TUNE-UP

ENGINE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER CODE

Engine can be identified by the 8th digit of the Vehicle Identification Number. This number is stamped on a plate located on top left corner of instrument panel.

VIN Engine Codes

Application	Code
4.2L (255") 2-Bbl.	D
5.0L (302") 2-Bbl.	F
5.0L (302") EFI	F
5.8L (351") 2-Bbl.	G

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, and then bottom portion. If any spark plug wire is disconnected with this system, the connection must first be greased with silicone grease before reconnection.*

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

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 converter with unburned air/fuel mixture.*

ENGINE COMPRESSION

Compression Ratio	
4.2L	8.2:1
5.0L	8.4:1
5.8L	8.3:1

Recommended Fuel ..... **Unleaded (87 AKI Minimum)**

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

VALVE CLEARANCE

Hydraulic Lifters ..... Zero Lash

VALVE ARRANGEMENT

All Models
E-I-E-I-E-I-E-I (Left bank, front to rear).
I-E-I-E-I-E-I-E (Right bank, front to rear).

SPARK PLUGS

Application	Gap (In.)	Torque (Ft. Lbs.)
All Models	.048-.052	10-15

Spark Plug Type

Application	Autolite No.
4.2L & 5.0L	ASF-52
5.8L	ASF-42

HIGH TENSION WIRE RESISTANCE

1) Loosen wires from spark plugs by twisting spark plug boot carefully to loosen seal on plug. Remove wires by pulling on plug boot. Remove distributor cap from distributor, 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 by connecting one ohmmeter lead to spark plug terminal and other lead to distributor cap insert. If any wire has more than 5000 ohms resistance per inch, remove wire from cap and recheck. If resistance still exceeds 5000 ohms per inch, replace wire.

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

DISTRIBUTOR

Models not equipped with EEC III use Dura Spark II ignition systems. EEC III models use Dura Spark III. No adjustment is required on any model.

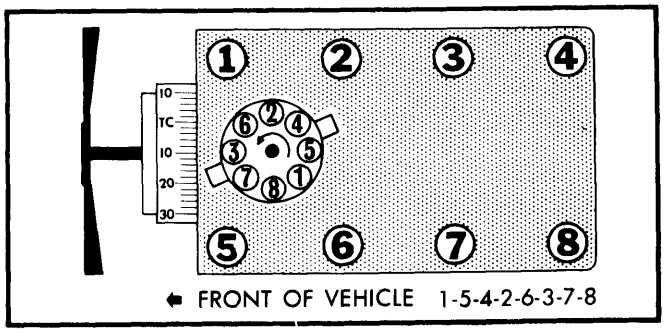

Fig. 1 4.2L & 5.0L Firing Order and Timing Marks

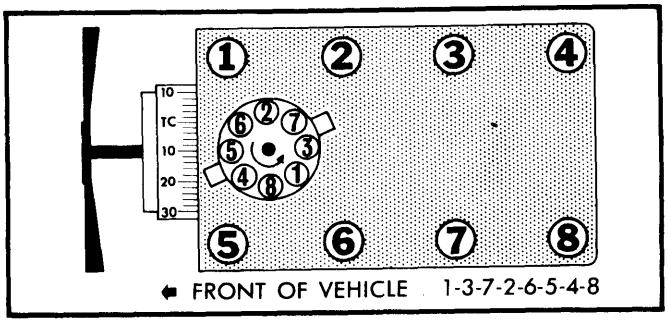

Fig. 2 5.8L Firing Order and Timing Marks

TUNE-UP (Cont.)

IGNITION TIMING

NOTE – *Magnetic probe timing device may be used if instrument is available and engine is so equipped. Timing probe offset is 135° ATDC on all V8 engines.*

NOTE – *Engine timing is not adjustable on vehicles with the EEC III system. These vehicles include all models with 5.0L engine and EFI, and Calif. Ford and Mercury with 5.8L engine.*

EEC Engines – Check that all 4 lobes on pulse ring (behind crankshaft pulley) are in good condition. Gap between sensor and pulse ring should not exceed .075". Use timing light to observe timing advance as engine speed is changed from idle to 2500 RPM.

