TUNE-UP

ENGINE IDENTIFICATION

Engine identification number is stamped on left front of block below cylinder head. First digit indicates model year, then the next 3 digits indicate engine size in cubic inches. Engine can also be identified by the 8th digit in the Vehicle Identification Number (VIN). VIN is located on a plate attached to driver's door post.

VIN Engine Codes

Application	VIN Code
5.2L (318") 2-Bbl.	P
5.2L (318") 4-Bbl.	M
5.9L (360") 4-Bbl.	T
5.9L (360") 4-Bbl. Heavy Duty Single Exhaust	U
5.9L (360") 4-Bbl. Heavy Duty Dual Exhaust	V

TUNE-UP NOTES

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 — *Due to production changes, 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, use the decal specifications.*

CAUTION — *On vehicles equipped with catalytic converters do not add fuel system cleaning agents to fuel tank or carburetor as their use may be detrimental to the catalytic converter.*

CAUTION — *Before making a compression test or cranking engine using a remote starting switch, disconnect coil wire from distributor and secure to a good ground.*

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

NOTE — *For tune-up purposes, "Light Duty" refers to vehicles 8500 lbs. GVW or less and "Heavy Duty" refers to vehicles over 8500 lbs. GVW.*

ENGINE COMPRESSION

Compression Ratio	
5.2L	8.6:1
5.9L	8.5:1
Minimum Compression Pressure	100 psi
Maximum Pressure Variation	40 psi

Test compression with engine warm, all plugs removed and throttle wide open.

VALVE CLEARANCE

All (Hydraulic)	Zero Lash

VALVE ARRANGEMENT

E-I-I-E-E-I-I-E (Front to rear, both banks).

SPARK PLUGS

Application	Gap (In.)	Torque (Ft. Lbs.)
5.2L	.035	30
5.9L Light Duty	.035	30
5.9L Heavy Duty	.035	10

Spark Plug Type

Application	Champion No.
5.2L	RN-11Y
5.9L Light Duty	RN-12Y
5.9L Heavy Duty	RF-10

HIGH TENSION WIRE RESISTANCE

1) Carefully remove spark plug wire from spark plug and install proper adapter between wire and spark plug. Remove distributor cap with wires attached. Connect an ohmmeter between spark plug adapter and opposite end of wire. If resistance is not within specifications, remove wire from cap and retest. If not within specifications, replace wire.

2) To check coil wire resistance, remove distributor cap from distributor (with wires still attached). Do not remove wire from coil. Connect an ohmmeter between center contact in cap and either primary terminal at coil. If combined resistance of coil and cable is not within specifications, remove coil wire at coil tower and check cable resistance.

3) If resistance is now within specifications, check for a loose connection at coil tower or for a faulty coil. If resistance is not within specifications, replace wire.

Resistance (Ohms)

Application	Maximum
Coil Wire	
Installed	25,000
Removed	15,000
Spark Plug Wire	
To 25" Length	30,000
Over 25" Length	50,000

DISTRIBUTOR

All models are equipped with Chrysler Electronic Ignition system and no adjustments are required. Automatic transmission models use a dual pick-up distributor, while manual transmission vehicles have a single pick-up.

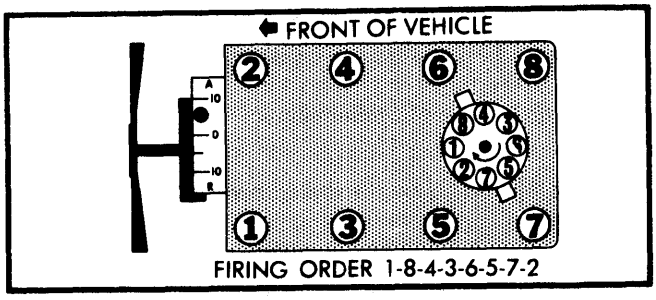

Fig. 1 Firing Order and Timing Marks (5.2L & 5.9L)

TUNE-UP (Cont.)

IGNITION TIMING

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

1) Connect timing light to number 1 cylinder and tachometer to engine. Start engine, set parking brake and place transmission in Neutral. Bring engine to normal operating temperature.

2) Disconnect and plug vacuum hoses to EGR valve and at distributor. Disconnect PCV valve from grommet and vapor canister purge hose at carburetor, leaving connections open. Idle set RPM should be within ±100 RPM of specifications. To adjust, use idle speed screw.

3) Reconnect PCV valve and purge hose and check timing. If not within ±2°, loosen distributor hold-down screw and adjust timing until within specifications. Tighten hold-down screw when timing is correct. Recheck idle set RPM and timing.

CAUTION – *DO NOT use distributor vacuum advance unit as a handle when turning distributor housing.*

4) If timing was adjusted or idle speed screw was turned, perform propane enrichment procedure. Unplug and reconnect all vacuum hoses and remove all test equipment.

