

TUNE-UP

ENGINE IDENTIFICATION

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

| Application | Digits or Letter Code |
|-------------|-----------------------|
| 196" | ①4-196 |
| 232" | L |

① - Suffix "E", if present, indicates an emission controlled engine.

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, 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-E-I-I-E-E-I-I-E (Front to rear.)

SPARK PLUGS

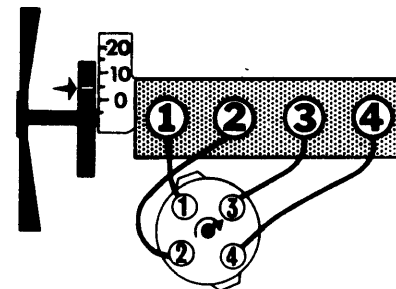
| | |
|-----------------|----------------|
| Gap 4 Cyl. | .025-.030" |
| Gap 6 Cyl. | .033-.037" |
| Torque | |
| 4 Cyl. | 28-30 ft. lbs. |
| 6 Cyl. | 25 ft. lbs. |

Spark Plug Type

| Application | Champion No. |
|-------------------|--------------|
| 196" | J-10Y |
| 232" | XN-14Y |
| Metro 6 Cyl. | J-11 |

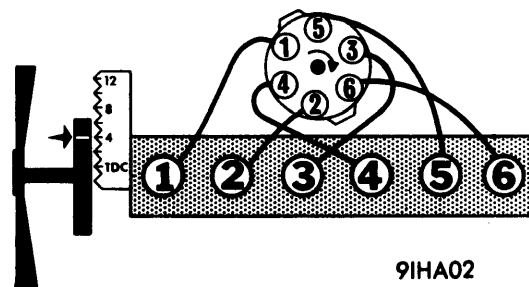
DISTRIBUTOR

| | |
|-----------------------------------|--------------|
| Point Gap | |
| 196" New | |
| Federal..... | .017" |
| Calif. | .019" |
| 196" Used | |
| Federal..... | .014" |
| Calif. | .016" |
| 232" | .016" |
| Cam Angle | |
| 196" | 42-48° |
| 232" | 31-34° |
| Breaker Arm Spring Tension | |
| 196" | 17-20 ozs. |
| All Others | 17-21 ozs. |
| Condenser Capacity | .18-.23 mfd. |



91HA01

FIRING ORDER & TIMING MARKS 4 CYL.



91HA02

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 slow (hot) idle speed set.

| Application | Timing |
|-------------------|---------|
| 196" Federal..... | 4° BTDC |
| 196" Calif. | TDC |
| 232" | TDC |

TUNE-UP (Cont.)

HOT (SLOW) IDLE RPM

Gas Only, All Exc. W/Carb. Model 1920 — With vehicle level, engine at normal operating temperature, and choke plate wide open, adjust idle speed screw to obtain specified RPM. Adjust idle mixture screw(s) to obtain highest steady manifold vacuum or, if vacuum gauge is not available, the smoothest maximum idle speed. If necessary, reset idle speed screw to specified RPM.

NOTE — When setting idle mixture on Model 1920 carburetor, 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.

Gas Only, W/Carb. Model 1920 — With vehicle level, engine at normal operating temperature, choke open, air cleaner installed, air conditioning "ON", and transmission in Neutral, connect tachometer to engine. Turn idle mixture screw counterclockwise (out) against its tab stop and attach vacuum gauge to engine. Adjust idle speed 20 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 caps, remove them by grinding or filing (not by prying) and use the following procedure. Turn mixture in just to the point that idle RPM starts to drop and install new limiter cap fully counterclockwise against tab stop. Adjust idle speed 20-40 RPM faster than specifications. Turn idle mixture screw clockwise (in) to reduce idle speed to specifications.

| Application | Idle Speed (RPM) | RPM |
|--|------------------|---------|
| 196" Federal..... | | 450-500 |
| 196" Calif. Man. Trans. | | 700 |
| 196" Calif. Auto. Trans. (in "D")..... | | 550 |
| 232" Man. Trans. | | 725 |
| 232" Calif. Auto. Trans. (in "D")..... | | 550 |

COLD (FAST) IDLE RPM

Man. Choke — The cold (fast) idle speed is set when hot (slow) idle RPM 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 ½ to one turn.

IGNITION

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 |

CHOKE ADJUSTMENT

Gas, 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 choke knob in and out several times and check to see that choke is full open when knob is all the way in.

Gas, Auto Choke — Non-adjustable. Check for freedom of movement of choke linkage; if binding occurs, replace.

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.

| Application | Dashpot Clearance | Clearance |
|-------------------|-------------------|------------|
| 196" Federal..... | | .095-.105" |
| 196" Calif. | | .125-.155" |
| 232" | | .105-.135" |

FUEL PUMP PRESSURE & VOLUME

| | |
|-------------------------------|--------------------|
| Pressure (At 1000 RPM)ⓐ | 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. |

ⓐ — 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.

DISTRIBUTOR

| Application | ⓐIHC Part No. |
|-----------------------------|---------------|
| 196" | 359215-C91 |
| 196" Emission Control | 360724-C91 |

ⓐ — Holley made.

| Application | Delco Part No. |
|-------------|----------------|
| 232" | 1110479 |

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

CARBURETION

CARBURETORS
Holley Series 1904 1-Bbl.

| Application | Holley Part No. | |
|---------------------|-----------------|--------------|
| | Man. Trans. | Auto. Trans. |
| 196" | R2569 | ① |
| ① - Not applicable. | | |

Holley Series 1920 1-Bbl.

| Application | Holley Part No. | |
|-------------------------|-----------------|--------------|
| | Man. Trans. | Auto. Trans. |
| 196" Emission Con. | R-3993 | ① |
| 232" | R-4405 | R-4405 |
| ① - Not applicable. | | |

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 - The downshift switch is located under the pedal on conventional chassis and on a bracket under the floorboard on the Metro chassis. Loosen lock nut and adjust screw to obtain 1/4" between switch and pedal on conventional chassis and 1/4" between switch and pad on throttle linkage on Metro chassis when throttle plate is wide open.

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.

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.

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.)

CAPACITIES (EXCEPT COOLING)

| Application | Quantity |
|------------------------------------|----------|
| Crankcase | |
| 4 Cyl. | ① 4 qts. |
| 6 Cyl. | ① 6 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 | |
| 700 to 1100 | 15 gals. |
| 1200..... | 17 gals. |

- ① - Add 1 quart with filter change.
 ② - Fill to bottom of filler plug hole.