TUNE-UP ALL SERIES

CONTENTS

DESCRIPTION AND OPERATION

TUNE-UP PURPOSE

The purpose of an engine tune-up is to restore power and performance that has been lost through wear, corrosion or deterioration of one or more parts or units. In the normal operation of an engine, these changes take place gradually at a number of points so that it is seldom advisable to attempt an improvement in performance by correction of one or two items only. Time will be saved and more lasting results will be obtained by following a definite and thorough procedure of analysis and correction of all items affecting power, performance, and exhaust emission.

Because of federal laws limiting exhaust emissions, it is even more important that the engine tune-up be done accurately, using the specifications listed on the tune-up label found in each engine compartment.

The parts or units which affect power and performance may be divided into three groups:

(1) Units affecting compression

(2) Units affecting ignition

(3) Units affecting carburetion

The tune-up procedure should cover these groups in the order given. Correction of items in the carburetion group should not be attempted until all items affecting compression and ignition have been satisfactorily corrected.

Most of the service procedures for performing a tune-up are covered in the carburetor and electrical sections, therefore, the procedure found under Major Repair is a guide only.

DIAGNOSIS

ENGINE MISFIRE

CONDITION	POSSIBLE CAUSE	CORRECTION
Engine starts and runs but mises at idle speed only.	1. Engine vacuum leak.	1. Check engine vacuum connections and hoses for leaks. Repair or replace as necessary.
	2. Spark plug malfunction	1. Inspect, clean, and adjust or install new plugs as necessary.
	3. Ignition wire malfunction.	1. Clean and inspect wires, replace if brittle, cracked or worn. Refer to HEI diagnosis.
	4. HEI malfunction.	1. Refer to HEI diagnosis and/or engine electrical.
	5. EGR malfunction.	1. Refer to EGR diagnosis.
	6. PCV malfunction.	1. Refer to PCV diagnosis.
	7. Engine valve leakage.	1. Refer to engine diagnosis (compression check).
	8. Intake manifold or cylinder head gasket leaks.	1. Check intake manifold gaskets and seals for leaks. Make necessary repairs or replacements.
	9. Carburetor malfunction.	1. Refer to carburetor diagnosis.

Engine starts and runs but misses at high speeds.	1. Spark plug malfunction.	1. Inspect, clean and adjust or install new plugs.
	2. Engine valve leakage.	1. Refer to (compression check).
	3. HEI malfunction.	1. Refer to HEI diagnosis and/or engine electrical.
	4. Ignition wire malfunction.	1. Clean, check resistance and inspect wires, replace if brittle, cracked or worn.
	5. Malfunctioning fuel pump or fuel system.	1. Refer to fuel pump diagnosis.
	6. Faulty carburation (including fuel filters).	1. Refer to carburetor diagnosis.
	7. EFE valve malfunction.	1. Refer to EFE diagnosis.
	8. PCV malfunction.	1. Refer to PCV diagnosis.
	9. Faulty carburetor inlet air temperature regulation.	1. Refer to Thermac Air Cleaner diagnosis.
	10. Exhaust system restricted.	1. Make necessary repairs or replacements.
(NOTE: The catalytic converter diagnosis in this manual should be performed.)		
Engine starts and runs, misses at all speeds.	1. Spark plug malfunction.	1. Inspect and replace as required.
	2. HEI malfunction.	2. Refer to HEI diagnosis and/or engine electrical.
	3. Engine valve leakage.	3. Refer to engine diagnosis (compression check).
	4. EGR malfunction.	4. Refer to EGR diagnosis.
	5. EFE valve malfunction.	5. Refer to EFE diagnosis.
	6. Malfunctioning fuel pump or fuel system.	6. Refer to fuel pump diagnosis.
	7. Faulty carburation (including fuel filter).	7. Refer to carburetor diagnosis.
	8. Contaminated fuel.	8. Remove and install fresh fuel. Clean fuel system and carburetor as required.

MAINTENANCE AND ADJUSTMENTS

IDLE MIXTURE ADJUSTMENT ALL MODELS

Idle mixture screws have been preset and capped at the factory.

Before suspecting the carburetor as the cause of poor engine performance or rough idle, check the ignition system including the distributor, set ignition timing, check the PCV system and compression pressures. Also, check all vacuum hoses and connections for leaks.

