1975-79 TUNE-UP PROCEDURES
Ford Motor Co. 6-Cylinder Tune-Up

ENGINE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

Engine can be identified by 4th character of Vehicle Identification Number (VIN). Number is the first line of rating plate or vehicle certification label.

Cowl & Windshield Models - Rating Plate is located on right side of cowl top panel under hood.

"F" & "E" Models - Rating plate is located on rear face of left front door.

P350 Models - Rating plate is included in boxed items and is affixed by body manufacturer.

ENGINE IDENTIFICATION CODE

ENGINE CODE

Application	Code
300" 6-Cyl. 1-Bbl.	B
300" 6-Cyl. 1-Bbl. Heavy Duty	K

TUNE-UP NOTES

CAUTION: When performing tune-up on vehicles equipped with a catalytic converter, do not allow or create a condition of engine misfire in one or more cylinders for an extended period of time. Damage to converter from overheating may occur due to loading with unburned fuel.

NOTE: Due to production changes, always refer to Emission Control Tune-Up Decal before attempting tune-up. In the event of a conflict between specifications given in this manual and decal specifications, use the decal specifications.

NOTE: For tune-up, California models built before 1977 and Federal models built before 1978, "Light Duty" refers to vehicles 6000 lbs. GVW or less and "Heavy Duty" to vehicles 6001 lbs. or more. 1977 California and Federal models built after 1978, "Light Duty" refers to vehicles 8500 lbs. GVW or less and "Heavy Duty" to vehicles 8501 lbs. or more.

NOTE: In some applications within this article it will be necessary to refer to engine calibration number. To determine location of calibration number decal on engine, refer to Ford Motor Co. Vacuum Diagrams in EXHAUST EMISSION CONTROL section.

ENGINE COMPRESSION

Test compression with all spark plugs removed and engine at normal operating temperature. Crank engine through at least 5 compression strokes before recording reading. Maximum compression variation should not exceed 25% between highest and lowest cylinder.

ENGINE COMPRESSION SPECIFICATIONS

Application	Specification
Compression Ratio	
300" Light Duty	8.9:1
300" Heavy Duty	8.0:1
Recommended Fuel	[1] (87 AKI Minimum)

[1] - Leaded or unleaded. If equipped with a catalytic converter, unleaded fuel (87 AKI Minimum) must be used.

VALVE CLEARANCE

VALVE CLEARANCE SPECIFICATIONS

Application	Clearance
300"	[1] .100-.200"

[1] - Clearance allowable with tappet collapsed. Desired clearance is .125-175".

VALVE ARRANGEMENT

E-I-E-I-E-I-E-I-E-I-E-I (Front-to-Rear).

SPARK PLUGS

SPARK PLUG INSTALLATION

Application	Specification
Gap	
1975-76	.044"
1977-79	[1] .042-.046"
Torque	15-25 ft. lbs.

[1] - Gap is .052-.056" on 1977-78 Heavy Duty Calif. and Federal Calibration No. 7-77-R10 and 7-78-R10.

SPARK PLUG TYPE

Application	Autolite No.
1975-76	BTRF-42
1977-78	BSF-42
1979	BSF-42 or BRF-42

HIGH TENSION WIRE RESISTANCE

1) Loosen wires from spark plugs by twisting spark plug boot carefully to loosen seal on spark plug. Remove wires by pulling on plug boot. Remove distributor cap, leaving wires connected to cap.

NOTE: Do not disconnect wires from distributor cap unless replacement is necessary.

2) Using an ohmmeter, check resistance of each wire (including distributor cap). Replace any wire exceeding 5000 ohms resistance per inch.

NOTE: Whenever a high tension wire is disconnected, the interior of spark plug terminal boot must be coated with dielectric silicone grease before connection. Do not puncture wires.

DISTRIBUTOR

All 1975-76 models are equipped with Motorcraft Solid State Ignition systems. The 1977-79 models use Motorcraft Dura-Spark II Ignition systems. No adjustments are required.