Ignition Timing Specifications (Degrees BTDC@RPM)

Application	Man. Trans.	Auto. Trans.
5.2L 2-Bbl.	10@650	16@650
5.2L 4-Bbl.		
Federal		16@650
Calif.	12@750	16@750
Nationwide	8@750	8@750
5.9L 4-Bbl.		
Light Duty		
Federal	12@600	
Calif.	12@725	16@750
Heavy Duty		
Federal	4@700	4@700
Calif.	10@750	10@750

HOT (SLOW) IDLE RPM

1) Set parking brake, place transmission in neutral and warm engine to normal operating temperature. Allow engine to idle at least 2 minutes before adjusting.

2) Turn on air conditioning and disconnect compressor clutch wire. If not equipped with air conditioning, connect a jumper wire between 12V and solenoid wire.

CAUTION – *Be sure jumper wire is connected to solenoid wire. Wrong connections may damage wiring harness.*

3) On 2-Bbl. models, remove external screw and spring from top of solenoid. Insert 1/8" Allen wrench into solenoid and adjust to solenoid RPM. On 4-Bbl. models, use screw on throttle lever to adjust solenoid RPM.

4) Turn air conditioning off and reconnect compressor clutch (or remove jumper wire). Disconnect and plug hoses at EGR valve, distributor and 3/16" hose at canister. Remove PCV valve from valve cover and allow to draw air. Disconnect 5/16" hose (red stripe) at canister and allow to draw air.

5) Allow engine to idle for 2 minutes. Adjust curb idle speed using screw on solenoid. Reconnect all hoses and remove test equipment.

Idle Speed (RPM)

Application	Curb Idle	Solenoid Energized
5.2L 2-Bbl.	650	800
5.2L 4-Bbl.		
Federal	650	800
Calif.	750	800
Nationwide	750	800
5.9L 4-Bbl.		
Light Duty		
Federal	600	800
Calif.		
Man. Trans.	725	800
Auto. Trans.	750	800
Heavy Duty		
Federal	700	800
Calif.	750	800

IDLE MIXTURE

MIXTURE SCREW PLUG REMOVAL

2-Bbl. Carburetors – **1)** Remove carburetor. Remove throttle body from carburetor and clamp in a padded vise. Drill a 1/16" pilot hole above both roll pins, then redrill to 1/8" and drive out roll pins with punch.

2) Drill a 1/16" pilot hole into casting at a 45° angle toward plug. Redrill hole to 1/8" and drive out plug with a blunt punch. Position roll pins partially in holes, then reassemble and install carburetor.

4-Bbl. Carburetors – **1)** Remove carburetor and clamp in a padded vise with mixture screws facing up. Drill a 1/16" pilot hole at a 45° angle towards concealment plugs in the side of screw housings.

2) Redrill hole with 1/8" drill, then use punch to drive out plugs. Use a punch inserted through screw openings to remove roll pins. Position new pins from bottom of throttle body but leave screws accessible. Reinstall carburetor.

PROPANE ENRICHMENT PROCEDURE

1) Warm engine to normal operation temperature. Place transmission in neutral and turn all accessories off. Disconnect and plug hoses at EGR valve, distributor and 3/16" hose at canister.

TUNE-UP (Cont.)

2) Disconnect vacuum hose from heated air cleaner to carburetor and connect propane bottle to carburetor port. Pull PCV valve from valve cover and allow to draw fresh air. Disconnect 5/16" hose (red stripe) from canister and allow to draw fresh air.

3) Open propane valve. Adjust propane until maximum engine speed is reached (with air cleaner in place). When maximum RPM is attained, adjust idle speed screw on solenoid to obtain mixture RPM specification.

4) Readjust propane level to increase RPM as high as possible, then readjust idle speed screw to maximum RPM again. Turn off propane. Then turn mixture screws evenly (with air cleaner in place) until curb idle is reached.

5) Turn on propane again and adjust for highest RPM. If it differs more than 25 RPM from mixture speed, repeat adjustment procedure. Turn off engine and remove all test equipment. Reconnect all hoses. Use a screwdriver to press roll pin into place, then reinstall mixture screw plugs.

Mixture Adjustment RPM

Application	Man. Trans.	Auto. Trans.
5.2L 2-Bbl.	740	740
5.2L 4-Bbl.		
Federal	.....	740
Calif.	830	830
Nationwide	810	810
5.9L 4-Bbl.		
Light Duty		
Federal	680	.....
Calif.	825	850
Heavy Duty		
Federal	800	800
Calif.	810	810

COLD (FAST) IDLE RPM

1) Warm engine to operating temperature and place transmission in neutral. Disconnect and plug hoses at EGR valve, distributor and 3/16" hose at canister. Disconnect PCV valve and 5/16" hose at canister (red stripe) and allow both to draw fresh air.

2) Remove air cleaner, place fast idle screw on 2nd highest step of cam and adjust fast idle speed with screw. Reconnect all hoses, remove test equipment and install air cleaner.