At the 22,500 mile maintenance period, and in case of, major carburetor overhaul, throttle body replacements, or when poor idle quality exists after performing the checks in the previous paragraph, idle mixture may be adjusted. To properly set idle mixture to achieve the smoothest idle while maintaining emission levels within the standards, the approved lean drop procedure must be followed.

LEAN DROP PROCEDURE

Models 2GC and 4MC Carburetors (350 and 455 Cu. In. Engines Only)

1. Set parking brake and block drive wheels.

2. Disconnect evaporative emission hose from the carburetor. Disconnect and plug the distributor vacuum advance hose at the vacuum advance unit.

(NOTE: Adjust curb idle speed and mixture with engine at normal operating temperature (not hot), air conditioning off, air cleaner installed and transmission selector in drive.)

3. Adjust curb idle speed to specified RPM.

4. Cut off tab on mixture caps (care must be taken to avoid damage to mixture screws) equally richen (turn out) mixture screws until maximum idle speed is achieved.

Reset curb idle speed if necessary to obtain 80 RPM above specified curb idle speed.

5. Equally lean (turn in) mixture screws until specified curb idle speed is achieved.

6. Reconnect evaporative emission hose, and distributor vacuum advance hose.

Model 2GC Carburetor (231 Cu. In. Engine Only)

1. Set parking brake and block drive wheels.

2. Disconnect evaporative emission hose from the air cleaner. Disconnect and plug the distributor vacuum hose at the vacuum advance unit. Disconnect and plug the EGR vacuum hose at the EGR valve.

(NOTE: Adjust idle speeds and mixture with engine at normal operating temperature (not hot), air conditioning off, air cleaner installed, transmission selector in drive-automatic transmission and neutral manual transmission.)

3. Adjust idle speed to specified RPM (idle stop solenoid energized).

4. Cut off tab on mixture caps (car must be taken to avoid damage to mixture screws) equally richen (turn out) mixture screws until maximum idle speed is achieved. Reset idle speed if necessary with idle solenoid screw to obtain (80 RPM automatic transmission) (300 RPM manual transmission) above specified idle speed.

5. Equally lean (turn in) mixture screws until spedified idle speed is achieved (idle stop solenoid energized). Reset curb idle speed (idle stop solenoid de-energized) if necessary.

6. Reconnect evaporative emission hose, EGR vacuum hose, and distributor vacuum advance hose.

Model 4MC Carburetor (400 Cu. In. Engine Only)

1. Set parking brake and block drive wheels.

2. Disconnect and plug carburetor hose from vapor canister. Disconnect and plug distributor vacuum hose at vacuum advance unit.

3. Cut off tab on mixture caps (if not previously broken). Turn in mixture screws until they are lightly seated and back out five turns on each screw. Install air cleaner.

4. Start engine and warm up to normal operating temperature.

CAUTION: *Do not overheat. (If engine is cold, idle in drive for 15 minutes, followed by 2,000 RPM in NEUTRAL for 10 seconds.)*

5. With air conditioning off, transmission selector in DRIVE, air cleaner off and air cleaner vacuum fitting in manifold plugged, adjust speed screw to obtain idle mixture speed "before lean drop idle" as shown on the emission control label.

(NOTE: To check speeds after adjustments have been made, put trans. selector in NEUTRAL and bring engine speed up to 2,000 RPM for 5 to 10 seconds. Allow engine to return to idle, place trans. selector in DRIVE, and check idle speed obtained after 10 seconds of idle.)

6. Using the above procedure to check speeds, adjust mixture screws equally to obtain maximum RPM possible. Then readjust the speed screw to return speed to the "idle mixture speed before lean drop to idle". Repeat the attempt to increase the speed and again readjust the speed back to the "idle mixture speed before lean drop to idle". Proceed to the next step when it is no longer possible to increase speed by adjustment of the mixture screws.

7. Using the above procedure to check speeds, equally lean (turn in) mixture screws until the specified idle speed is achieved.

8. Final setting of the idle speed should be checked with the air cleaner installed and air cleaner vacuum hose connected. Minor adjustments to obtain specified idle speed should be made using mixture screws.