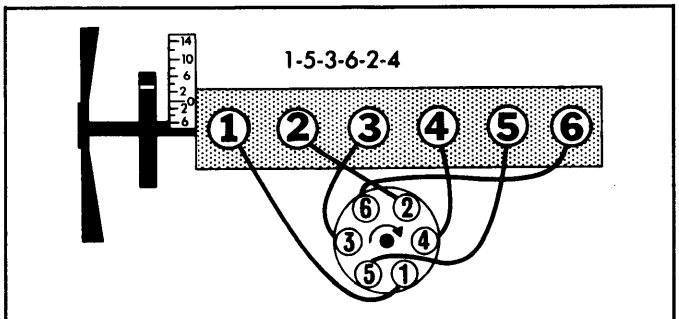

Fig. 1: 300" Firing Order & Timing Mark Identification

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IGNITION TIMING

NOTE: Connect timing light to number one spark plug. Do not puncture spark plug wire or boot to make connection.

1) Place mark on proper degree line of damper (or of pointer and damper notch). Disconnect vacuum lines at distributor and plug lines.
2) For vehicles with dual mode timing ignition module, disconnect the 3-pin switch assembly connector from the ignition module.

NOTE: Vehicles built in 1979 may be equipped with dual mode timing modules. They may be identified by having an ignition barometric pressure switch assembly (located near the ignition module) and include 3 connectors.

3) Connect a tachometer to engine. Start engine and warm to normal operating temperature. Place shift lever in "NEUTRAL". Set timing idle speed to specification and check ignition timing.
4) If not within ±2°, reset timing. Tighten hold down bolt and recheck timing.
5) If equipped with dual mode timing ignition module (1979 only), reconnect switch assembly connector and compare basic timing to elevation requirements.

DUAL MODE TIMING SPECIFICATIONS

Altitude	Timing Change
Below 2400 feet	Specification less 3-6°
2400-4300 feet	Specification or Specification less 3-6°
Over 4300 feet	Specification

NOTE: Check for presence of roll pin retaining reluctor to sleeve in distributor shaft. Verify Orange and Purple wires are not reversed between distributor pick-up coil and ignition module. This will cause timing to be 22 1/2 degrees off.

IGNITION TIMING SPECIFICATION (DEGREES BTDC@RPM)

Application	Man. Trans.	Auto. Trans.
1975-76 [1]		
1977		
Light Duty	6°@700	6°@550
Heavy Duty	10°@600	10°@700
1978		
Light Duty		
Calif.	6°@700	8°@550
Federal	6°@700	10°@550
Heavy Duty	10°@600	10°@700
1979		
Light Duty		
Calif.	6°@500	10°@500
Federal	6°@500	10°@500
Heavy Duty	12°@700	12°@700

[1] – See Emission Decal for specifications.

NOTE: Some 1975-76 models may develop detonation or pre-ignition. If the vehicle is equipped with a backpressure EGR valve, ensure the transducer is operating. To check this, partially plug the exhaust pipe. Starty and warm engine to operating temperature. Increase the engine speed to 2500 RPM and note EGR valve. If valve opens, system is okay. If not, ensure vacuum is available to EGR valve. If valve is okay, but does not affect idle, clean EGR passages.

NOTE: Some 1977 vehicles may detonate. Ensure no other causes of detonation are present. On Calibration numbers 7-52G-R0, 7-52H-R0, 7-51G-R0 and 7-51H-R0, the timing may be retarded 2 degrees (up to 6 degrees) from base igntion timing until knock goes away.

NOTE: An engine that idles smoothly, but runs rough at 1000-2000 RPM, may be caused by crossed Orange and Purple primary ignition wires in engine harness between distributor and module. To check, turn ignition key off, and rotate engine until initial timing marks align. Remove distributor cap. One spoke of armature should be opposite stator pole. If pole is between spokes or off to one side, wires are probably crossed.

HOT (SLOW) IDLE RPM

NOTE: Hot idle (slow) RPM procedures and specifications for 1975-76 vehicles are located on the Emission Decal. Specifications are not available from the manufacturer.

NOTE: Some 1977 F100 vehicles and Calibration numbers 7-51G-R0 and 7-52G-R0 may exhibit poor driveability at part throttle. To correct this, replace the EGR transducer carburetor spacer with a revised one (D7TZ-9ZF452-G.

1975-76 MODELS

1) Place transmission selector lever in "NEUTRAL" (Man. Trans.) or "PARK" (Auto. Trans.). Warm engine to normal operating temperature. Stop engine and remove air cleaner assembly, plugging vacuum hoses. Check throttle and choke linkage for binding.
2) Connect tachometer. Ensure solenoid is energized. Turn solenoid mounting screw to set higher idle speed specified on Emission Decal Label. Run engine at 2500 RPM for 15 seconds in "NEUTRAL" (Man. Trans.) or "PARK" (Auto. Trans.). Let engine speed stabilize.
3) Disconnect wire to idle solenoid. Compare speed to lower idle speed specification and adjust throttle screw if necessary. Reconnect all disconnected wires and vacuum hoses.

