TUNE-UP

ENGINE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER CODE

Engine can be identified by fifth digit of Vehicle Identification Number, located on a plate attached to left corner of instrument panel and visible through windshield.

Engine Codes

Application	Code
2300 cc (2.3L) 2-Bbl.	
Standard	A
Turbo	A

TUNE-UP NOTES

NOTE — *Due to running changes in production and emission standards, manufacturer recommends that specifications shown on engine compartment Emission Control Tune-Up Decal be used in all instances.*

NOTE — *If the Dura Spark 2-piece distributor cap must be removed, first remove top portion, then rotor, then bottom portion. If any spark plug wire is disconnected with this system, connection must first be greased with silicone grease before it is attached.*

NOTE — *When connecting a tachometer to Dura Spark ignition coil, install the alligator clip on tachometer into the "DEC" (TACH TESTING) cavity.*

CAUTION — *On vehicles equipped with catalytic converters, do not allow or create a condition of engine misfire in more than one cylinder for more than 30 seconds. Damage to converter may result due to loading of converter with unburned air/fuel mixture.*

ENGINE COMPRESSION

Compression Ratio	9.0:1
Recommended Fuel	Unleaded (87 AKI Minimum)

Test compression with all spark plugs removed and engine warm. Crank engine through at least five compression strokes before recording pressure. Maximum compression variation between highest and lowest cylinder must not exceed 25 %.

VALVE TAPPET CLEARANCE

Application	Clearance
Hydraulic Lifters	Zero Lash

VALVE ARRANGEMENT

E-I-E-I-E-I-E-I (front to rear).

SPARK PLUGS

Gap	.032-.036"
Torque	10-15 ft. lbs.

Spark Plug Type

Application	Autolite No.
2300 cc	
Standard	AWSF-42
Turbo	AWSF-32

HIGH TENSION WIRE RESISTANCE

1) Using suitable tool (T74P-6666-A), loosen wires from spark plugs by twisting spark plug boot carefully to loosen its seal on spark plug. Turn ignition switch off and remove distributor cap.

NOTE — *DO NOT remove wires from distributor cap except for replacement.*

2) Using an ohmmeter, check resistance of each wire by connecting one lead to spark plug terminal and other lead to distributor cap insert. If resistance exceeds 5000 ohms per inch, remove wire from cap and check resistance again. If still in excess of 5000 ohms per inch, replace wire.

NOTE — *Whenever a high tension wire is disconnected, the interior of the spark plug terminal boot must be coated with dielectric silicone grease before reconnection.*

DISTRIBUTOR

All models are equipped with Dura Spark II ignition systems and no adjustments are necessary.

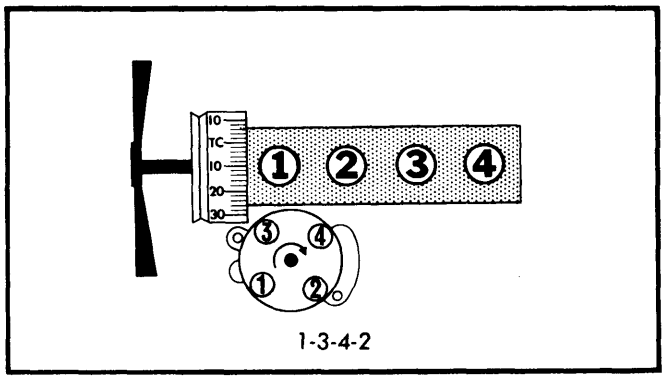

Fig. 1 2300 cc Firing Order and Timing Marks

IGNITION TIMING

NOTE — *Timing instrument should be connected to number one spark plug wire using a suitable adapter or snap-on connector. Do not puncture spark plug wire or boot to make connection.*

1) Clean front damper surface and make white mark on proper degree line of damper and pointer. Turn A/C off and de-energize throttle solenoid positioner (if equipped). Disconnect and plug vacuum lines from distributor.

2) If equipped with dual mode timing ignition module, disconnect the 3-pin switch assembly from ignition module.

TUNE-UP (Cont.)

3) On all models, connect timing light to No. 1 spark plug and a tachometer to engine.

