SHOP TIPS FROM Autolite

VOL. 5, NO. 11 JULY-AUGUST 1967

AUTOLITE EQUIPPED CARS WIN AGAIN

1st

INDIANAPOLIS 500
MAY 31, 1967

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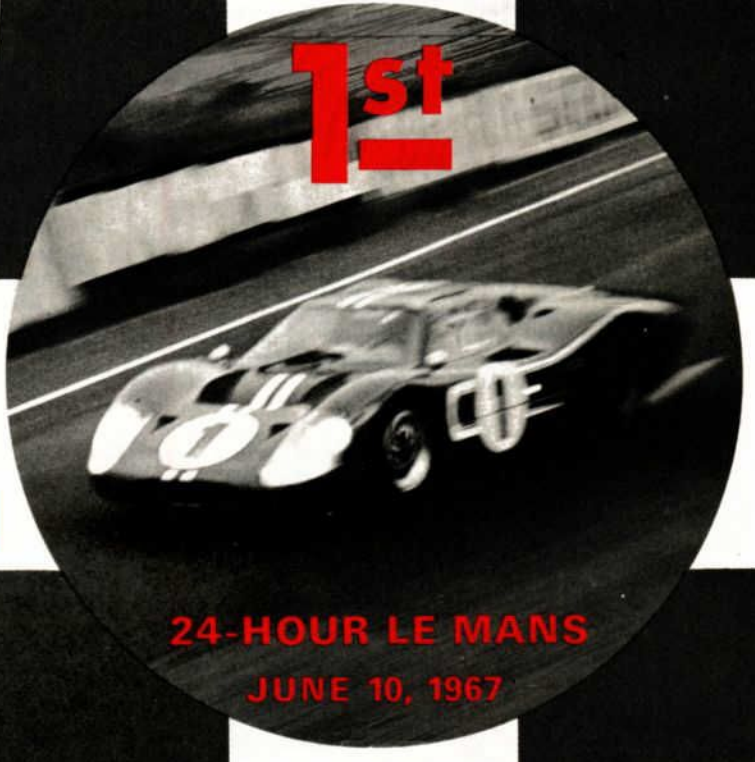

24-HOUR LE MANS
JUNE 10, 1967

...AND AGAIN

Technical parts and service information published by the Autolite-Ford Parts Division and distributed by Ford and Lincoln-Mercury dealers to assist servicemen in Service Stations, Independent Garages and Fleets.

THIS ISSUE FEATURES
19 TIMELY TOPICS
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ROUGH ENGINE

IN THIS ISSUE

Be sure and file this and future bulletins for ready reference. If you have any suggestions for additional information that you would like to see included in this publication, please write to: Autolite-Ford Parts Division of Ford Motor Company, Ford Products Merchandising Dept., P.O. Box 3000, Livonia, Michigan 48151.

Autolite Ford

VOL. 67 PSM 128 LITHO IN U.S.A.

Rough engine idle may be caused by a number of things. One of the more common, however, is improper vacuum.

Although this article applies specifically to all 1967 Ford Motor Company cars with 8-cylinder engines, except 427 CID, the fundamentals can be applied to other applications. The 1967 8-cylinder engines use three different sources for vacuum to operate the vacuum advance in the distributor. The sources are:

I–Intake manifold (see typical installation in Figures 1 &2).

C–Carburetor (see typical installation in Figure 3).

T–Thermal sensing–This is a new device that switches the vacuum source between the intake manifold and the carburetor as explained in the March, 1967 issue of Shop Tips (see typical installation in Figure 4).

The following chart illustrates the application of these three types of vacuum sources.

VACUUM SOURCES	ENGINE DISPLACEMENT				
	289	390	410	428	462
NON THERMACTOR					
1. Automatic Transmission—A/C or Non A/C	C	I	I	I	C
2. Standard Transmission—A/C or Non A/C	C	C	C	C	
THERMACTOR					
1. Standard and Automatic Transmission—A/C or Non A/C (except as noted below)	C	C	C	C	C
a) Mustang, Cougar—Standard and Automatic Transmission, Thermactor, A/C	T	C	–	–	–
b) Fairlane, Comet, Mercury Inter.—Standard and Automatic Transmission, Thermactor, A/C	C	T	–	–	–
c) Thunderbird—Thermactor equipped, A/C or Non A/C	–	T	–	T	–
d) Mercury Full Size—Standard and Automatic Transmission, Thermactor, A/C	–	T	T	T	–
e) Mercury Full Size—Standard and Automatic Transmission, Thermactor, Non A/C	–	–	–	T	–
IMCO					
1. Mercury Full Size—Automatic Transmission, A/C or Non A/C	–	–	C	–	–

NOTE: The vacuum line must be taken off the distributor when setting timing on engines with manifold or thermal device sources for vacuum. Timing will be out of specifications up to 20° if this is not done. Also, to reduce the chance of an incorrect reading, this is highly recommended on units using the carburetor as a source for vacuum.

In the process of correcting rough engine idle conditions, some service technicians have found that relocating the distributor vacuum line to the previously normal connection at the carburetor APPEARS to smooth out engine idle. While this may appear to work, especially on low mileage engines, it nearly always causes subsequent overheating problems at engine idle. The source of distributor vacuum, therefore, should not be relocated to correct a rough engine idle.

Intensive investigation has verified that in all cases where the vacuum is connected correctly, the evident rough engine idle was actually caused by a malfunction within the engine package, even though apparent correction was achieved by transferring the distributor vacuum take off source to the carburetor.