Non-EEC Engines – **1)** Warm engine to normal operating temperature. Connect tachometer and timing light, then disconnect and plug vacuum line at distributor. Place transmission selector in "N".

2) If engine is equipped with dual mode timing module (basic Part No. -12A244-), disconnect 2-wire connector. Connect a jumper wire between the Black and Yellow wires in module side of connector.

3) On all models, check engine timing. If within ±2° of specified timing, do not adjust. If not, turn distributor to adjust. Tighten hold-down bolt and recheck timing.

4) If equipped with dual mode timing module, remove jumper wire and reconnect 2-wire connector. Disconnect and plug vacuum hose at ignition timing vacuum switch, then apply more than 12 in. Hg with hand vacuum pump. Timing should retard 16-20°. If not, replace switch or module as necessary. Connect vacuum line to switch.

5) On all models, connect vacuum line at distributor advance mechanism. Remove test equipment.

Ignition Timing Specifications (Degrees BTDC@RPM)

Application	Timing
4.2L	
Fed.	①10@800
Calif.	②8@800
5.0L	
2-Bbl.	
Fed.	③8@800
Calif.	8@800
EFI	④
5.8L	
Fed.	10@600
Calif.	④

① – On Ford/Mercury with AOT, set to 7° BTDC.
② – On Ford/Mercury with AOT, set to 5° BTDC. On Thunderbird/XR7 with AOT, set to 12° BTDC.
③ – On Thunderbird/XR7 with AOT, set to 10° BTDC.
④ – Non-Adjustable.

HOT (SLOW) IDLE RPM

NOTE – *Relocate air cleaner while making adjustments, but leave all hoses connected. Install air cleaner while making speed checks. Do not apply foot brake on hydro-boost systems as engine RPM will be affected during speed checks.*

NOTE – *Adjustment procedures vary with engine size and carburetor type or fuel injection. Locate the appropriate procedure for the vehicle being serviced and follow only the steps indicated for that vehicle.*

ALL V8 ENGINES

2150 2-Bbl. – **1)** Warm engine to operating temperature and connect tachometer. With A/C off and transmission selector in "D", adjust idle speed with TSP bracket screw.

2) Run engine briefly at 2000 RPM in "N", then recheck idle speed. Disconnect A/C compressor clutch wire, then turn A/C on. Place transmission selector in "D".

3) Adjust solenoid RPM with hex nut between dashpot and TSP. After adjustment, reconnect compressor clutch wire and remove test equipment.

7200VV 2-Bbl. – **1)** Warm engine to operating temperature and connect tachometer. With A/C off and transmission selector in "D", disconnect and plug vacuum hose at throttle kicker.

2) Adjust curb idle with idle speed screw on throttle lever, or solenoid bracket screw. Run engine briefly at 2000 RPM in "N", then recheck idle speed. Reconnect throttle kicker vacuum hose.

3) Apply slight pressure to top of nylon nut on accelerator pump to take up linkage clearance. Turn nut on accelerator pump rod clockwise to obtain .010" clearance between top of accelerator pump and pump lever. Turn accelerator pump rod 1 turn counterclockwise to set lever preload.

4) Disconnect and plug vacuum hose at throttle kicker. Connect a hand vacuum pump and apply 10 in. Hg of vacuum. With transmission selector in "D", rotate throttle kicker or turn bracket adjusting screw to obtain correct RPM. Remove vacuum source and connect vacuum hose.

EFI – **1)** Warm engine to operating temperature and connect tachometer. Turn A/C off. Stop engine, then restart and run at 2000 RPM for 60 seconds. Let engine stabilize at idle for 15 seconds, then place transmission selector in "D".

NOTE – *Idle stabilizing time must not exceed 60 seconds before curb idle speed is checked.*

2) Check idle speed. If adjustment is required, stop engine. If idle speed is low, turn bracket adjusting screw clockwise 1 turn. If speed is high, turn screw counterclockwise.

