

TUNE-UP

ENGINE IDENTIFICATION

The Engine Identification Number is located on left side, upper front corner of block on four cylinder engines. On the 232" six cylinder engine it is on right side of crankcase, adjacent to distributor. The cubic inch displacement is indicated by the first four or five digits on the 196" engine and by a letter code on the 232" engine.

Application	Digits or Letter Code
196"	4-196E
232"	L

MODEL IDENTIFICATION

Number is located on rear face of left front door.

613105H587201

- First Four Digits** — Model Code.
- Fifth Digit** — Engine Type.
- Sixth Digit** — Cab or Body Type.
- Remaining Digits** — Chassis Serial Number.

TUNE-UP NOTES

► **IDLE SPEED ADJUSTMENT CAUTION** — Procedures and specifications for idle speed adjustment must be followed exactly as outlined. See "Hot (Slow) Idle RPM" under Tune-Up.

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

COMPRESSION PRESSURE

With engine warm, all spark plugs removed and throttle wide open, the maximum variation between cylinders should not exceed 10 psi.

Application	PSI
196"	140
232"	145

VALVE TAPPET CLEARANCE

Application	Clearance (Hot)
All Hydraulic.....	Zero Lash

VALVE ARRANGEMENT

- 4 Cyl. — E-I-E-I-E-I-E-I (Front to rear.)
- 6 Cyl. — E-I-I-E-I-E-E-I-E-I-E (Front to rear.)

SPARK PLUGS

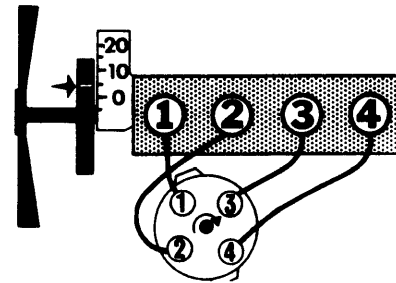
Gap	
4 Cyl.025-.030"
6 Cyl.033-.037"
Torque	
4 Cyl.	28-30 ft. lbs.
6 Cyl.	25 ft. lbs.

Spark Plug Type

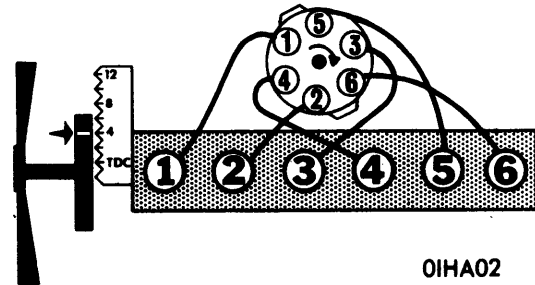
Application	Champion No.
196"	J-10Y
232"	RN-14Y
Metro 232"	J-11Y

DISTRIBUTOR

Point Gap	
All Used016"
All New.....	.019"
Cam Angle	
196"	42-48°
232"	31-34°
Breaker Arm Spring Tension	
196"	17-20 ozs.
232"	17-21 ozs.
Condenser Capacity18-.23 mfd.



FIRING ORDER & TIMING MARKS 4 CYL.



FIRING ORDER & TIMING MARKS 6 CYL.

IGNITION TIMING

Check or adjust timing with engine at normal operating temperature, distributor vacuum advance line disconnected and plugged, transmission in Neutral, and hot (slow) idle speed set.

Application	Timing
All	TDC

HOT (SLOW) IDLE RPM

NOTE — When setting idle mixture, do not allow engine to idle more than three minutes without increasing engine speed to 2000 RPM for one minute before continuing with adjustment procedure.

TUNE-UP (Cont.)

With vehicle level, engine at normal operating temperature, choke open, air cleaner installed, air conditioning "ON", and manual transmission in Neutral or automatic transmission in "D", connect tachometer to engine. Turn idle mixture screw counterclockwise (out) against its tab stop and attach vacuum gauge to engine. Adjust idle speed 20-40 RPM faster than specifications. Turn idle mixture screw clockwise (in) to reduce idle speed to specifications. If idle adjustment cannot be made due to limiter cap, remove it and use the following procedure. Turn mixture screw in just to the point that idle RPM starts to drop and install new limiter cap fully counterclockwise against tab stop. Adjust idle speed 40 RPM faster than specification. Turn idle mixture screw clockwise (in) to reduce idle speed to specifications.

Application	Idle Speed (RPM)	RPM
Man. Trans.		700
Auto. Trans. (in "D")		550

COLD (FAST) IDLE RPM

Man. Choke — The cold (fast) idle speed is set when hot (slow) idle speed and manual choke are properly adjusted.

Auto. Choke — With hot (slow) idle set and engine at normal operating temperature, turn fast idle screw in until screw just touches fast idle cam. Back screw out 1/2 to one turn.

CHOKE ADJUSTMENT

Man. Choke — Loosen choke cable adjusting screw on choke lever at carburetor. With choke knob in cab all the way in, pull choke cable at carburetor to remove excess slack. Release cable and tighten screw. Work knob in and out several times and check that choke is full open when knob is all the way in.

Auto. Choke — Non-adjustable. Check for freedom of movement of choke linkage; if binding occurs, replace linkage and thermostat in manifold well.

DASHPOT ADJUSTMENT

With engine at normal operating temperature and idle speed set, check to see that dashpot stem is fully depressed. Set the dashpot adjusting screw to the clearance specified.