IDLE DIAGNOSIS

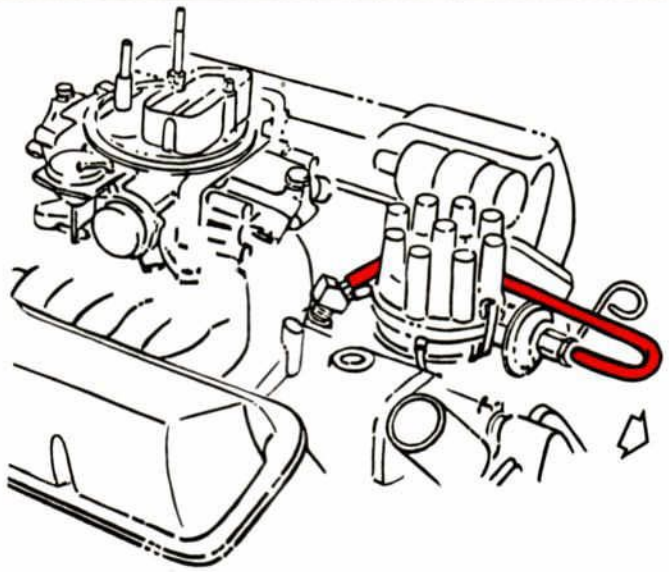


Fig. 1–Typical Intake Manifold Connection

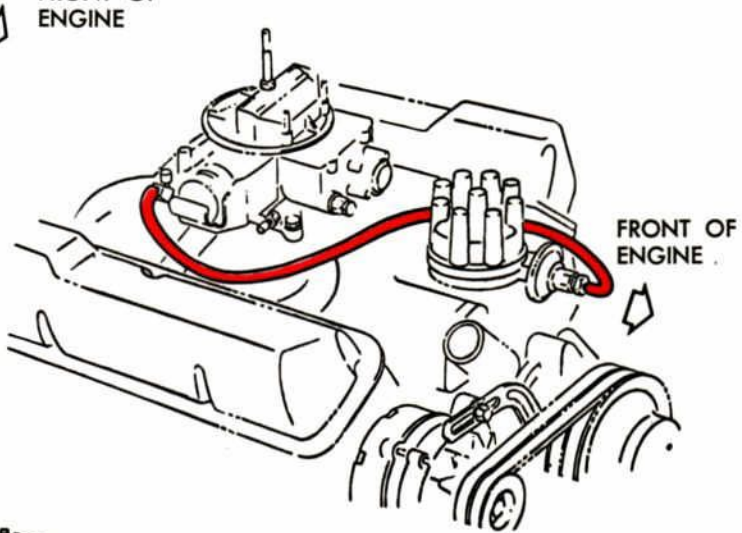


Fig. 2–Typical Intake Manifold Connection

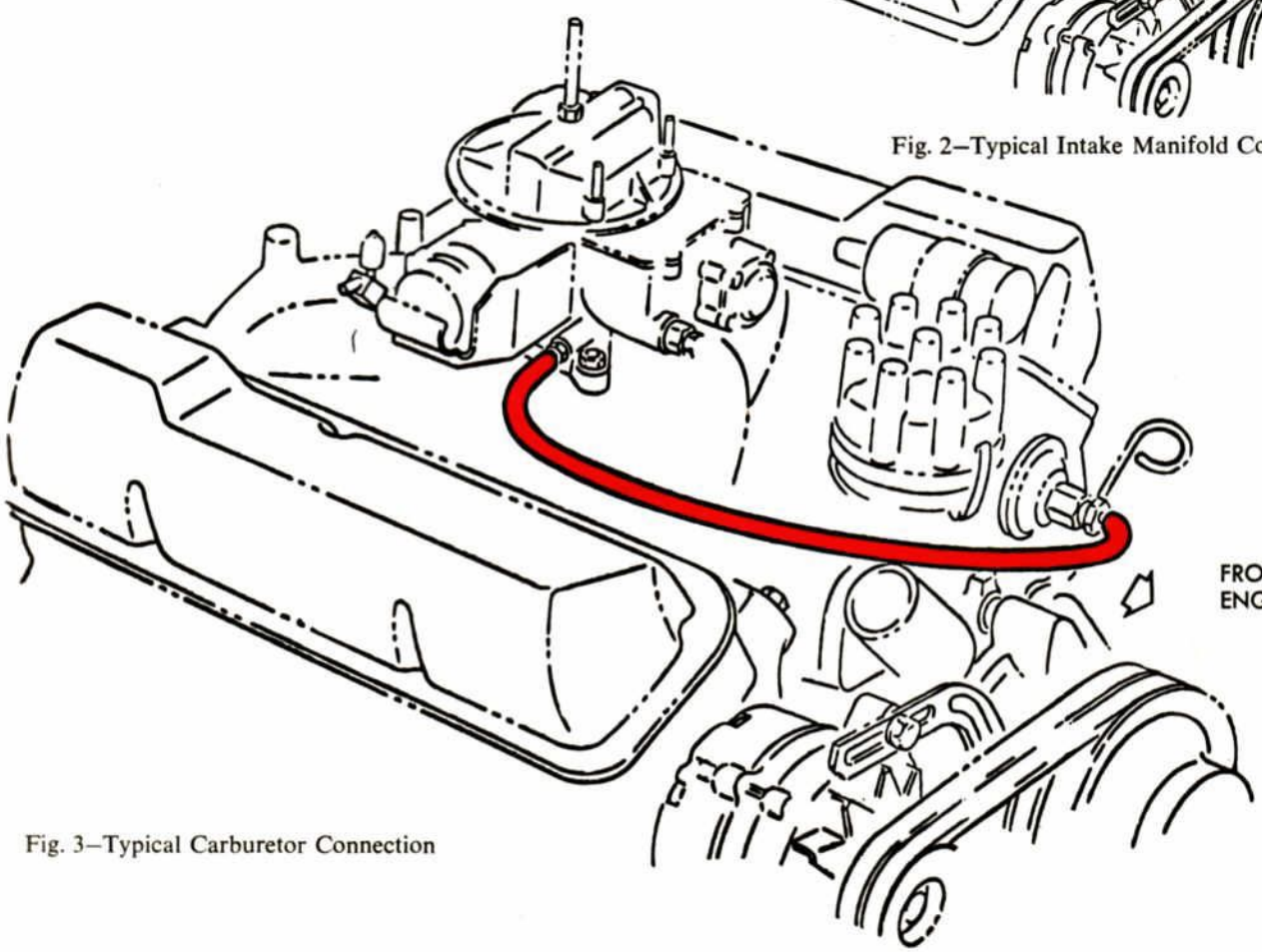


Fig. 3–Typical Carburetor Connection

ROUGH ENGINE IDLE DIAGNOSIS (cont'd)

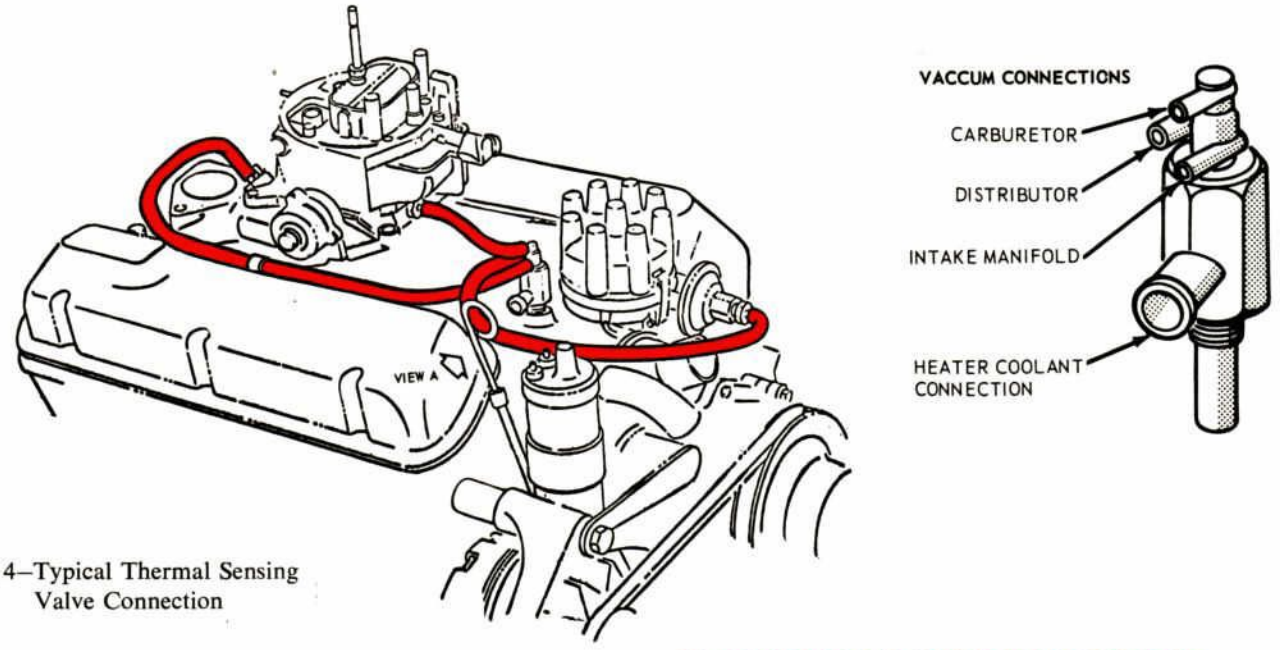


Fig. 4—Typical Thermal Sensing Valve Connection

The following engine diagnosis procedure will assist in establishing the actual cause of rough engine idle.

