetor and proceed.

3) If vehicle is equipped with A/C, adjust idle speed screw to obtain specified RPM. Turn A/C on and open throttle momentarily to make sure solenoid is fully extended. Adjust solenoid idle speed screw to obtain specified RPM. Turn A/C off.

4) If vehicle does not have A/C, adjust solenoid idle speed screw with solenoid energized to obtain specified RPM. Disconnect solenoid wire connector and adjust idle speed screw to obtain specified slow idle speed RPM. Connect solenoid wire connector. Install plug to seal idle speed screw or fill idle speed cavity with RTV sealant.

**2SE Carburetors Only** — 1) Place a punch between two locator points in throttle body beneath idle mixture screw plug. Break out throttle body to gain access to mixture screw plug. Drive out steel plug that conceals idle mixture screw. Reinstall carburetor.

2) With engine at normal operating temperature, connect tachometer. Set parking brake, block wheels and place transmission in neutral (Man. Trans.) or in drive (Auto. Trans.)

3) Turn mixture screw lean (clockwise) until drop in RPM is noted.

4) Turn idle mixture screw rich (counterclockwise) until highest possible RPM is reached. Do not turn mixture screw any further than the point at which highest RPM is reached.

5) Slowly turn mixture screw clockwise until idle drops 100 RPM from idle speed noted in previous step.

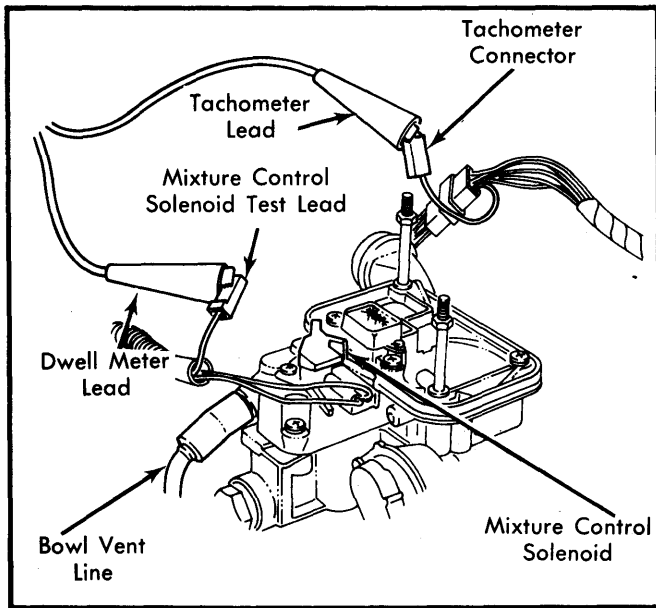
6) If idle speed is not within 30 RPM of specified curb idle, readjust curb idle speed as necessary and repeat steps 3), 4) and 5).

**E2SE Carburetors Only** — 1) Disconnect battery negative cable. Remove carburetor from vehicle. Place a punch between two locator points in throttle body beneath idle mixture screw plug. Break out throttle body to gain access to mixture screw plug. Drive out steel plug that conceals idle mixture screw. Reinstall carburetor.

2) Turn idle mixture screw clockwise until it lightly seats. Now back out mixture screw 3 turns (Auto. Trans.) or 2½ turns (Man. Trans.).

3) If plug in air horn covering idle air bleed screw has been removed, turn air bleed screw in until lightly seated and then back out ¼ turns. If plug has not been removed, adjustment is not necessary.

## TUNE-UP (Cont.)



**Fig. 2 Idle Mixture Adjustment Preparation (Model E2SE Carburetor Only)**

4) Install carburetor and negative battery cable. Do not install air cleaner and gasket. Disconnect bowl vent hose, EGR valve, and canister purge vacuum hoses at carburetor and plug carburetor ports.

5) Connect tachometer lead to distributor tachometer connector located at in vicinity of heater blower motor. Connect dwell meter to mixture control solenoid test wire connector. See Fig. 2.

6) Place transmission in park (Auto. Trans.) or in neutral (Man. Trans.) and set parking brake. Start engine and set idle to 700 RPM.

7) Adjust idle mixture screw until an average dwell meter reading of 25° is reached. If dwell is too low, slowly turn mixture screw counterclockwise. If dwell is too high, slowly turn mixture screw clockwise. Allow time for dwell to stabilize after each adjustment.

8) Disconnect wire connector at mixture control solenoid while watching tachometer. Tachometer reading should change at least 50 RPM. If idle does not change enough, check idle air

bleed circuit for leaks or restrictions. Reconnect mixture control solenoid wire.

