

- With the tools shown in Fig. 9, tighten the adjusting screw until the tool handle clicks. The tool is a preset torque wrench which clicks and breaks when the torque on the adjusting screw reaches 10 ft-lbs.
- Back off the adjusting screw exactly 3 full turns.
- Keep the adjusting screw from turning and torque the locknut to 35 to 45 ft-lbs. torque. On a Pinto or Bobcat, use Tool T70P-7B200-B to tighten the locknut. Then secure the adjustment with a 3/4 x 1-1/2 inch socket and torque wrench.

C-6 TRANSMISSION INTERMEDIATE BAND ADJUSTMENT

- Raise the vehicle on a hoist or jack stands.
- Clean the threads of the intermediate band adjustment screw.
- Remove and discard the adjustment screw locknut. Install a new lock nut on the adjustment screw, and leave it loose.
- Tighten the band adjustment screw, as shown in Fig. 10, until the wrench breaks (this should be exactly 10 ft-lbs); then, back it off **exactly** 1-1/2 turns.
- Hold the adjusting screw stationary and torque the locknut to 35 to 45 ft-lbs. torque.

JATCO TRANSMISSION INTERMEDIATE BAND ADJUSTMENT

- Raise the vehicle on hoist or jack stands.
- Loosen the servo cover attaching bolts and remove cover (Fig. 11).
- Loosen the intermediate band adjusting screw lock nut and tighten the adjusting screw to 10 ft-lb torque.
- Back off the adjusting screw two turns. Hold the adjusting screw stationary and tighten the lock nut to 22-29 ft-lb.
- Place a new gasket on the servo cover and install the cover. Torque bolts 3.6-5.1 ft-lb.
- Lower vehicle and check transmission fluid level.

ADJUST NEUTRAL START SWITCH (CONSOLE OR FLOOR SHIFT)

Check ability to start engine with shift lever in both **NEUTRAL** and **PARK** position **only**. Adjust switch, if necessary, as follows:

Cougar, LTD II, Ranchero and Thunderbird with C4 or C6 Transmission

- With the manual linkage properly adjusted and the engine turned off, place the selector lever in **neutral**.
- Remove the selector lever handle attaching screw and remove the handle (Fig. 12).
- Remove the dial housing attaching screws and remove the housing.
- Remove the two pointer back-up shield attaching screws and remove the shield.
- Loosen the two screws securing the neutral start switch to the selector lever housing (Fig. 13).
- Place the selector lever in **PARK** position and hold it against the forward stop.
- Move the neutral switch rearward to the end of its travel.



FIG. 9 Rear Band Adjustment—C4 Transmission

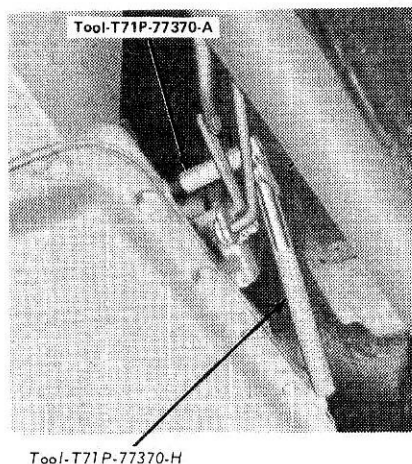


FIG. 10 Intermediate Band Adjustment—C-6 Transmission

- Hold the switch in the rearward position and tighten the attaching screws.
- Start engine with selector lever in **PARK**, then in **NEUTRAL**. If engine does not start, replace switch.
- Install the pointer back-up shield on the housing and lever assembly.
- Install the dial housing on the selector lever housing assembly.
- Install the selector lever handle.

MUSTANG II, GRANADA, MONARCH, VERSAILLES, PINTO, BOBCAT, FAIRMONT AND ZEPHYR (C4 TRANSMISSION)

- With the manual lever properly adjusted, loosen the two switch attaching bolts (Fig. 14).
- With the transmission manual lever in **NEUTRAL**, rotate the switch and insert the gauge pin (No. 43

drill shank end) into the gauge pin holes of the switch. The gauge pin has to be inserted to a full $31/64$ inch into the three holes of the switch (Fig. 14).

3. Tighten the two switch attaching bolts to 55 to 75 in-lbs. torque. Remove the gauge pin from the switch.

4. Check the operation of the switch. The engine should start only with the transmission selector lever in **NEUTRAL** and **PARK**.

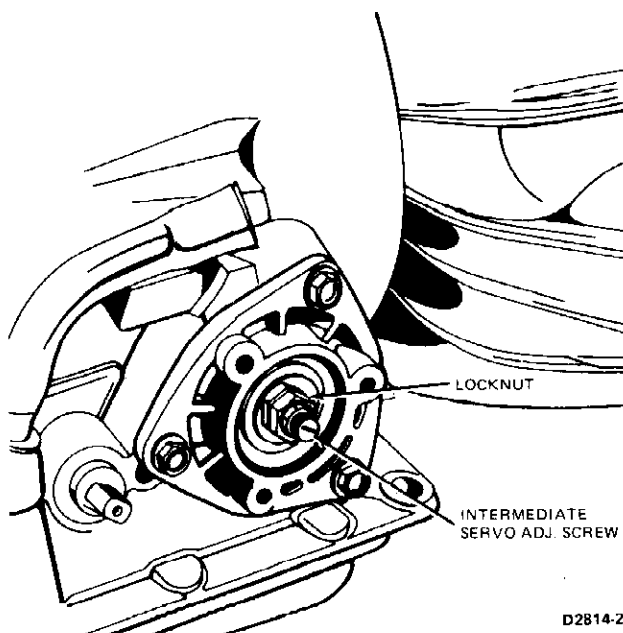


FIG. 11 Intermediate Band Adjustment—JATCO Transmission

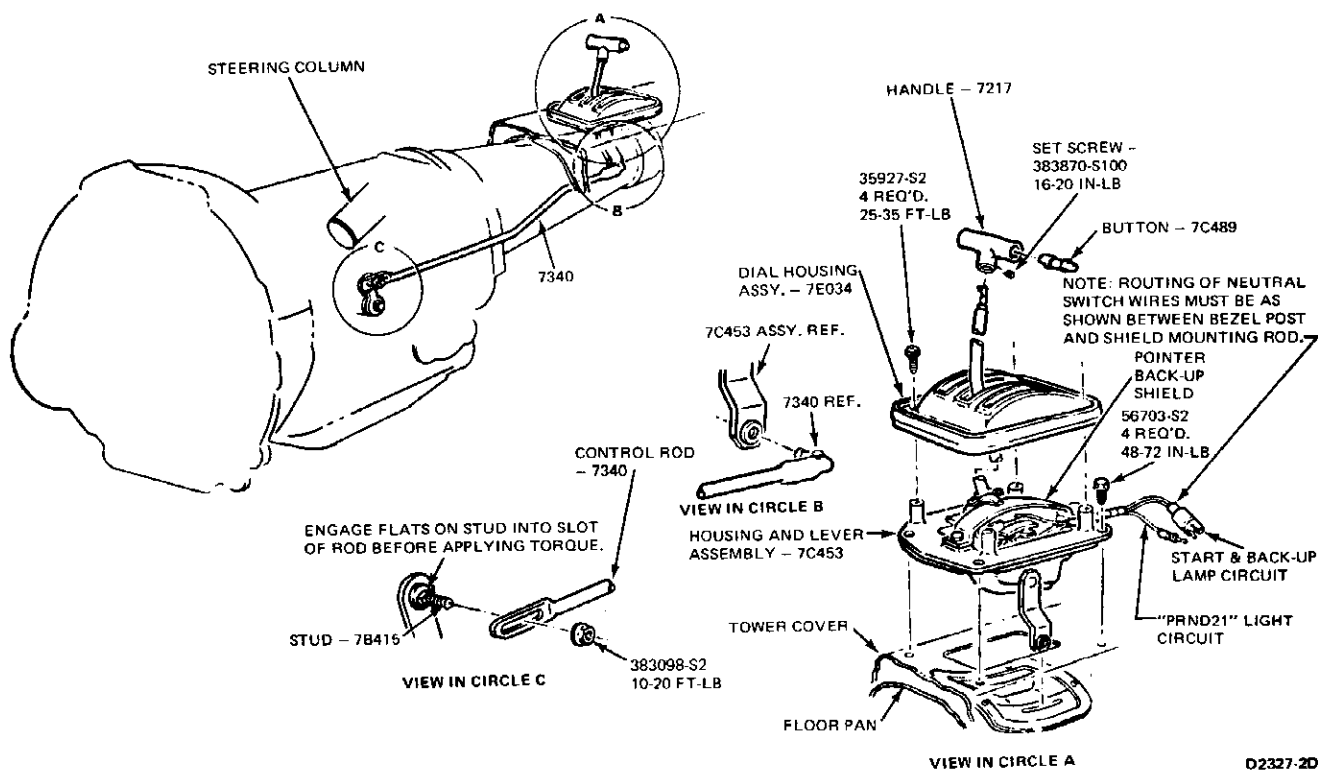
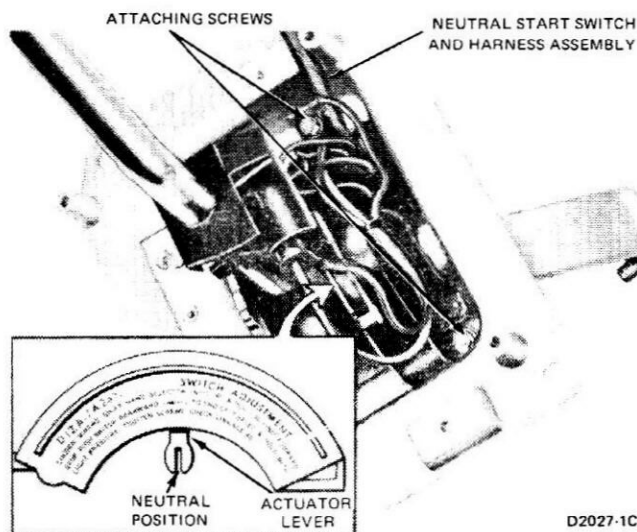
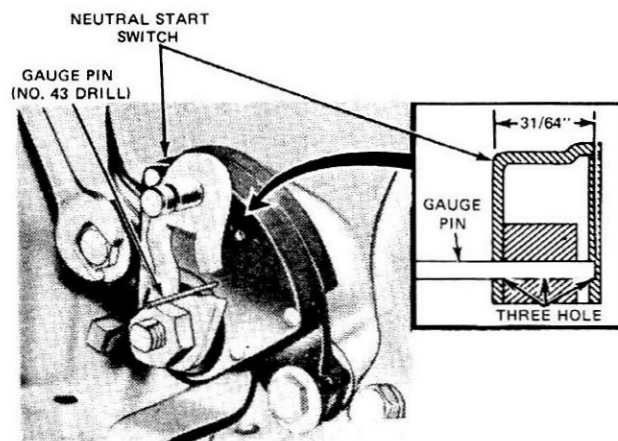


FIG. 12 Typical Linkage—Console or Floor Shift Automatic Transmission—LTD II, Ranchero, Cougar and Thunderbird



D2027-1C

FIG. 13 Typical Neutral Start Switch—Console Shift—Cougar, LTD II, Ranchero and Thunderbird with C4 or C6 Transmission



D1459-1A

FIG. 14 Neutral Start Switch Adjustment—Pinto, Bobcat, Versailles, Fairmont, Zephyr, Granada, Monarch and Mustang II with C4 Transmission

SPECIFICATIONS

Refer to the Car Specifications Book or Car Shop Manual Volume 1 for any Specifications or Special Tools not contained in this Part.