9. Remove plugs from vapor canister and distributor vacuum hoses and reconnect hoses.

Model 2MC Carburetor (260 Cu. In. Engine Only)

1. With engine at normal operating temperature, remove air cleaner and disconnect air cleaner vacuum hose at intake manifold, then cap fitting.

2. Choke open, air conditioning off.

3. Set parking brake and block drive wheels.

4. Disconnect hoses from vapor canister and EGR valve tubes at the carburetor and cap tubes. On California models there is no vacuum line to the distributor.

5. Timing should be set per the emission label.

6. Remove idle mixture screw caps. Lightly seat idle mixture screws.

7. Back each mixture screw out exactly the number of turns listed below:

Automatic Transmission Cars-5 Turns

8. With the engine running adjust the carburetor idle speed screw to:

NON CALIFORNIA
(Transmission in Dr.) ..... 610 RPM

CALIFORNIA MODELS
(Transmission in Dr.) ..... 700 RPM

9. Lean each idle mixture screw (turn in) 1/2 turn. Note idle RPM. Repeat this procedure until the RPM is:

NON CALIFORNIA
(Transmission in Dr.) ..... 550 RPM

CALIFORNIA MODELS
(Transmission in Dr.) ..... 600 RPM

This completes the adjustment of the idle mixture screws and the carburetor idle speed screw.

Complete Other Carburetor Adjustments as follows:

10. With transmission in park adjust fast idle speed screw to 900 RPM on low step of cam.

11. *On Air Conditioning Cars* After completing above adjustments, turn on A/C disconnect electrical connector

at A/C compressor clutch, and adjust solenoid (energized) screw to 650 RPM, transmission in drive. Reconnect electrical connector.

12. Reconnect canister and EGR valve hoses.

Model 1MC Carburetor (250 Cu. In. Engine Only)

1. With engine at normal operating temperature, air cleaner on, choke open, and air conditioning off, connect a tachometer to the engine.

2. Set parking brake and block drive wheels.

3. Disconnect fuel tank hose from vapor canister.

4. Disconnect vacuum advance hose at distributor and plug hose.

5. Start engine, check timing and adjust as required, connect vacuum advance hose to distributor.

6. On automatic transmission, place selector in drive and on manual transmission place selector in neutral.

7. Set idle speed to higher specified RPM, as shown under *LEAN DROP IDLE MIXTURE RPM* (Example **580**/550), by turning solenoid screw in or out.

8. Cut off tab on limiter cap. Do not remove cap from screw. Turn idle mixture screw counterclockwise (Richer) until maximum idle speed is achieved re-set idle speed to higher specified RPM, if required.

9. Observe tachometer and turn idle mixture screw clockwise (Leaner) until idle speed is at lower specified RPM. (Example 580/**550**).

10. Shut off engine, remove tachometer and connect fuel tank hose to vapor canister.

LEAN DROP IDLE MIXTURE RPM 250 ENGINE ONLY

Non-California Automatic Transmission 580/550 in Drive

California Automatic Transmission 640/600 in Drive

Manual Transmission 1200/850 in Neutral

ENGINE PERFORMANCE DIAGNOSIS REFERENCE CHART

CONDITION	REFERENCES
Engine will not crank but starter spins.	See "Starting System" Diagnosis.
Engine will not crank.	See "Starting System" and "HEI System" Diagnosis. See "Seat Belt Interlock System" Diagnosis.
Engine cranks slowly.	See "Starting System" Diagnosis.
Engine cranks normally, but will not start.	See "HEI System" and "Fuel System" Diagnosis. See Carburetion System Diagnosis.
Engine starts but fails to keep running.	See "HEI System" Diagnosis. See "Carburetor System" Diagnosis. See "Fuel System" and "Thermac Air Cleaner" Diagnosis. See "EGR System" Diagnosis.
Engine cranks normally but starts hard hot or cold.	See "HEI System" Diagnosis. See "Carburetor System" Diagnosis. See "Fuel System" Diagnosis.
Rough Engine Idle.	See "HEI System" Diagnosis. See "Carburetor System" Diagnosis. See "EFE System". "EFE–EGR Thermal Vacuum Switch", "PCV System" and "EGR System" Diagnosis.