NOTE – *Magnetic probe timing device may be used if instrument is available and engine is so equipped. Timing probe offset is 52½° ATDC on 2300 cc engine.*

NOTE – *On Dura Spark II ignition systems, use only a clamp-on type inductive pickup timing light and tachometer rated for this system.*

4) With engine at normal operating temperature, adjust ignition timing idle speed to specification. Check initial timing. If within ±2° of specification, do not adjust.

5) If more than ±2°, loosen distributor hold down bolt. Adjust ignition timing to specifications by rotating distributor to align marks on damper and pointer. Tighten hold down bolt and recheck timing.

6) For vehicles with dual mode ignition timing module, reconnect the 3-pin switch assembly connector to module and check its function as follows: Disconnect and plug vacuum line to switch. Using a vacuum pump, apply a minimum of 12 in. Hg vacuum to switch, timing should be to specifications. Apply zero vacuum to switch, timing should be 3-6° less than specifications. If not, replace unit.

Ignition Timing Specifications (Degrees BTDC@RPM)

Application	Man. Trans.	Auto. Trans.
2300 cc		
Federal	6@550	①6@600
Calif.	6@650	12@600
Turbo		
Federal	6@550	10@600
Calif.	2@600	10@600

① – Calibration No.'s 0-21A-R0, 0-21B-R0, 0-21B-R10; Timing is 17@650. Calibration No. 9-21B-R1U; Timing is 20@600.

HOT (SLOW) IDLE RPM

VEHICLE PREPARATION

NOTE – *In the event, specified engine idle speed cannot be achieved by normal adjustment on vehicles equipped with speed control, disconnect accelerator cable at carburetor throttle lever. If specified engine idle speed can be achieved with cable disconnected, check speed control installation prior to reinstalling accelerator cable.*

1) Loosen and relocate air cleaner. Disconnect and plug all hoses to air cleaner. Remove and plug vacuum hose(s) at thermactor dump valve (if equipped). For single vacuum line dump valves, apply manifold vacuum to dump valve.