Dashpot Clearance

Application	Clearance
196"125-.155"
232"105-.135"

FUEL PUMP PRESSURE & VOLUME

Pressure (At 1000 RPM) ①	
All	4-5.5 psi
Volume	
196" (At 4000 RPM).....	3.2 pts. in 1 min.
232" (At 2000 RPM).....	3.6 pts. in 1 min.

① — Fuel pressure test must be taken at carburetor inlet height.

MANIFOLD HEAT CONTROL VALVE

Check valve periodically for spring tension and freedom of operation.

EMISSION CONTROL

See appropriate article in EMISSION CONTROL Section.

IGNITION

DISTRIBUTOR

Application	① IHC Part No.
196"	360724-C91

① — Manufactured by Holley.

Application	Delco Part No.
232"	1110479

Other Data & Specifications — See Tune-Up and Holley or Delco Distributors in ELECTRICAL Section.

IGNITION COIL

Application	Delco Part No.
All	1115202

Resistance	Ohms @ 80°F
Primary	1.81-1.95
Secondary	7,200-9,500
Ballast Resistor (Loom).....	1.3-1.35

CARBURETION

CARBURETORS

Holley Series 1920 1-Bbl.

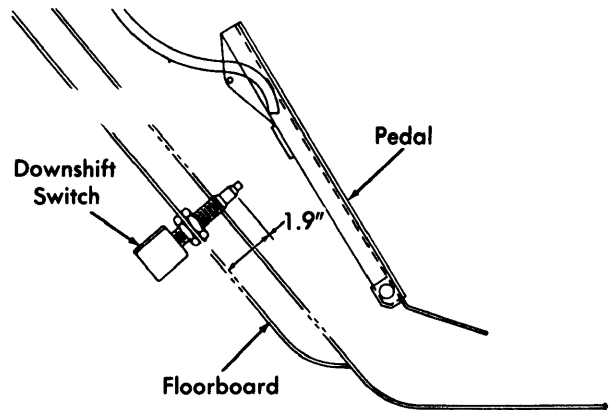
Application	Holley Part No.	
	Man. Trans.	Auto. Trans.
196"	R-4591	R-4591
232"	R-4542	R-4542

Other Data & Specifications — See *Tune-Up and Holley Carburetors* in **CARBURETION** Section.

ACCELERATOR AND DOWNSHIFT LINKAGE ADJUSTMENT

Accelerator Adjustment — With accelerator linkage clean and lubricated, adjust pedal stop screw so that pedal will just strike screw when carburetor throttle plate is wide open.

Downshift Adjustment — With idle speed and dashpot adjusted to specifications, loosen locknuts on downshift switch beneath gas pedal. Adjust switch so that shoulder of plunger is 1.9 inches off floorboard.



11H03

DOWNSHIFT SWITCH ADJUSTMENT

ELECTRICAL

BATTERY

12 Volt — Negative Ground.

STARTER

Application	Delco Part No.
196"	1107709
232"	1108384

Other Data & Specifications — See *Delco Starters* in **ELECTRICAL** Section.

ALTERNATOR

Application	Amps.	Delco Part No.
196"	37	1100687
232"	37	1100688

Other Data & Specifications — See *Delco Alternators* in **ELECTRICAL** Section.

ALTERNATOR REGULATOR

Application	Delco Part No.
All	1119507

Other Data & Specifications — See *Delco Alternator Regulators* in **ELECTRICAL** Section.

ENGINE

INTAKE MANIFOLD TIGHTENING

4 Cyl. — Manifold bolts are tightened to 40-45 ft. lbs.
 6 Cyl. — Manifold bolts and stud nuts are tightened to 20-25 ft. lbs.

BELT ADJUSTMENT

Belts are adjusted just tight enough to prevent slipping. Too tight an adjustment will damage bearings of water pump or accessories.

FILTERS & CLEANERS

Filter or Cleaner	Service Interval (Miles)
Oil Filter.....	① Replace 3,000-4,000
Air Filter	
Oil Bath	② Clean 5,000
Dry Type	③ Clean 5,000
PCV Valve.....	Clean 10,000
Fuel Filter.....	④
Distributor Shaft & Pivot Point.....	Oil 3,000-5,000
Distributor Cam.....	Lubricate 3,000-5,000

- ① — Or every oil change.
- ② — Oil with same viscosity oil in crankcase.
- ③ — Replace 15,000 to 20,000 miles.
- ④ — Clean when bowl shows sediment.

ENGINE (Cont.)

COOLING CAPACITIES

Application	Quantity
Standard	
4 Cyl.	① 12 qts.
6 Cyl.	① 11 qts.
Optional.....	②
① - Add 1.5 qts. if equipped with heater.	
② - With increased capacity radiator, fill to one inch below top of radiator upper tank.	

CAPACITIES
(EXCEPT COOLING)

Application	Quantity
Crankcase	① 4 qts.
Oil Bath Air Cleaner	
4 Cyl.	1 pt.
6 Cyl.	1 qt.
Automatic Transmission.....	9.5 qts.
Man. Trans. & Rear Axle	②
Front Axle & Transfer Case	②
Four-Wheel Drive Knuckle Ends	②
Fuel Tank	
Scout.....	10 gals.
Conventional Cab.....	16 gals.
Travelall & Panel Body.....	21 gals.
Metro	
Std.	23 gals.
Opt.	35 gals.
① - Add 1 quart with filter change.	
② - Fill to bottom of filler plug hole.	