I. CHECK FOR VACUUM LEAKS

A. Check for missing rubber caps at the various locations in the engine compartment such as, at the power brake cylinder, the fitting at the rear of the intake manifold, back of the carburetor spacer, at the left front side of the Autolite 4300 model 4V carburetor, and the right front on 2V models.

B. Replace any plastic caps on engine vacuum sources with rubber caps. (Ford Part No. 380613-S for 1/4" tube and Ford Part No. 380614-S for 3/16" tube.)

C. Disconnect all vacuum lines to vacuum powered accessories and temporarily plug the take-off connection(s) to verify that no leaks exist in the accessories. If there is no change in idle quality with the vacuum systems disconnected, it can be assumed there are no leaks which could be contributing to the condition.

D. Check for improper sealing of the carburetor to spacer and/or spacer to intake manifold gaskets.

E. Check for possible vacuum leaks at the intake manifold to cylinder head gasket.

II. CHECK AND ADJUST INITIAL IGNITION TIMING IN ACCORDANCE WITH THE FOLLOWING PROCEDURES:

A. Use normal service procedures. Note, however, that the distributor vacuum hose must be disconnected at the distributor and the hose must be plugged.

NOTE: If the vehicle is equipped with a distributor thermal sensing valve, disconnect the distributor and manifold vacuum hoses at the sensing valve and plug the manifold vacuum hose.

III. ADJUST HOT ENGINE IDLE SPEED TO SPECIFICATIONS

A. Establish initial setting of idle fuel mixture screws by turning each screw inward until lightly seated and then turning it outward 1-1½ turns.

B. Operate the engine and adjust engine idle speed to specifications.

C. Adjust each idle mixture screw inward until engine speed drops due to lean mixture. Adjust each screw outward until engine speed increases and then begins to drop. Turn each screw inward until engine speed reaches maximum.

D. If necessary, re-adjust the idle speed to specifications.

NOTE: On 4V carburetors, if it is necessary to adjust the idle speed screw after step "c", it is mandatory that step "c" be repeated until there is no further gain or loss in engine speed.

IV. CHECK IGNITION SYSTEM:

A. Check and adjust spark plugs to specifications.

B. Check distributor dwell and adjust as required.

C. Check for abnormally high secondary wire resistance. Correct as necessary.

V. IF, AFTER THE ABOVE CHECKS AND CORRECTIONS, ROUGH ENGINE IDLE STILL EXISTS, CHECK FOR THE FOLLOWING DISCREPANCIES:

A. Secondary throttle plates stuck slightly open (4V carburetor).

B. Improper carburetor fuel level.

C. Idle compensator stuck open (4V carburetor).

D. Improperly adjusted fuel bowl vent.

E. Perform a manifold vacuum test, cylinder leakage test, or a compression check to isolate a bent or sticking valve or other defective component.

The above systems check will make the cause of any rough idle condition apparent and the appropriate corrective action can then be taken.

IGNITION SYSTEM COMPONENT DIAGNOSIS

The following diagnostic procedure has been prepared to assist in the efficient correction of ignition system problems. A test procedure is provided for each of the primary ignition system components to determine quickly if replacement of that component will correct the problem. The specifications included in these test procedures supersede those published in the 1967 maintenance manual.

COILS

A. Inspect the coil for physical damage and replace for the following defects:
  1. Blown coil tower.
  2. Tower cracked or broken.
  3. Terminals broken.

B. Check coil for excessive resistance.
  1. Replace coil if primary resistance exceeds 2.0 ohms or secondary resistance exceeds 12,000 ohms.

C. Check ignition coil for open circuit output.
  1. Check the ignition coil with an approved coil tester and follow the manufacturers instructions. If a coil tester is not available, use a Rotunda or equivalent ignition scope as follows:
    a. Connect test equipment.
    b. Operate engine at 1000 RPM with #5 spark plug wire removed from spark plug. NOTE: Spark plug wire should be positioned so that high voltage does not arc to ground (i.e. open circuit).
    c. Observe the open circuit voltage on the scope and adjust the controls to spread the pattern.
    d. If the pattern is similar to Fig. 1 the coil is good. If output is greater than 25 KV, the primary circuit is good.
    e. If the pattern is similar to Fig. 2 or Fig. 3, the coil is defective and should be replaced.
    f. If the pattern is similar to Fig. 1, but the output is less than 25KV, the coil is good but there is excessive resistance in the primary circuit. Check the following related items:
      - coil terminal connections
      - battery cable ground connections
      - connection at breaker points
      - primary resistance wire
      - ignition switch and wiring connections
    g. When a new coil is installed, repeat this open circuit output test to insure that the problem has been corrected.

IGNITION POINTS

Replace the ignition points if:

A. Metal transfer exceeds the specified gap setting; for example, if the amount of metal transfer exceeds .017 inch on a set of eight cylinder distributor contacts. This condition can be detected by setting the contacts to the specified gap and observing if the metal transfer exceeds the gap setting.

B. The rubbing block, tungsten contact discs, moveable arm or stationary bracket is fractured.

C. The moveable arm at the pivot post is sticking or binding.

D. The points are electrically shorted.

E. The voltage drop across the contacts exceeds .25 volt or "high resistance" is indicated on an approved commercial point tester.

NOTE: If the points are severely burnt or eroded, check the primary resistance wire circuit as follows:
  1. Measure the resistance in primary resistance wire with an ohmmeter. Replace the wire if it is below 1.20 ohms or over 1.50 ohms.
  2. Check voltage drop between the accessory terminal on the ignition switch and the battery (+) terminal of the coil with the key on. Replace wire if the voltage reading is below 4.5 volts or above 6.6 volts. (Ford Service Part Number COLF-12250-A.)

CONDENSER

Condensers are seldom defective unless severe point erosion and loss of performance occurs at very low mileage (under 500 miles). Replace a condenser with any of the following conditions:

A. "Shorted" when checked with an ohmmeter.

B. Series resistance is over 1 ohm at room temperature.

C. Physical damage such as broken brackets, punctured or deeply dented condenser case, defective terminals or a damaged lead wire.

D. Defective as shown on an approved commercial condenser tester.

SPARK PLUG HIGH TENSION WIRES

Replace wires if:

A. The resistance exceeds 10,000 ohms per ft.

B. The insulation is burned or cut.

C. An intermittent open condition exists in the conductor or termination as determined by an ohmmeter while flexing cable.