Engine has inconsistent idle speed.	See "Carburetor System" Diagnosis. See "EFE System", "PCV System", "TVS System" and "EGR System" Diagnosis.
Engine runs but misses at idle speed only.	See "Engine Misfire" Diagnosis.
Engine runs but misses at high speed only.	See "Engine Misfire" Diagnosis.
Engine runs but misses at all speeds.	See "Engine Misfire" Diagnosis.
Part throttle engine detonation.	See "HEI System" Diagnosis. See "EGR System" Diagnosis. See "Carburetor System" Diagnosis.
Engine stalls at idle.	See "Carburetor System" Diagnosis. See "EFE–EGR Thermal Vacuum Switch" Diagnosis. See "Fuel System" Diagnosis. See "Thermac Air Cleaner" Diagnosis. See "EGR System" Diagnosis.
Engine stalls during deceler-ration (automatic transmission). Engine hesitates or stalls during acceleration.	See "Carburetor System" Diagnosis. See "EGR System" Diagnosis. See "Carburetion System" Diagnosis. See "HEI System" Diagnosis. See "EGR System", "EFE System", and "EFE–EGR Thermal Vacuum Switch" Diagnosis. See "Fuel System", "Thermac Air Cleaner" Diagnosis.
Poor operation during warm-up.	See "Carburetion System", "EFE System", "EGR System" Diagnosis. See "Fuel System", "HEI System" Diagnosis.
Poor engine performance on acceleration.	See "HEI System" Diagnosis. See "Carburetion System", "EGR System", "EFE System" Diagnosis. See "Fuel System" Diagnosis. See "Thermac Air Cleaner" and "Catalytic Converter System" Diagnosis. See "Transmission" Diagnosis.
Engine has less than normal power levels.	See "HEI System" Diagnosis. See "Carburetion System", "EFE System" Diagnosis. See "Fuel System" Diagnosis. See "Catalytic Converter System" Diagnosis. See "Thermac Air Cleaner" Diagnosis. See "EGR System" Diagnosis. See "Transmission" Diagnosis.

Engine surges.	See "Carburetion System", "EGR System", "EFE System" Diagnosis. See "Fuel System", "HEI System" Diagnosis.
Engine diesels (after run) upon shut-off.	See "Carburetion System" Diagnosis.
Poor or change in fuel economy.	See "HEI System" Diagnosis. See "Carburetion System", "EGR System" Diagnosis. See "Thermac Air Cleaner" Diagnosis.
Engine oil in air cleaner.	See "PCV System" Diagnosis.
Engine hot light on – over heating at idle.	See "Cooling System" Diagnosis. See "TVS System" Diagnosis.
Loss of engine coolant or overheating.	See "Cooling System" Diagnosis.
Excessive engine oil consumption.	See "Cooling System" Diagnosis.
All automatic transmission related problems.	See "Transmission" Diagnosis.
Engine exhaust system vibration, rattling, leaking or after-fires.	See "EFE System, Catalytic Converter System" Diagnosis.
Fuel odor.	See "Evaporative Emission System" Diagnosis.

MAJOR REPAIR

ENGINE TUNE-UP CHECK LIST

To make sure hydrocarbon and carbon monoxide emissions will be within limits, it is very important that the adjustments be followed exactly as listed on the sticker found in each engine compartment.

The suggested procedure for engine tune-up is as follows:

PRELIMINARY CHECKS

1. Check engine oil level. Correct if necessary.
2. Check engine coolant level. Correct if necessary.
3. Check transmission fluid level. Correct if necessary.
4. Check all drive belt tensions and condition. Correct if necessary.

BATTERY

1. Check electrolyte level. Correct if necessary.
2. Clean battery terminals and cable ends.
3. Take hydrometer readings.
4. Perform high rate discharge test.