9) Connect bowl vent hose, EGR valve hose, and canister purge vacuum hoses and reset curb idle to specified range. Disconnect tachometer and dwell meter. Install plug or fill mixture screw cavity with RTV Sealant. Install air cleaner and gasket.

### COLD (FAST) IDLE RPM

Prepare vehicle for this adjustment as instructed by the Emission Label on the vehicle. Adjust basic timing as per Emission Label. Place fast idle screw on highest step of fast idle cam and turn fast idle screw to obtain specified RPM.

Application	Fast Idle RPM	
	Man. Trans.	Auto. Trans.
2.5L 4-Cyl.		
All Fed. Man. Trans. ....	2400	
Concord & Spirit		
With A/C .....		2600
Without A/C .....	2400	2400
Eagle		
Without A/C .....	2500	2500

### AUTOMATIC CHOKE

The 2SE and E2SE carburetors use non-adjustable chokes. These chokes are preset at the factory and should not be changed.

### FUEL PUMP

Make all tests with air cleaner removed and fuel inlet line or filter disconnected at carburetor. Disconnect fuel return line at fuel filter and plug nipple on filter. Make all tests at idle speed.

Pressure .....	6.5-8.0 psi
Volume .....	1.0 pints in 30 seconds

### EXHAUST EMISSION SYSTEMS

See EXHAUST EMISSION SYSTEMS section.

## GENERAL SERVICING

### IGNITION

#### DISTRIBUTOR

Delco High Energy Ignition Distributor (HEI).

### IGNITION COIL

#### Coil Resistance (Ohms@75°F)

Application	Primary	Secondary
2.5L 4-Cyl.		
All Models .....	0.4-1.0	6000-30,000

## GENERAL SERVICING (Cont.)

## Coil Output

All Models ..... 35 KV

## CARBURETION

## CARBURETOR

Application	Model
2.5L 4-Cyl.	
Federal Man. Trans. ....	Rochester 2SE
All Except Federal Man. Trans. ....	Rochester E2ES

## ELECTRICAL

## BATTERY

Application	Reserve (Minutes)	Cranking Amps <sup>①</sup>
Standard .....	75 .....	380
Optional .....	80 .....	450
Optional .....	100 .....	440

① — Cranking amps rating specifies minimum amps a fully charged battery will deliver at 0° for 30 seconds without falling below 7.2 volts. Reserve capacity is number of minutes a fully charged battery at 80° F can be discharged at steady rate of 25 amperes and hold a voltage of 1.75 volts per cell (10.5 total) or higher.

## STARTER

## Starter Specifications

Application	Volts	Amps	Test RPM
2.5L 4-Cyl. ....	9 .....	45-70 .....	7000-11,900

## ALTERNATOR

Delco — 10 SI

Application	Rated Amp. Output
Standard .....	42
Optional	
Non-Fleet .....	55
Fleet .....	63

Field Current Draw	Amps@80°F
All Models .....	4.0-5.0

## ALTERNATOR REGULATOR

Delco-Remy model 1116387 non-adjustable, integral with alternator.

Operating voltage (at 50-100°F) ..... 13.9-14.9

## ENGINE

## REPLACEMENT INTERVALS

Component	Interval (Miles)
Oil Filter .....	7,500
Air Filter .....	①30,000
Fuel Filter .....	12,500
PCV Valve .....	30,000
Spark Plugs .....	30,000
Oxygen Sensor .....	30,000

① — Every 15,000 miles for heavy duty or dusty conditions.

## COOLING CAPACITIES

Application	Quantity
2.5L 4-Cyl.	
All Models .....	6.5 qts.

## TRANSMISSION &amp; DIFFERENTIAL CAPACITIES

Application	Quantity
Man. Trans. (Dexron II)	
4-Speed .....	3.5 pts.
5-Speed .....	4.0 pts.
Auto. Trans. (Dexron II)	
Concord & Spirit .....	7.1 qts.
Eagle .....	8.5 qts.
Rear Differential (SAE 85W-90)	
All Models .....	3.0 pts.
Front Differential (SAE 85W-90)	
Eagle Only .....	2.5 pts.
Transfer Case (Dexron II)	
Eagle Only .....	3.0 qts.

## OIL &amp; FUEL CAPACITIES

Application	Quantity
Crankcase (including filter)	
All Models .....	3.0 qts.
Fuel Tank	
Concord .....	22.0 gal.
Spirit .....	21.0 gal.
Eagle	
SX/4 & Kamback .....	21.0 gal.
All Other Models .....	22.0 gal.