D. A leakage test discloses an insulation puncture or a dielectric failure.

E. The spark plug boot is torn or cut. Many of the above defects are caused by improper spark plug wire removal techniques. To properly remove a wire from a spark plug, grasp and rotate the spark plug boot by hand to free the boot from the spark plug insulator. The boot and plug wire must then be removed by pulling on the boot.

CAUTION: A spark plug wire or boot should not be probed for engine timing purposes. This insulation puncture will cause a high voltage leak and a subsequent ignition system complaint.

DISTRIBUTOR CAPS

Replace distributor caps which have electrical leakage (tracking) between terminals, eroded terminals or a broken carbon button.

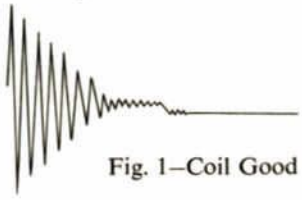


Fig. 1—Coil Good

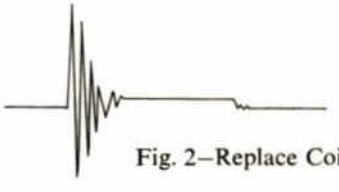


Fig. 2—Replace Coil

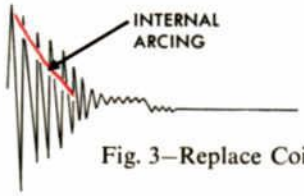


Fig. 3—Replace Coil

SPARK PLUG HIGH VOLTAGE WIRES

To avoid replacing spark plug wires that *appear* faulty, the following brief test is published to help service technicians make a positive diagnosis of faulty secondary ignition system wiring.

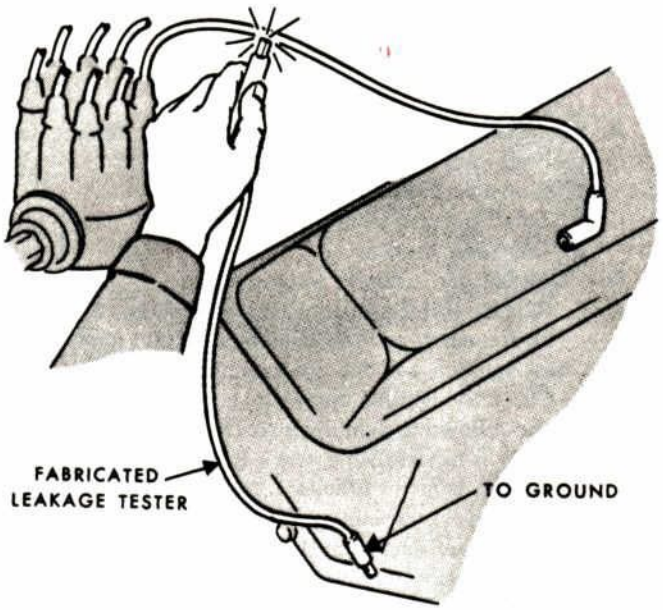
A. RESISTANCE CHECK: Spark plug wires which exhibit excessively high resistance in the conductor, pin staple or terminals will cause spark plug misfire and subsequent rough engine operation and therefore must be replaced. Spark plug wires should be replaced if any of the following conditions exist:

1. A wire which measures open circuit (infinite resistance) when checked.
2. A wire that has an intermittent connection so that it exhibits an open circuit condition while being flexed in the terminal area.
3. Any wire whose terminal to terminal resistance exceeds 1,000 ohms per inch of wire. Example: A 15 inch wire should not exceed 15,000 ohms resistance.

B. LEAKAGE TEST: In addition to high resistance, insulation failure (puncture and leakage of the spark plug wire to ground) of the plug wire can also cause plug misfire and rough engine operation. Dielectric failure or leakage of the plug wire can be checked in the following manner.

1. Fabricate a leakage tester by using a 30-36 inch piece of 14 gauge insulated wire with two insulated alligator clips attached to the wire ends.
2. Remove and open circuit the plug wire at the spark plug. Note: Position the plug boot so that the wire will not fire to ground through the open boot end.
3. Attach one clip of the fabricated wire to ground and with the engine running, move the remaining clip on the wire along the entire length and circumference of the spark plug wire. Punctures and/or leakage of the wire insulation will be evidenced by the presence of a bright spark or arc through the insulation of the spark plug wire to the alligator clip to ground. See illustration.

LEAKAGE TEST



Leakage Test

Spark plug wires which exhibit leakage should be replaced, however corona should not be mistaken as spark leakage. Corona is merely the glowing that appears caused by the electrical stress in the air adjacent to the spark plug wire. This is not a malfunction.

In addition to checking the wires for resistance and leakage, it is also equally important that the wire terminations are properly seated at the distributor cap and spark plug.

IGNITION TIMING SPECIFICATION REVISION

(1967 289 CID High Performance Engines for California Registration)

The 289 4-V High Performance engines produced beginning approximately April 5, 1967 have Thermactor exhaust emission control systems for *both* standard and automatic transmission equipped vehicles.

The initial ignition timing and distributor curve specifications are as follows:

Initial Ignition Timing–
Standard and Automatic
Transmission .....6° BTDC
Engine Idle Speed–
with headlights on:
Standard Transmission .....750 RPM
Automatic Transmission
(In Drive) .....650 RPM

CENTRIFUGAL DISTRIBUTOR ADVANCE CHARACTERISTICS

Distributor	Crankshaft Advance At 2000 Engine rpm	Set Test Stand To 0° at 250 Distributor rpm And 0 Inches Mercury		
		Distributor rpm	Advance (Camshaft or Distributor Degrees)	Max. Adv. (Camshaft Degrees)
① C7ZF-J	12—14	300	0—½	14
		500	¼—1¼	
		1000	8¾—10	
		1500	10¼—11¾	
		2000	12—14	
② C5OF-E	13—15	650	2¼—3¾	14
		750	4—5½	
		1000	6½—7½	
		1600	7½—8¾	
		2000	8¼—9¾	

①Standard Transmission
②Automatic Transmission

ALTERNATOR SERVICE

NOISY ALTERNATORS

When investigating noises that seem to be caused by the alternator, first try to localize the noise area to make sure the alternator is at fault, rather than the alternator belt(s), water pump or some other engine component. Start the engine and use a stethoscope or similar sound detection instrument. If a positive diagnosis still can not be made, remove the alternator belt(s) and operate the engine. If the noise disappears, the alternator is at fault.

An alternator with a shorted diode will normally whine (magnetic noise) and will be most noticeable at idle speeds. If this condition is suspected, perform an alternator output test. If the output is about 10 amperes less than the specified rating, a shorted diode is usually indicated.

A squealing sound usually indicates a defective alternator bearing, water pump bearing or a worn drive belt(s). Check the belt(s) for bumps, fraying or abrasions and replace as required. If the belt(s) appear satisfactory, apply a light coat of belt dressing and adjust to the specified tension.

If the noise is traced to the alternator, remove the alternator. Inspect the bearings for wear, shaft scoring or an out-of-round condition. Visually inspect the machined surfaces of both alternator housings and the stator core. Check for improper assembly of the core to the housing. Repair or replace alternator components as required.

LOOSE BATTERY, STARTER AND/OR STARTER RELAY CABLE CONNECTIONS

Loose or corroded connections at any one of the above points can be responsible for low battery, slow cranking, hard starting, no start, headlight flare, clicking starter relay or ammeter fluctuation.

