1975-79 TUNE-UP PROCEDURES
General Motors Diesel Tune-Up

1978-79 350" Diesel Engine Equipped Models

ENGINE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

The Vehicle Identification Number (VIN) appears on the left door pillar of 1978 models or upper left side of instrument panel pad for 1979 models. Engine can be identified by 3rd character of VIN number.

1979 VIN CODE

Application	VIN Code
350" Diesel	Z

ENGINE IDENTIFICATION CODE

Engine is a 350" V8 Diesel. Engine code letters are suffix of Engine Identification Code. Number is on a label located on rear face of left valve cover.

1979 ENGINE CODES

Application	Engine Code
350" Diesel	
1978	QA
1979	QV

TUNE-UP NOTES

NOTE: Due to late changes and corrections, always refer to Engine Tune-Up Decal before attempting tune-up. If the decal specifications are different than the specifications presented here, use the decal specifications.

CAUTION: DO NOT spray any starting fluid containing Ether fluid into any diesel engin. Severe engine mechanical damage may result. If necessary, a diesel engine may be started by spraying a small amount of penetrating oil such as "WD-40" into the air intake.

ENGINE COMPRESSION

NOTE: Prior to checking compression, ensure battery is fully charged. When cranking engine, 6 "puffs" per cylinder should be used to obtain reading.

1) Remove air cleaner. Install air crossover screened cover (J-26996-1). Disconnect electrical wire from fuel solenoid terminal of injection pump.
2) Disconnect glow plug wires. Remove all glow plugs. Use high pressure compression tester. Crank engine.

NOTE: Compression should build up evenly and rapidly. Crank engine past six compression strokes. If piston rings are worn or cracked, compression will read low on 1st stroke, will rise on each stroke thereafter, but will not reach normal level.

COMPRESSION SPECIFICATIONS

Application	Specification
Compression Ratio	22.5:1
Compression Pressure	275 psi (min.)
Max. Pressure Variation	[1]
Recommended Fuel	Diesel 2-D [2]

[1] - Lowest cylinder must read within 70% of highest.
[2] - Use 1-D for vehicle operation below 20° F (-7° C).

VALVE CLEARANCE

Lifters are hydraulic and are not adjustable. They should have zero lash.

NOTE: Some engines were produced with both standard and .010" oversize lifters installed. Oversize lifters can be identified by an "O" etched on side of lifter boss. Diesel engine lifters are NOT interchangeable with gasoline engine lifters.

GLOW PLUGS

Glow plugs are actually small 12-volt heaters. Eight of these plugs are screwed into engine. One into each cylinder for preheating and aiding in cold weather starting. Glow plugs are activated when ignition switch is turned to "RUN" position prior to starting. They shut off automatically, a short time after engine starts. Two glow plug relays are located on firewall near wiper motor. When no-start condition exists, check glow plugs as follows:

1) Ensure engine cranking speed is 100 RPM or more. Battery voltage should be 12.4 volts or more and fuel system should be functioning properly.
2) Turn ignition switch to "RUN" position.

NOTE: Switch in "RUN" position will allow 2-5 minutes for circuit checking before automatic emergency shut-down occurs. To reset system, turn ignition OFF and back ON again. If "WAIT" light on dash comes on, proceed with test. If not, engine is too warm for glow plug operation. Disconnect thermistor (located on top front of engine) to activate glow plugs.

3) Connect 12-volt test light to ground. Touch test probe to one glow plug on right bank of engine; then to one on left bank. Test light should come ON in both tests.
4) Connect test light to positive lead of battery. Contact each glow plug terminal. Replace plugs that DO NOT light test light.

NOTE: For complete diagnosis and trouble shooting of glow plug starting system, see GENERAL MOTORS DIESEL FUEL INJECTION article in the FUEL SYSTEMS section.

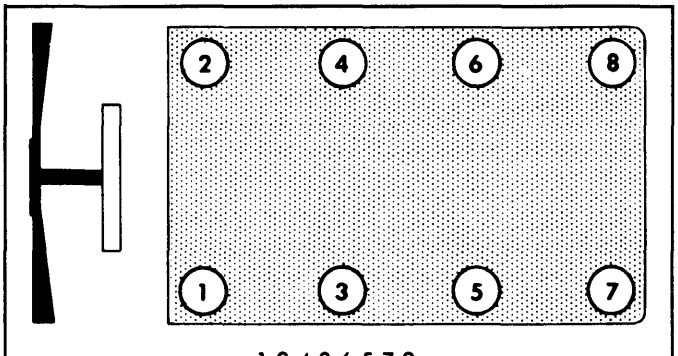

Fig. 1: General Motors 350" Diesel Firing Order

NOTE: If injector pump is removed, mark fuel pipe to injector pump fittings for reinstallation.

INJECTOR TIMING

WITHOUT LUMINOSITY PROBE

1) With engine off, loosen (3) pump retaining nuts.
2) Align mark on injection pump with mark (line) on adaptor and tighten nuts to 35 ft. lbs. *See Fig. 2.*

NOTE: To rotate pump to align marks, use a ¾" open end wrench on boss at front of injection pump.

1975-79 TUNE-UP PROCEDURES
General Motors Diesel Tune-Up (Cont.)