Fast Idle Speed (RPM)

Application	Man. Trans.	Auto. Trans.
5.2L 2-Bbl.	1500	1500
5.2L 4-Bbl.		
Federal	.....	1500
Calif.	1500	1600
Nationwide	1800	1800
5.9L 4-Bbl.		
Light Duty		
Federal	1500	.....
Calif.	1700	1700
Heavy Duty		
Federal	1500	1500
Calif.	1500	1500

AUTOMATIC CHOKE SETTING

All models use an electric assist choke which requires no adjustment.

FUEL PUMP

Pressure (At Idle)	5-7 psi
Volume (At Idle)	1 quart in 1 minute

MANIFOLD HEAT CONTROL VALVE

Every 30,000 (Light Duty) or 18,000 (Heavy Duty) miles, apply a suitable solvent to both ends of valve shaft where it rotates in bushing. Work valve back and forth a few times.

NOTE – *Apply solvent only when manifold is cool.*

EMISSION CONTROL SYSTEMS

See appropriate article in Emission Control Section.

GENERAL SERVICING

IGNITION

DISTRIBUTOR

All models are equipped with Chrysler Corp. Electronic Ignition System. Units are entirely self-contained and require no outside adjustments.

Other Data & Specifications – *See Tune-Up and Chrysler Corp. Distributors in ELECTRICAL Section.*

IGNITION COIL

Coil Resistance (Ohms@75°F)

Application	Primary	Secondary
Essex	1.34-1.55	9000-12,200
Prestolite	1.60-1.79	9400-11,700
Ballast Resistor		1.1-1.3 ohms

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GENERAL SERVICING (Cont.)

FUEL SYSTEMS

CARBURETORS

Application	Carb. Model
5.2L 2-Bbl.	Holley 2280
5.2L 4-Bbl.	Carter Thermo-Quad
5.9L 4-Bbl.	Carter Thermo-Quad

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

ELECTRICAL

BATTERY

Application	Cold Cranking Amps@0°F	Reserve Capacity Minutes
Standard	305	68
Optional	375	86
Optional	430	100
Optional	500	125

STARTER

All models use a Chrysler Corp. reduction gear type starter.

Starter Specifications

Application	Volts	Amps	Test RPM
All Models	11	90	3700

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

ALTERNATORS

All models use Chrysler Corp. alternator.

Tag Color	Rated Amp. Output
Violet	41
Yellow	60
Yellow ("D", "W", "AD", "PD", "AW" & "PW")	117

Other Data & Specifications – *See Chrysler Corp. Alternator in ELECTRICAL Section.*

ALTERNATOR REGULATOR

All models use Chrysler Corp. Electronic Voltage Regulator. Unit is nonadjustable.

Operating Voltage (@80°F) – 13.9-14.6 Volts

Other Data & Specifications – *See Chrysler Corp. Electronic Regulators in ELECTRICAL Section.*

BELT ADJUSTMENT

NOTE – *Do not use either the gauge or torque method when checking belt adjustment. Instead, use belt deflection method.*

Application	Deflection New Belt①	Deflection Used Belt①
All	1/4 - 1/2"	1/4 - 5/16"

① – With 10 pounds deflection pressure midway between pulleys. Used belts are any operated more than 15 minutes.

COOLING CAPACITIES

Application	Quantity (Qts.)
5.2L	①16.0
5.9L	①14.5

① – Add 1 quart for A/C or increased cooling.

REPLACEMENT INTERVALS

Component	Light Duty Interval (Miles)	Heavy Duty Interval (Miles)
Oil Filter	15,000	12,000
Fuel Filter	30,000	18,000
Air Filter	30,000	①24,000
PCV Valve	30,000	24,000
Spark Plugs	30,000	18,000

① – Clean at 12,000 mile intervals.

CAPACITIES (EXCEPT COOLING)

Application	Quantity
Crankcase	①5.0 qts.
Automatic Transmission (Dexron II)	②7.7 pts.
Manual Transmission	
4-Speed Overdrive (A-833) (Dexron II)	7.5 pts.
4-Speed N.P. 435 (SAE 80W-90)	7.0 pts.
Transfer Case	
N.P. 205 (SAE 80W-90)	4.5 pts.
N.P. 208 (Dexron II)	6.0 pts.
Rear Axle (SAE 80W-90)	
8 3/8" Ring Gear	4.5 pts.
9 1/4" Ring Gear	4.5 pts.
9 3/4" Ring Gear	6.0 pts.
10 1/2" Ring Gear	6.5 pts.
Front Axle (SAE 80W-90)	
Model 44	3.5 pts.
Model 60	6.5 pts.
Fuel Tank	
Van Models	
B150/350	22.0 or 36.0 gals.
CB350/450 & MB250	22.0 or 45.0 gals.
MB350/450	45.0 gals.
Pickup Models	22.0 or 30.0 gals.
All Other Models	35.0 gals.

① – Add 1 quart with filter change.
② – Without torque converter drain.