

SECTION A

ENGINE TUNE-UP ALL SERIES

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DIVISION I SPECIFICATIONS AND ADJUSTMENTS

69-1 SPECIFICATIONS AND ADJUSTMENTS

Gasoline, Grade Required (With 2-Barrel Carb. Engines)	Regular
Gasoline, Grade Required (With 4-Barrel Carb. Engines)	Premium
Gasoline Tank Capacity (Approximately)	
Series 43-44000	20 Gal.
Series 45-46-48000	25 Gal.
Series 49000	21 Gal.
Gasoline Gauge, Make & Type	A.C., Electric
Fuel Pump, Make & Type	A.C., Mechanical
Drive	Eccentric at Camshaft Sprocket
Fuel Pump Pressure—At Carb. Level	
225-300-340 Engines	3 3/4 Lbs. Min.
400-430 Engines	5 Lbs. Min.
Fuel Filter, In Carburetor Inlet	
225 Engine	Sintered Bronze GF-94
All Other Engines	Pleated Paper GF-415
Fuel Filter, in Gas Tank	Woven Plastic
Carburetor, Make & Type	Carter or Rochester, Downdraft
Carburetor, Barrels & Compression Ratio	
2 Barrel	9 to 1 Comp. Ratio
4 Barrel	10.25 to 1 Comp. Ratio
Air Cleaner, Make & Type	A.C., Plastic Foam Element
Air Cleaner Element Type	
225 Engine	A132C
300-340 Engines	A96C
400-430 Dual Intake Engines	A96C
430 Engine	A202C

69-1 SPECIFICATIONS AND ADJUSTMENTS (Cont'd.)

Positive Crankcase Ventilator Valve, Type	
All Engines Under 300 Cu. In.	CV-684C
All Engines 300 Cu. In. & Over	CV-683C
Intake Manifold Heat, Type	Exhaust Crossover Passage
Thermostat Wind-Up @ 70° F., Valve Closed	1/2 Turn
Idle Speed, Auto. Trans. in Drive or Man. Trans. in Neutral	
All Standard Engines	550 RPM
Air Injection Reactor Car and/or Air Cond. Car (With Air Cond. Off)	Add 50 RPM

69-2 ENGINE TUNE-UP CHART

Engine Usage	Spark Plug	Plug Gap	Dwell Angle	Breaker Gap	Initial Timing	Choke Setting
225 Cu. In. V-6	44S	.035"	30°	.016"	5° BTC	Index
300-2	44S	.035"	30°	.016"	2-1/2° BTC	Index
340-2	44S	.035"	30°	.016"	2-1/2° BTC	Index
340-4	44S	.035"	30°	.016"	2-1/2° BTC	Two Notches Rich
400-4	44TS	.035"	30°	.016"	2-1/2° BTC	Index
430-4	44TS	.035"	30°	.016"	2-1/2° BTC	Index

69-3 IGNITION SYSTEM CHART

	225 Eng.	300 Eng.	340 Eng.	400-430 Eng.
Distributor Number (less Cap)	1110376	1111158	1111159	1111149
Timing, Crankshaft Degrees before U.D.C. (with Vacuum Hose Disconnected and Engine Idling)	5°	2-1/2°	2-1/2°	2-1/2°
Centrifugal Advance, Crankshaft Degrees and RPM				
Start Advance, @ RPM	700-950	550-750	550-850	650-850
Medium Advance, Degrees @ RPM	14-18 @ 1800	12-16 @ 1400	10-14 @ 1700	17-21 @ 1800
Maximum Advance, Degrees @ RPM	24-28 @ 4200	30-34 @ 4600	26-30 @ 4600	28-32 @ 4800
Vacuum Advance, Crankshaft Degrees and Inches of Vac.				
Start Advance, @ In. of Vacuum	6-8	6-8	6-8	6-8
Maximum Advance, Degrees @ In. of Vacuum	14-18 @ 16	14-18 @ 16	14-18 @ 16	14-18 @ 16

- NOTE:**
1. For Ignition System Service Procedures refer to Group 68.
 2. For Fuel System Service Procedures refer to Group 64.
 3. For Carburetor Idle and Automatic Choke Adjustments refer to Para. 64-2.
 4. For Throttle Linkage and Dash Pot Adjustments refer to Para. 64-3.
 5. For Trouble Diagnosis refer to Para. 64-6.