FLUID CAPACITY

Vehicle	Transmission Type	Engine	CAPACITY (Qts.)	
			U.S. Measure	Imperial Measure
Granada/Monarch	JATCO	4.1L (250 CID)	8½	7
Fairmont/Zephyr	C3	2.3L, 3.3L (200 CID)	8	6½
Fairmont/Zephyr	C4	3.3L (200 CID)	7½	6
Granada/Monarch	C4	4.1L (250 CID)	8½	6¾
Granada/Monarch/Versailles	C4	5.0L (302 CID)	10½	8½
Fairmont/Zephyr	C4	5.0L (302 CID)	10½	8½
Fairmont/Zephyr	C4	4.1L (250 CID)	8½	6¾
LTD II/Cougar	C4	5.8L, 5.0L (351/302 CID)	10½	8½
Thunderbird/Ford/Mercury	FMX	5.8L, 6.6L (351/400 CID)	11	9
	C6	5.8L, 6.6L, 7.5L (351/400/460 CID)	12½	10½
Pinto/Bobcat	C3	2.3L, 2.8L	8	6½
Mustang II	C4	2.3L, 2.8L, 5.0L (302 CID)	7	5¾
Lincoln Continental/Continental Mark V	C6	6.6L, 7.5L (400/460 CID)	12½	10½

*Approximate dry capacity, includes cooler and lines. Fluid level indicator should be used to determine actual fluid requirements and fluid specification. Check level at normal operating temperature. **DO NOT OVERFILL.**

① If it is necessary to add or replace fluids, use only fluids which have been certified by the supplier as meeting one of the Ford Motor Company specifications shown below:

② C3, C4 and FMX transmissions – Use fluids meeting specification ESW-M2C33-F (Type F):

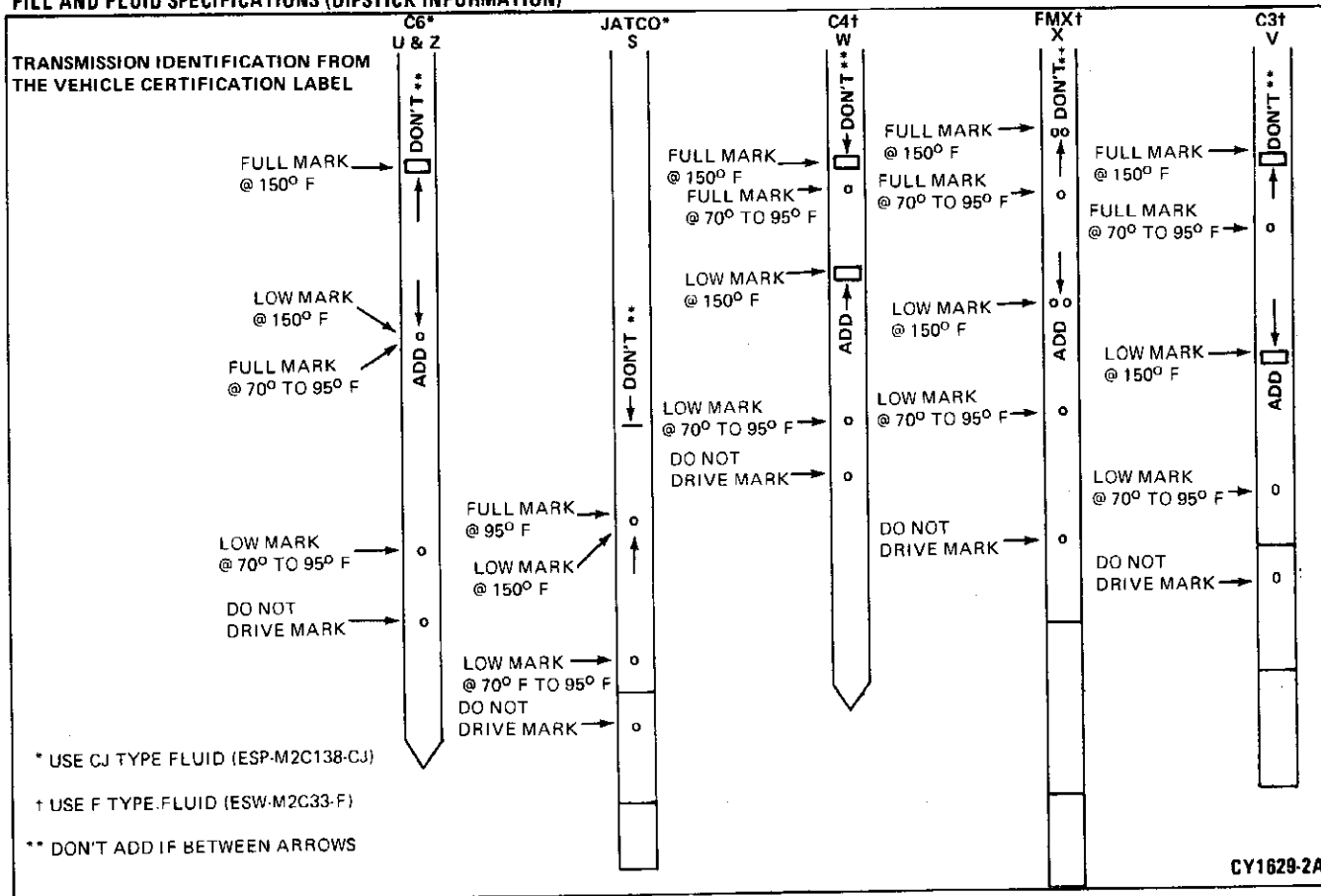
Ford
Qualification
No. 2P-6XXXXX
ESW-M2C33-F (Type F)

③ JATCO C6, (Type CJ) transmissions – Use fluid meeting specification ESP-M2C138-CJ.

CY1528-2F

FILL AND FLUID SPECIFICATIONS

FILL AND FLUID SPECIFICATIONS (DIPSTICK INFORMATION)



Gasoline Engines

PART
50-21

CN4062-2A

LUBRICATION

ENGINE OIL AND FILTER

To maintain effective operation of the emission control systems and to properly protect the engine, use of a high grade motor oil is essential. Use Ford Long Life motor oil or a brand that meets Ford Motor Company performance specification ESE-M2C144-A.

These oils neutralize corrosive acids, and keep the crankcase emission control (PCV) valve clean and fully operative.

Proper oil filtration is also necessary. Use a Motorcraft Long Life oil filter or one that meets the Ford specification ES-C8AF-6714-A or -C.

Oil Viscosity

From Specifications Chart, select the viscosity that most nearly matches the temperature range that is expected for the next maintenance interval.

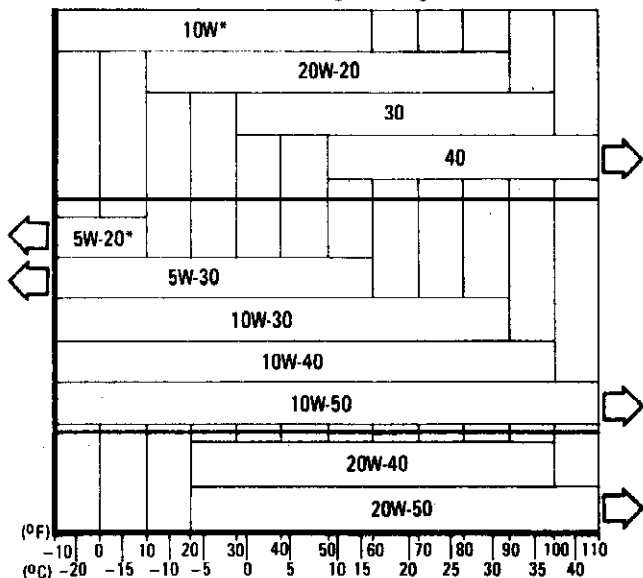
MAINTENANCE

All engine maintenance items are covered in Part 50-29; Emission Systems. Refer to Part 29-02 for all engine diagnosis.

SPECIFICATIONS

Refer to the Car Specifications Book or Car Shop Manual Volume 2 for any Procedures, Specifications or Special Tools not contained in this section.

OIL VISCOSITY RECOMMENDATIONS
All 1978 Passenger Car Engines



*Not recommended for sustained high speed driving or heavy duty operations such as trailer towing.

Consistent Outside Temperature $\frac{^{\circ}\text{F}}{^{\circ}\text{C}}$

CY1433-18

Cooling System

PART
50-27

SUBJECT	PAGE	SUBJECT	PAGE
MAINTENANCE		SPECIFICATIONS	27-1
Anti-Freeze Level Adjustment	27-1		
Coolant Level Adjustment	27-1		

MAINTENANCE

ADJUST ANTI-FREEZE (COOLANT PROTECTION) LEVEL

Be sure the engine is at operating temperature. Check the anti-freeze in the cooling system by using a permanent anti-freeze test hydrometer.

WARNING—Do not attempt to remove the radiator cap under any circumstances while the engine is operating. To do so might lead to damage to the cooling system and the engine and could result in serious personal injury from hot coolant or steam blow-out. Switch off the engine and wait until it has cooled. Even then, use extreme care when removing the cap from a hot radiator. Wrap a thick cloth around the cap and turn it slowly to the first stop. Step back while the pressure is released from the cooling system. When you are sure all the pressure has been released, press down on the cap—still with a cloth—turn and remove it.

Use the recommended mixture of permanent anti-freeze and water to maintain adequate protection against the temperatures to be encountered in area of car operation. To provide sufficient protection against corrosion and boiling, this level should be at least 0°F.

To avoid possible chemical damage to the cooling system, do not mix different brands of anti-freeze. Use only those permanent anti-freeze brands which meet Ford specification M97B18-C. If equipped with a constant full (coolant recovery) system, it should not be necessary to add coolant to the radiator filler neck, unless the system has become inoperative due to radiator overheating or leakage. Add only to the plastic bottle. Do not check cross-flow radiator coolant level while coolant is at operating temperature or while engine is running.

ADJUSTING COOLANT LEVEL

If the coolant level is not to specification, add the recommended mixture of water and permanent anti-freeze (or anti-freeze alone) to maintain the proper coolant level and anti-freeze protection.

Standard and Expansion Bottle Cooling Systems

If the cooling system is not equipped with a coolant recovery reservoir, add coolant through the radiator filler neck to the following level with the engine cold (at ambient temperature): For cross-flow radiators—2-1/2 inches below the pressure cap seat in the filler neck. For down-flow radiators—1-1/2 inches below the pressure cap seat in the filler neck.

After operating engine until the top radiator hose is warm, recheck coolant level. Cross-flow radiators—1-1/2 inches below the pressure cap seat in the filler neck. Down-flow radiators—1/4 inch below the pressure cap seat in the filler neck. If coolant is not at this level with engine warm, add sufficient coolant to adjust level. Do not attempt to add coolant to expansion bottle.

Coolant Recovery Systems

If the cooling system is equipped with a coolant recovery reservoir, add coolant through the **reservoir cap only** to the COLD or HOT mark on the plastic reservoir bottle, depending on the temperature of the engine.

SPECIFICATIONS

Refer to the Car Shop Manual Volume 2, Group 27 for any Specifications or Special Tools not contained in this Section. Also refer to Part 50-29 for specifications on maintenance procedures related to emission systems.