The battery post and cable terminals should be cleaned with a terminal brush and then tightened to 4-6 lbs. torque. The starter relay and starting motor cable terminals then should be removed, cleaned and reinstalled with 50-70 in. lbs. torque. The battery also should be checked and recharged, if necessary. After recharging, a capacity check should be performed before any attempt is made to replace the battery, starter, starter relay, alternator or alternator regulator.

SERVICING ALTERNATOR CIRCUIT BOARDS

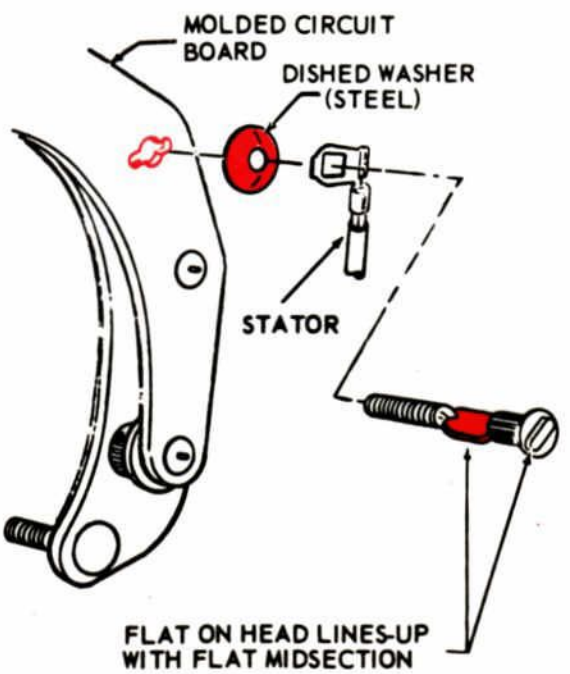
Autolite Alternators utilize two types of circuit boards—a *molded* circuit board and a *printed* circuit board. Certain differences in design require special service procedures for each type of circuit board whenever it must be removed from the alternator.

MOLDED CIRCUIT BOARD

The molded circuit board is used in approximately 50% of the Autolite alternators. This type circuit board utilizes retaining screws with a flattened midsection, which act as a locking device. To prevent damage to the board during removal, the screw must be turned so the flat lines-up with the slot. Do not attempt to force the screw out of the board while it is in the lock position. (See illustration.)

PRINTED CIRCUIT BOARD

If a molded circuit board is replaced by a printed circuit board during an alternator repair, the fiber washers supplied with the printed circuit board assembly MUST BE USED. Do not use the molded circuit board steel-dished washers with the printed circuit board because they will short circuit the copper inlay strips of the printed circuit board. The result will be an immediate alternator failure when it's put into service.



Molded Circuit Board

DOOR LATCH AND DOOR LATCH

This article is a diagnostic procedure (for all car lines) to assist in the efficient correction of a problem within the mechanical portion of the door latch system.

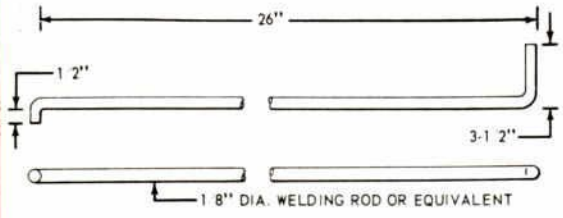
To properly review and diagnose a latch system malfunction, the door trim panel and associated trim parts should be removed. In the event that the latch system is inoperative and the door cannot be opened from either inside or outside of the vehicle, the following procedure must be employed to open the door.

DOOR OPENING PROCEDURE

ALL CAR LINES EXCEPT AS NOTED

Fabricate a latch actuating tool from ⅛ inch diameter welding rod or equivalent as shown in Figure 1.

Enter the vehicle through the opposite door and lower the side glass of the inoperative door to the full "down" position. From outside the vehicle, insert the fabricated tool through the glass opening at the latch end of the door and engage the door latch pawl lever as shown in Figure 2. A slight downward pressure will then unlatch the door. The chart shown with Figure 1 will assist in determining for each car line the approximate depth the rod should be inserted to engage the latch.



ROD INSERTION DEPTH CHART (DEPTH MEASURED IN INCHES)

Car Line	Front Door	Rear Door
Ford—Mercury All Models (as applicable)	16	10.5
Lincoln All Models (as applicable)	16	15
Thunderbird All Models (as applicable)	14	11
Mustang—Cougar All Models	14	—
Fairlane—Falcon—Mercury Intermediate 2-Door Sedan Models	13	—
Fairlane—Falcon—Mercury Intermediate 4-Door Models	13	13 (at 45° angle) see Figure 3
Fairlane—Mercury Intermediate 2-Door Hardtop Models	13	—

Fig. 1—Rod Actuating Tool and Rod Insertion Depth Chart

NOTE: Because of the stationary vent window design used on the Mercury Intermediate, Fairlane and Falcon sedan and station wagon rear doors, it will be necessary to approach the latch on these units with the rod at an angle of approximately 45 degrees as shown in Figure 3. A slight pressure on the latch pawl lever will unlatch the door.

After opening the door and removing the trim panel, inspect all rod attachments in the latch system to insure proper connections. In each case, the rod should be inserted in the nylon bushing and the metal clip engaged around the rod (see Fig. 2—View A). The following actuating rods should be inspected to assure proper attachment at both ends of each rod.

FRONT DOORS

- Door Latch Actuating Rod (adjustable)
- Inside Release Handle To Latch Rod
- Door Latch To Cylinder Rod
- Door Inside Lock Push Button Rod

REAR DOORS

- Inside Release Handle To Latch Rod

If, after determining that all rods in the latch system are properly and securely connected, the latch system continues to malfunction, the following problem diagnosis and correction procedure must be used to resolve specific problems:

A. Front Door Cannot Be Opened (unlatched) From Either Inside Or Outside The Vehicle.

POSSIBLE CAUSE AND REPAIR

All Car Lines—
If no distinct free play is evident when a slight pressure is applied to the door handle outside push button, the door latch actuating rod (Fig. 4) has been adjusted too short. This condition pre-loads the latch so that when the door is closed and then locked (inside lock push button depressed), the latch locking lever will travel past the latch pawl and restrict the necessary upward movement of the locking lever to unlock the door. (Fig. 5—View A).