NOTE: If specified idle speed cannot be achieved by normal adjustments on vehicles with speed control, disconnect accelerator cable at carburetor throttle lever. If idle speed can then be achieved, check speed control installation.

1977-79 LIGHT DUTY MODELS

Preliminary Adjustment - 1) Apply parking brake and block wheels. Turn off all accessories. Remove air cleaner assembly and plug vacuum lines to air cleaner.
2) Revise dump valve lines for dump valves with one or 2 vacuum lines at the side by disconnecting and plugging line(s). For dump valves with one line at top only, remove line at dump valve and plug it, if not connected to intake manifold. Then, connect a slave line from dump valve fitting to intake manifold fitting. Check throttle and choke linkage for free movement. Connect a tachometer.

Curb Idle Speed - 1) Run engine at 2500 RPM for 15 seconds in "NEUTRAL" or "PARK", and allow engine to return to curb idle. Place transmission selector lever in "DRIVE" (Auto. Trans.) or "NEUTRAL" (Man. Trans.).
2) Allow engine to stabilize at curb idle speed. Measure and adjust if not within ±50 RPM of specification.
3) To set curb idle speed, adjust solenoid dashpot by loosening lock nut and rotating solenoid housing until desired speed is obtained. Repeat procedure until consistent curb idle is achieved. Tighten lock nut.

TSP "OFF" Speed - Collapse Throttle Solenoid Positioner (TSP) plunger by forcing throttle lever against plunger. Check TSP "OFF" speed and adjust if not within ±50 RPM of specification.

Final Adjustments - 1) Reconnect dump valve vacuum lines to original positions. Reinstall air cleaner assembly and reconnect vacuum lines.
2) Run engine at 2500 RPM for 15 seconds in "NEUTRAL" or "PARK", and recheck curb idle speed. Adjust if not within ±50 RPM.

1975-79 TUNE-UP PROCEDURES
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NOTE: Air cleaner must be installed when making final curb idle speed measurement. If a final curb idle speed adjustment is required, check bowl vent setting. See CARTER CARBURETORS in FUEL SYSTEMS section.

HOT (SLOW) IDLE RPM - LIGHT DUTY

Application	Curb Idle RPM	TSP "OFF" RPM
1977-78		
Auto. Trans.	550	.....
Man. Trans.	700	.....
1979		
Auto. Trans.	550	500
Man. Trans.	700	500

1977-79 HEAVY DUTY MODELS

Preliminary Adjustments - 1) Apply parking brake and block wheels. Turn off all accessories and disengage all power take-off units. Connect tachometer.

2) Place transmission selector lever in "NEUTRAL" (Man. Trans.) or "PARK" (Auto. Trans.). Run engine until normal operating temperature is reached. Stop engine and remove air cleaner assembly, plugging vacuum hoses. Check throttle and choke linkage for binding.

3) Disconnect system vacuum hose to decel throttle control diaphragm and plug hose. If equipped, disconnect fuel evaporation purge valve signal vacuum line at first point of removal other than valve.

NOTE: Do not remove vacuum line at purge valve or valve damage may result.

Curb Idle Speed - 1) If equipped with a TSP or solenoid-dashpot, check that solenoid is energized. Run engine at 2500 RPM for 15 seconds in "NEUTRAL" (Man. Trans.) or "PARK" (Auto. Trans.). Let engine speed stabilize.

2) Compare speed to specification and adjust if necessary. If equipped with TSP, loosen solenoid body lock nut and rotate solenoid body until curb idle speed is achieved. Tighten lock nut.

NOTE: If may be necessary to temporarily disconnect solenoid wire when rotating solenoid body to prevent twisting.

3) On carburetors without a solenoid device, turn throttle adjusting screw until curb idle speed meets specification.

4) Any time curb idle speed is adjusted, collapse dashpot stem and check clearance between collapsed stem and throttle lever pad. Adjust to specifications and repeat curb idle speed check.

TSP "OFF" Speed - Run engine at idle with transmission selector lever in "NEUTRAL" (Man. Trans.) or "PARK" (Auto. Trans.). Collapse TSP solenoid plunger by forcing the throttle lever pad against plunger. Measure speed and compare it to specifications. If not within specifications, adjust throttle adjusting screw.