Engine Emission Control Systems

**PART
50-29**

All Models

SUBJECT	PAGE	SUBJECT	PAGE
EMISSION SYSTEMS –		SPECIFICATIONS	29-18
Scheduled Maintenance	29-1	SPECIAL TOOLS	29-18
MAINTENANCE PROCEDURES			
Index	29-1		

CA4268-2B

EMISSION SYSTEMS—SCHEDULED MAINTENANCE

GENERAL INFORMATION

This Part contains scheduled maintenance as it applies to emission systems. The Emission Systems Required Maintenance schedule lists the items required to maintain the vehicle emission systems at levels determined by the federal government (Environmental Protection Agency). Directly following the schedules are a number of Maintenance Procedures, each of which is related to an item listed on the maintenance schedule. Use these procedures to perform the required emission system maintenance items listed on the maintenance schedules.

Maintenance service adjustments must conform to specifications contained herein, listed in the Specifications Book, or shown on the vehicle engine Emissions Decal, or the emissions systems may become inoperative. These services are not covered by warranty, and the customer will be charged for labor, parts and lubricants used.

Four maintenance schedules are used: Three for vehicles built for sale in the U.S., and one for vehicles built for sale in Canada. To determine which to follow,

refer to the Vehicle Emission Control Information decal (Fig. 1).

FORD MOTOR COMPANY		SHIFT	MAINT
VEHICLE EMISSION CONTROL INFORMATION		SCH#1	SCH#2
ENGINE FAMILY 2.8 "DV" (X160) EGR/AIR/CATALYST ENGINE DISPLACEMENT 2.8 (171 CID) TRANS. AUTO SPARK PLUG AWRP-42 GAP .032-.036		B	
VALVE INT. COLD #14	ALTITUDE	☐ OVER 4000 FT ☒ UNDER 4000 FT	
LASH EXH. COLD #18	CD	☐ OVER 4000 FT ☒ UNDER 4000 FT	
TRANSMISSION GEAR	NEUTRAL	DRIVE	IDLE SPEED
IGNITION TIMING - 2°	6° BTDC	REDUCTION	LESS THAN
TIMING RPM	750	100 MPH	
CHOKE SETTINGS	INDEX		
FAST IDLE HIGH CAM	1750	150	
100 RPM/KICK DOWN			
CURR. IDLE A/C	750	75	
50 RPM NON A/C	750	75	
TSP OFF A/C	900	75	
50 RPM NON A/C	900	75	
CATALYST		B-000	
THIS VEHICLE CONFORMS TO U.S.E.P.A. AND CALIFORNIA REGULATIONS APPLICABLE TO 1978 MODEL YEAR NEW MOTOR VEHICLES			

A4056-1C

FIG. 1 Typical Emission Certification Label

MAINTENANCE PROCEDURES INDEX			
Procedure		Procedure No.	Page
A. Engine Mechanical Subsystems			
Engine Oil Change and Oil Filter Replacement		A-1	29-3
Engine Valve Clearance Check – 2.8L V-6		A-2	29-3
Coolant Condition and Protection		A-3	29-4
Cooling System, Hoses and Clamps Check		A-4	29-4
Coolant Replacement		A-4	29-4
Drive Belt Condition and Tension		A-5	29-5
B. Emission Subsystems			
PCV Valve Replacement		B-1	29-7
Thermactor Idle Dump Delay Valve		B-2	29-7
C. Ignition Subsystems			
Spark Plug Replacement		C-1	29-7
D. Fuel Subsystems			
Idle Fuel Mixture (Artificial Enrichment)		D-1	29-8
Engine Idle Speeds		D-2	29-9
Choke System		D-3	29-13
Carburetor Air Cleaner Element and Crankcase Emission Filter		D-4	29-18

CA1425-2E

MAINTENANCE SCHEDULE —
VEHICLES BUILT FOR SALE IN U.S. AND CANADA
 (Vehicles Designated "A" or "B" on Emission Control Decal)

		SERVICE INTERVAL: Time in Months, or Miles (or Kilometres) in Thousands, Whichever Occurs First, Unless Otherwise Specified															
		2.3L/2.8L/3.3L/4.1L (200/250 CID)							All V-8 Engines								
MAINTENANCE OPERATION	Months Miles (in Thousands) Kilometres (in Thousands)	(Foot Note)	5 5 8	10 10 16	20 20 32	30 30 48	40 40 64	50 50 80	Foot Note	7.5 7.5 12	15 15 24	22.5 22.5 36	30 30 48	37.5 37.5 60	45 45 72	52.5 52.5 84	
Change Engine Oil		X,1		AB	AB	AB	AB	AB	Y,1	AB	AB	AB	AB	AB	AB	AB	
Replace Oil Filter		X,1		AB	AB	AB	AB	AB	Y,1	AB		AB		AB		AB	
Check Cooling System Hoses & Clamps		2						AB	2							AB	
Check Coolant Condition & Protection		3	ANNUALLY							3	ANNUALLY						
Replace Coolant		2						AB	2							AB	
Check Drive Belt Condition & Tension				B	A	B	A			B		A	B		A		
Replace Carburetor Air Cleaner Element		4				AB			4				AB				
Replace Crankcase Emission Filter:																	
a. 2.3L, 2.8L, 3.3L/4.1L (200/250 CID) Engines; 7.5L (460 CID)		4				AB			4				AB				
b. All V-8 Engines Except 7.5L (460 CID)									4							AB	
Replace Spark Plugs:																	
a. All Except 3.3L (200 CID) Engine in California		Z			A	B	A		Z			A	B		A		
b. 3.3L (200 CID) Engine in California		Z	Each 50,000 Miles or 30 Months, Whichever Occurs First														
Replace PCV Valve:																	
a. All 2.3L Engines					A	B											
b. All Other Engines if PCV Valve (High Flow) Part Number is Specified on Engine Emission Decal		Z			A	B			Z			A	B				
Check Idle Fuel Mixture (After PCV Valve Replacement) if Artificial Enrichment Specifications are given on Engine Emission Decal		Z			A	B			Z			A	B				
Check Thermostator Delay Valve					A	B	A					A	B		A		
Check Choke System					A	B	A					A	B		A		
Check Engine Valve Clearance (2.8L Engines Only)			A	B	A	B	A										
Check Engine Idle Speeds:																	
a. All Engines Except 2.3L w/Feedback Carburetor (California Only)		Z	A	B					A	AB							
b. 2.3L Engine w/Feedback Carburetor (California Only)		Z	B														

FOOTNOTES:

X — Change engine oil and replace oil filter every 10,000 miles or twelve (12) months, whichever occurs first.

Y — Change engine oil every 7,500 miles or twelve (12) months, whichever occurs first.

Replace engine oil filter at first oil change, followed by replacement at alternate oil changes. If vehicle mileage is less than 15,000 miles each twelve (12) months, replace oil filter at every oil change.

Z — Consult the Vehicle Emission Control Information Decal for specifications pertinent to this maintenance operation.

1. Severe Service Operation: When operating your vehicle under any of the following conditions, change engine oil every 3,000 miles or three (3) months, whichever occurs first, and replace the oil filter at alternate oil changes; check, clean and regap spark plugs every 6,000 miles:

- Extended periods of idling or low speed operation such as police, taxi or door-to-door delivery.
- Towing trailers over 2,000 lbs. gross trailer weight for long distances, except as follows:
 - Pinto/Bobcat/Mustang II: Towing any trailer up to 1,000 lbs. gross trailer weight for long distances.
 - Fairmont/Zephyr/Granada/Monarch/Versailles: Towing trailers over 1,000 lbs. gross trailer weight for long distances.
- Operation when outside temperature remains below 10°F. for 60 days or more and most trips are less than 10 miles.
- Operation in severe dust conditions.

2. Check the cooling system hoses and clamps and replace coolant at the recommended service interval or every three (3) years, whichever occurs first.

3. If coolant is dirty or rusty in appearance, the system should be drained, cleaned and refilled with the prescribed solution of cooling system fluid and water. Use only a permanent type coolant that meets Ford Specification ESE-M97B18-C.

4. More often if operated in severe dust conditions

A-1: ENGINE OIL CHANGE AND OIL FILTER REPLACEMENT

1. Apply parking brake and block wheels.
2. Bring engine to normal operating temperature and turn off.
3. Remove oil drain plug and drain engine oil.
4. Clean oil drain plug and inspect gasket. Replace gasket if damaged.
5. Re-install oil drain plug and torque to specification.
6. If the engine oil filter is scheduled for replacement, perform the following:
 - a. Remove oil filter and discard.
 - b. Clean the gasket sealing surface at the cylinder block or adapter.
 - c. Coat the gasket on the filter with a light film of oil; screw the filter onto the adaptor or cylinder block until the gasket contacts the sealing surface; then, advance it an additional 1/2 turn.
7. Remove the oil filler cap and fill the crankcase with the specified amount (Fig. 2), type and grade of oil.
8. Re-install the oil filler cap; start the engine and inspect for oil leak(s). Correct as required.

Engine Displacement	Quantity* (In U.S. Quarts)	
	With Filter Change	Without Filter Change
2.3L I-4	5	4
2.8L V-6	5	4½
3.3L (200 CID) I-6	5	4
4.1L (250 CID) I-6	5	4
5.0L (302 CID) V-8	5	4
5.8L (351W CID) V-8	5	4
5.8L (351M CID) V-8	5	4
6.6L (400 CID) V-8	5	4
7.5L (460 CID) Passenger V-8	5	4
7.5L (460 CID) Police Interceptor V-8	7½**	6

* To convert to imperial measure, multiply the quantity shown by 0.83.

** Includes one quart for filter change and 1/2 quart for cooler.

CA1427-1F

FIG. 2 Engine Oil Capacity

A-2: ENGINE VALVE CLEARANCE CHECK — V-6

1. As a safety precaution, remove battery negative cable from battery during removal and installation of right hand rocker arm cover. In addition, make sure that the transmission is in Neutral (M/T) or in Park (A/T) and parking brake is applied.
2. Remove and/or reposition components as necessary to allow removal of rocker arm covers.
3. If lifting eyes have not been previously removed, remove and discard both lifting eyes.
4. Remove rocker arm covers.
5. Torque rocker arm support bolts to 43-49 ft-lbs.
6. Check valve clearance as follows:
 - A. Check intake and exhaust valves for cylinder No. 1.
 - (1) Place a finger on adjusting screw of intake rocker arm for cylinder No. 5. The slightest

motion of the rocker arm can now be easily detected.

- (2) Using a remote starter button or equivalent, "bump" the engine over until intake valve for cylinder No. 5 just barely begins to open. Camshaft is now properly positioned for checking both intake and exhaust valve for cylinder No. 1.
- (3) For the intake valve a 0.014 feeler should have a light to moderate drag and a 0.015 feeler should be very tight. If adjustment is necessary, turn adjusting screw clockwise to decrease lash and counterclockwise to increase it. Adjusting screws are self-locking and will remain in the set position.

NOTE: Do not use go, no-go feeler gauges.

CAUTION: When checking valve clearance insert feeler gauge between rocker arm and valve tip at front (or rear) edge of valve tip and move toward opposite edge with a rearward (or forward) motion that is parallel to centerline of crank. **Do not** insert feeler gauge at outboard edge and move inward toward carburetor (perpendicular to centerline of crank)—this method will result in an erroneous "feel" that will produce excessively tight valves.