3) Restart engine and run at 2000 RPM for 60 seconds. Let engine stabilize at idle for 15 seconds, then place transmission selector in "D" and check idle speed. Repeat procedure until speed is correct.

TUNE-UP (Cont.)

Idle Speed (RPM)

Application	Curb Idle	Solenoid/Kicker Energized
4.2L & 5.0L		
2-Bbl.	500①	650
EFI	550	.....
5.8L		
Fed.	600	700
Calif.	550	640

① – Set Fed. Capri/Mustang to 700, Calif. Thunderbird/XR7 to 675.

IDLE MIXTURE ADJUSTMENT

NOTE – *No idle mixture adjustment is possible on vehicles with EFI or 7200VV 2-Bbl. carburetors. If engine performance is unsatisfactory, see Ford Electronic Engine Control in COMPUTERIZED ENGINE CONTROL Section.*

MIXTURE SCREW CAP REMOVAL

Remove carburetor, drain fuel bowl, and mount upside down. Place pliers underneath mixture cap to support it, then tap plug tang with pin punch and drive cap out. Repeat procedure for second mixture screw cap. After adjustment, replace mixture screw caps.

PROPANE ENRICHMENT PROCEDURE 2150 CARBURETORS ONLY

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.

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. Remove fresh air duct from air cleaner and insert hose from propane supply ¾ way into air cleaner.

3) Ensure hot idle compensator is closed (if equipped). Disconnect canister purge return hose at engine and plug connection. Disconnect purge valve hose at air cleaner and plug nipple.

4) On vehicles with air injection, and 2 dump valve vacuum, disconnect and plug both hoses. On vehicles with 1 fitting, remove and plug hose, then connect a hose from manifold vacuum to fitting.

5) Check engine idle and timing and correct if necessary. Disconnect PCV valve from grommet and allow to draw fresh air. Run engine briefly at 2000 RPM.

6) With engine idling, open propane valve slowly and watch for RPM gain. When speed begins to drop off, note maximum speed gain. If gain is within "RPM Gain" specifications, do not reset.

7) If not within specifications, remove carburetor and mixture screw plugs. Reinstall carburetor and run engine until warm, then accelerate briefly to 2000 RPM. Proceed with adjustment.

8) If measured speed gain was higher than specified, turn mixture screw counterclockwise (rich) slightly, then repeat propane procedure until speed gain matches "Reset RPM".

9) If measured speed gain was lower than specified, turn mixture screw clockwise (lean) slightly, then repeat propane procedure until gain matches "Reset RPM".

10) Install mixture screw caps. Reconnect PCV valve and other vacuum lines. Readjust idle speed if necessary, then remove test equipment.

Idle Mixture Adjustment Specifications

Application	RPM Gain	Reset RPM
All Models	30-90	60

COLD (FAST) IDLE RPM

EFI – 1) Warm engine to operating temperature. Disconnect and plug vacuum line at EGR valve and fast idle pulldown motor. Stop engine.

2) Set fast idle lever on specified step of fast idle cam. Start engine and check idle speed between 20-60 seconds after engine is started. Adjust if necessary.

NOTE – *If speed is not checked between 20-60 seconds after engine starts, stop engine and repeat procedure.*

3) Reconnect vacuum line at EGR valve and fast idle pulldown motor. Remove test equipment.

All Except EFI – Warm engine to operating temperature. Disconnect and plug hose at EGR valve. Place fast idle screw on specified step of fast idle cam and adjust RPM. Reconnect EGR vacuum line and remove test equipment.

Fast Idle Speed

Application	RPM	Cam Step
4.2L		
Fed.	①1600	Kickdown
Calif.	②1500	Kickdown
5.0L		
Carb.	②1600	Kickdown
EFI		
Fed.	2200	1st High
Calif.	2150	1st High
5.8L		
Fed.	1500	Kickdown
Calif.	1650	2nd High

① – Set models with AOT to 1700 RPM.
② – Set models with AOT to 1800 RPM.

AUTOMATIC CHOKE

No choke adjustment is possible due to riveted, tamperproof choke assembly.

TUNE-UP (Cont.)