ELECTRICAL TEST

1. Check cranking volts at coil.

START ENGINE

1. Check timing.
2. Check firing voltage.
3. Check aviable voltage.
4. Check coil polarity. Correct if necessary.

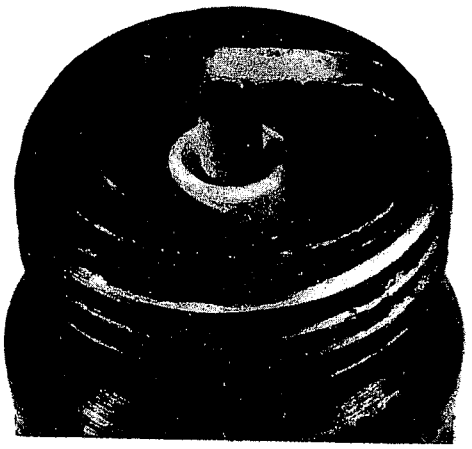
COMPRESSION TEST (Dry)

1. Remove spark plugs. (Note; with compressed air blow around spark plugs before removal).
2. Perform compression test noting each cylinder reading.
3. Use compression pressure limit chart (at the end of procedure) to determine if a problem cylinder exists.
4. If a problem cylinder does exist use "wet" compression test to determine cause. Correct as necessary.

DISTRIBUTOR SERVICE

1. Check distributor cap and rotor for cracks, carbon

tracking or other signs of deterioration. Replace if necessary.



NORMAL OPERATION

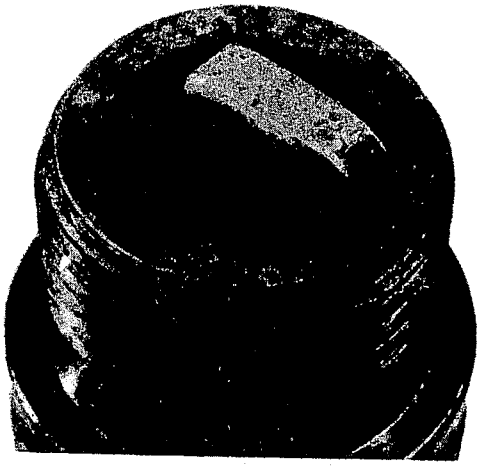
Brown to grayish-tan deposits and slight electrode wear indicate correct spark plug heat range and mixed periods of high and low speed driving.

SPARK PLUGS HAVING THIS APPEARANCE MAY BE CLEANED, REGAPPED AND REINSTALLED.

When reinstalling spark plugs that have been cleaned and regapped, be sure to use a new engine seat gasket in each case.

4B6G1

Figure 6G-1



CARBON FOULING

Dry, fluffy black carbon deposits may result from overrich carburetion, excessive hand choking, a faulty automatic choke, or a sticking manifold heat valve. A clogged air cleaner can restrict air flow to the carburetor causing rich mixtures. Poor ignition output (faulty breaker points, weak coil or condenser, worn ignition cables) can reduce voltage and cause misfiring. Fouled spark plugs are the result—not the cause—of this problem. **AFTER THE CAUSE HAS BEEN ELIMINATED, SPARK PLUGS HAVING THIS APPEARANCE CAN BE CLEANED, REGAPPED AND REINSTALLED.**

Excessive idling, slow speeds under light load also can keep spark plug temperatures so low that normal combustion deposits are not burned off. In such a case a hotter type spark plug will better resist carbon deposits.

4B6G2

Figure 6G-2

DEPOSIT FOULING—"A"

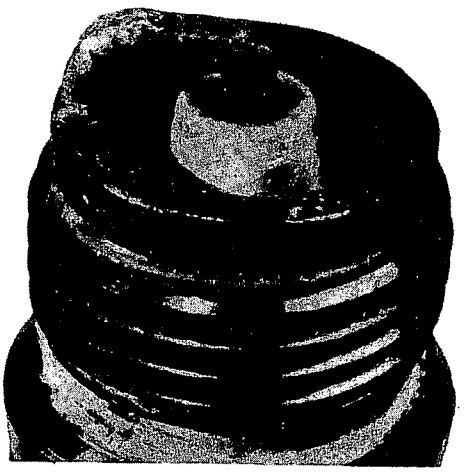
Red, brown, yellow and white colored coatings which accumulate on the insulator are by-products of combustion and come from the fuel and lubricating oil, both of which today generally contain additives. Most powdery deposits have no adverse effect on spark plug operation; however, they may cause intermittent missing under severe operating conditions, especially at high speeds and heavy load.

IF THE INSULATOR IS NOT TOO HEAVILY COATED, THE SPARK PLUGS MAY BE CLEANED, REGAPPED AND REINSTALLED.

