# TUNE-UP

## ENGINE IDENTIFICATION

Engine can be identified by eighth digit of Vehicle Identification Number, and by fourth digit of Build Date Code stamped on metal plate attached to right bank cylinder head cover.

| Application | Code Letter |
|---|---|
| 304" | H |
| 360" (2-Bbl.) | N |
| 360" (4-Bbl.) | P |
| 401" | Z |

## MODEL IDENTIFICATION

### VEHICLE IDENTIFICATION NUMBER

A thirteen digit Vehicle Identification Number is stamped on a metal plate affixed to left hand side of firewall under hood. Number is decoded as follows:

**J4M144CH00001**

**First Digit** – Manufacturer.
**Second Digit** – Model Year.
**Third Digit** – Transmission Type & Assembly Plant.
**Fourth & Fifth Digit** – Chassis Type.
**Sixth Digit** – Body Style.
**Seventh Digit** – Gross Vehicle Weight.
**Eighth Digit** – Engine Code.
**Remaining Digits** – Sequence Build Number.

## COMPRESSION PRESSURE

With engine at normal operating temperature, spark plugs removed, throttle and choke valves wide open and engine at cranking speed, variation between cylinders should be no more than 15 psi.

## 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.

## VALVE TAPPET CLEARANCE

Hydraulic Lifters ..... Zero Lash

### VALVE ARRANGEMENT

E-I-I-E-E-I-I-E (both banks, front to rear).

## SPARK PLUGS

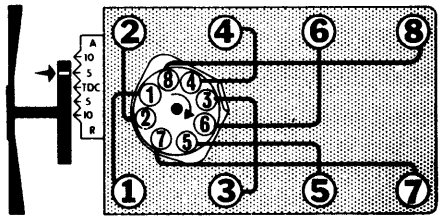
Gap ..... .033-.037"
Torque ..... 25-30 ft. lbs.

**Spark Plug Type**

| Application | Champion No. |
|---|---|
| All | N-12Y |

## DISTRIBUTOR

Point Gap ..... .016"
Cam Angle ..... 29-31°
Breaker Arm Spring Tension ..... 17-21 ozs.
Condenser Capacity ..... .18-.23 mfd.




4JE01

**FIRING ORDER & TIMING MARKS (TYPICAL)**

## IGNITION TIMING

With engine at normal operating temperature, running at 500 RPM and vacuum line disconnected and plugged, set timing to specifications.

| Application | Timing |
|---|---|
| All (Standard) | 5°BTDC |
| 401" (Heavy Duty) | 2.5°BTDC |

## HOT (SLOW) IDLE RPM

*NOTE – Do not idle engine for over three minutes at a time. If idle mixture adjustment is not completed within three minutes, run engine at 2000 RPM for one minute before continuing, repeat as necessary.*

To adjust engine idle RPM, engine must be at normal operating temperature and air cleaner installed. Idle RPM can be adjusted by either a standard tachometer procedure or a perferred "IR", Infared Analyzer procedure. Idle limiter caps are installed on idle mixture screws to effectively control exhaust emission levels at idle. These caps must be removed to perform standard tachometer or "lean drop RPM" procedure. Caps do not normally need removal during "IR" procedure. To remove caps, install a sheet metal screw in center of cap and turn clockwise. Discard cap.

**Idle Speed RPM**

| Application | Man. Trans. | Auto. Trans. |
|---|---|---|
| All | 750 | 700 |

*NOTE – If limiter caps are removed during either procedure, new (blue) caps must be installed. Install new caps over idle mixture screws with ear positioned against full rich stop.*

### "IR" INFARED ANALYZER PROCEDURE

With engine at normal operating temperature, Auto. Trans. in "D", Man. Trans. in "N", insert probe of analyzer into tailpipe. *NOTE – If equipped with dual exhaust, insert probe into side opposite heat valve. Exhaust system must be free of leaks to obtain accurate reading.* Adjust idle RPM by turning hex screw

## TUNE-UP (Cont.)

on throttle stop solenoid to obtain specified RPM. To set idle mixture, observe CO level. If less than specified, turn mixuture screw counterclockwise 1/16 turn at a time until specified reading is obtained. If greater than specified, turn screws clockwise until specified reading is obtained. Allow ten seconds for meter to stabilize after each adjustment. If idle speed changes more than 40 RPM during mixture adjustment, reset as previously outlined and repeat mixture adjustment.

**Specified CO Level**

| Application | CO% |
|---|---|
| All (W/A.I.R.) | 0.5-1.0 |
| All (W/O A.I.R.) | 1.0-1.5 |

### TACHOMETER PROCEDURE

With engine at normal operating temperature, Auto. Trans. in "D", Man. Trans. in "N", and limiter caps removed, adjust idle RPM to 30 RPM above specified by turning hex screw on throttle stop solenoid. To adjust idle mixture, turn mixture screw from full rich stop clockwise until a loss of engine RPM is noted, then turn mixture screws counterclockwise until highest RPM reading is obtained at "lean best idle" setting. *NOTE — If idle speed changes more than 40 RPM during mixture adjustment, reset idle as previously outlined and repeat mixture adjustment.* As a final adjustment, turn mimixture screws clockwise until specified RPM drop is obtained.