- (4) Use a similar procedure on the exhaust valve. A 0.016 feeler should have a light to moderate drag and a 0.017 feeler should be **very tight**.
- B. Check valve clearance of remaining valves by applying the procedures in Step 6A to successive cylinders in firing order (which is 1-4-2-5-3-6) as shown in the following table:

To adjust both valves for cylinder #	1	4	2	5	3	6
The intake valve must be opening for cylinder #	5	3	6	1	4	2

CA4094-1A

7. Clean all gasket material from cylinder heads and rocker arm covers.
8. Reinstall rocker arm covers using new gaskets and torque attaching screws to 3-5 ft-lbs.
9. Reinstall all components that were removed or repositioned in Step 2 to their original location. Torque components to specification.

Note: If the engine is equipped with a "Dura Spark" ignition system and **any** high tension ignition wire was detached from a spark plug, the distributor cap, or the coil to perform this maintenance operation, silicone grease (D7AE-19A331-AA or equivalent) must be applied to the boot before reconnection. Using a small clean screwdriver, apply a thin layer of silicone grease on the entire interior surface of the boot.

10. Start the engine and check for oil and vacuum leaks.

A-3: COOLANT CONDITION AND PROTECTION

1. Remove radiator cap as follows:
 - A. **NEVER** remove the radiator cap under any conditions while the engine is operating. Failure to follow these instructions could result in damage to the cooling system or engine and/or personal injury.
 - B. To avoid having scalding hot coolant or steam blow out of the radiator, use extreme care when removing the cap from a hot radiator. If possible, wait until the engine has cooled, then wrap a thick cloth around the radiator cap and turn it slowly to the first stop. Step back while

the pressure is released from the cooling system. When you are sure all the pressure has been released, press down on the cap (still with a cloth), turn and remove it.

2. Check coolant for dirty or rusty appearance. If dirty or rusty, replace the coolant according to Procedure A-4 (Coolant Replacement).

NOTE: If the coolant is to be replaced, the remainder of this procedure may be omitted.

3. If coolant condition is satisfactory, check coolant concentration for proper protection level. Maintain a protection level of at least -20°F (-30°C) to preserve anti-rust protection and assure proper engine operating temperature. If concentration level is low, open the radiator petcock, drain the radiator partially, and add 100 percent concentration of Ford Cooling System Fluid, or equivalent, to obtain the recommended protection level.

COOLANT SPECIFICATION —Use only a permanent-type coolant that meets Ford Specification ESE-M97B18-C, such as Ford Cooling System Fluid. Do not use alcohol or mix them with the specified coolant.

4. Coolant level should be maintained as follows:

A. Standard Cooling System and Expansion Bottle System

- (1) Check coolant level and if required, fill with recommended coolant mixture to approximately 3/4 to 1-1/2 inches below the filler neck seat on a downflow radiator (vertical tubes) or to approximately 2-1/2 to 4.0 inches below the filler neck seat on a crossflow radiator (horizontal tubes).
- (2) Do not add coolant to expansion bottle (no filler neck) if so equipped. Expansion bottle should be nearly empty. If not, check radiator cap, radiator filler neck, and overflow hose for proper operation.
- (3) Reinstall radiator cap.

A-4: COOLING SYSTEM CHECK AND COOLANT REPLACEMENT

1. Bring the engine to normal operating temperature and turn the engine off. With cooling system under pressure, inspect cooling system hoses and clamped hose connections for leaks, excessive deterioration, or contact wear. Inspect radiator assembly retention. Note any discrepancies and proceed to Step 2.
2. Remove the radiator cap, as follows:
 - (A) **NEVER** remove the radiator cap under any conditions while the engine is operating. Failure to follow these instructions could result in damage to the cooling system or engine and/or personal injury.
 - (B) To avoid having scalding hot coolant or steam blow out of the radiator, use extreme care when removing the cap from a hot radiator. If possible, wait until the engine has cooled, then wrap a thick cloth around the radiator cap and turn it slowly to the first stop. Step back while the pressure has been released, press down on the cap (still with a cloth), turn and remove it.

3. Place the heater temperature control at the maximum heat position.
4. Open radiator petcock and remove the cylinder block drain plug(s) to drain the coolant system.
NOTE: For all 2.8L applications, open radiator petcock and remove heater hose from thermostat housing (located at lower left front of engine) to drain the coolant system.
5. Correct/Repair/Replace any components found leaking, deteriorated or worn in Step 1.
6. Flush with clear water. If excessively dirty or rusty, the use of Ford radiator flush and/or reverse pressure flushing is recommended. Drain and flush reservoir on coolant recovery and expansion bottle systems if so equipped.
7. Close radiator petcock and install cylinder block drain plug(s) or heater hose (2.8L only).
8. When refilling the cooling system, use equal parts of water and Ford Cooling System Fluid or equivalent.

COOLANT SPECIFICATION —Use only a permanent-type coolant that meets Ford Specification ESE-M97B18-C, such as Ford Cooling System Fluid or equivalent. Do not use alcohol or methanol antifreeze or mix them with the specified coolant.

To refill the cooling system, proceed as follows:

(A) Standard Cooling System and Expansion Bottle System Refill

1. Refill the radiator to approximately 2 1/2 inches below the filler neck seat on a crossflow radiator (horizontal tubes) and to approximately 3/4 inch below the filler neck seat on a downflow radiator (vertical tubes) with the recommended coolant mixture.
2. Operate engine until thermostat opens and the radiator upper hose becomes hot.
3. Stop the engine and add coolant to approximately 1 1/2 inches below the filler neck seat on a crossflow radiator, and to approximately 1/4 inch below the filler neck seat on a downflow radiator. Do not add coolant to expansion bottle (no filler neck) if so equipped.
4. Reinstall radiator cap.

A-5: DRIVE BELT CONDITION AND TENSION

NOTE: Due to space limitations, it may be necessary to remove components to gain access for inspecting, checking, or replacing accessory drive belts.

If the engine is equipped with a "Dura Spark" ignition system and any high tension ignition wire was detached from a spark plug, the distributor cap, or the coil to perform this maintenance operation, silicone grease (Ford D7AE-19A331-AA or equivalent) must be applied to the boot before reconnection. Using a small clean screwdriver, apply a thin layer of silicone grease on the entire interior surface of the boot.

1. Apply the parking brake and block the wheels.
2. Inspect all accessory drive belts for excessive wear, cracks, glazed condition, and frayed or broken cords. Replace any drive belt exhibiting

these conditions and adjust to new belt tension specification.

CAUTION: On dual belt accessory drive, the belts **must** be replaced in matched sets.

3. Bring the engine to normal operating temperature and turn the engine off. Using a belt tension gauge (T63L-8620-A or equivalent), check the tension of all drive belts; on dual drive belts, check only one belt. Compare measured tension to specification.

NOTE: A belt tension gauge offers the most accurate means of checking belt tension. Accordingly, a belt tension gauge should be used whenever possible; removal of fan shroud, air induction hardware, etc., may be necessary. If space limitations, however, make it **absolutely impossible** to use a tension gauge, the following procedure may be substituted:

- a. Press firmly on the belt (approximately at the middle of the free span between pulleys).
 - b. Belt deflection should be as follows:
—For all belts with a free span **less** than 12", deflection should be between 1/8" and 1/4".
—For all belts with a free span **greater** than 12", deflection should be between 1/8" and 3/8".
 4. If any belt is not to tension specification, adjust the drive belt as follows:
 - A. Loosen the accessory pivot bolt and/or adjustment slot fastener(s).
 - B. If accessible, install a belt tension gauge on the drive belt.
 - C. Without damaging the accessory, move the accessory toward or away from the engine until the correct belt tension specification is registered.
- NOTE:** New and used belt tension specifications differ when using the belt tension gauge. Refer to belt tension specifications. When the deflection method is used, use the deflection specifications in Step 3.
- D. Tighten the accessory adjustment slot fastener(s) to the specified torque(s).
 - E. Tighten the accessory pivot bolt to the specified torque.
 - F. Recheck belt tension. Repeat adjustment process if necessary.

A. New and Used Drive Belt Tension Specifications

- (1) All 1/4" wide drive belts that are **newly installed*** should read 50-80 lbs.
- (2) All 1/4" wide drive belts, **not newly installed*** at the time of inspection, and **having less than ten (10) minutes of engine operation** on them, should read between 40-80 lbs. If a belt tension is not within specified tension range, re-adjust the belt tension to 40-60 lbs.
- (3) All 1/4" wide drive belts **with more than ten (10) minutes of engine operation** on them should read between 40-60 lbs. If a belt tension is not within the specified tension range, re-adjust the belt tension to 40-60 lbs.

COOLING SYSTEM CAPACITIES

VEHICLE	ENGINE	OPTIONS	CAPACITY (QTS.)	
			U.S.	IMP.
Pinto/Bobcat	2.3L	S/C	8.6	7.1
	2.3L	A/C	9.0	7.5
	2.8L	S/C	8.5	7.0
	2.8L	A/C	9.1	7.6
Mustang II	2.3L	S/C	8.8	7.1
	2.3L	A/C	9.1	7.6
	2.8L (M/T)	S/C	8.4	7.0
	2.8L (A/T)	S/C	8.6	7.1
	2.8L (M/T)	A/C	8.6	7.1
	2.8L (A/T)	A/C	9.1	7.6
	5.0L (302 CID)	S/C & A/C	14.6	12.1
Fairmont/Zephyr	2.3L	S/C	8.6	7.1
	2.3L	A/C	10.3	8.6
	3.3L (200 CID)	S/C, A/C	9.0	7.5
	5.0L (302 CID)	S/C	13.9	11.5
	5.0L (302 CID)	A/C	14.0	11.6
Granada/Monarch	4.1L (250 CID)	S/C, X/C	10.5	8.7
	4.1L (250 CID)	A/C	10.6	8.8
	5.0L (302 CID)	S/C	14.2	11.8
	5.0L (302 CID)	A/C	14.3	11.9
Versailles	5.0L (302 CID)	S/C	14.2	11.8
	5.0L (302 CID)	A/C	14.3	11.9
LTD II/Cougar/Ranchero	5.0L (302 CID)	S/C	14.3	11.9
	5.0L (302 CID)	A/C	14.6	12.1
	5.0L (302 CID)	Police Interceptor & Taxi	15.9	13.2
LTD II/Cougar/Thunderbird	5.8L (351W CID)	S/C	15.4	12.8
	5.8L (351W CID)	A/C	15.7	13.0
	5.8L (351M CID)	S/C, A/C, T.T.	16.5	13.7
	5.8L (351M CID)	Police Interceptor & Taxi	17.0	14.1
	6.6L (400 CID)	S/C, A/C	16.5	13.7
	6.6L (400 CID)	T.T., Police Interceptor	17.0	14.1
Ford/Mercury	5.0L (302 CID)	S/C, A/C	15.2	12.6
	5.0L (302 CID)	Police Interceptor	17.1	14.2
	5.8L (351W CID)	S/C, A/C	16.3	13.5
	5.8L (351W CID)	Police Interceptor	18.2	15.1
	5.8L (351M CID)	S/C, A/C	17.0	14.2
	6.6L (400 CID)	S/C, A/C	17.0	14.2
	6.6L (400 CID)	Police Interceptor & T.T.	17.46	14.5
	7.5L (460 CID)	S/C, A/C	18.6	15.4
	7.5L (460 CID)	T.T. & Police Interceptor	19.7	16.3
Continental Mark V	6.6L (400 CID)	S/C, A/C	16.9	14.06
	7.5L (460 CID)	S/C, A/C	18.6	15.4
	7.5L (460 CID)	T.T.	18.8	15.6
Lincoln Continental	6.6L (400 CID)	A/C	16.9	14.06
	7.5L (460 CID)	A/C	18.7	15.5
	7.5L (460 CID)	T.T.	19.0	15.8

To convert to imperial measure, multiply U.S. quarts shown by .83.