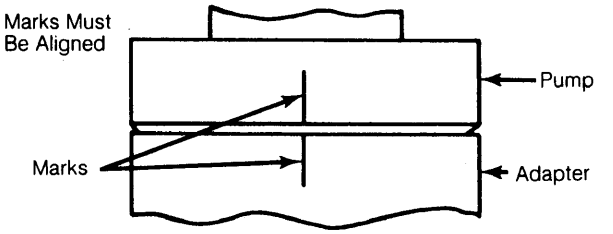

Fig. 2: Timing Marks on Injection Pump & Adapter

3) With transmission vacuum regulator valve installed, loosen throttle rod lock nut and shorten rod several turns.
4) Rotate bellcrank to full throttle stop. Then lengthen rod until injection pump lever touches injection pump full throttle stop. Release bellcrank. Tighten lock nut on throttle rod. Check idle adjustment.

WITH LUMINOSITY PROBE

1) Warm engine to operating temperature. Remove air cleaner. Disconnect EGR valve hose. Disconnect 2-wire connector from alternator.
2) Install RPM sensor to probe at front of engine. Remove No. 3 glow plug. Ensure both sides of luminosity probe are clean and install probe.
3) Set timing meter offset selector to "B" (99.5). Connect timing meter to battery. Start engine. Ensure idle is set to 1200 RPM. Observe timing reading and record it. Wait 2 minutes and recheck timing (it should not move within a 2 minute period).
4) Adjust injector pump, if timing is not 4.5°ATDC at 1200 RPM. Stop engine and adjust injector pump. Rotate pump to the left to advance timing or to the right to retard timing. Retighten all mounting bolts before starting engine. Start engine and recheck timing.

NOTE: If vehicle is operated at high altitude, retard timing 1 degree.

HOT (SLOW) IDLE RPM

NOTE: Use Magnetic Pickup Tachometer (J-26925) to check idle speed. Insert probe in timing indicator hole.

1) Block driving wheels and engage parking brake. Start engine.
2) Adjust slow idle screw on injection pump to obtain 575 RPM. *See Fig. 3.* Automatic transmission should be in "D" (Drive) and A/C should be OFF.

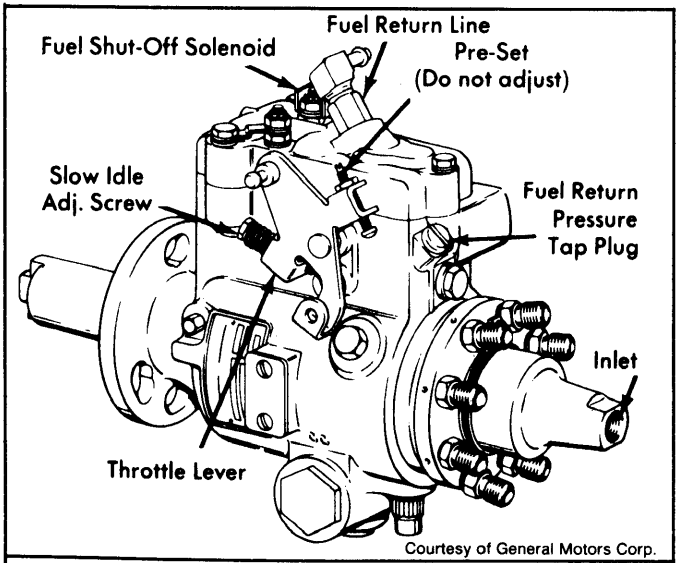

Fig. 3: Diesel Injection Pump Adjustment Locations

IDLE SOLENOID ADJUSTMENT (FAST IDLE RPM)

1) Block driving wheels and engage parking brake. Start engine. Ensure fast idle solenoid is energized by attaching a jumper wire across fast idle temperature switch connector terminals. This switch is located in left rear corner of intake manifold. Connector removal is usually not necessary.
2) Advance throttle momentarily to ensure fast idle solenoid is fully extended and energized.
3) Adjust the extended solenoid to 650 RPM with shift lever in "D" (Drive). Remove jumper wire after adjustment.

INJECTION PUMP FUEL PRESSURE

1) Remove fuel return pressure tap plug. *See Fig. 3.*
2) Screw Pressure Tap Adapter (J-28526) into pump housing. Ensure to use seal from tap plug on tap adapter before installing. Connect a low pressure gauge to adapter.
3) Connect Magnetic Pickup Tachometer (J-26925). Place shift lever in PARK position. Start engine. Raise engine speed to 1000 RPM. Compare pressure to specifications listed in INJECTION PUMP FUEL PRESSURE table.

INJECTION PUMP FUEL PRESSURE

Application	Specification
Pressure	8-12 psi
Maximum Fluctuation	2 psi

4) If pressure does NOT read within specifications, replace fuel return line connector assembly. Recheck pressure and if still not within specifications, remove injection pump for repair.
5) Remove tachometer, gauge and adapter. Install new pressure tap plug screw seal on plug. Install plug in housing.

INJECTION NOZZLES

If engine starts, but idles roughly, check injection nozzles as follows:

1) Start engine. Loosen injection line fitting at each nozzle, one at a time. Be sure to direct fuel away from sources which could cause fire.
2) If idle speed or quality does NOT change when an injection line fitting is loosened, replace that nozzle and repeat test.
3) Disconnect fuel return system from nozzles on one bank of engine at a time. Start engine. Observe fuel seepage at nozzles. Replace any nozzle that leaks excessively. Torque nozzle clamp bolt to 25 ft. lbs.

FUEL PUMP

Application	Type
350" Diesel	Gear Driven Mechanical Fuel Injection Pump (High Pressure Rotary)