DIVISION II

DESCRIPTION AND OPERATION

69-4 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 and performance.

Economical, trouble-free operation can better be assured if a complete tune-up is performed each 12,000 miles.

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. While the items affecting compression and ignition may be handled according to personal preference, 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 complete engine tune-up are covered in Groups 64 and 68; therefore, this paragraph provides an outline only with references to these sections where detailed information is given.

DIVISION III

SERVICE PROCEDURES

69-5 TUNE-UP PROCEDURES

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

1. Remove all spark plugs.
2. Position throttle and choke valve in full open position.
3. Connect jumper wire between distributor terminal of coil and ground on engine to avoid high tension sparking while cranking engine.
4. Hook up starter remote control cable and turn ignition switch to "on" position.

CAUTION: The starter must not be energized when the ignition switch is in the LOCK position as the ground contact will be damaged in the ignition switch.

5. Firmly insert compression gauge in spark plug port. Crank

engine through at least four compression strokes to obtain highest possible reading.

6. Check compression of each cylinder. Repeat compression check and record highest reading obtained on each cylinder during the two pressure checks.

The recorded compression pressures are to be considered normal if the lowest reading cylinder is more than 75% of the highest reading cylinder. See the following example and the "Compression Pressure Limit Chart".

Example:

Cylinder No.	Pressure (PSI)
1	129
2	135
3	140
4	121
5	120
6	100
7	130
8	126

75% of 140 (highest) is 105. Thus, cylinder number 6 is less than 75% of number 3. This condition, accompanied by low speed mission, indicates an improperly seated valve or worn or broken piston ring.

7. If one or more cylinders read low, inject about a tablespoon of engine oil on top of pistons in low reading cylinders through spark plug port. Repeat compression check on these cylinders.

a. If compression improves considerably, rings are worn.

b. If compression does not improve, valves are sticking or seating poorly.

c. If two adjacent cylinders indicate low compression and injecting oil does not increase compression, the cause may be a

head gasket leak between the cylinders. Engine coolant and/or oil in cylinders could result from this defect.

NOTE: Low compression pressure in two adjacent cylinders indicates a possible head gasket leak between the two cylinders.

8. Clean, inspect, gap to .035", and install spark plugs.

9. Inspect battery and cables.

10. If battery is in good condition but cranking speed is low, test cranking motor circuit.

11. Adjust fan belt (and power steering belt if so equipped). If difficulty is experienced in keeping battery charged, check generator regulator.

12. Inspect entire ignition system and make indicated corrections.

13. Inspect and test fuel pump.

14. Check gasoline filter.

15. Check operation of choke valve and check setting of choke thermostat.

16. Check adjustment of fast idle cam and choke unloader.

17. Check throttle linkage and dash pot adjustment.

18. Adjust carburetor idle speed and mixture.

19. Inspect all water hose connections and tighten clamps, if necessary.

20. Road test car for power and overall performance.

b. Compression Pressure Limit Chart

This chart may be used when checking cylinder compression pressures. It has been calculated so that lowest reading number is 75% of the highest reading number.

Maximum Pressure Pounds/ Sq. Inch	Minimum Pressure Pounds/ Sq. Inch	Maximum Pressure Pounds/ Sq. Inch	Minimum Pressure Pounds/ Sq. Inch
134	101	186	140
136	102	188	141
138	104	190	142
140	105	192	144
142	107	194	145
144	108	196	147
146	110	198	148
148	111	200	150
150	113	202	151
152	114	204	153
154	115	206	154
156	117	208	156
158	118	210	157
160	120	212	158
162	121	214	160
164	123	216	162
166	124	218	163
168	126	220	165
170	127	222	166
172	129	224	168
174	131	226	169
176	132	228	171
178	133	230	172
180	135	232	174
182	136	234	175
184	138	236	177
		238	178

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 136 psi. Since the lowest reading obtained was 145 psi, the car is within limits and the compression is considered satisfactory.