7.5L (460 CID) Police Interceptor includes engine oil cooler.

Capacities shown include heater.

Service refill recommendations are 50/50 mix of water and Ford Long Life Coolant ESE-M97B18-C.

Expansion reservoirs do not use coolant in bottle except during extreme operation.

All figures shown are actual but may vary $\pm 15\%$ due to system variations.

S/C — no air conditioning (standard cooling).

A/C — air conditioning.

- (4) All 3/8", 15/32", 1/2" and 5/8" wide drive belts that are **newly installed*** should read 120-160 lbs.
- (5) All 3/8", 15/32", 1/2" and 5/8" wide drive belts **not newly installed*** at the time of inspection, and **having less than ten (10) minutes of engine operation on them**, should read between 90-160 lbs. If a belt tension is not within the specified tension range, re-adjust the belt tension to 90-120 lbs.
- (6) All 3/8", 15/32", 1/2" and 5/8" wide drive belts **with more than ten (10) minutes of engine operation on them**, should read between 75-120 lbs. If a belt tension is not within the specified tension range, re-adjust the belt tension to 90-120 lbs.

***Newly installed** means installation of the drive belt before the engine has made no more than one rotation and the belt has had a chance to stretch or seat into the pulley grooves.

B. The following is a list of fastener torque values for attachment of alternators, air pumps and related components.

1. Alternator and air pump to adjusting arm (thru slot): 24-40 ft-lb.
2. Alternator pivot bolt: 45-57 ft-lb.
3. Air pump pivot bolt: 22-32 ft-lb.
4. Mount bracket fasteners according to the following specifications:

A. Standard screw and washer assy., bolts and nuts.

Size	Grade@	Torque
1/4" - 20	5	70-105 in-lb.
1/4" - 20	8	105-155 in-lb.
5/16" - 18	5	12-18 ft-lb.
5/16" - 18	8	17-25 ft-lb.
3/8" - 16	5	22-32 ft-lb.
3/8" - 16	8	30-45 ft-lb.
7/16" - 14	5	40-55 ft-lb.
7/16" - 14	8	50-70 ft-lb.
M 8	5	14-21 ft-lb.
M 8	8	20-28 ft-lb.
M 10	5	28-40 ft-lb.
M 10	8	40-57 ft-lb.

C. Flange bolts with serrations under head of bolt (i.e., spin-lock type)

Size	Grade@	Torque
1/4" - 20	5	80-115 in-lb.
5/16" - 18	5	16-22 ft-lb.
3/8" - 16	5	27-37 ft-lb.
7/16" - 14	5	45-60 ft-lb.
M 8	5	18-25 ft-lb.
M 10	5	32-44 ft-lb.

@ Identification of grades 5 and 8



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B-1: PCV VALVE REPLACEMENT

1. Remove the PCV valve from the PCV hose.
2. Install a new PCV valve in the hose.
Note: If a high flow PCV valve is scheduled for installation, consult the Vehicle Emission Control Information Decal for the **correct** high flow PCV valve part number.
3. Check curb idle speed in accordance with Procedure D-2.

B-2: THERMACTOR IDLE DUMP DELAY VALVE

1. If necessary, remove the air cleaner assembly.
2. Remove the thermactor delay valve from the thermactor dump valve vacuum line.
3. Perform the following delay valve functional test:
 - a. **Equipment Required:**
 - (1) Vacuum gauge—USG Model 12121-1, 2" dia., 0-30" Hg vacuum gauge with 0.20" OD vacuum hose nipple adaptor and 24" of 5/32" ID distributor vacuum hose or equivalent.
 - (2) Stop watch or wristwatch with a sweep second hand.
 - (3) External vacuum source capable of maintaining a constant vacuum (10" Hg minimum).
 - b. Set external vacuum source to 10" Hg.
 - c. Connect colored side of delay valve to vacuum source.
Note: 0.20" OD to 0.27" OD adaptor may be required to connect colored side of valve to vacuum source.
 - d. Connect the 24" section of vacuum hose to gauge and to white side of delay valve.
 - e. Apply vacuum and observe time in seconds for gauge to rise from 0 to 8" Hg with a constant 10" Hg vacuum source.
 - f. The minimum and maximum time for the delay valve to reach 8" Hg should be as follows:

		Time in Seconds	
Color Code	I.D. No.	Minimum	Maximum
White/Red	40	14.0	47.2
White/Blue	20	8.0	26.0

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CAUTION: When checking the delay valve, do not allow oil or dirt to get into the valve as this will impair its function.

4. Replace the delay valve if it fails to meet specification or reinstall the delay valve if it meets specification. The white side of the delay valve should face **away** from the thermactor dump valve.
5. Reinstall air cleaner assembly, if removed, and torque air cleaner nut(s) to specification.

C-1: SPARK PLUG REPLACEMENT

NOTE: If the engine is equipped with a "Dura Spark" ignition system and any high tension ignition wire is detached from a spark plug, the distributor cap, or the coil to perform this maintenance operation, silicone grease (Ford D7AE-19A331-AA or equivalent) must be applied to the boot before reconnection. Using a small clean screwdriver, apply a thin layer of silicone grease on the entire interior surface of the boot.

1. Remove required components to provide access to spark plugs.

2. When clearance permits, use the spark plug wire installation and removal Tool (T74P-6666-A or equivalent). Otherwise, use your hand(s). In either situation, proceed as follows:
Remove the spark plug wire from each spark plug by grasping the molded boot, twisting the boot until it loosens and then pulling it off the spark plug. Do not pull on the wire as the connection will be damaged; any spark plug wire and/or boot damaged must be replaced (see caution below).
3. Each original spark plug wire is numbered as to the plug it would be connected to. If spark plug wires are not numbered, each wire should be marked as to the plug number from which it was removed.
4. Clean the area around each spark plug port with compressed air.
5. Using the proper size spark plug socket, remove each spark plug.
6. Check the gap on each new spark plug and set to specification if necessary.
7. Install each spark plug and torque to specifications.
8. Re-grease the spark plug boots (see NOTE) and reinstall the spark plug wires.
9. Reinstall all components which were removed to provide access to the spark plugs.

D-1: IDLE FUEL MIXTURE

A. Propane Enrichment Method

NOTE: —Leave all vacuum signal hoses attached to the air cleaner assembly when relocating the assembly to perform carburetor adjustments. **The air cleaner assembly must be installed, however, when measuring engine speeds.**

—Some engines may experience normal oscillations in idle speeds which could cause variations in engine speed measurement. If this condition is encountered, use the **average** engine speed.

1. Apply the parking brake and block the wheels. Then, start the engine, bring to normal operating temperature, and turn off.
2. Connect a tachometer.
NOTE: If the engine has a "Dura-Spark I" ignition system (blue coil tower), use tachometer 02-0362 or equivalent.
3. If so equipped, disconnect the fuel evaporative purge valve signal vacuum hose as follows:
Trace the purge valve vacuum hose from the purge valve (located on the canister) to the first point where the vacuum hose can be detached from the underhood hose routing, (vacuum tee connection, PVS, etc.). Disconnect the vacuum hose at **that** point, cap the open port and plug the vacuum hose.
CAUTION: To prevent possible damage to the purge valve, **do not** disconnect the vacuum hose at the purge valve.
4. If so equipped, disconnect the evaporative emission purge hose at the air cleaner and plug the nipple.
5. Disconnect the crankcase ventilation closure hose from the air cleaner and plug the nipple.

6. Disconnect the flexible fresh air tube from the air cleaner duct or adaptor. Using a propane enrichment Tool (T75L-9600-A or equivalent), insert the tool hose approximately 3/4 of the way into the duct or fresh air tube. If necessary, secure the hose with tape.
7. Verify that the idle mixture limiter(s) is set to maximum rich position (counterclockwise against the stop); correct if required.
8. Check engine curb idle rpm (or A/C—off rpm) in accordance with Procedure D-2; if necessary, reset to specification.
With the engine idling, place the transmission selector in the mode specified for idle fuel mixture check (see engine emission decal and the note below). **Gradually** open the propane tool valve and watch for engine speed gain, if any, on the tachometer. When the engine speed reaches a maximum and then begins to drop off, note the amount of speed gain.
9. **NOTE:** —On vehicles equipped with automatic transmission, the transmission position in which curb idle speed is set **may differ** from the position in which the idle fuel mixture check is performed. Be sure the correct transmission position is employed in both cases.

—With the transmission in neutral, run the engine at approximately 2500 rpm for 15 seconds before each mixture check.

—If the engine speed will not drop off, check the bottle gas supply. If necessary, repeat Step 9 with a new bottle gas supply.

10. Compare measured speed gain to specified speed gain:
NOTE: If it is determined that idle fuel mixture adjustment will be necessary, adjust the mixture according to the **reset** rpm specification.
 - a. If the measured speed gain is within specification, except as noted below, proceed to Step 11.
NOTE: If the measured speed gain is "0" rpm (no rpm rise) and the **minimum** speed gain specification is "0" rpm, proceed to Step 10d.
 - b. If the measured speed gain is **higher** than the speed gain specification:
—Turn the mixture screw(s)/limiter(s)* **counterclockwise** (rich) in equal amounts and simultaneously repeat Steps 8-9 until the measured speed rise meets the **reset** rpm specification. After final adjustment, proceed to Step 11.
 - c. If the measured speed gain is **lower** than the speed gain specification:
—Turn the mixture screw(s)/limiter(s)* **clockwise** (lean) in equal amounts and simultaneously repeat Steps 8-9 until the measured speed rise meets the **reset** rpm specification. After final adjustment, proceed to Step 11.

*If the mixture limiter(s) must be removed for further adjustment, use Tool T-75L-9500-A to simplify removal and prevent damage to screw.

- d. If there is no rpm rise and the **minimum** speed gain specification is "0" rpm, perform the following speed drop test:

NOTE: Speed drop test information is specified with the artificial enrichment requirements on the engine emission decal whenever the minimum speed gain specification is "0" rpm.

- (1) While watching the tachometer, adjust the mixture screw(s)/limiter(s) clockwise (lean) by the number of turns specified for the speed drop test. Note the drop in engine speed.

—If the measured speed drop is **equal to** or drops off by **more than** (including stall) the speed drop specification, return the mixture limiter(s) to the maximum rich position, or the mixture screw(s) to the position before adjustment. Proceed to Step 11.

—If the measured speed drop is **less than** the specified **minimum** speed drop specification, leave the mixture limiter(s) in the adjusted position and repeat Steps 8-10.

11. Turn engine off. Install new service limiter(s) against the maximum rich stop if the mixture limiter(s) were removed. If the mixture limiter(s) was **not** removed but the mixture limiter(s) is **not** against the maximum rich stop, remove the limiter(s) and install new service limiter(s) against the stop.

NOTE: Re-check engine rpm and idle fuel mixture if the mixture screw is disturbed during limiter installation.

Pre-soaking the limiter cap in hot water will soften the material and reduce the installation effort.

12. Remove test equipment and secure air cleaner wing nut(s) to specification.

- B. **Optimum Idle Method** (California Only—To be used **only** when propane enrichment equipment is not available)

NOTE: —Leave all vacuum signal hoses attached to the air cleaner assembly when relocating the assembly to perform carburetor adjustments. **The air cleaner assembly must be installed, however, when measuring engine speeds.**

—Some engines may experience normal oscillations in idle speeds which could cause variations in engine speed measurement. If this condition is encountered, use the **average** engine speed.