**Specified RPM Drop**

| Application | RPM Drop |
|---|---|
| All | 40 |

### COLD (FAST) IDLE RPM

With engine at normal operating temperature, set fast idle screw on second step (2 Bbl.) or middle step (4 Bbl.) and against shoulder of next highest step of fast idle cam. Turn fast idle screw to obtain specified fast idle RPM.

| Application | Fast Idle RPM |
|---|---|
| All | 1600 |

### AUTOMATIC CHOKE SETTING

To adjust automatic choke, loosen cover screws and rotate cover in desired directions, as indicated on cover, to specified setting.

| Application | Setting |
|---|---|
| All (Except Carb. No. 4RA2) | 2 Notches Rich |
| All (W/Carb. No. 4RA2) | 1 Notch Rich |

### FUEL PUMP PRESSURE & VOLUME

| | |
|---|---|
| Pressure | ①5-6.5 psi |
| Volume | ①1 qt. in 1 minute |

① — Measured at 500 RPM.

### EMISSION CONTROL

*See appropriate article in EMISSION CONTROL Section.*

## IGNITION

### DISTRIBUTOR

| Application | Delco-Remy No. |
|---|---|
| 304" (All) | 1112179 |
| 360" (2 Bbl.) | |
| Man. Trans. | 1112112 |
| Auto. Trans. | 1112215 |
| 360" (4 Bbl.) | 1112215 |
| 401" (All) | 1112215 |

**Other Data & Specifications** — *See Tune-Up & Delco Distributors in ELECTRICAL Section.*

### IGNITION COIL

| | |
|---|---|
| Delco | 1115266 |
| American Motors | 201632 |

| Resistance | Ohms @ 75°F |
|---|---|
| Primary | |
| Delco | 1.77-2.05 |
| American Motors | 1.64-1.80 |
| Secondary | |
| Delco | 3,000-20,000 |
| American Motors | 9,300-11,800 |
| Ballast Resistor (Loom) | 1.30-1.40 |

## CARBURETION

### CARBURETORS

**Ford Model 2100 2-Bbl.**

| Application | Ford Part No. Man. Trans. | Auto. Trans. |
|---|---|---|
| 304" (Calif.) | 4DMJ2 | N/A |
| 304" (Federal) | 4DM2 | N/A |
| 360" (J-20) | 4RHD2 | 4RHD2 |
| 360" (All except J-20) | 4DM2 | 4RA2 |

**Ford Model 4300 4 Bbl.**

| Application | Ford Part No. Man. Trans. | Auto. Trans. |
|---|---|---|
| 360" | N/A | 4TA4 |
| 401" (J-20) | 4THD4 | 4THD4 |
| 401" (All except J-20) | N/A | 4TA4 |

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

### ACCELERATOR AND DOWNSHIFT LINKAGE ADJUSTMENT

**Accelerator Linkage** — Accelerator linkage is cable type and no adjustment is required.

**Downshift Switch Adjustment** — With accelerator throttle lever held in wide open position, adjust switch so that plunger is fully depressed.

# ELECTRICAL

## BATTERY

12 Volt – Negative Ground.

| Application | Amp. Hr. Rating |
|---|---|
| Standard | 50 |
| Optional | 60 |
| Optional | 70 |

## STARTER

| Application | Ford No. |
|---|---|
| All | DOFF-11001-B |

**Other Data & Specifications** – *See Ford Starters in ELECTRICAL Section.*

## ALTERNATOR

| Application | Amps. | Motorola No. |
|---|---|---|
| Standard | 37 | 8AL2015K |
| Optional | 51 | 8AL2016K |

**Other Data & Specifications** – *See Motorola Alternators in ELECTRICAL Section.*

## ALTERNATOR REGULATOR

| Application | Motorola No. |
|---|---|
| All | 8RH2003 |

**Other Data & Specifications** – *See Motorola Alternator Regulators in ELECTRICAL Section.*

# ENGINE

### INTAKE MANIFOLD TIGHTENING

Tighten intake manifold bolts evenly to 37-47 ft. lbs.

## BELT ADJUSTMENT

**Tension (Lbs.) Using Strand Tension Gauge**

| Application | New Belt | Used Belt |
|---|---|---|
| All | 125-155 | 90-115 |

## FILTERS & CLEANERS

| Filter or Cleaner | Service Interval (Miles) |
|---|---|
| Oil Filter | Replace 5,000 |
| Air Filter | ①Clean 5,000 |
| Fuel Filter | Replace 15,000 |
| Auto. Trans. Filter | Replace 25,000 |
| PCV Valve | Replace 15,000 |
| Oil Filler Cap | Clean 15,000 |

① – Replace 15,000 miles.

## CAPACITIES

| Application | Quantity |
|---|---|
| Cooling System (Includes Heater) | |
| 304" | 13 qts. |
| 360", 401" | 14 qts. |
| Crankcase (Includes Filter) | 5 qts. |
| Man. Trans. | |
| 3-Speed | 2.75 pts. |
| 4-Speed | 6.5 pts. |
| Auto. Trans. | |
| Oil Change | 10 pts. |
| Overhaul | 22 pts. |
| Transfer Case | |
| Model 20 | 3.25 pts. |
| Quadra-Trac | 3.5 pts. |
| Quadra-Trac (W/Reduction Unit) | 4.5 pts. |
| Differential | Fill to bottom of filler plug hole. |
| Fuel Tank | |
| CJ Series | 15.5 gals. |
| Cherokee & Wagoneer | 22.0 gals. |
| Truck | 19.0 gals. |