

# 1982 General Motors Diesel Tune-Up 1-59

## TUNE-UP

### ENGINE IDENTIFICATION

#### VEHICLE IDENTIFICATION NUMBER CODE

Eighth digit of Vehicle Identification Number (VIN) is used to identify engine. VIN is located at top left side of dashboard and visible through windshield.

#### VIN Engine Codes

Application	Code
1.8L (111") 4-Cyl. Diesel .....	D
4.3L (262") V6 Diesel .....	V
5.7L (350") V8 Diesel .....	N

#### ENGINE IDENTIFICATION NUMBER

Engine code on 4-cyl. engines is located at rear of left side of engine block, below the exhaust manifold. On V6 engines, the code is stamped on the front of the engine block, below the cylinder head and to the right of the water pump. V8 engines have the code stamped on the left front side of the engine block.

#### TUNE-UP NOTES

**NOTE** — In order to comply with emission standards, specifications shown on engine compartment emission control decal must be used in all instances.

**NOTE** — Ensure that all diesel injection lines and fittings are thoroughly cleaned before removing. Cap all lines, nozzles, and fittings when removed. Dirt in system may damage injection pump.

**NOTE** — Some models are equipped with water separator units. Check periodically for presence of water, and drain off if needed or when "Water-in-Fuel" indicator lights up (if equipped).

#### ENGINE COMPRESSION

**NOTE** — Prior to checking compression, be sure batteries are fully charged. When turning engine over during test, 6 "puffs" per cylinder should be used to obtain reading.

Compression Ratio	
1.8L .....	22.0:1
4.3L .....	21.6:1
5.7L .....	22.5:1
Compression Pressure	
1.8L .....	370 psi (Minimum)
4.3L & 5.7L .....	275 psi (Minimum)
Max. Variation Between Cylinders	
1.8L .....	21 psi
4.3L & 5.7L .....	30%

**4-Cyl. Engines — 1)** Run engine until it reaches normal operating temperature. Remove sensing resistor, glow plug connector, glow plugs and fuel cut solenoid.

**2)** Disconnect fusible link wire from the Q.S.S.I. (Quick Start Silent Idling) controller at the connector. Install adapter (J-29762) and compression gauge into glow plug hole. Crank engine for a minimum of 6 "puffs" and note compression reading. Repeat for each cylinder.

**V6 & V8 Engines — 1)** Remove air cleaner and install air crossover cover (J-26996-1). Disconnect wire from fuel solenoid terminal of injector pump. Disconnect wires from glow plugs, then remove all glow plugs.

**2)** Install compression gauge (J-26999) into glow plug hole. Crank engine for a minimum of 6 "puffs" and note compression reading. Repeat for each cylinder. Compression should build evenly and rapidly to proper level.

**3)** If piston rings are worn or cracked, compression will be low on first stroke and will rise on each additional stroke, but will not reach specified level.

**CAUTION** — Do not add oil to cylinders during compression check as extensive engine damage will result.

#### VALVE CLEARANCE

1.8L 4-Cyl.	
Intake .....	.010"
Exhaust .....	.014"
4.3L V6 & 5.7L V8	
Hydraulic Lifters .....	Zero Lash

#### VALVE ARRANGEMENT

1.8L	I-E-I-E-I-E-I-E
4.3L	I-E-E-I-E-I (Left Bank, Front-to-Rear) I-E-I-E-E-I (Right Bank, Front-to-Rear)
5.7L	I-E-I-E-E-I-E-I (Front-to-Rear, Both Banks)

#### GLOW PLUGS

Glow plugs are 12 volt heaters. Each cylinder has a glow plug screwed into the cylinder head. The tip of the glow plug projects into the combustion chamber to preheat the cylinder and aid in cold engine starting. Glow plugs are activated when the ignition switch is turned to the "RUN" position.

Engine	Part Number
1.8L .....	8-94241-449-0
4.3L & 5.7L .....	5613680

#### INJECTOR TIMING

**4-Cyl. Engines — 1)** Rotate crankshaft until No. 1 piston reaches TDC of compression stroke. Remove upper timing belt cover. Check to make sure that timing belt is properly tensioned and that timing marks are aligned.

