TUNE-UP

ENGINE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER CODE

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

VIN Code

Application	Code
151" 2-Bbl. (Omega)	5
151" 2-Bbl. (Starfire)	V

ENGINE IDENTIFICATION NUMBER CODE

The Engine Identification Number is stamped on the front of the engine block near the water pump.

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 — *Before making a compression test or cranking engine with a remote starting switch, disconnect ignition switch connector (pink wire) from H.E.I. system distributor.*

CAUTION — *Do not remove spark plug wires with engine running. High Energy Ignition secondary voltage is higher than standard ignition systems and may inflict harmful electrical shock.*

CAUTION — *Damage to the H.E.I. electronic module and/or ignition coil may result if "TACH" terminal, in distributor cap connector or on ignition coil, is directly grounded.*

ENGINE COMPRESSION

Compression Ratio
151" VIN 5 & V 8.3:1
Recommended Fuel ..... Unleaded (87 AKI Minimum)
Compression Pressure (At 160 RPM Minimum)
All ..... 140 psi
Max. Variation Between Cylinders ..... 20 psi

Remove air cleaner and place throttle and choke in wide open position. Check compression through at least 4 compression strokes.

NOTE — *If using a remote starting switch, disconnect ignition switch connector (pink wire) at distributor.*

VALVE TAPPET CLEARANCE

Hydraulic Lifters ..... Zero Lash

VALVE ARRANGEMENT

All Engines — I-E-I-E-E-I-E-I

SPARK PLUGS

Gap ..... .060"
Torque ..... 15 ft. lbs.

Spark Plug Type

Application	AC No.
151" VIN 5 (Omega)	R43TSX
151" VIN V (Starfire)	R44TSX

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.

Resistance (Ohms) Per Wire

Application	Resistance
All	50,000 Max.

DISTRIBUTOR

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

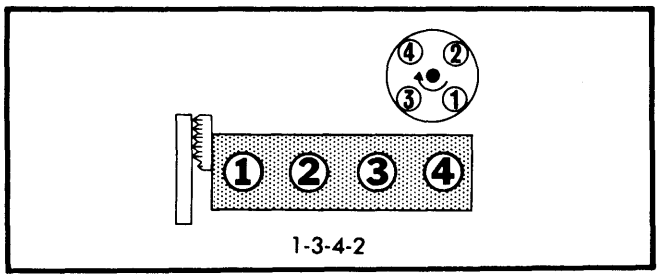

Fig. 1 151" Firing Order and Timing Marks VIN 5 (Omega)

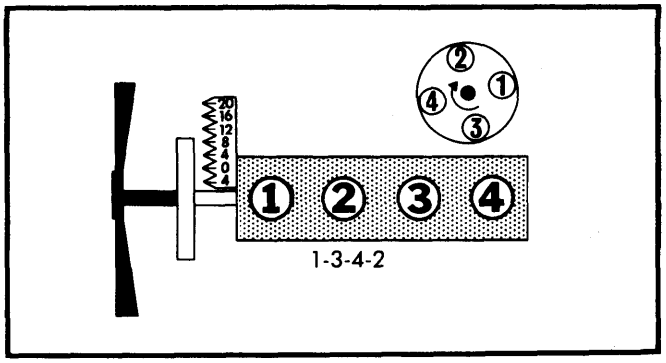

Fig. 2 151" Firing Order and Timing Marks VIN V (Starfire)

TUNE-UP (Cont.)

IGNITION TIMING

NOTE – *Engines have a receptacle for a magnetic probe timing light, located at 9.5° ATDC. Do not use this receptacle with a normal timing light.*

Set ignition timing with engine at normal operating temperature, choke open, and air conditioning off. Disconnect and plug vacuum advance at distributor. Set timing with engine at specified RPM; automatic transmission in Drive and manual transmission in neutral.

Ignition Timing Specifications (Degrees BTDC@RPM)

Application	Man. Trans.	Auto. Trans.
151" VIN 5	10@1000	10@650
151" VIN V	12@1000	12@650

HOT (SLOW) IDLE RPM

NOTE – *Check Emission Control Decal for specific instructions on disconnecting hoses and other idle preparation procedures.*

Without A/C – Place automatic transmission in Drive. Check to see that solenoid is energized, and open throttle slightly to allow plunger to fully extend. Adjust solenoid plunger screw to set solenoid RPM, then disconnect solenoid lead. Set curb idle speed with idle speed screw. Reconnect solenoid lead.