HOT (SLOW) IDLE RPM - HEAVY DUTY

Application	Curb Idle	TSP "OFF"
1977-78		
Auto. Trans.	600	[1] 450
Man. Trans.	600	[1] 450
1979		
Auto. Trans.	550	500
Man. Trans.	700	500

[1] - Calif. only.

Decel Throttle Control Speed - 1) If engine is equipped with a separate decel throttle control diaphragm and TSP, check curb idle speed.

2) Connect a slave vacuum source from manifold fitting to the diaphragm. Place transmission selector lever in "NEUTRAL" (Man. Trans.) or "PARK" (Auto. Trans.). Run engine at 2500 RPM for 15 seconds. Allow engine speed to stabilize.

3) If engine speed is not within ±50 RPM of specification, adjust diaphragm shaft length by loosening lock nut on adjusting screw and rotating screw until specification is obtained. Tighten lock nut.

4) Disconnect slave vacuum hose from diaphgram and plug hose. Let engine return to curb idle speed. Repeat procedure until consistent specified speed checks are obtained.

5) Check dashpot clearance by collapsing stem and checking clearance between collapsed stem and throttle lever pad. Adjust if not to specification.

NOTE: To avoid damage to diaphragm, hold shaft with one ¼" open-end wrench, while adjusting screw with second wrench of same size.

DECEL THROTTLE CONTROL SYSTEM RPM

Application	Man. Trans.	Auto. Trans.
1977-79	1450±50	1450±50

Final Adjustments - Remove slave manifold vacuum hose and reconnect decel throttle control vacuum hose to diaphragm. Reinstall air cleaner assembly and attach all vacuum hoses to original locations. Recheck curb idle speed with air cleaner assembled. Stop engine after necessary adjustments are completed. Remove test equipment and tighten air cleaner wing nuts.

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.

EXHAUST GAS ANALYZER PROCEDURE

1975-79 Models Without Catalytic Converter - 1) Apply parking brake and block wheels. Connect tachometer. Disconnect and plug fuel evaporative purge valve return hose at engine.

2) Warm engine to normal operating temperature. Disconnect evaporative emission purge hose at air cleaner and plug nipple.

3) For vehicles equipped with thermactor, disconnect and plug hoses of dump valves equipped with 2 fittings. If valves have one fitting, remove and plug hose at valve. Connect slave hose to dump valve and intake manifold vacuum source.

4) On all vehicles, insert analyzer probe in tailpipe. If CO reading not to specification, adjust mixture screws. Reset idle speed and recheck CO. After adjustment, reconnect all disconnected hoses.

PROPANE ENRICHMENT PROCEDURE

NOTE: For specifications for Propane Enrichment Procedure, see Emission Control Tune-Up Decal. Specifications for 1975-78 are not available. If no decal for 1979 vehicles can be located, use specifications at end of instructions.

1975-79 Models With Catalytic Converter - 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.

2) Apply parking brake and block wheels. Connect tachometer.

3) Disconnect and plug fuel evaporative purge valve return hose at engine. Disconnect evaporative emission purge hose at air cleaner and plug nipple.

1975-79 TUNE-UP PROCEDURES
Ford Motor Co. 6-Cylinder Tune-Up (Cont.)

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 2 fittings. If valves have one fitting, remove and plug hose at valve. Connect slave hose to dump valve and intake manifold vacuum source.
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 specification. With shift lever in "NEUTRAL" or "PARK", run engine at 2500 RPM for 15 seconds before each mixture check.
7) With engine idling at normal operating temperature, place transmission shift lever in "NEUTRAL" (Man. Trans.) or "DRIVE" (Auto. Trans.). 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. If necessary, repeat test with new bottle.

8) Compare measured speed gain to specifications. 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" specifications. After final adjustment, proceed to step **15)**.
11) If measured speed gain is LESS than specification, 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 previously removed.

NOTE: Idle mixture RPM gain and reset RPM specifications for 1975-78 vehicles are found on the Emission Decal Label.

1979 IDLE MIXTURE SPECIFICATIONS

Engine & Calibration Number [1]	RPM Gain/Reset RPM	Zero Gain Turns/RPM Drop
300" Engine		
Light Duty		
9-51M-R0	20-150/100-130	N/R
9-51S-R0	60-170/100-120	N/R
9-51T-R0	80-180/110-130	N/R
9-52G-R0	20-100/50-100	N/R
All Others	20-150/50-80	N/R
Heavy Duty	N/R	N/R

[1] - Calibration No. is located on an identification label on front of valve cover. On some engines, label may be on same component as Emission Control Tune-Up Decal under hood.