Sometimes, even after cleaning, an invisible shunt path remains. The only remedy under such circumstances is to replace the plug.

4B6G3

Figure 6G-3



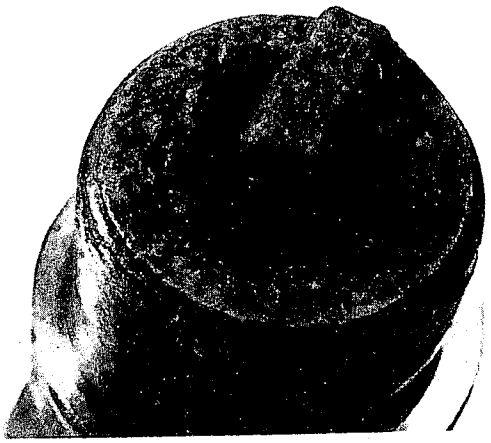
DEPOSIT FOULING—"B"

Most powdery deposits, as shown in "A", have no adverse effect on the operation of the spark plug as long as they remain in the powdery state. However, under certain conditions of operation, these deposits melt and form a shiny yellow glaze coating on the insulator which, when hot, acts as a good electrical conductor. This allows the current to follow the deposits instead of jumping the gap, thus shorting out the spark plug.

Glazed deposits can be avoided by not applying sudden load, such as wide open throttle acceleration, after sustained periods of low speed and idle operation. **IT IS ALMOST IMPOSSIBLE TO EFFECTIVELY REMOVE GLAZED DEPOSITS, SO WHEN THEY OCCUR THE PLUG SHOULD BE REPLACED.**

4B6G4

Figure 6G-4



OIL FOULING

Wet, oily deposits with very little electrode wear may be caused by oil pumping past worn rings. "Break-in" of a new or recently overhauled engine before rings are fully seated may also result in this condition. Other possibilities of introduction of oil into the combustion chamber are a porous vacuum booster pump diaphragm or excessive valve stem guide clearances and/or defective intake valve seals.

Usually, these spark plugs can be degreased, cleaned and reinstalled.

A HOTTER TYPE SPARK PLUG WILL REDUCE OIL DEPOSITS, but too hot a spark plug can cause preignition and, consequently, severe engine damage. An engine overhaul may be necessary in severe cases to obtain satisfactory service.

4B6G5

Figure 6G-5

EXCESSIVE OVERHEATING

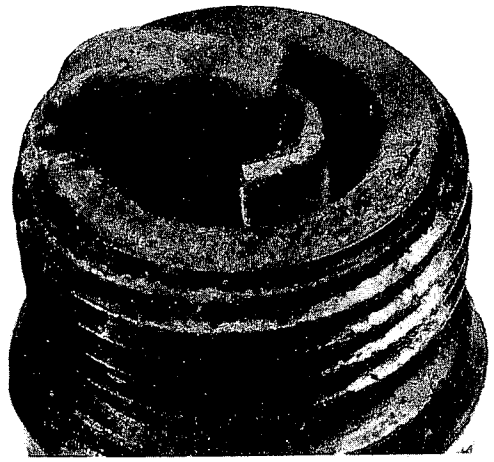
Excessive overheating is evidenced by burned or blistered insulator tips and badly worn electrodes. It is brought on by preignition**, cooling system defects, lean fuel air ratios, low octane fuels, overadvanced ignition timing, improper installation procedures (see adjacent illustration), and stuck closed heat riser valves.

INSTALL A NEW PLUG OF THE RECOMMENDED HEAT RANGE AFTER PROBLEM HAS BEEN CORRECTED.

Sustained high speed and/or heavy load service can produce high temperatures which will cause preignition and, in this instance, a colder spark plug should be used.

4B6G7

Figure 6G-7



HEAT SHOCK FAILURE

Heat shock is a common cause of broken and cracked insulator tips. Heat shock is the result of an excessively fast rise in tip temperature under severe operating conditions. It occurs due to engine detonation* caused by overadvanced ignition timing, or the use of too low octane fuel.

Chipped and broken insulator tips also result from improper gapping tools or procedures in which excessive or side pressures are exerted against the insulator tip.

