

TUNE-UP

ENGINE IDENTIFICATION

Engines can be identified by the eighth digit of the Vehicle Identification Number (VIN). The VIN number is stamped on a plate located at the base of the steering column on "P" (Van conversion) models, and on the upper left corner of the dash on all other models.

VIN ENGINE CODES

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

TUNE-UP NOTES

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: For tune-up purposes, "Light Duty" refers to vehicles up to 8500 lbs. GVW. "Heavy Duty" refers to vehicles exceeding 8500 lbs. GVW.

ENGINE COMPRESSION

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.

COMPRESSION SPECIFICATIONS

Compression Ratio	
4.1L	8.3:1
4.8L	8.0:1
Compression Pressure	130 psi (9.1 kg/cm ²)
Maximum Pressure Variation Between Cylinders	30 psi (2.1 kg/cm ²)

VALVE CLEARANCE

All engines have hydraulic lifters which should be adjusted to 1 turn down from zero lash.

VALVE ARRANGEMENT

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

SPARK PLUGS

SPARK PLUG SPECIFICATIONS

Application	Gap In. (mm)	Torque Ft. Lbs. (N.m)
All Models035 (.90)	17-27 (23-37)

SPARK PLUG TYPE

Application	AC No.
All Models	
Light Duty	R45TS
Heavy Duty	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 incorrect, or fluctuates from infinity to any value, replace cable.

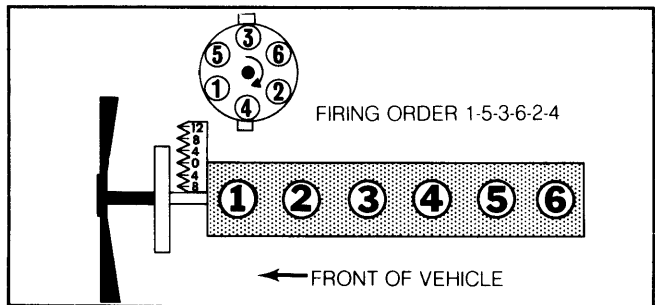
RESISTANCE (Ohms)

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

DISTRIBUTOR

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

Fig. 1: Timing Mark and Firing Order



Magnetic probe located at 10° ATDC.

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.

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.

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IGNITION TIMING (Degrees BTDC@Idle)

Application	Man. Trans.	Auto. Trans.
4.1L	10	10
4.8L	8	8

HOT (SLOW) IDLE RPM

4.1L Models

1) Warm engine to normal operating temperature and place transmission selector in "D". Disconnect and plug EGR and canister purge hoses at carburetor.

2) Open throttle slightly to allow solenoid to extend, then adjust curb idle by turning screw in back of solenoid. Disconnect solenoid wire and set base idle speed with idle speed screw. Reconnect solenoid wire and all hoses.

4.8L Models

1) Warm engine to normal operating temperature. Place transmission in neutral on all models. Adjust curb speed by turning solenoid assembly in or out.

2) Disconnect solenoid wire and set base idle speed by turning hex head screw in rear of solenoid. Reconnect solenoid wire.

3) Connect hose from hand vacuum pump to throttle return control (if equipped). Apply 20 in. Hg and adjust plunger to obtain 1500 RPM. Reconnect hoses and remove test equipment.

SLOW IDLE SPEED (RPM)

Application (Decal No.)	Curb Idle	Base Idle
4.1L		
CAM & CAN	700	550
CVK & CVM	650	475
CAT & CAU	625	450
CAY, CAZ, CBC & CBD	650	450
CBJ, CXK & CXM	650	525
CAW, CAX, CBA & CBB	700	450
CAR & CAS	600	550
CBF, CMT & CMY	750	550
All Others	650	500
4.8L		
Man. Trans.	700	450
Auto. Trans.	700	450

IDLE MIXTURE

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

PROPANE ENRICHMENT PROCEDURE

4.1L Models Only

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

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

3) With engine idling in "D" or neutral, open propane supply control valve slowly. Engine speed will increase. 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 incorrect, 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 enriched idle.

6) Turn each mixture screw in (clockwise) $\frac{1}{8}$ turn at a time until idle speed is correct. Recheck enriched speed with propane. If incorrect, repeat steps 5) and 6). 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.
4.1L Engines		
Federal	¹ 60	² 50
Calif.	100	30
Nationwide	³ 60	20

¹ — Set carburetor Nos. 17082487 and 17082489 to 100 RPM. Set carburetor Nos. 17082339 and 17082485 to 40 RPM.

² — Set carburetor Nos. 17082338 and 17082484 to 10 RPM. Set 17082488 and 17082486 to 20 RPM & No. 17082336 to 20 RPM.

³ — Set carburetor No. 17082433 to 70 RPM & 17082483 to 60 RPM.

LEAN DROP PROCEDURE

4.8L Models Only

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 if directed on Emission Control Tune-Up decal.

2) Warm engine to normal operating temperature. Make sure choke is open and air conditioning "OFF". Connect a tachometer to engine. Disconnect and plug

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distributor vacuum advance hose. Check ignition timing and adjust if necessary. Reconnect vacuum advance hose.

3) Carefully remove limiter cap from idle mixture 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 idle RPM is reached. Reconnect all hoses and install air cleaner, then recheck idle speed.

COLD (FAST) IDLE RPM

4.1L Engine

Place fast idle screw on high step of fast idle cam. Turn screw to adjust fast idle RPM.