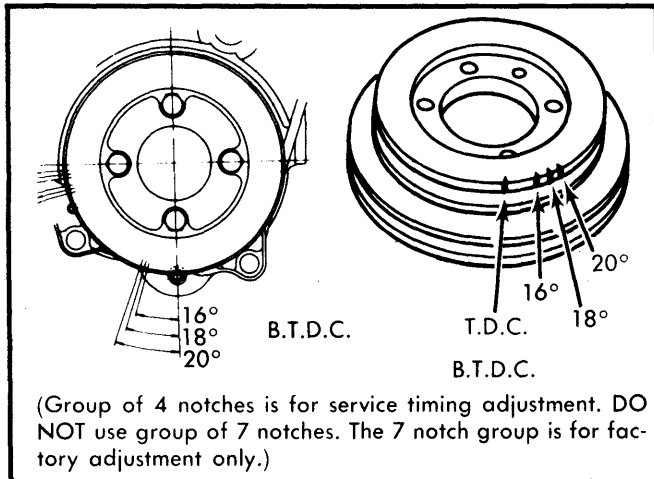
**2)** Remove camshaft cover. Check for alignment of slot on rear of camshaft to camshaft cover mounting surface using alignment tool (J-29761).

**3)** Remove injector lines, distributor head screw and washer. Install static timing gauge (J-29763) and set lift at about .04" from plunger. Rotate crankshaft to bring No. 1 piston to 45-60° BTDC. Zero dial indicator.

**4)** Rotate crankshaft (in normal direction of travel) until 18° mark on pulley lines up with pointer. See Fig. 1. Observe dial

## TUNE-UP (Cont.)

indicator reading. If dial indicator reading is not .02", timing requires adjustment.



**Fig. 1 1.8L Crankshaft Dampener Pulley Timing Notches**

5) To adjust timing, hold crankshaft at 18° BTDC, loosen 2 nuts on injection pump flange and rotate pump until dial indicator reads .02". Tighten pump flange nuts, recheck dial indicator reading and readjust as necessary.

6) Remove timing gauge and replace distributor screw and washer. Install camshaft cover, injection lines and fuel filter.

**V6 & V8 Engines** — 1) With transmission in "P", run engine until it is at normal operating temperature. Stop engine and remove air cleaner. Install cover (J-26996-1) and disconnect EGR hose. Clean both ends of special glow plug adapter.

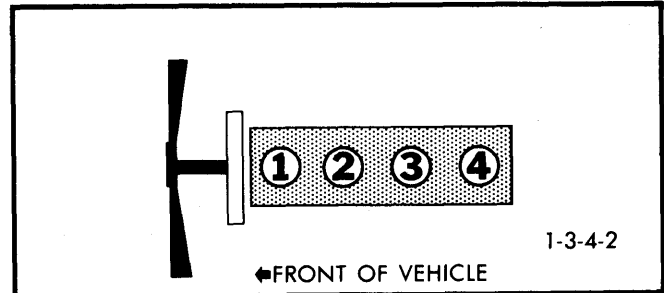
2) Remove glow plug from number 1 cylinder on V6 engines and number 3 cylinder on V8 engines. Install glow plug adapter in empty glow plug hole. Install RPM counter into holder at crankshaft balancer. Set timing meter selector to position "A" on V6 and position "B" on V8 engines. Connect meter leads to battery.

3) Start engine and verify idle speed of 650 RPM on V6 engines and 600 RPM on V8 engines. Check timing at 2 minute intervals. When reading stabilizes over a 2 minute period, check timing against specifications and adjust as necessary. On V6 engines, timing should be set at 7° ATDC @ 1300 RPM. V8 engine timing should be set at 4° ATDC @ 1250 RPM. On both engines, transmission should be in "P" while adjusting timing.

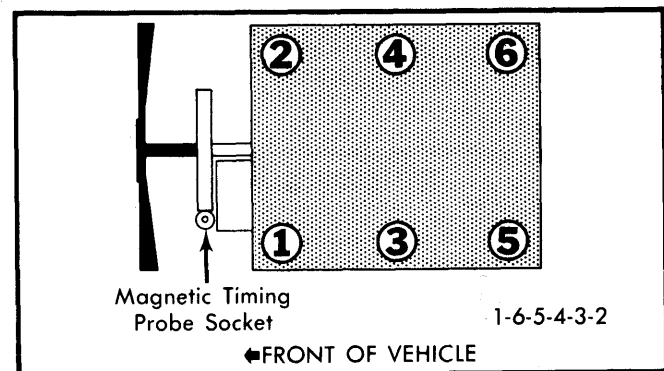
4) If timing is to specifications, remove test meter and replace all components removed or disconnected. If timing is not to specifications, stop engine and note relative position of marks on pump flange with pump intermediate adapter.