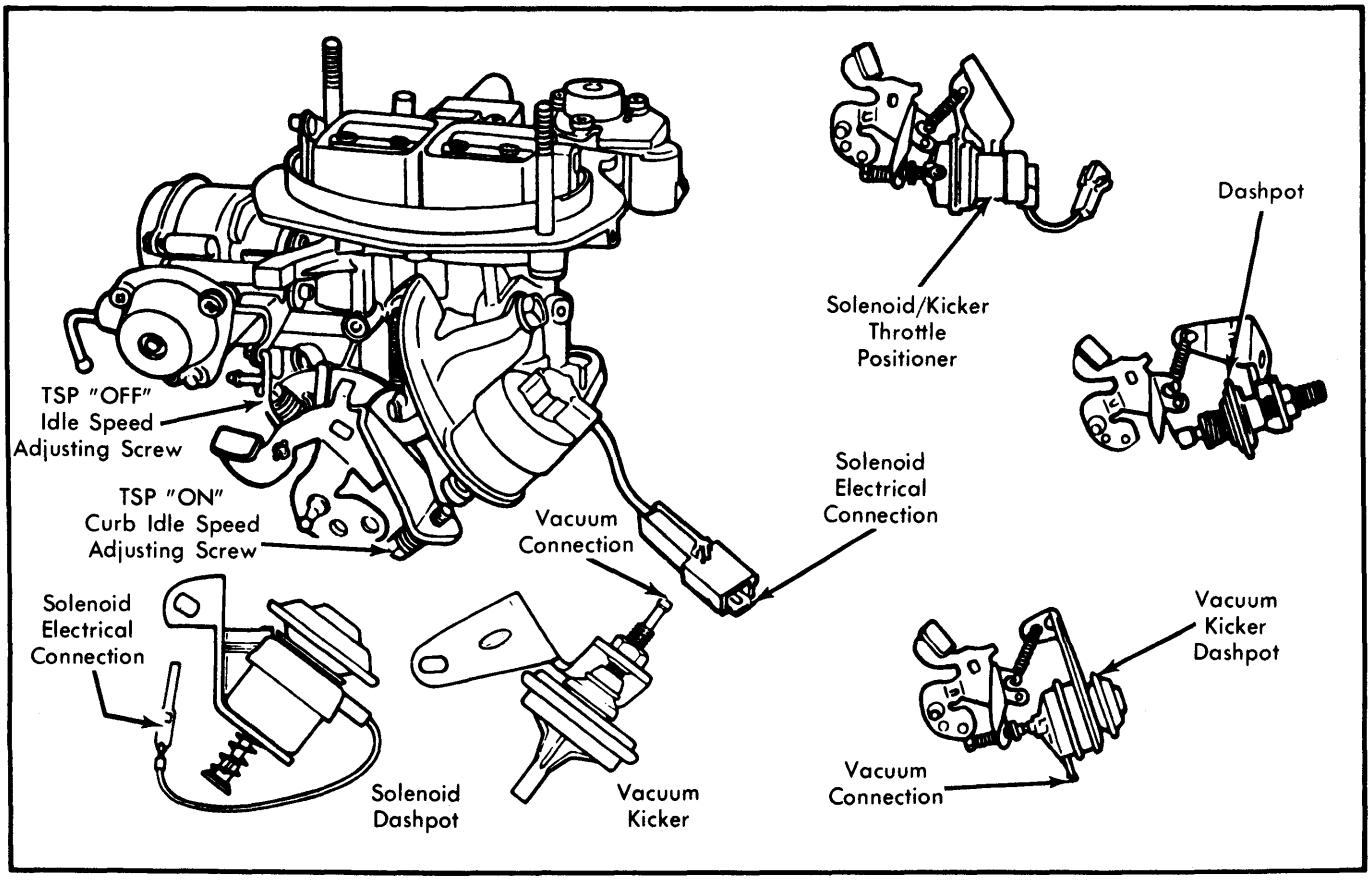

Fig. 2 Throttling Devices for Ford Carburetors (5200 Carburetor with TSP Shown)

TUNE-UP (Cont.)

2) Replace spark delay valve in distributor line(s) with in-line connector(s). Remove and plug spark port vacuum hose from appropriate vacuum switch (3-way catalyst vehicles only).

3) Turn off all lights and accessories. Place heater control in "OFF" position. Bring engine to normal operating temperature and check free movement of throttle linkage. Attach tachometer to engine.

NOTE – *If equipped with Dura Spark II ignition system, use a tachometer rated for this system.*

CURB IDLE SPEED

NOTE – *These instructions also include speed tests for A/C "ON", A/C "OFF" and Throttle Solenoid Positioner "OFF" (TSP "OFF").*

1) Curb idle speed is controlled by various throttling devices, including throttle solenoid positioner, solenoid/kicker and solenoid/dashpot. Check throttle lever pad adjusting screw for proper adjustment and operation and correct any interference found.

2) If curb idle speed is controlled by other throttling devices, adjust throttle stop adjusting screw and check for adjustment, proper operation, and possible interferences.

3) Run engine at 2500 RPM for 15 seconds in "NEUTRAL". Then place throttle in normal idle position and check engine speed in "NEUTRAL" for manual transmission vehicles or "DRIVE" for automatic transmission vehicles.

NOTE – *Air cleaner must be installed when making speed checks.*

4) Measure average speed after engine has stabilized. Repeat step **3)** and measure curb idle speed three times to determine average speed. If not within specifications, adjust either throttle lever pad adjusting screw or throttle stop screw according to steps **1)** and **2)**.

Curb Idle Speed RPM

Application	Man. Trans.	Auto. Trans.
2300 cc		
All Models	850	750

TSP "OFF"

1) For vehicles with throttle solenoid positioner, solenoid/kicker or solenoid/dashpot, TSP "OFF" speed is controlled by throttle stop adjusting screw. Check that throttle control device is adjusted and operating properly without binding.

NOTE – *Air cleaner must be installed for speed check.*

2) Run engine at 2500 RPM for 15 seconds in "NEUTRAL." Then place shift lever in "NEUTRAL" for manual transmission or "DRIVE" for automatic transmission vehicles.

3) Manually collapse the solenoid. Measure average speed after engine has stabilized. Repeat 2500 RPM "cleanout" and check engine speed three times to determine average. If not within specifications, adjust throttle stop adjusting screw and repeat procedure until speed is correct.