Disengage the latch actuating rod at the latch (see Fig. 4). After the latch locking lever and latch actuating rod lever have returned to their normal "free" positions, adjust the latch actuating rod (the lower end of the rod is adjust-

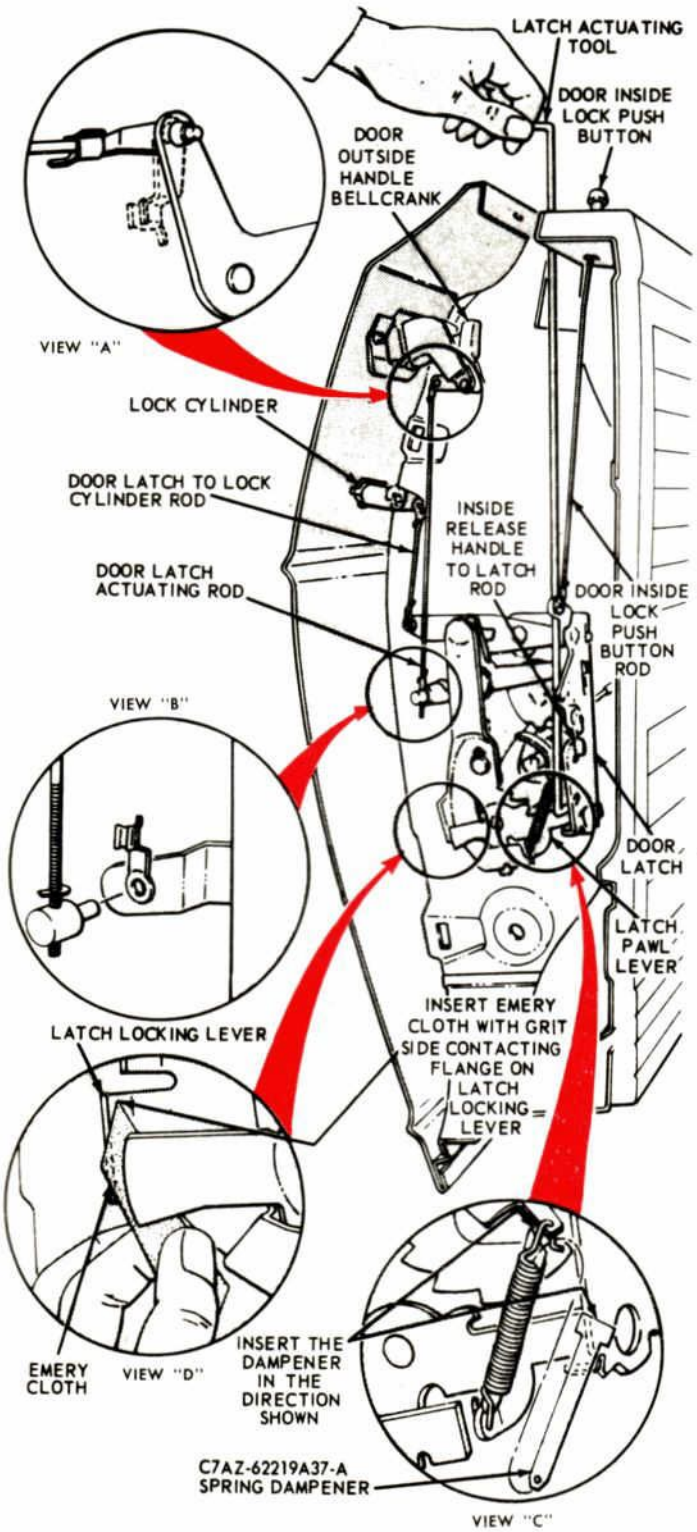


Fig. 2–Ford and Thunderbird Latch System Shown–Other Systems Typical

able) so that the gap between the door outside handle bell crank and push button pin is set to the appropriate dimension shown in Figure 4.

FORD, MERCURY, THUNDERBIRD AND LINCOLN ONLY

Inspect the latch to determine if the latch actuating rod lever has by-passed the lower edge of its guide slot in the latch plate while the latch was in a "locked" condition.

This condition causes the latch actuating rod lever to remain in an actuated position and prevents the locking lever from returning to its normal "free" position (Fig. 5 illustrates this condition). If this problem occurs, latch assembly replacement is necessary.

B. Door cannot be opened (unlatched) from outside the vehicle when the door is unlocked and the outside push button is fully depressed. (Front door–all car lines except Lincoln–Front and Rear Door).

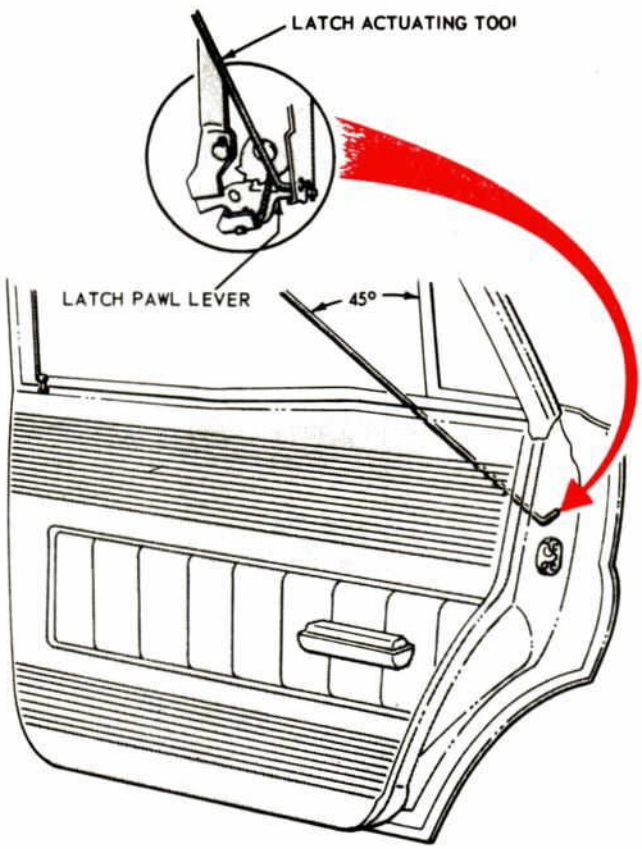


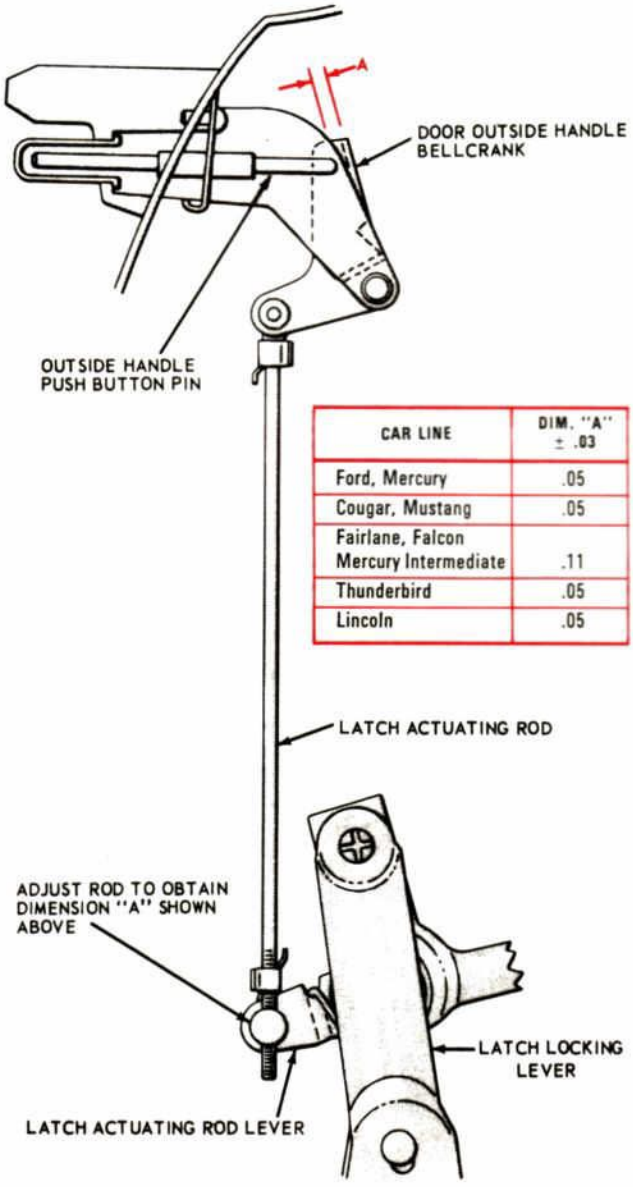
Fig. 3–Latch Pawl Lever

POSSIBLE CAUSE AND REPAIR

All Car Lines–The door latch actuating rod (Fig. 4) is adjusted too long and will not operate the latch actuating lever sufficiently to unlatch the door.