FUEL PUMP

Carbureted Models – Check fuel pump volume and pressure at idle RPM. Pinch off fuel return line.

Fuel Injected Models – Disconnect the return line at throttle body and connect hose to container. Connect pressure gauge at diagnostic fitting on throttle body. Disconnect wiring connector at fuel tank and apply 12 volts to pump with jumper wire for 10 seconds.

Fuel Pump Specifications

Application	Specification
Mechanical Pump	
Pressure	6.0-8.0 psi
Volume	1 pt. in 20 seconds
Electric Pump (EFI)	
Pressure	
Pumping	35-45 psi
Rest	Min. 30 psi
Volume	10 oz. in 10 seconds

EXHAUST EMISSION SYSTEMS

See EXHAUST EMISSION SYSTEMS section.

GENERAL SERVICING

IGNITION

DISTRIBUTORS

Most 1981 vehicles use the Dura-Spark II ignition system. The Electronic Engine Control (EEC III) system is used on all fuel injected models and on Calif. Ford and Mercury with 5.8L engine.

IGNITION COIL

Coil Resistance (Ohms 75°F)

Application	Primary	Secondary
All Models	1.13-1.23	7700-9300
Ballast Resistor (@75° F)	1.05-1.15 ohms	
Coil Output (@75° F)	28 KV Min.	

CARBURETION/FUEL INJECTION

CARBURETORS

Application	Model
4.2L & 5.0L	
Federal	
Ford & Mercury with AOT	Motorcraft 7200VV
All Other Models	Motorcraft 2150
Calif.	Motorcraft 7200VV
5.8L	
All Models	Motorcraft 7200VV

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

FUEL INJECTION

All Lincoln and Mark VI models are equipped with electronic fuel injection (EFI). California Ford and Mercury models also use EFI.

Other Data & Specifications – *See Tune-Up and Ford Electronic Fuel Injection in FUEL SYSTEMS Section.*

ELECTRICAL

BATTERY

Application	Standard Amps	Optional Amps
Ford & Mercury	36, 45, 54	.....
Lincoln & Mark VI	54	.....
Fairmont & Zephyr	36, 77	45, 54
All Other Models	36	45, 54

STARTER

All models use a Motorcraft positive engagement starter.

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 REGULATORS

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

GENERAL SERVICING (Cont.)

BELT ADJUSTMENT

Tension (Lbs.) Using Standard Tension Gauge

Application	New Belt	① Used Belt
V-Belts		
1/4"	50-80	40-60
All Others	120-160	90-120
V-Ribbed Belts②		
4K	90-120	90-110
5K (W/Absorber)	75-140	75-130
5K (W/O Absorber)	110-140	110-130
6K (W/Tensioner)	85-140	85-140
6K (W/O Tensioner)	140-170	140-160

① – Any belt operated for 10 minutes or more.
② – Belt designation indicates the number of V-ribs per inch.

OIL & FUEL CAPACITIES

Application	Quantity
Crankcase (Including filter)	5.0 qts.
Fuel Tank	
Lincoln, Mark VI, Thunderbird & XR7	18.0 gals.
Ford & Mercury	
EFI	18.0 gals.
All Other Models	20.0 gals.
Capri & Mustang	12.5 gals.
Cougar, Fairmont, Granada & Zephyr	16.0 gals.

REPLACEMENT INTERVALS

Application	Interval (Miles)
Oil Filter	7500
Air Filter	30,000
PCV Valve	52,500
Spark Plugs	30,000

COOLING CAPACITIES

Application	Quantity
4.2L	
Fairmont & Zephyr	13.5 qts.
All Other Models	15.0 qts.
5.0L	13.4 qts.
5.8L	
Std. & A/C	14.0 qts.
Trailer Tow	15.0 qts.

TRANSMISSION & DIFFERENTIAL CAPACITIES

Application	Quantity
Auto. Trans. (Dexron II)	
C-4	10.0 qts.
AOT	12.0 qts.
Rear Axle (Hypoid Gear Lube)	
6.75" Axle	2.5 pts.
7.5" Axle	3.5 pts.
8.5" Axle	4.0 pts.