Throttle Solenoid Positioner

Application	"OFF" RPM
2300 cc	625

A/C "ON"

1) For vehicles with kicker, speed is controlled by kicker position. For vehicles with kicker/dashpot or solenoid/kicker, there is no adjustment as the throttle lever pad adjusting screw controls other functions.

2) Check kicker, kicker/dashpot or solenoid/kicker for proper adjustment, operation and freedom from interference. Run engine at 2500 RPM for 15 seconds in "NEUTRAL." Then, place transmission shift lever in "NEUTRAL" for manual transmission vehicles or "DRIVE" for automatic transmission vehicles.

3) Air cleaner must be installed on carburetor, A/C should be "ON" (kicker extended) and A/C compressor clutch wire should be disconnected.

4) Measure average speed after engine has stabilized. Repeat 2500 RPM "cleanout" and let engine stabilize. Measure engine speed three times to determine average. If not within specifications, adjust kicker position and repeat test until speed is correct.

DASHPOT DEVICES

For vehicles with dashpot devices, adjust clearance after speed tests are completed. To adjust dashpot, adjust dashpot position. To adjust kicker/dashpot, adjust throttle lever pad adjusting screw. For solenoid/dashpots, there is no adjustment as throttle lever pad adjusting screw controls curb idle.

VEHICLE SERVICE AFTER ENGINE SPEED TESTS

Reinstall all hoses, wires, and components to their original positions and torque air cleaner nuts to specification. Engines equipped with a thermactor extended idle dump system will experience a 50-100 RPM drop in engine idle speed when vacuum lines are purged by running engine at 2500 RPM for 15 seconds in either "NEUTRAL" or "DRIVE" position.

IDLE MIXTURE

NOTE – *If adjustments to the air/fuel mixture are made that require removing the idle limiter caps, it is imperative that the BLUE SERVICE LIMITER CAPS be installed. Idle mixture should be adjusted only during carburetor repair or when necessary as a result of government inspection laws.*

PROPANE ENRICHMENT PROCEDURE

NOTE – *For specifications for Propane Enrichment, see Emission Control Tune-Up Decal.*

1) Leave all vacuum signal hoses attached to air cleaner assembly when relocating air cleaner for carburetor adjustments. Air cleaner must be installed for engine speed checks.

TUNE-UP (Cont.)

CAUTION — *Do not let engine idle for extended periods, as catalyst overheating may cause excessive underbody temperatures.*

2) Apply parking brake and block wheels. Disconnect automatic brake release and plug vacuum connection. Connect tachometer (20362 or equivalent). Remove and plug vacuum line to distributor. Check to see correct PCV valve is being used (low or high flow).

3) Check air cleaner element and replace if necessary. Disconnect and plug fuel evaporative purge return hose at engine. Disconnect fuel evaporative purge hose at air cleaner and plug nipple.

4) Disconnect flexible fresh air tube from air cleaner duct or adapter. Insert hose from propane enrichment tool (Rotunda T75L-9600-A) into duct or fresh air tube.

5) For vehicles equipped with thermactor, disconnect and plug hoses of dump valves equipped with two fittings. If dump valves have one fitting, remove and plug hose at valve. Connect slave hose to dump valve and intake manifold vacuum fittings.

6) Be sure idle mixture limiter(s) is set to maximum rich position (counterclockwise against stop). Check curb idle speed or A/C "OFF" RPM and set to specifications. With shift lever in "NEUTRAL", run engine at 2500 RPM for 15 seconds before each mixture check.

NOTE — *On vehicles equipped with turbocharger, jump wire electric fan to prevent overheating while testing.*

7) With engine idling at normal operating temperature, place transmission shift lever in "NEUTRAL" for manual transmission or "DRIVE" for vehicles with automatic transmissions. Gradually open propane tool valve and watch for engine speed gain on tachometer. When speed reaches maximum and begins to drop off, note amount of speed gain.

NOTE — *If engine speed will not drop off, check bottle gas supply. Repeat if necessary with new bottle.*

8) Compare measured speed gain to specifications on vehicle decal. If idle mixture adjustment is necessary, adjust to "Reset RPM". If speed increase is within "RPM Gain" specification, proceed to step **15)**.

9) If measured speed gain is zero RPM and minimum speed gain specification is zero RPM, proceed to step **12)**.