Disengage the latch actuating rod at the latch (Fig. 4) and adjust the length of the rod so that the gap between the door handle bell crank and push button pin is set to the appropriate dimension shown in Fig. 4.

C. Door cannot be opened from inside the vehicle.



CAR LINE	DIM. "A" ± .03
Ford, Mercury	.05
Cougar, Mustang	.05
Fairlane, Falcon Mercury Intermediate	.11
Thunderbird	.05
Lincoln	.05

Fig. 4–Door Latch Adjustment

POSSIBLE CAUSE AND REPAIR

Ford, Mercury, Thunderbird and Lincoln Only–Inspect the latch to determine if the release lever has by-passed the latch actuating rod lever. This condition (shown in Fig. 5) prevents the release lever from returning to its normal position and latch assembly replacement is necessary for problem correction.

D. Door rebounds (will not latch) upon closing.

POSSIBLE CAUSE AND REPAIR

Ford, Mercury, Thunderbird and Lincoln Only–Inspect the latch to determine if the latch actuating rod lever has by-passed the lower edge of its guide slot in the latch plate while the latch was in an "unlocked" condition. This condition (shown in Fig. 5) prevents the latch pawl from returning to its normal operating position. Replacement of the latch is necessary for problem correction.

E. A loud noise resembling that of a tuning fork from the vicinity of the door latch as the door is closed.

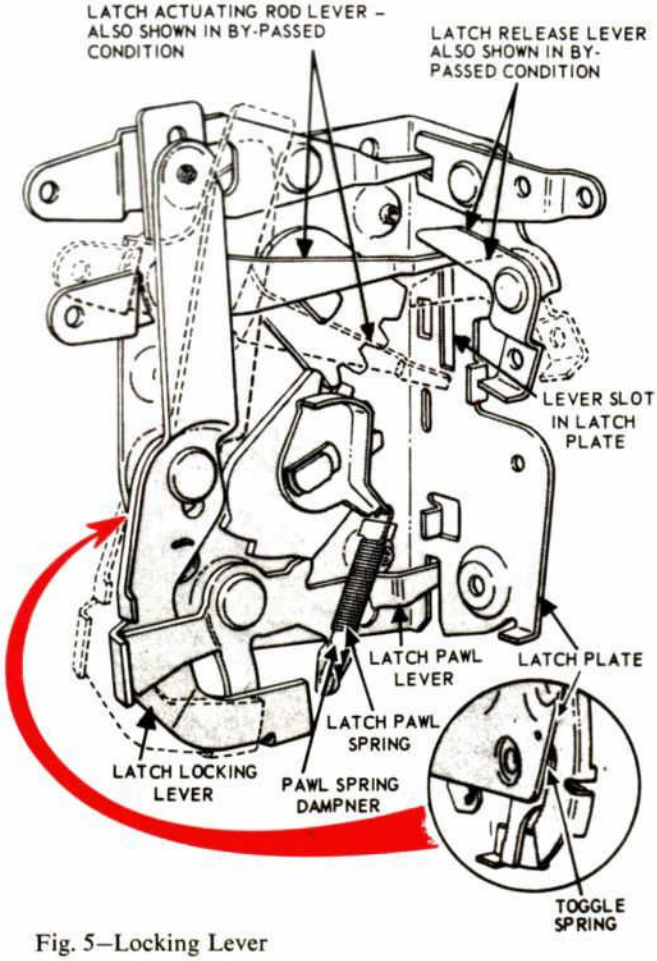


Fig. 5–Locking Lever

POSSIBLE CAUSE AND REPAIR

Ford, Mercury, Thunderbird and Lincoln Only—A plastic strip which functions as a sound deadener is inserted in the door latch pawl spring during latch assembly. If the pawl spring dampener is missing, the spring will transmit an objectionable tuning fork type noise as the door is closed.

If the door latch spring dampener (Fig. 2—View C) is missing, procure a service released dampener (Ford Part Number C7AZ-62219 A37-A) or fabricate one as shown in Figure 6 from mylar or similar soft plastic material. Insert the dampener into the spring as shown in Figure 2, View C.

F. The front door accidentally locks when the door is closed with the inside lock push button in an "unlocked" (up) position.

POSSIBLE CAUSE AND REPAIR

All Car Lines—Review the door latch and determine if the door latch locking lever toggle spring is missing (see Fig. 5). This is evident if the inside lock push button can be moved up and down freely. Also, by inspecting the latch with the door inside lock push button in the "unlocked" (up) position, it can be readily determined if the toggle spring is missing.

If the toggle spring is missing, remove the latch from the door and procure one of the following service replacement toggle springs noted below:

C7AZ-6221872-A (Ford Part Number)—Right Door
C7AZ-6221873-A (Ford Part Number)—Left Door

To install, insert one leg of the toggle spring in the slot in the lock actuating lever, while the lever is in a "locked" position. Apply pressure to the other leg of the toggle spring while guiding the leg into the hole provided in the latch plate (see Fig. 5). Prior to reinstalling the latch in the door, operate the latch to assure proper installation of the spring.

G. The door latch will not "lock" or "unlock" when the vacuum system is activated.

POSSIBLE CAUSE AND REPAIR

Ford, Mercury, Thunderbird and Lincoln Only—Operation of the vacuum system can be restricted by the inside lock push button binding on the door trim panel; the push button rod binding on the door sheet metal; or burrs on the door latch locking lever, where the latch pawl contacts the lever.