With A/C – Place automatic transmission in Drive. With air conditioning off, set curb idle speed with idle speed screw. Disconnect compressor clutch lead at compressor, and turn air conditioning on. Open throttle slightly to allow plunger to extend, then turn solenoid screw to adjust solenoid RPM. Connect compressor lead after adjustment.

Idle Speed (RPM)

Application	Curb Idle	Solenoid Energized
151" VIN V		
Man. Trans.		
Fed. With A/C	1000	1250
Fed. Without A/C	550	1000
Calif. With A/C	1000	1200
Calif. Without A/C	500	1000
Auto. Trans.		
All With A/C	650	850
Fed. Without A/C	550	650
Calif. Without A/C	500	650
151" VIN 5		
Man. Trans.		
Fed. With A/C	1000	1300
Calif. With A/C	1000	1200
All Without A/C	500	1000
Auto. Trans.		
All With A/C	650	900
All Without A/C	500	650

IDLE MIXTURE

NOTE – *Mixture screws on all carburetors are covered by hardened steel plugs. Mixture adjustment is not part of a tune-up and should not be performed unless carburetor has been disassembled or vehicle failed emissions testing.*

MIXTURE SCREW PLUG REMOVAL

1) Remove carburetor from engine, drain fuel and mount on a holding fixture upside down. Place a punch between the 2 locating marks on underside of carburetor, and break out throttle body.

2) Use punch to drive out hardened steel plug. If it shatters, remove loose pieces. Repeat to remove other plug (if equipped).

PROPANE ENRICHMENT PROCEDURE FEDERAL ONLY

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 the Emission Information Label under hood.

2) Connect a tachometer to engine. Disconnect vacuum advance and set timing to specification on Emission Label. Reconnect vacuum advance. Disconnect PCV hose at valve cover (VIN V) or air cleaner (VIN 5). Insert propane hose into opening in hose or air cleaner using tool J-26911.

3) Propane cartridge must be in a vertical position. Slowly open propane control valve until maximum engine speed is reached with transmission in drive (neutral for manual transmission).

NOTE – *Too much propane will cause engine speed to drop.*

4) Observe propane flow meter to ensure propane cartridge is full. With propane flowing, adjust idle speed screw to the enriched RPM (see specifications). 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 2,000 RPM for 30 seconds. Put transmission in drive (neutral for manual transmission). Check idle speed. If it is as shown on Emission Label, idle mixture is correct, proceed to step 8.

6) If idle speed is too low, carefully remove cap(s) from mixture screw(s) and back screw(s) out 1/8 turn at a time until specified speed is reached. If speed is too high, turn mixture screw(s) in 1/8 turn at a time until specified speed is reached.

NOTE – *It may be necessary to remove air cleaner to reach idle mixture screw(s). Reinstall air cleaner to check 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 and accelerate engine to 2,000 RPM for 30 seconds and recheck idle speed. Idle speed should be to specification, if not repeat procedure starting with step 6.

TUNE-UP (Cont.)

8) If idle is unusually rough, turn mixture screws in until lightly seated. Back screws out equally to average previous position and rerun propane idle test starting with step 2. If idle is correct, turn engine off and remove propane tool. Connect positive crankcase ventilation and reconnect all other hoses.

Propane Enriched RPM

Application	Propane Enriched RPM
151"	
Man. Trans.	
VIN 5	1250
VIN V	1150
Auto. Trans	700

IDLE MIXTURE ADJUSTMENT - C-4 CALIFORNIA ONLY

1) If mixture adjustment is necessary, remove carburetor and remove steel plugs over mixture screws. Turn screws in until seated, then back out 5 turns. If plug in air horn has been removed, turn idle air bleed screw in until seated, then back out 3 turns. If plug is in place, DO NOT remove.

2) Remove vent stack screen assembly. Turn part throttle lean mixture screw in until seated, then back out 2½ turns. Reinstall carburetor. Disconnect bowl vent line at carburetor, and disconnect and plug vacuum hose to "T" in bowl vent line (if used).

3) Disconnect EGR valve and canister purge at carburetor and plug carburetor port. Connect dwell meter to green mixture control solenoid lead, and connect tachometer to brown test lead from distributor. Set dwell meter on 6 cylinder scale.