ELIMINATE THE CAUSE AND INSTALL A NEW PLUG OF THE RECOMMENDED HEAT RANGE.

4B6G6

Figure 6G-6

IMPROPER INSTALLATION

Spark plug overheating caused by poor heat transfer is the result of failure to install the spark plug with sufficient torque to provide good contact between the spark plug and engine seat (also see adjacent illustration).

Dirty threads in the engine head which allow the plug to seize before it is actually seated will also cause this condition.

A NEW SPARK PLUG OF THE RECOMMENDED HEAT RANGE SHOULD BE INSTALLED IN ACCORDANCE WITH AC INSTALLATION INSTRUCTIONS.

4B6G8

Figure 6G-8

NOTE: *Spark plugs are usually the end result of another problem rather than the cause of a problem. Proper inspection and diagnosis of the spark plugs is essential for a lasting tune-up.*

1. Check condition of spark plugs. Replace if necessary. See Figures 6G-1 thru 6G-8.

2. Clean cylinder threads and seat.

3. Gap all spark plugs to .060" (except 260-V8 gap at .080") install plugs and torque to 15 lb. ft.

4. Check spark plug wire(s) for cracks, hardness, or other signs of deterioration. Replace if necessary.

Spark plug wire(s).

Resistance ..... 3,000 - 20,000 Ohms

CARBURETOR SERVICE

1. Torque carburetor bolts to 15 lb. ft. All engines (except 260 V-8 10 lb. ft.)

2. Torque intake manifold bolts to specifications.

3. Check automatic choke operation.

a. Check choke coil rod for free operation and proper adjustment. Correct if necessary.

b. Check primary and secondary vacuum breaks for free operation and proper adjustment. Correct if necessary.

c. Check choke unloader operation. Correct if necessary.

d. Check fast idle speed. Adjust if necessary.

4. Check secondary operation if equipped. Adjust if necessary.

5. Check accelerator pump operation. Correct if necessary.

6. Check float level, (if complaint of stall on turns was received). Correct if necessary.

7. If any of the above were out of adjustment be sure to adjust idle speed to specifications.

FILTERS

1. Replace air cleaner element if necessary.

2. Replace PCV filter in air cleaner if necessary.

3. Replace fuel filter in carburetor if necessary.

4. Replace carbon canister filter if necessary.

START ENGINE

1. Set timing to specifications.

2. Set idle speed to specifications.

FUEL PUMP

1. Test fuel pump pressure and volume.

2. Replace fuel pump if it does not meet specifications.

FINAL INSPECTION

1. Check engine vacuum hoses for disconnects, cracks, kinks, deterioration and proper routing. Correct if necessary.

2. Check condition of upper and lower radiator hoses. Replace if necessary.

3. Check condition of heater hoses. Replace if necessary.

Compression Compression Pressure Limit Chart

This chart may be used when checking cylinder compression pressures. It has been calculated so that lowest reading number is 70 percent of the highest reading number.

EXAMPLE: *After checking the compression pressures in all cylinders, it was found that the highest pressure obtained was 182 psi. The lowest pressure reading was 145 psi. By locating 182 in the maximum column, it is seen that the minimum allowable pressure is 127 psi. Since the lowest reading obtained was 145 psi, the car is within limits and the compression is considered satisfactory.*

Maximum Pressure Pounds Sq. Inch	Minimum Pressure Pounds Sq. Inch	Maximum Pressure Pounds Sq. Inch	Minimum Pressure Pounds Sq. Inch
134	94	186	130
136	95	188	132
138	97	190	133
140	98	192	134
142	99	194	136
144	101	196	137
146	102	198	139
148	104	200	140
150	105	202	141
152	106	204	143
154	108	206	144
156	109	208	146
158	111	210	147
160	112	212	148
162	113	214	150
164	115	216	151
166	116	218	153
168	118	220	154
170	119	222	155
172	120	224	159
174	122	226	158
176	123	228	160
178	125	230	161
180	126	232	162
182	127	234	164
184	129	236	165
		238	167