4.8L Engine

Place cam follower on high step of fast idle cam. Support lever with pliers and bend tang in or out to adjust fast idle RPM.

FAST IDLE SPEED (RPM)

Application	Man. Trans.	Auto. Trans.
4.1L	2000	¹ 2200
4.8L	2400	2400

¹ — Set decals CAY, CBD and CBC to 2000 RPM.

NOTE: On models with manual choke, rotate fast idle cam clockwise to farthest "UP" position.

AUTOMATIC CHOKE

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

FUEL PUMP

To test pressure, pinch off fuel return line (if equipped) and connect pressure gauge to fuel line at carburetor. Hold pressure gauge at level of pump outlet.

FUEL PUMP

Application	Pressure psi (kg/cm ²)	Volume Pints (Liters)
All Models	4.5-6.0	1 pt in 30 sec.
	(.3-.4)	(.47 in 30 sec.)

EMISSION CONTROL

NOTE: See appropriate article in EMISSION CONTROL Section.

GENERAL SERVICING

IGNITION

DISTRIBUTOR

All vehicles are equipped with Delco-Remy High Energy Ignition.

DISTRIBUTOR PICKUP COIL RESISTANCE (Ohms)

All Models 500-1500 ohms

IGNITION COIL

COIL RESISTANCE (Ohms)@75°F (24°C)

Application	Primary	Secondary
All Models	0.4-1.0	6000-30,000

COIL OUTPUT

At all engine speeds 25-35KV Minimum

FUEL SYSTEMS

CARBURETORS

Application	Model
4.1L	Rochester 2SE 2-Bbl.
4.8L	Rochester 1ME 1-Bbl.

ELECTRICAL

BATTERY SPECIFICATIONS

Application	Cold Cranking Amps. ¹	Reserve Capacity Minutes
4.1L	275	60
4.8L	430	100

¹ — At 0°F (-18°C).

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GENERAL SERVICING (Cont.)

STARTER

All starters are Delco-Remy overrunning clutch models.

STARTER SPECIFICATIONS

Application	Volts	Amps.	Test RPM
4.1L	9	50-80 ..	5500-10,500
4.8L	9	50-80	3000-6000

ALTERNATOR

All models are equipped with Delco-Remy Integral Regulator Alternators.

ALTERNATOR SPECIFICATIONS

Application	Rated Amp. Output
Standard	
4.1L	37
4.8L	
G20,G30 & "P" Models	42
All Others	37
Optional (All)	61, 80
Field Current Draw @ 12 volts ¹	
All Models	4.0-4.5 amps.

¹ — At 80°F(27°C).

ALTERNATOR REGULATOR

All models are equipped with Delco-Remy non-adjustable regulator, integral with alternator.

REGULATOR SPECIFICATIONS

Operating Voltage @85°F (29°C)	12.5-15.5 volts
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ADJUSTMENTS

BELT ADJUSTMENT

Tension Using Strand Tension Gauge

Application	Lbs. (Kg)
New Belt	
Air Conditioning	135-145 (61-66)
All Others	120-130 (54-59)
Used Belt ¹	
Air Conditioning	90-100 (41-45)
All Others	70-80 (32-36)

¹ — Any belt that has been rotated at least one complete revolution of the engine pulley.

SERVICE INTERVALS

REPLACEMENT INTERVALS

Components	Intervals (Miles)
Oil Filter	7500
Fuel Filter	12,000
Spark Plugs	30,000
PCV Valve and Filter	30,000
Air Filter	30,000

CAPACITIES

COOLING SYSTEM

Application	Quantity
4.1L	
Van Models	17.0 qts. (16.1L)
All Other Models	15.5 qts. (14.7L)
4.8L	
"P" Models	13.5 qts. (12.8L)
All Other Models	15.5 qts. (14.7L)

CAPACITIES (EXCEPT COOLING)

Application	Quantity
Crankcase ¹	
4.1L	5.0 qts. (3.8L)
4.8L	6.0 qts. (4.7L)
Automatic Transmission (Dexron)	
THM 350	
Overhaul	10.0 qts. (9.5L)
Refill	6.0 pts. (2.8L)
THM 400	
Overhaul	10.0 qts. (9.5L)
Refill	7.0 pts. (3.8L)
Manual Transmission (SAE 80W-90)	
3-Speed	3.0 pts. (1.4L)
4-Speed	4.0 pts. (1.9L)
Transfer Case (SAE 10W-30)	5.0 pts. (2.4L)
Front Axle (SAE 80W-90)	5.0 pts. (2.4L)
Rear Axle (SAE 80W-90)	²
Power Take-Off (SAE 80W-90)	5.0 pts. (2.4L)
Fuel Tank	
Pickup Models	
Short Wheelbase (Each Tank)	16 gals. (61L)
Long Wheelbase (Each Tank)	20 gals. (76L)
Van Models	
Standard	22 gals. (84L)
Optional	33 gals. (125L)
Suburban Models	
Standard	25 gals. (95L)
Optional	31 gals. or 40 gals. (118L or 152L)
Blazer Models	
Standard	25 gals. (95L)
Optional	31 gals. (118L)
"P" Models	
Standard	31 gals. (118L)
Optional	40 gals. (152L)

¹ — Including 1 quart for filter change.

² — Fill to bottom of filler hole.