1. Apply the parking brake and block the wheels. Then, start the engine, bring to normal operating temperature, and turn off.
2. Connect a tachometer.

NOTE: If the engine has a "Dura-Spark I" ignition system (blue coil tower), use tachometer 02-0362 or equivalent.

3. If so equipped, disconnect the fuel evaporative purge valve signal vacuum hose as follows: Trace the purge valve vacuum hose from the purge valve (located on the canister) to the first

point where the vacuum hose can be detached from the underhood hose routing, (vacuum tee connection, PVS, etc.). Disconnect the vacuum hose at **that** point, cap the open port and plug the vacuum hose.

CAUTION: To prevent possible damage to the purge valve, **do not** disconnect the vacuum hose **at the purge valve.**

4. If so equipped, disconnect the evaporative emission purge hose at the air cleaner and plug the nipple.
5. Disconnect the crankcase ventilation closure hose from the air cleaner and plug the nipple.
6. Remove the idle mixture limiter(s) with Tool T75L-9500-A or equivalent.
7. Check curb idle rpm (or A/C—OFF rpm) in accordance with Procedure D-2; if necessary, reset to specification.
8. With the engine idling, place the transmission selector in the position specified for the propane enrichment check (see engine emission decal). Adjust the engine rpm to the "alternate idle speed change" rpm. (See engine emission decal.) Note the **new** idle speed rpm on the tachometer.

NOTE: —If the "alternate idle speed change" rpm is specified as "0", the above idle speed adjustment is not necessary.

—On vehicles equipped with automatic transmission, the transmission position in which curb idle rpm is set **may differ** from the position in which the idle fuel mixture check is performed. Be sure the correct transmission position is employed in both cases.

9. Adjust the idle mixture screw(s) (rich or lean) and idle speed to achieve best idle at the **new** idle speed rpm.
10. If the "alternate idle speed change" rpm is "0", proceed to Step 12; otherwise, proceed to Step 11.
11. Turn the idle mixture screw(s) clockwise (lean) in equal amounts until the engine speed drops by the specified "alternate idle speed change" rpm.
12. Turn the engine off. Install new service limiter(s) at the maximum rich stop.

NOTE: —If the mixture screw setting is disturbed during limiter installation, repeat Steps 7-11.

—Pre-soaking the limiter cap in hot water will soften the material and reduce the installation effort.

13. Reconnect pertinent hoses removed in Steps 3, 4 and 5.
14. Remove test equipment and tighten the air cleaner wing nut(s) to specification.

D-2: ENGINE IDLE SPEEDS

A. Pre-Adjustment Instructions (All Engine Speeds)

NOTE: —Leave all vacuum signal hoses attached to the air cleaner assembly when relocating the assembly to perform carburetor adjustments. **The**

air cleaner assembly must be installed, however, when measuring engine speeds.

—Some engines may experience normal oscillations in idle speeds which could cause variations in engine speed measurement. If this condition is encountered, use the **average** engine speed.

—When performing engine rpm adjustments on vehicles equipped with the hydro-boost brake system, make certain the main brake foot pedal is **not** depressed—since engine rpm is affected by foot pedal pressure.

1. Apply the parking brake and block the wheels.

NOTE: If vehicle is equipped with automatic parking brake release, disconnect the vacuum line at the parking brake and plug the vacuum line.

2. Turn off all accessories. Start the engine, bring to normal operating temperature, and turn engine off.
3. On 2.3L engine applications equipped with thermactor systems, revise the dump valve vacuum hoses as follows:
 - a. For dump valves with one or two vacuum hoses at the **side**, disconnect and plug the hose(s).
 - b. For dump valves with one vacuum hose at the **top** only connected to the spark port in the carburetor, remove the hose at the dump valve and plug it. Connect a slave hose from the **dump valve vacuum fitting to an intake manifold vacuum fitting**.
4. Disconnect the fuel evaporative purge valve signal vacuum hose as follows: Trace the purge valve vacuum hose from the purge valve (located on the canister) to the first point where the vacuum hose can be detached from the underhood hose routing, (vacuum tee connection, etc.). Disconnect the vacuum hose at **that point**, cap the open port, and plug the vacuum hose.

CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum hose at the purge valve.

5. Check throttle and choke linkages for freedom of movement. Correct as required.
6. Connect a tachometer.

NOTE: If the engine has the "Dura Spark I" ignition system (blue coil tower), use tachometer 02-0362 or equivalent.

B. Fast Idle rpm

1. Revise the distributor vacuum advance hose as follows:
 - a. On all engines **except** 2.8L/5.0L (302 CID) engines with Model 2700 carburetor, remove the spark delay valve, if so equipped, and route the distributor vacuum advance hose directly to the advance side of the distributor.
 - b. On 2.8L/5.0L (302 CID) engines with Model 2700 carburetor, remove and plug the distributor vacuum advance hose.
2. Trace the EGR signal vacuum hose from the EGR valve to the carburetor:

- a. If an EGR/PVS valve or cold weather modulator is located in the vacuum hose routing, disconnect the EGR vacuum hose at the EGR valve and plug the hose.
 - b. If not equipped with an EGR/PVS valve or cold weather modulator, **do not detach** the EGR vacuum hose.
3. On 2.3L engines with Model 6500 carburetor:
 - a. Remove vacuum hose from cold start vacuum switch.
 - b. Apply vacuum signal to cold start vacuum switch (5" Hg minimum). Use manifold vacuum or external source.
 4. With the engine running at normal operating temperature, the choke plate fully opened, and the transmission in Neutral (M/T) or Park (A/T), place the fast idle lever on the specified step of the fast idle cam. Allow engine speed to stabilize and measure the fast idle rpm. Adjust if not within ± 100 rpm of specification.
 5. Run engine at approximately 2500 rpm for 15 seconds and recheck fast idle rpm.
 6. On 5.0L (302 CID) engine with Model 2700 carburetor, check the auxiliary fast idle rpm as follows:
 - a. Turn the engine off. Disconnect the vacuum hose from the vacuum-operated throttle modulator and plug the hose.
 - b. Connect a slave vacuum hose from an engine manifold vacuum source to the throttle modulator.
 - c. Start the engine and depress the throttle until vacuum modulator plunger extends fully. Then, release the throttle.
 - d. Check the auxiliary fast idle rpm. If adjustment is necessary, loosen the locknut securing the modulator. Turn the modulator until the specified auxiliary fast idle rpm is obtained; then, tighten the locknut.
 - e. Remove the slave vacuum hose and reconnect the system vacuum hoses.
 7. Repeat Steps 4 thru 6 until the required fast idle rpm can be repeated.
 8. Turn the engine off. Reconnect the vacuum line(s)/spark delay valve (if so equipped) removed in Steps 1 thru 3.
- C. **Curb Idle Speed (Also Includes "A/C-Off", "A/C-On", and "TSP-OFF" Speeds, If so Specified)**
1. Before each speed check (includes re-check), run the engine at approximately 2500 rpm for 15 seconds in neutral or park. Allow engine to return to curb idle.
 2. With the air conditioning selector in the "OFF" position (unless otherwise specified), the engine at normal operating temperature, the choke plate fully opened, and the transmission selector in the specified gear (see engine emission decal), measure each required engine speed as defined and specified on the engine emission decal. If not within ± 50 rpm of specification, adjust the respective engine speed as follows:

NOTE: —The method of adjusting each engine speed depends upon the speed-controlling device(s) employed. Therefore, examine the carburetor, determine the device(s) used, if they are functional, and then perform the adjustment procedure.

—Repeat Steps 1 and 2 until each engine speed is repeatable.

—On carburetors equipped with a dashpot, the dashpot clearance must be adjusted each time the curb idle speed is adjusted.

2.3L ENGINE WITH MODELS 5200 AND 6500 CARBURETORS

a. No Solenoid Device

- (1) Curb Idle rpm
Turn the throttle stop adjusting screw until the specified curb idle rpm is obtained. (Insure adjusting screw is against stop).
- (2) Dashpot Clearance (if equipped)
With the engine off, collapse the dashpot plunger and check the clearance between the plunger and throttle lever pad. Adjust if not in specified limits.

b. Anti-Diesel TSP or Anti-Diesel TSP with Vacuum-Operated Throttle Modulator (A/C Only)

- (1) Curb Idle rpm
Turn the TSP-ON idle adjusting screw until the specified curb idle rpm is obtained.
- (2) TSP-OFF rpm
With the engine running, collapse the TSP plunger by forcing the throttle lever pad against the plunger. Turn the throttle stop adjusting screw until the specified TSP-OFF rpm is obtained.

c. Solenoid-Dashpot

- (1) Curb Idle rpm
Adjust the curb idle rpm by turning the TSP-ON adjusting screw until the specified curb idle rpm is obtained.
- (2) Dashpot Clearance
Dashpot clearance adjustment is not required. Clearance is controlled by the TSP.
- (3) TSP-OFF rpm
With the engine running, collapse the solenoid-dashpot plunger by forcing the throttle lever pad against the TSP plunger. Turn the throttle stop adjusting screw until the specified TSP-OFF rpm is obtained.

d. Vacuum-Operated Throttle Modulator (A/C Only)

- (1) Curb Idle rpm
Loosen the locknut securing the vacuum-operated throttle modulator and rotate the modulator until there is clearance between the modulator stem and the throttle lever pad. Adjust curb idle rpm by turning the throttle stop adjusting screw until the specified curb idle rpm is obtained.
Adjust the vacuum-operated throttle modulator by turning the modulator (locknut loosened)

until the modulator stem contacts the throttle lever pad. Then, tighten the locknut.

e. Vacuum-Operated Throttle Modulator with Dashpot (A/C Only)

- (1) Curb Idle rpm
Adjust the curb idle rpm by turning the throttle stop adjusting screw until the specified curb idle rpm is obtained.
NOTE: If the curb idle rpm cannot be adjusted low enough, loosen the TSP-ON adjusting screw on the throttle lever pad until sufficient clearance is present.
- (2) Dashpot Clearance
Collapse the throttle modulator plunger and check the clearance between the stem pad and the TSP-ON adjusting screw on the throttle lever pad. If adjustment is necessary, turn the TSP-ON adjusting screw until the specified clearance is obtained between the screw and the modulator pad.

3.3L (200 CID) ENGINE WITH MODEL 1948 CARBURETOR

a. No Solenoid Device

- (1) Curb Idle rpm
Turn the throttle stop screw until the specified curb idle rpm is obtained.
- (2) Dashpot Clearance (if equipped)
With the engine off, collapse the dashpot plunger and check the clearance between the plunger and throttle lever pad. Adjust if not in specified limits.

b. Anti-Diesel TSP

- (1) Curb Idle rpm
Turn the TSP-ON adjusting screw until the specified curb idle rpm is obtained.
- (2) TSP-OFF rpm
With the engine running, collapse the TSP plunger by forcing the throttle lever pad against the plunger. Turn the throttle stop adjusting screw until the specified TSP-OFF rpm is obtained.