10) If measured speed gain is GREATER than specification, turn mixture screw(s)/limiter(s) counterclockwise in equal amounts and repeat steps **6)** through **8)** until measured speed rise meets "Reset RPM" specification. After final adjustment, proceed to step **15)**.

11) If measured speed gain is LESS than specifications, turn mixture screw(s)/limiter(s) clockwise in equal amounts and repeat steps **6)** through **8)** until speed rise meets "Reset RPM" specifications. After final adjustment, proceed to step **15)**.

12) If there is ZERO increase in RPM and the minimum speed gain specification is zero RPM, perform the following speed drop test. While watching tachometer, adjust mixture screw(s)/limiter(s) clockwise by number of turns specified on decal. Note drop in engine speed.

13) If measured speed drop is EQUAL TO or drops off MORE THAN speed drop specification, return mixture limiter(s) to maximum rich position or mixture screw(s) to position prior to adjustment. Then proceed to step **15)**.

14) If measured speed drop is LESS THAN the specified minimum, leave mixture limiter(s) in adjusted position and repeat steps **6)** through **13)**.

15) Check curb idle speed and remove all test equipment. Reconnect all components and reinstall air cleaner, if removed.

Propane Enriched Idle Speed RPM

Application	Man. Trans.	Auto. Trans.
2300 cc		
All Models	880	770

COLD (FAST) IDLE RPM

NOTE — *Before making cold (fast) idle RPM adjustment, prepare vehicle as outlined under HOT (SLOW) IDLE RPM, Vehicle Preparation.*

1) Check fast idle screw for proper adjustment, operation and possible interference.

2) Run engine at 2500 RPM for 15 seconds in "NEUTRAL." Then place shift lever in "NEUTRAL" for manual transmission vehicles or "DRIVE" for those with automatic transmissions. Position fast idle lever on 2nd highest step of fast idle cam.

3) Measure average speed when engine has stabilized. Repeat step **2)** measuring speed three times to determine average speed. If speed is not within specifications, adjust fast idle screw and repeat procedure until speed is correct.

Fast Idle Speed

Application	RPM
2300 cc	
Federal	
Man. Trans.	1800
Auto. Trans.	2000
Calif.	2000

AUTOMATIC CHOKE

Loosen choke cover retaining screws. Rotate choke cover until mark on cover aligns with specified setting on choke housing. Tighten choke cover retaining screws.

TUNE-UP (Cont.)

Automatic Choke Setting

Application	Man. Trans.	Auto. Trans.
2300 cc		
Federal	2NR	1NR
Calif.	IN.	IN.
Turbo	2NR	.....

NOTE – *Some California models are not adjustable due to a tamperproof choke cover and assembly that has no index marks.*

FUEL PUMP

Make all tests with engine at normal operating temperature and at idle speed with transmission in neutral. When making pressure test pinch off pump-to-tank fuel return line.

Pressure ..... 5.0-7.0 psi
Volume (Minimum) ..... **One pint in 25 seconds.**

EXHAUST EMISSION SYSTEMS

See EXHAUST EMISSION SYSTEMS section.

GENERAL SERVICING

IGNITION

DISTRIBUTOR

All models are equipped with Motorcraft Dura Spark II ignition system.

IGNITION COIL

Application	Specification
Coil Primary (@75°F)	1.13-1.23 ohms
Coil Secondary (@75°F)	7,700-9,300 ohms
Ballast Resistor (@75°F)	1.05-1.15 ohms
Coil Output (@75°F)	28 KV Min.

CARBURETION

CARBURETORS

Application	Model
2300 cc	
Federal	Holley-Weber 5200
Calif.	Holley-Weber 6500
Turbo	Holley-Weber 5200

Other Data & Specifications – *See Tune-Up and Holley Carburetors in FUEL SYSTEMS Section.*

ELECTRICAL

BATTERY

12 Volt – Negative Ground.

Application	Standard Amps	Optional Amps
All Models	36, 45	54, 77

STARTER

Motorcraft positive engagement type.

Application	Cranking RPM	Cranking Amps
4" Armature	180-250	150-250
4½" Armature	150-290	150-210

ALTERNATOR

Motorcraft external regulator alternator.