COLD (FAST) IDLE RPM

LIGHT DUTY

Follow appropriate preliminary adjustment instructions under HOT (SLOW) IDLE RPM heading then proceed as follows:

Fast Idle Adjustment - 1) Remove spark delay from distributor vacuum advance line and route vacuum line directly to advance side of distributor.
2) Trace EGR signal vacuum line from EGR valve to carburetor. If EGR/PVS or temperature vacuum switch is located in vacuum routing, disconnect EGR line at EGR valve and plug line. If none is found, do not detach EGR vacuum line.
3) Disconnect fuel evaporative purge valve signal vacuum line. Trace and disconnect purge valve vacuum line from valve on canister at first point where line can be detached. Cap the open port and plug line.

CAUTION: Do not remove vacuum line at purge valve or valve may be damaged.

4) With engine at normal operating temperature, choke plate fully opened, and transmission in "NEUTRAL" (Man. Trans.) or "PARK" (Auto. Trans.), place fast idle lever on 2nd highest step of fast idle cam. Check fast idle RPM.
5) Run engine at approximately 2500 RPM for 15 seconds and recheck fast idle speed after engine stabilizes. Repeat until stable fast idle RPM is achieved. Readjust if not within ±100 RPM.
6) Reconnect vacuum lines and spark delay valve.

FAST IDLE SPEED RPM - LIGHT DUTY

Application	RPM	Cam Step
All Models	1600	Second Highest

HEAVY DUTY MODELS

Follow appropriate preliminary adjustment instructions under HOT (SLOW) IDLE RPM heading then proceed as follows:

Fast Idle Adjustment - 1) Disconnect and plug EGR vacuum hose at EGR valve. With engine at normal operating temperature and choke fully open, run engine at 2500 RPM for 15 seconds in "NEUTRAL" (Man. Trans.) or "PARK" (Auto. Trans.). Let engine speed stabilize.
2) If equipped with automatic choke, depress throttle lever and manually rotate fast idle cam until fast idle screw rests on Second highest step of cam. Compare fast idle speed to specification and adjust as necessary. Repeat procedure until speed consistently matches specification.

FAST IDLE SPEED RPM - HEAVY DUTY

Application	RPM	Cam Step
1975-76	[1]	[1]
1977-78	1500	Second Highest
1979	[2] 1600	Second Highest

[1] - See Emission Decal Label.
[2] - Calibration No. 9-77M-R0 has fast idle speed of 2550 on high step of fast idle cam.

AUTOMATIC CHOKE ADJUSTMENT

Loosen choke cover screws and turn choke cover in direction indicated on cover to specified setting.

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AUTOMATIC CHOKE SPECIFICATIONS

Application	Setting
1975	
F100	Index
All Others	1-Rich
1976	Index
1977-78	
Light Duty	Index
Heavy Duty	1-Rich
1979 [1]	Index

[1] – Calibration No. 9-77M-R0 Calif. Man. Trans. has manual choke.

FUEL PUMP

Check fuel pump at idle RPM with engine in normal operating temperature and transmission in neutral.

Pressure	5.0-7.0 psi
Volume	One Pint in 20 seconds

MANIFOLD HEAT CONTROL VALVE

Check valve for freedom of movement and lubricate with a solvent.

IGNITION SYSTEMS

DISTRIBUTOR

All 1975-76 models are equipped with Motorcraft Solid State Ignition systems. The 1977-79 models use Motorcraft Dura-Spark II Ignition systems.

Other Data & Specifications – See Motorcraft Solid State Ignition system or Motorcraft Dura-Spark II Ignition system article in DISTRIBUTORS & IGNITION SYSTEMS section.

IGNITION COIL

IGNITION COIL SPECIFICATIONS

Application	Specification
Resistance	
Primary	
1975-78	1.0-2.0 Ohms
1979	1.13-1.23 Ohms
Secondary	
1975-78	7000-13,000 Ohms
1979	7700-9300 Ohms
Primary Ballast Resistor	1.05-1.15 Ohms
Coil Reserve Voltage (Minimum)	28,000 Volts

FUEL SYSTEM

CARBURETORS

Application	Carb. Model
1975-78	Carter YF 1-Bbl.
1979	Carter YFA 1-Bbl.

Other Data & Specifications – See Carter Carburetors in FUEL SYSTEMS section.