3.3L/4.1L (200/250 CID) ENGINES WITH MODEL YFA CARBURETOR

a. No Solenoid Device

- (1) Curb Idle rpm
Turn the throttle stop adjusting screw until the specified curb idle rpm is obtained.
- (2) Dashpot Clearance (if equipped)
With the engine off, collapse the dashpot plunger and check the clearance between the plunger and throttle lever pad. Adjust if not to specified limits.

b. Anti-Diesel TSP

- (1) Curb Idle rpm
Turn the throttle stop adjusting screw until the specified curb idle rpm is obtained.
- (2) TSP-OFF rpm
With the engine running, collapse the TSP plunger by forcing the throttle lever pad against the plunger. Turn the throttle stop adjusting screw until the specified TSP-OFF rpm is obtained.

c. Anti-Diesel TSP and A/C TSP

(1) A/C-On rpm

—Move the climate control selector on the instrument panel to "A/C-On" to energize the front TSP.

—Open the throttle to allow the TSP plunger to extend fully. Then, release the throttle.

—Disconnect the A/C compressor clutch wire at the compressor.

—Check A/C-On rpm. If adjustment is required, loosen the locknut securing the front TSP and turn the TSP until the specified A/C-ON rpm is obtained. Then, tighten the locknut.

—After completion, move the climate control selector to the "off" position. Reconnect the A/C compressor clutch wire.

(2) A/C-Off rpm

Adjust the TSP—located at the back of the carburetor—by turning the hex head on the rear of the solenoid until the specified A/C-Off rpm is obtained.

(3) TSP-OFF rpm

With the engine running, collapse the back TSP plunger by forcing the throttle lever pad against the plunger. Turn the throttle stop adjusting screw until the specified TSP-OFF rpm is obtained.

2.8L/5.0/5.8/6.6L (302/351W/351M/400 CID) ENGINES WITH MODEL 2150 CARBURETOR

2.8L/5.0L (302 CID) ENGINES WITH MODEL 2700 CARBURETOR

NOTE: On engines equipped with the Model 2700 carburetor, the accelerator pump lever lash must be checked and adjusted (if necessary) each time the A/C-Off rpm or curb idle rpm is adjusted. Perform the following procedure:

—Apply a slight pressure downward on the top of the nylon nut located on the accelerator pump to take up the linkage clearances.

—Check the accelerator pump lever lash, between the top of the accelerator pump stem and the accelerator pump lever. Compare to specified clearance.

—If necessary, adjust the accelerator pump lash using the nylon nut on the accelerator pump rod to obtain the specified clearance.

a. No Solenoid Device

(1) Curb Idle rpm

Turn the throttle stop adjusting screw until the specified curb idle rpm is obtained.

(2) Dashpot Clearance (if equipped)

With the engine off, collapse the dashpot plunger and check the clearance between the plunger and the throttle lever pad. Adjust if not to specification.

b. Anti-Diesel TSP (Non-A/C Only)

(1) Curb Idle rpm

V-8 Engines: Adjust the solenoid positioner by rotating the long screw (part of the TSP mounting bracket) until the specified curb idle rpm is obtained.

2.8L Engines: Adjust the solenoid positioner by turning the hex head, located on the rear of the solenoid, until the specified curb idle rpm is obtained.

(2) TSP-OFF rpm

With the engine running, collapse the TSP plunger by forcing the throttle lever pad against the plunger. Turn the throttle stop adjusting screw until the specified TSP-OFF rpm is obtained.

c. A/C TSP (A/C Only)

(1) A/C-On Speed

—Move the climate control selector on the instrument panel to "A/C-On".

—Open the throttle to allow the TSP plunger to extend fully. Then, release the throttle.

—Disconnect the A/C compressor clutch wire at the compressor.

—Check A/C-On rpm and, if necessary, adjust as follows:

—**V-8 Engines:** Turn the long screw (part of the TSP mounting bracket) until the specified A/C-On rpm is obtained.

—**2.8L Engines:** Adjust the solenoid positioner by turning the hex head, located on the rear of the solenoid, until the specified A/C-On rpm is obtained.

—After completion, move the climate control selector to the "Off" position. Reconnect the A/C compressor clutch wire.

(2) A/C-Off rpm

Turn the throttle stop adjusting screw until the specified A/C-OFF rpm is obtained.

7.5L (460 CID) ENGINE WITH MODEL 4350 CARBURETOR

a. Non-A/C (Except Police Interceptor) (The TSP is non-functional)

(1) Curb Idle rpm

Turn the throttle stop adjusting screw until the specified curb idle rpm is obtained.

b. A/C TSP (Except Police Interceptor)

(1) A/C-ON Speed

—Move the climate control selector on the instrument panel to "A/C-ON".

Open the throttle to allow the TSP plunger to extend fully. Then, release the throttle.

—Disconnect the A/C compressor clutch wire at the compressor.

—Check A/C-ON rpm and, if necessary, adjust as follows:

—Turn the long screw (part of the TSP mounting bracket) until the specified A/C-ON rpm is obtained.

—After completion, move the climate control selector to the "OFF" position. Reconnect the A/C compressor clutch wire.

(2) A/C-OFF rpm

Turn the throttle stop adjusting screw until the specified A/C-OFF rpm is obtained.

c. **Anti-Diesel TSP: Police Interceptor A/C and Non-A/C Only**

- (1) Curb Idle rpm
Adjust the solenoid positioner by rotating the long screw (part of the TSP mounting bracket) until the specified curb idle rpm is obtained.
- (2) TSP-OFF rpm
With the engine running, collapse the TSP plunger by forcing the throttle lever pad against the plunger. Turn the throttle stop adjusting screw until the specified TSP-OFF rpm is obtained.

D. **Post-Adjustment Instructions (All Engine Speeds)**

1. On 2.3L engines equipped with Thermactor systems, correct the dump valve vacuum hose routing (see Step 4 in Pre-Adjustment Instructions).
2. Reconnect the fuel evaporative purge valve signal vacuum hose (see Step 5 in Pre-Adjustment Instructions).
3. Stop engine. Remove all test equipment, reconnect automatic parking brake release (if disconnected), and torque the air cleaner wing nut(s) to specification.

D-3: AUTOMATIC CHOKE SYSTEM

I. APPLICATION:

A. Pre-Check Instructions

1. Apply parking brake and block the wheels.
2. Start the engine, bring to normal operating temperature, and turn off.
3. Remove the air cleaner assembly and plug the vacuum hose(s) to the air cleaner.

B. Freedom of Linkage and System Integrity Check

1. Verify that vacuum hoses, solenoid, and electric choke wires are properly connected and intact; correct as required. Check torque of carburetor hold-down nuts; retorque to specification, if necessary.
2. Verify that the choke cap index mark points to the specified mark on the choke housing; correct if required.
3. Check all carburetor linkages for freedom of operation as follows:

- a. Manually depress the throttle lever to 1/4 open position and rotate the choke plate to the closed position. Release the choke plate; the choke plate should rotate smoothly to the open position. If sticking or binding is exhibited, clean/repair/replace/adjust the choke linkage, as required, to restore freedom of choke plate movement. If necessary, bring engine to normal operating temperature and recheck linkage freedom.

CAUTION: On Models 5200 and 6500 carburetors: if the bimetal assist spring is to be removed during repair work, be careful not to deform the spring during removal and reinstallation.

4. If the carburetor is not equipped with an electric assist or full electric choke, proceed to Part D. Otherwise, proceed to Part C.

C. Electric Choke Functional Check

1. Model 5200 and 6500 Carburetors

- a. To set the choke on high cam, depress the throttle lever to the 1/4 open position and then push the choke plate completely closed. While holding the choke plate closed, release the throttle lever; then release the choke plate.
- b. Use a choke tester (14-0206 or equivalent) and direct the air flow at the choke bimetal housing cover.
- c. Cool the choke housing following the choke tester manufacturer's instructions, **except** as follows:
—Do not use the manufacturer's choke come-off time specifications if supplied with tester kit.
—Direct a continuous volume of air onto the choke bimetal housing cover until the bimetal closes and seats the choke plate lightly in the air horn.
- d. Move the fast idle speed cam to the kickdown step to avoid excessive engine speed.
- e. Without touching the throttle, start the engine. Using a stopwatch, measure the choke plate opening time from engine start-up until the choke plate reaches the stop in the vertical position.
- f. Compare measured choke come-off time to specification:
—If the choke come-off time meets specification, allow the engine to return to curb idle speed. Turn the engine off, and proceed to Part D (if applicable) and, then, Part E.
—If the choke come-off time does not meet specification, allow the engine to return to curb idle speed. Turn the engine off, and proceed to Appendix "A" (see Section III).

2. Model 2150 Carburetor

- a. To set the choke on high cam, depress the throttle lever to the 1/4 open position and then push the choke plate completely closed. While holding the choke plate closed, release the throttle lever; then, release the choke plate.
- b. Remove the hot air supply tube at the choke housing. Connect a choke port adaptor and choke tester (14-0206 or equivalent) to the choke hot air inlet port. Follow the choke tester manufacturer's instructions for connecting the tester.

CAUTION: Use extreme care when removing and reinstalling the choke hot air supply tube to prevent cross-threading and thread damage.

- c. Cool the choke housing following the choke tester manufacturer's instructions, **except** as follows:
—Do not use the manufacturer's choke come-off time specifications if supplied with tester kit.

—Before activating the choke tester, manually retract the positive choke closure spring (external spring on pulldown motor) and secure it in the retracted position with an alligator clip. After the choke plate closes, remove the alligator clip and proceed to Step d.

—Turn off choke tester or inlet valve momentarily at 15-second intervals until the bimetal closes and seats the choke plate lightly in the air horn.

- d. Remove the choke tester from the choke hot air inlet port adaptor and install a plug or cap on the adaptor.
- e. Move the fast idle cam to the kickdown step to avoid excessive engine speed.
- f. Without touching the throttle, start the engine. Using a stopwatch, measure the choke plate opening time from engine start-up until the choke plate reaches the stop in the vertical position.
- g. Compare measured choke come-off time to specification:
 - If the choke come-off time meets specification, allow the engine to return to curb idle speed. Turn the engine off, and proceed to Step h.
 - If the choke come-off time does not meet specification, allow the engine to return to curb idle speed. Turn the engine off, and proceed to Appendix "A" (See Section III).
- h. Remove the choke tester adaptor and reinstall the choke hot air supply tube (see **Caution note under Step B**). Proceed to Part D (if applicable) and, then, Part E.

3. Models 4350 and YFA Carburetors

- a. To set the choke on high cam, depress the throttle lever to the 1/4 open position and then push the choke plate completely closed. While holding the choke plate closed, release the throttle lever; then, release the choke plate.
- b. Remove the hot air supply tube at the choke housing. Connect a choke port adaptor and choke tester (14-0206 or equivalent) to the choke hot air inlet port. Follow the choke tester manufacturer's instructions for connecting the tester.

CAUTION: Use extreme care when removing and reinstalling the choke hot air supply tube to prevent cross-threading and thread damage.

- c. Cool the choke housing following the choke tester manufacturer's instructions, except as follows:
 - Do not use the manufacturer's choke come-off time specifications if supplied with tester kit.
 - Turn off choke tester or inlet valve momentarily at 10 second intervals until the bimetal closes and seats the choke plate lightly in the air horn.

- d. Remove the choke tester from the choke hot air inlet port adaptor. Leave the adaptor open (unplugged).

- e. Move the fast idle cam to the kickdown step to avoid excessive engine speed.

- f. Without touching the throttle, start the engine. Using a stopwatch, measure the choke plate opening time to the following position:

— **Model YFA Carburetor:** choke plate rotation time is measured from engine start-up until the choke plate reaches the stop in the vertical position.

— **Model 4350 Carburetor:** choke plate rotation time is measured from engine start-up until the choke linkage moves the secondary throttle lockout lever just clear of the secondary throttle shaft lever.