5) Loosen bolts attaching pump to adapter, just enough to enable pump to be rotated. Rotate pump to the left to advance timing or to the right to retard timing. The width of the mark on the intermediate adapter equals about 2/3 of a degree on V6 engines and about 1 degree on V8 engines.

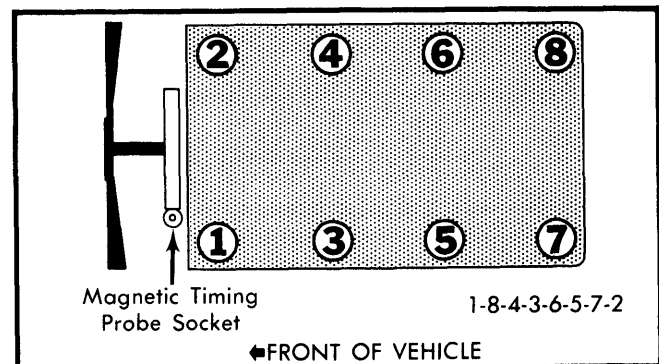
6) When timing is correct, tighten bolts. Recheck timing and, if correct, remove all test equipment and replace all removed or disconnected components.



**Fig. 2 1.8L 4-Cyl. Diesel Firing Order**



**Fig. 3 4.3L V6 Diesel Firing Order**



**Fig. 4 5.7L V8 Diesel Firing Order**

## IDLE SPEED ADJUSTMENT

**4-Cyl. Engines** — 1) Set parking brake and block drive wheels. Place transmission in neutral and connect tachometer. Start and run engine until it reaches normal operating temperature. Loosen lock nut on idle speed adjusting screw. See Fig. 5. Turn adjusting screw to obtain slow idle speed of 575-675 RPM for manual transmission and 675-775 for automatic transmission. Tighten lock nut.

2) Apply vacuum to the fast idle actuator. Loosen lock nut on fast idle adjusting screw. Turn knurled adjusting nut to obtain fast idle speed of 950 RPM.

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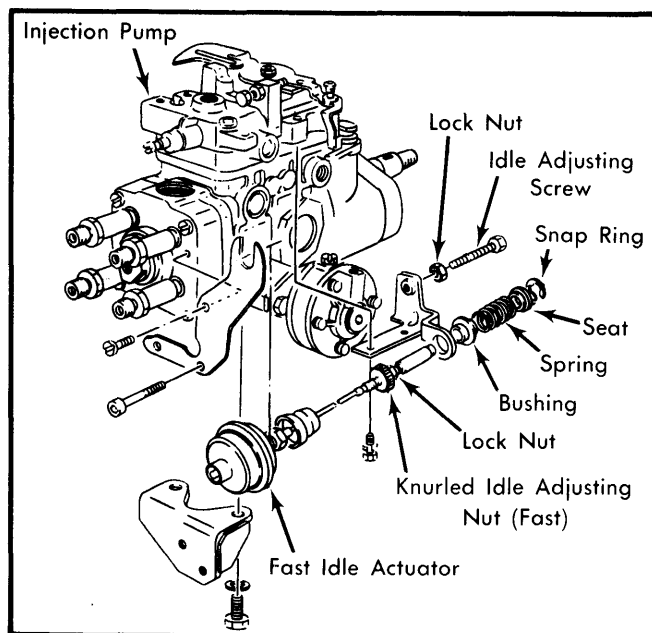


Fig. 5 1.6L Idle Adjustment Locations

**V6 & V8 Engines** – 1) Set parking brake and block drive wheels. Connect a magnetic pick-up tachometer (J-26925) to engine. Insert probe of tachometer into timing indicator hole. Start and run engine until it reaches operating temperature.

**NOTE** – On some models, it will be necessary to disconnect the parking brake release vacuum line. This will enable the parking brake to remain engaged when the transmission is shifted into gear.

2) Disconnect the 2 lead connector at alternator and A/C compressor clutch lead at compressor. Turn all electrical accessories off.