Color Code	Rated Amp. Output
Rear Terminal	
Orange	40
Green	60
Black	65
Side Terminal	
Black	70
Red	100

ALTERNATOR REGULATOR

Motorcraft Solid State Electronic Regulator, calibrated and preset by manufacturer. No adjustment is required or possible on this unit.

GENERAL SERVICING (Cont.)

ENGINE

INTAKE MANIFOLD TIGHTENING

2300 cc – Check manifold bolts for 14-21 ft. lbs. torque.

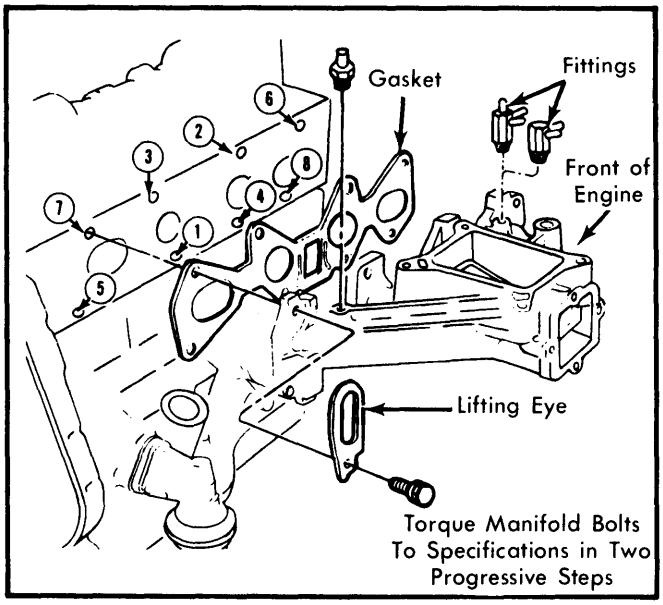

Fig. 3 Intake Manifold Tightening Sequence

BELT ADJUSTMENTS

Tension (Lbs.) With Strand Tension Gauge

Application	New Belt	①Used Belt
All Belts (Exc. 1/4")	120-160	75-120
1/4" Belts	50-80	40-60

① – Any belt operated for 10 minutes or longer.

CAPACITIES (COOLING)

Application	Standard Qts.	Optional Qts.
2300 cc	8.6	9.0
Turbo	9.2	9.2

FILTERS & CLEANERS

NOTE – *Refer to decal on vehicle for maintenance schedule code.*

Filter or Cleaner	Replacement Interval (Miles) Per Maintenance Schedule "A"	"B"
Oil Filter	10,000	10,000
Oil Filter (Turbo)	3,000	3,000
Air Cleaner	30,000	30,000
Crankcase Vent Filter	50,000	50,000
PCV Valve	20,000	30,000
Fuel Filter	①	①

① – Replace only once, at 10,000 miles (A & B).

CAPACITIES (EXCEPT COOLING)

Application	Quantity
Crankcase	
Mustang & Capri	
Standard	①4.0 qts.
Turbocharged	①4.5 qts.
Fairmont, Zephyr, Pinto & Bobcat	②4.0 qts.
Auto. Trans. (Type F)③	
C3 Models (Bobcat & Pinto)	8.0 qts.
C4 Models (All Others)	7.25 qts.
Man. Trans. (Hypoid Gear Lube)	
Standard 4-Speed	2.8 pts.
Single Rail 4-Speed	3.5 pts.
Overdrive 4-Speed	4.5 pts.
Rear Axle (Hypoid Gear Lube)	
6 3/4" Ring Gear	2.5 pts.
7 1/2" Ring Gear	3.5 pts.
8" Ring Gear	4.0 pts.
Fuel Tank	
Pinto & Bobcat	④11.7 gals.
Mustang & Capri	⑤11.5 gals.
Fairmont & Zephyr	⑥14.0 gals.

① – Add 1/2 qt. with filter change.
② – Add 1 qt. with filter change.
③ – Approximate refill capacity. Use dipstick.
④ – Calif. Sedan with Auto. Trans., 13.0 gals., Sta. Wagon, 14.0 gals.
⑤ – With Turbo, 11.9 gals. With A/C 12.5 gals.
⑥ – With Turbo, 12.7 gals.