- g. Compare measured choke come-off time to specification:

—If the choke come-off time meets specification, allow the engine to return to curb idle speed. Turn the engine off, and proceed to Step h.

—If the choke come-off time does not meet specification, allow the engine to return to curb idle speed. Turn the engine off, and proceed to Appendix "A" (see Section III).

- h. Remove the choke tester adaptor and reinstall the choke hot air supply tube (see **Caution note under Step b**). Proceed to Part D (if applicable) and then Part E.

4. Model 1946 Carburetor

- a. With the engine at curb idle speed, disconnect the stator lead at the choke cap terminal and connect a test light in series with the stator lead and ground; the test light should glow at all times while the engine is running. If the test light does not glow, either the alternator or the stator lead is defective. Repair or replace as required.
- b. Turn the engine off. To set the choke on high cam, depress the throttle lever to the 1/4 open position and then push the choke plate completely closed. While holding the choke plate closed, release the throttle lever; then, release the choke plate.
- c. Remove the hot air supply tube at the choke housing. Connect a choke port adaptor and choke tester (14-0206 or equivalent) to the choke hot air inlet port. Follow the choke tester manufacturer's instructions for connecting the tester.

CAUTION: Use extreme care when removing and reinstalling the choke hot air supply tube to prevent cross-threading and thread damage.

- d. Cool the choke housing following the choke tester manufacturer's instructions, **except** as follows:
 - Do not use the manufacturer's choke come-off time specifications if supplied with tester kit.

—Turn off choke tester or inlet valve momentarily at 15 second intervals until the bimetal closes and seats the choke plate lightly in the air horn.

- e. Remove the choke tester from the choke hot air inlet port adaptor and install a plug or cap on the choke port adaptor.
- f. With the engine **off** and the fast idle screw positioned on the high step of the cam, disconnect the stator lead from the choke cap terminal and connect a jumper wire from the positive terminal of the battery of the terminal on the choke cap. Using a stopwatch, measure choke plate rotation time from the point of completing the circuit until the choke plate reaches the stop in the vertical position.
- g. Compare measured choke come-off time to specification:
—If the choke come-off time meets specification, proceed to Step h.
—If the choke come-off time does not meet specification, proceed to Appendix "A" (see Section III).
- h. Remove the choke tester adaptor and reinstall the choke hot air supply tube (**see Caution note under Step c**). Remove the jumper wire and reconnect the stator lead to the choke cap. Proceed to Part D (if applicable) and, then, Part E.

D. Altitude Compensation Assembly (if so equipped)

1. Remove the aneroid housing (outer most housing) and gasket by removing the three machine screws. This exposes the poppet valve assembly.
2. Check the poppet valve for freedom of operation. If poppet valve is free, proceed to Step 4.
3. If poppet valve is sticky or binds, spray choke cleaner (C9AZ-19A501-B or equivalent) on the poppet valve and guide area to remove any deposits. Make sure that valve is completely free by depressing the valve. If unable to free up the valve, replace the altitude compensator assembly.
4. Reinstall the aneroid housing and gasket onto the valve housing (three machine screws).

E. Post-Check Instructions

1. Reinstall air cleaner assembly and reconnect pertinent vacuum lines. Torque air cleaner wing nut(s) to specification.

II. APPLICATION: MODEL 2700 (VARIABLE VENTURI)

A. Pre-Check Instructions

1. Apply parking brake and block wheels.
2. Start the engine, bring to normal operating temperature, and turn off.
3. Remove air cleaner assembly and plug vacuum line(s) to air cleaner.

B. Freedom of Linkage and System Integrity Check

1. Verify that vacuum hoses, solenoid and electric choke wires are properly connected and intact,

check that all carburetor hold down nuts are torqued to specification. Correct as required.

2. Check all carburetor linkages for freedom of operation. Correct as required.

C. Electric Choke Functional Check

1. Remove the hot air supply tube at the choke housing. Connect a choke port adaptor and choke tester (14-0206 or equivalent) to the choke hot air inlet port. Follow the choke tester manufacturer's instructions for connecting the tester.

CAUTION: Use extreme care when removing and reinstalling the choke hot air supply tube to prevent cross-threading and thread damage.

2. To set the choke, manually depress the throttle lever to the 1/2 open position and push the choke control rod **down** until the high cam choke lever pad aligns with the third from the highest step of the fast idle cam, counting the highest step as the first (see Fig. 3).
3. Cool choke housing following the choke tester manufacturer's instructions, **except** as follows:
 - a. Do not use manufacturer's choke come-off time specification if supplied with tester kit.
 - b. Turn off the choke tester air inlet valve momentarily at 15 second intervals until the cam lever just touches the cam adjusting screw.
4. Remove choke tester from adaptor.
5. Without touching the throttle, start the engine and verify the following:
 - a. That the choke metering rod moves downward to the seated position within the specified time.
 - b. Open the throttle and observe that the choke high cam lever diaphragm retracts (see Fig. 3).
6. If any of the conditions in Step 5 are not met, refer to the appropriate section of Appendix "A".
7. Turn off the engine.
8. Remove choke tester adaptor and reinstall hot air supply tube.

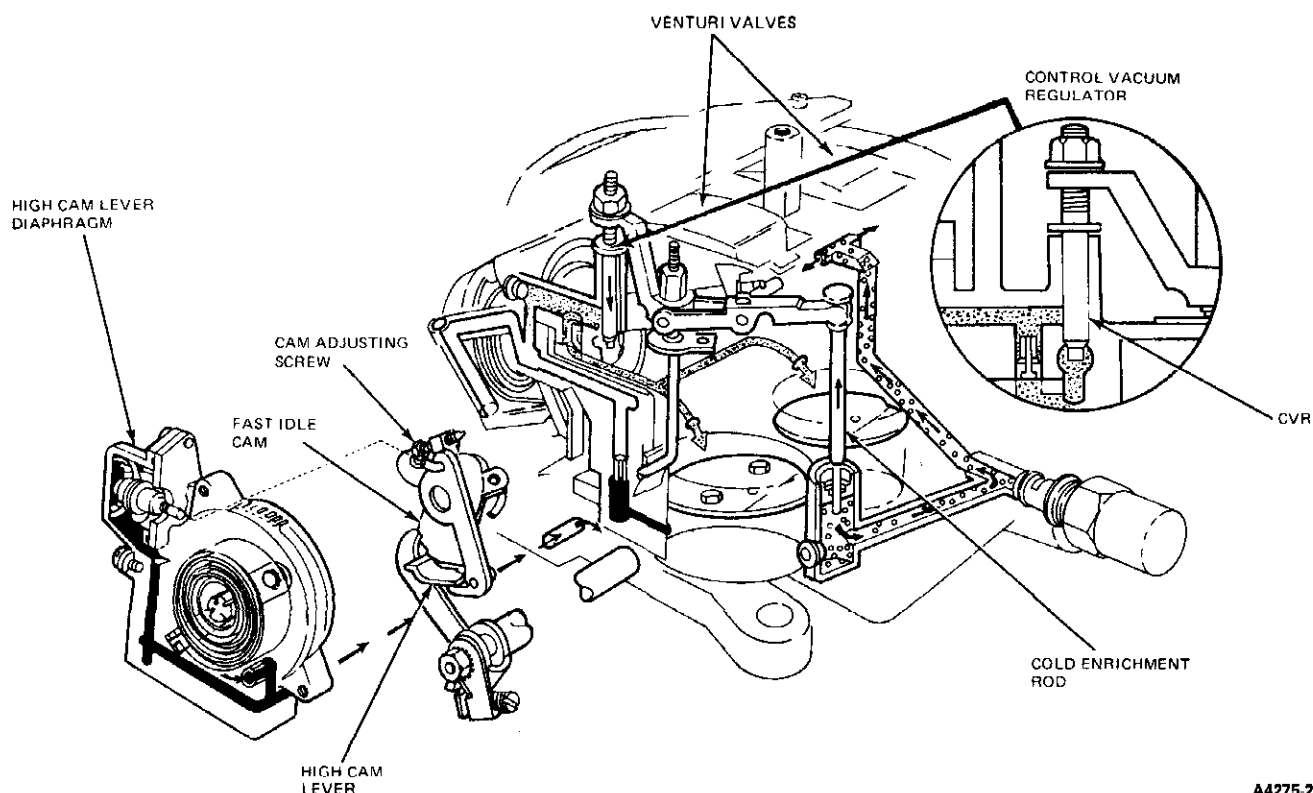
D. Post-Check Instructions

1. Reinstall the air cleaner assembly and reconnect pertinent vacuum lines. Torque air cleaner wing nuts to specification.

III. APPENDIX "A": DIAGNOSIS OF CHOKE SYSTEM

A. All Carburetors except Model 2700: Choke plate does not rotate to the specified position within the specified time.

1. Repeat the electric choke functional check (Section I, Part C) to verify the choke plate rotation time:
 - a. If choke come-off time meets specification, discontinue Appendix "A" and proceed with the remaining steps in Section I, Part C.
 - b. If choke come-off time again does not meet specification, continue with Appendix "A".



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FIG. 3 Motorcraft Model 2700 VV Carburetor .

2. Check all choke linkage for binding; correct as required.
3. For the Model 1946 carburetor **only**: if choke linkage repairs were made, repeat Section I, Part C. If the choke linkage freedom is verified, **replace the choke cap** and repeat Section I, Part C.
4. Remove the choke tester adaptor and reinstall the hot air supply tube.
5. Start the engine and bring to normal operating temperature.
6. With the engine at curb idle speed, disconnect the stator lead at the choke cap terminal and connect a test light in series with the stator lead and ground; the light should glow at all times while the engine is running. If the test light does **not** glow, either the alternator or the stator lead is damaged. Repair or replace as required.
7. If Step 6 did **not** reveal any discrepancy, replace the choke cap.
8. After repairs are completed, repeat the electric choke functional check (Section I, Part C).

B. Model 2700 (Variable Venturi) Carburetor

1. Choke High Cam Lever Fails to Retract

- a. Check for binding, misaligned linkages, broken parts, contamination and/or loose parts.
- b. If repairs were made in Step a, repeat Part C of Section II to see if the choke high cam lever retracts.

—If diaphragm retracts, discontinue Appendix "A" and proceed with remaining steps in Section I, Part C.

- If diaphragm does not retract, continue with Appendix "A".
- c. Remove carburetor and place on a carburetor work stand or equivalent so that throttle can be fully opened.
 - d. Remove high cam pulldown diaphragm cover and check the sealing surface of cover and diaphragm for cracks, bends, distortion, chips, or contamination. Also, make sure vacuum passage in diaphragm cover is open. Repair or replace as required.
 - e. Cap choke hot air inlet; then, using a 21-0014 hand vacuum pump or equivalent, apply a vacuum to the vacuum passage in the high cam pulldown diaphragm flange. If a vacuum reading is maintained, the system is plugged. Clean as required.
 - f. Pull the high cam pulldown diaphragm back from its base (the casting) being careful not to tear or distort it. Inspect it for pinholes, cracks, or decomposed diaphragm material, then proceed as follows:

CAUTION: Rotating pulldown diaphragm changes pulldown setting; therefore, be sure to rotate diaphragm **back** to its original position after inspection.

—If the high cam pulldown diaphragm is satisfactory, reinstall the diaphragm cover taking care to align all vacuum passages. Check linkage and diaphragm for freedom of movement. Install carburetor on vehicle making all necessary connections and return to Step 7 of Section II, Part C.