4) Run engine on high step of fast idle cam for at least 3 minutes until cooling fan begins to cycle. Run engine at 3000 RPM and carefully adjust lean mixture screw until average dwell reading is 35°. Turn screw out to raise dwell; in to lower dwell.

5) Return engine to idle and adjust engine to 700 RPM while cooling fan is off. Adjust idle mixture screw to obtain average dwell of 25° while cooling fan is off. Turn screw out to raise dwell; in to lower dwell.

NOTE - *These adjustments are very sensitive. Make final checks with adjusting tool removed, and allow time between adjustments for engine to stabilize.*

6) Disconnect mixture control solenoid lead while cooling fan is off. Check for a drop of at least 50 RPM, then connect lead. Repeat 3000 RPM check. If not correct, repeat adjustment procedure. Remove test equipment, connect hoses, and replace vent stack screen.

COLD (FAST) IDLE RPM

With automatic transmission in park or manual transmission in neutral, engine at normal operating temperature, idle speed correctly set, air cleaner installed, choke open, EGR valve and distributor vacuum line disconnected and plugged and air conditioning off, place fast idle screw on high step of fast idle cam. Adjust fast idle screw to obtain specified RPM.

Cold (Fast) Idle RPM

Application	Man. Trans.	Auto. Trans.
151" VIN V		
Federal	2600	2600
Calif.	2400	2600
151" VIN 5		
Federal	2600	2600
Calif.	2200	2600

AUTOMATIC CHOKE

The choke coil cover is riveted in place on all models and no adjustments are possible.

FUEL PUMP

Make all tests at idle speed. For pressure test, pinch off fuel return line (if equipped).

Pressure	
151" VIV V	5.5-6.5 psi
151" VIN 5	6.5-8.0 psi
Volume	1 pint in 30 seconds

EXHAUST EMISSION SYSTEMS

See EXHAUST EMISSION SYSTEMS section.

GENERAL SERVICING

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 the surface on which module will be mounted.*

IGNITION COIL

Resistance

Primary (At 75°F)	.4-1.0 ohms
Secondary (At 75°F)	6000-30,000 ohms

Coil Output

At all engine speeds	25-35 KV Minimum①

① - Replace if below 25 KV.

GENERAL SERVICING (Cont.)

CARBURETION

CARBURETORS

Application	Model
Federal	Rochester 2SE
Calif.	Rochester E2SE

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

ELECTRICAL

BATTERY

12 Volt, Negative Ground.

Application	Cold Crank Amps @0°F	Reserve Capacity Minutes
Standard	350	80
Optional	430	100
Optional	465	125

STARTER

Delco-Remy solenoid actuated with overrunning clutch.

Application	Volts	Amps	Test RPM
VIN V	9	45-75	6500-9700
VIN 5	9	45-70	7000-11,900

ALTERNATOR

Application	Std. Amps	Opt. Amps
VIN V	37	55, 63
VIN 5	42	63, 70

ALTERNATOR REGULATOR

Delco-Remy nonadjustable, integral with alternator.

Operating Voltage (@80°F)	13.8-14.8

ENGINE

MANIFOLD TIGHTENING

Tighten intake manifold bolts to 25 ft. lbs. and exhaust manifold bolts to 35 ft. lbs. Start with bolts in top center of manifold and tighten alternately toward ends of manifold.

FILTERS & CLEANERS

Filter Or Cleaner	Service Interval (Miles)
Oil Filter	Every Other Oil Change
Air Filter	Replace 30,000
Fuel Filter	Replace 15,000
PCV Valve & Filter	Replace 30,000
Evaporative Canister Filter	Replace 30,000

BELT ADJUSTMENTS

Tension (Lbs.) Using Strand Tension Gauge

Application	New Belt	Used Belt
A/C	135-165	80-100
All Others	120-150	75-80

CAPACITIES

Application	Quantity
Crankcase (With or without filter)	3.0 qts.
Cooling System	
Starfire	
Standard	11.0 qts.
With A/C	11.5 qts.
Omega	
Standard	9.5 qts.
With A/C	9.75 qts.
Man. Trans. (SAE 80W-90)	3.0 pts.
Man. Transaxle (Dexron II)	6.0 pts.
Auto. Trans. (Dexron II)	7.0 pts.
Auto. Transaxle (Dexron II)	10.0 pts.
Rear Axle (SAE 80W-90)	3.5 pts.
Fuel Tank	
Omega	14.0 gals.
Starfire	18.5 gals.