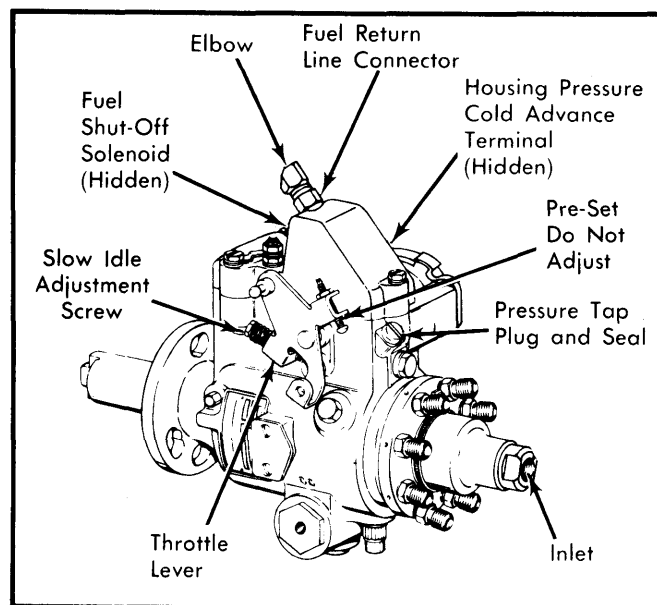


Fig. 6 4.3L & 5.7L Injection Pump Adjustment Locations

**NOTE** – DO NOT apply service brake or turn steering wheel while checking or adjusting idle speed.

3) Start engine and place transmission in "D". Check idle speed and adjust if necessary. Slow idle should be set to 650 RPM on V6 engines and 600 RPM on V8 engines. Transmission should be placed in "D" when checking idle. Adjust idle speed by turning slow idle speed adjusting screw on fuel injection pump. See Fig. 6.

4) Disconnect fast idle cold advance (engine temperature) switch and install a jumper wire between connector terminals. Do not allow jumper wire to touch ground. Start engine and check fast idle speed. Fast idle should be 750 RPM on all engines with transmission in "D".

5) If adjustment of fast idle is necessary, adjust speed using fast idle solenoid plunger and then recheck glow idle speed. Readjust slow idle as necessary and reconnect all disconnected components.

## INJECTION PUMP HOUSING FUEL PRESSURE

**V6 & V8 Engines Only** – 1) Remove air crossover and install screened covers (J-29657). Remove torque screw by adding a second nut to the torque screw to the torque screw lock nut, then back out torque screw. This second nut will prevent changing torque screw adjustment.

2) Install torque screw seal on pressure tap adapter (J-29382), then install adapter into torque screw hole in injection pump. Install a gauge adapter (J-28526) into pressure tap adapter. Install a low pressure gauge into adapter and connect a magnetic pick-up tachometer to engine.

3) Block wheels and apply parking brake. Start engine and check pressure reading on gauge with engine running at 1000 RPM and transmission in "P". Pressure should be 8-12 psi with not more than 2 psi fluctuation.

4) If pressure is zero, check operation of housing pressure cold advance as follows:

- Remove electrical connector from housing pressure cold advance terminal.
- If pressure is normal with lead disconnected, check operation of temperature switch on cylinder head bolt.
- If pressure is still zero, remove injection pump cover and check operation of advance solenoid and correct as necessary.

5) If pressure is low, but above zero, replace fuel return line connector assembly. If pressure is too high, check for a restricted fuel return line. If return line is not restricted and pressure is still too high, replace fuel line connector assembly. If pressure remains too high, remove and repair injection pump.

6) Remove test equipment and install pressure tap plug using new seal. Install air crossover.

## EXHAUST EMISSION SYSTEMS

See EXHAUST EMISSION SYSTEMS section.

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## GENERAL SERVICING

### FUEL INJECTION

Application	Type
1.8L 4-Cyl. ....	Bosch VE
4.3L V6 ....	Roosa-Master or CAV
5.7L V8 ....	Roosa-Master or CAV

**V6 & V8** — Delco-Remy nonadjustable, integral with alternator.

### ELECTRICAL

#### BATTERY

Application	Cold Cranking Amps at 0°F	Reserve Capacity Minutes
1.8L 4-Cyl. ....	550	135
4.3L V6 ....	506	90
5.7L V8 ....	465	115
Optional ....	550	135

#### STARTER

**4-Cyl.** — Nippondenso with gear reduction, solenoid actuated drive.

**V6 & V8** — Delco-Remy solenoid actuated with overrunning clutch.

#### Starter Specifications

Application	Volts	Amps	Test RPM
1.8L 4-Cyl. ....	①	①	①
4.3L V6 ....	9	160-120	4,000-5,500
5.7L V8			
Cadillac ....	9	120-210	9,000-13,400
Riviera & Toronado	9	120-210	9,000-13,400
All Others ....	9	160-220	4,000-5,500

① — Information not available from manufacturer.