SPECIFICATIONS

SPECIFICATIONS AND ADJUSTMENTS

ENGINE	SERIES	OIL FILTER	AIR FILTER	FUEL FILTER	PCV VALVE	CRANK-CASE VENT FILTER
350–4	X	PF24	A329C A368C HD*	GF441	CV768C	FB59
350–4	A & B	PF24	A329C A368C HD*	GF441	CV768C	FB59
350–2	A & B	PF24	A329C A368C HD*	GF427	CV768C	FB59
455–4	B' C & E	PF24	A212CW A279C HD*	GF441	CV768C	FB59
350–2	X	PF24	A329C A368C HD*	GF427	CV768C	FB59
231–2	A, X	PF39	A169CW	GF427	CV768C	FB59
231–2	H	PF37	A169CW	GF427	CV768C	FB59
400–4	B & C	PF30	A212CW	GF441	CV679C	FB59
260–2	X	PF30	A329C	GF441	CV679C	FB56
250–1	X	PF25	A169CW	GF427	CV781C	FB59

*Heavy Duty

ENGINE	SPARK PLUG	SPARK PLUG GAP	INITIAL (1) TIMING ± 2°	CURB IDLE SPEED (5)		FAST IDLE SPEED
				IDLE SOLENOID DISCONNECTED	IDLE SOLENOID CONNECTED	
231 MAN. TRANS. ALL SERIES	R44SX	.060"	12° BTDC AT IDLE	600 IN NEUTRAL	800 IN NEUTRAL	PRE SET
V-6 AUTO. TRANS. ALL EXCEPT "H" SERIES	R44SX	.060"	12° BTDC AT IDLE	500 IN DRIVE	700 IN DRIVE	PRE SET
V-6 AUTO TRANS. "H" SERIES	R44SX	.060"	12° BTDC AT IDLE	500 IN DRIVE	650 IN DRIVE	PRE SET
250 L-6 NON CALIFORNIA MAN. TRANS.	R46TX	.060"	10° BTDC AT IDLE	425 IN NEUTRAL	850 IN NEUTRAL	(3) 1800 IN NEUTRAL HIGH STEP OF CAM
250 L-6 NON CALIFORNIA AUTO. TRANS.	R46TX	.060"	10° BTDC AT IDLE	425 IN DRIVE	(4) 550 IN DRIVE	(3) 1700 IN PARK HIGH STEP OF CAM
250 L-6 CALIFORNIA AUTO. TRANS.	R46TX	.060"	10° BTDC AT IDLE	425 IN DRIVE	600 IN DRIVE	(3) 1700 IN PARK HIGH STEP OF CAM
260 V-8 NON CALIFORNIA	R46SX	.080"	18° BTDC AT 1100 RPM	550 IN DRIVE	650 IN DRIVE	(3) 900 IN PARK LOW STEP OF CAM
260 V-8 CALIFORNIA	R46SX	.080"	14° BTDC AT 1100 RPM	600 IN DRIVE	(4)650 IN DRIVE	(3) 900 IN PARK LOW STEP OF CAM
350 V-8	R45TSX	.060"	12° BTDC AT IDLE	600 IN DRIVE		(2) 1800 IN PARK HIGH STEP OF CAM 4 BBL ONLY
400 V-8	R45TSX	'060"	16° BTDC AT IDLE	650 IN DRIVE		(2) 1800 IN PARK HIGH STEP OF CAM
455 V-8	R45TSX	.060"	12° BTDC AT IDLE	600 IN DRIVE		(2) 1800 IN PARK HIGH STEP OF CAM

5B6G9

(1) SET TIMING WITH HOSE FROM DISTRIBUTOR VACUUM ADVANCE UNIT DISCONNECTED AND PLUGGED.
(2) VACUUM HOSE TO EGR DISCONNECTED AND PLUGED AIR CLEANER IN PLACE, ENGINE AT NORMAL OPERATING TEMPERATURE. AIR CONDITIONING OFF.
(3) VACUUM HOSE TO EGR AND VACUUM ADVANCE DISCONNECTED AND PLUGGED, AIR CLEANER IN PLACE, ENGINE AT OPERATING TEMPERATURE. AIR CONDITIONING OFF.
(4) AIR CONDITIONING ON - AIR CONDITIONING COMPRESSOR CLUTCH WIRES DISCONNECTED.
(5) ENGINE AT OPERATING TEMPERATURE, AIR CLEANER IN PLACE.

Figure 6G-9