#### ALTERNATOR

Application①	Rated Amp Output
1.8L 4-Cyl. ....	55
4.3L V6 ....	37, 42, 55, 60, 63, 70, 76, 85
5.7L V8 ....	55, 60, 70, 80, 85, 100

① — Application may use any of the alternators listed depending on vehicle model and accessories used.

#### ALTERNATOR REGULATOR

**4-Cyl.** — Nippondenso nonadjustable, integral with alternator.

### COOLING CAPACITIES

Application	Quantity
<b>Buick</b>	
4.3L V6	
Regal .....	14.8 qts.
Skylark	
With A/C .....	13.2 qts.
Without A/C .....	13.9 qts.
5.7L V8	
Electra & LeSabre .....	18.0 qts.
Regal .....	17.3 qts.
<b>Cadillac</b>	
5.7L V8	
Eldorado & Seville .....	18.4 qts.
All Others .....	23.7 qts.
<b>Chevrolet</b>	
1.8L 4-Cyl. ....	9.0 qts.
4.3L V6	
Caprice & Impala .....	13.4 qts.
Celebrity	
With A/C .....	13.3 qts.
Without A/C .....	13.8 qts.
5.7L V8 .....	18.3 qts.
<b>Oldsmobile</b>	
4.3L V6	
Cutlass	
With A/C .....	14.5 qts.
Without A/C .....	15.3 qts.
Cutlass Ciera	
With A/C .....	13.3 qts.
Without A/C .....	13.8 qts.
5.7L V8	
Cutlass .....	17.4 qts.
Delta 88 .....	18.3 qts.
Toronado .....	18.1 qts.
98 .....	18.0 qts.
<b>Pontiac</b>	
4.3L V6 .....	13.8 qts.
5.7L V8 .....	17.3 qts.

### TRANSMISSION & DIFFERENTIAL CAPACITIES

Application	Quantity
<b>Auto. Trans. (Dexron II)</b>	
THM 200C	
Chevette .....	7 pts.
All Others .....	7 pts.
THM 200-4R .....	7 pts.
THM 350C .....	6 pts.
<b>Auto. Transaxle (Dexron II)</b>	
THM 125C .....	8 pts.
THM 325-4L .....	10 pts.
<b>Rear Axle (SAE 80W-90)</b>	
7½" Ring Gear .....	3.5 pts.
8½" & 8¾" Ring Gear .....	4.25 pts.
Final Drive (SAE 80W-90) .....	3.2 pts.

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## GENERAL SERVICING (Cont.)

### BELT ADJUSTMENT

Tension (Lbs.) Using Strand Tension Gauge

Application	New Belt	Used Belt
Air Pump .....	100 .....	45
A/C Compressor .....	145 .....	65-80
All Others .....	135 .....	65-80

### REPLACEMENT INTERVALS

Component	Interval (Miles)
Oil Filter (Every Oil Change) .....	5,000
Air Filter .....	30,000
Fuel Filter .....	30,000
Positive Crankcase Ventilation Valve (Clean & Inspect) .....	15,000

### OIL & FUEL CAPACITIES

Application	Quantity
Crankcase (Including Filter)	
1.8L 4-Cyl. ....	6 qts.
4.3L V6 .....	6 qts.
5.7L V8 .....	7 qts.
Fuel Tank	
Celebrity, Century, Cutlass Ciera, 6000 .....	16.6 gals.
Chevette .....	12.5 gals.
Bonneville, Cutlass, Grand Prix, Malibu, Regal	
Sedan .....	20 gals.
Wagon .....	18 gals.
Eldorado, Riviera, Seville, Toronado .....	23 gals.
Caprice, Deville, Electra, Impala, LeSabre, Monte Carlo	
Sedan .....	27 gals.
All Others	
Sedan .....	27 gals.
Wagon .....	22 gals.