FABRICATE FROM .005 INCH THICK MYLAR OR AN EQUIVALENT SOFT PLASTIC MATERIAL

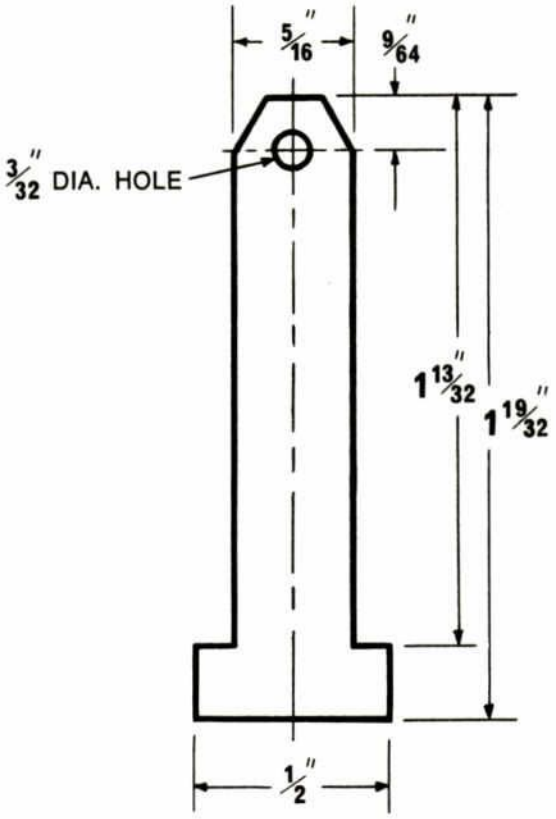


Fig. 6—Latch Spring Dampener

Prior to removing the door trim panel, a bind condition can be readily determined by removing the inside lock push button and activating the vacuum system. If the latch operates satisfactorily, loosen the trim panel and adjust as required to remove any bind that may exist between the push button and trim panel.

If the latch continues to malfunction with the push button removed, manually cycle the push button rod 10 to 15 times to remove any minor burrs that may exist in the latch. If cycling the latch manually does not improve the vacuum operation of the latch, remove the trim panel. Place a piece of emery cloth between the flange on the latch locking lever and the latch pawl (Fig. 2—View D), and with the emery cloth in place, cycle the lock button rod manually 10 to 15 times to remove any major burrs on the latch locking lever.

If none of the above conditions exist or the latch continues to malfunction after employing the above procedures, the problem is not caused by the mechanical portion of the door latch system. Check the vacuum system as explained in the December, 1966 issue of *Shop Tips*.

TECHNICAL

SYNTHETIC SEALS AND CLEANING SOLVENTS

Many cleaning solvents can be very detrimental to and, in most cases, can cause rapid deterioration of synthetic rubber seal material. Therefore, it's most important that service technicians DO NOT clean, soak or wash in cleaning solvents, the synthetic seals used in steering gears, power steering pumps and power train components (rear axles, automatic transmissions and standard transmissions).

ALTERNATOR-REGULATOR FAILURES

Many regulator failures are caused by human error. These arise when the field terminal (or wire) makes contact with either the battery terminal or ground terminal. Never attempt to polarize the alternator or regulator. This is unnecessary as the alternator is polarized each time the engine is started. Make all wiring connections complete and tight before finally connecting the battery cable. This will prevent any accidental grounding or contact between connections during the installation.

COIL POLARITY

Reversed coil polarity will usually result in a hard starting condition and/or poor performance which is most noticeable at high speeds. Under operating temperatures, this reversed polarity can require up to 30% more voltage to fire the spark plug. Incorrect polarity can be checked by any of the following methods:

1. In a car with a negative grounded battery, the distributor lead should be connected to the negative terminal on the coil while a positive grounded system has the distributor lead connected to the positive terminal on the coil.

2. When the lead of an ordinary lead pencil is inserted between the spark plug and the wire removed from that plug while the engine is running, correct polarity is indicated by the spark flaring on the spark plug end of the lead. If the spark flares on the other end of the lead, the coil connections should be reversed.

3. When a DC voltmeter is connected with the positive lead attached to the engine ground and the negative lead momentarily touched to the spark plug terminal (engine running), the needle should swing up the scale. If it does not, incorrect polarity is indicated and the coil leads should be reversed.

4. If an oscilloscope is attached to the engine according to instructions, reversed polarity will be shown by an inverted pattern.

GROUND CIRCUIT CAPACITY FOR TRUCKS WITH HIGH CURRENT DRAW ACCESSORIES

The ground circuit of trucks with the normal type of accessory can easily handle the current draw. However, when a high current draw accessory (50 or more amps.) such as a snow plow, lift gate, winch, etc., is installed, a high capacity ground circuit is required.

The preferred method of providing a sufficient high capacity ground is with a six (6) gauge cable, routed from the accessory motor to a ground on the truck engine. If this method is not practical, route the ground cable from accessory motor to the body sheet metal. Grounding the accessory motor by either method will insure an adequate ground circuit to prevent possible electrical failures.

LOW TOP SPEED AND/OR NO CARBURETOR DECHOKE

A possible cause of the subject condition, very often overlooked, is that of improper throttle linkage (cable or rod type) adjustment. This adjustment should, in fact, be the initial step in the diagnosis of this condition, to avoid unnecessary corrective efforts. Improper adjustment not only limits engine performance, but the carburetor dechoke system will not function should a flooded starting condition occur.

The following steps should be used to verify and obtain proper linkage adjustment:

1. Remove the air cleaner.
2. From the passenger's compartment, observe the throttle linkage with the accelerator fully depressed. The throttle lever on the carburetor should touch the throttle stop on the carburetor base (Fig. 1).
3. If the throttle lever does not contact the stop, check for carpet interference and/or adjust the linkage as necessary for full throttle lever travel.

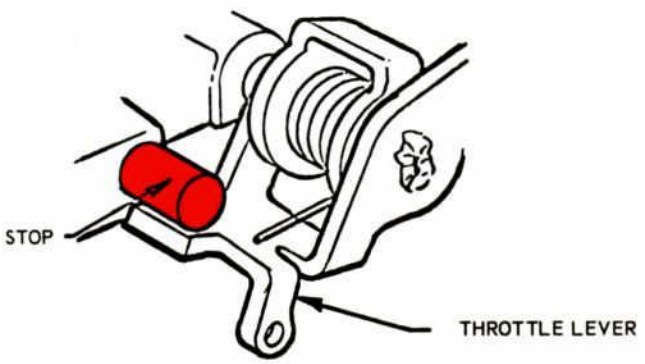


Fig. 1—Carburetor Throttle Stop

SERVICE BRIEFS

WHEEL BEARING LUBE REVISION

Beginning with the first production of 1967 cars and trucks (Louisville trucks built after April 10, 1967) the grease for front wheel bearings (and rear wheel bearings where applicable) was changed from a sodium base grease (yellow) Ford Part No. C2AZ-19585-A . . . to a lithium base grease (blue-black) Ford Part No. C1AZ-19590-B, C or D. Lithium base grease contains molybdenum disulfide which provides better rust protection and has a higher melting point than sodium base grease. THESE LUBRICANTS ARE NOT COMPATIBLE, AND MUST NOT BE MIXED.

1966 and prior models were originally serviced with a lithium base grease for front disc brakes and a sodium base grease for front drum brakes. Lithium base grease can be used on models with drum brakes. The wheel bearings, bearing cups and hubs, however, must be thoroughly cleaned and all sodium base grease removed before repacking with lithium base grease.

STOP LIGHT SWITCH— INSTALLATION PROCEDURES

Whenever service to the stop light switch or adjacent areas (Fig. 3) is required, the installation procedures in this article should be followed, or the stop lights may operate continuously without applying the brakes. Special attention should be paid to the possibility of misalignment. Attach the stop light switch to the master cylinder and the brake pedal as follows:

1. Apply a light coat of Multi-Purpose Long Life Lubricant Ford Part No. C1AZ-19590-B (or equivalent) to both the outside and inside diameters of bushing (Ford Part No. C5DZ-2474-A) and install in the master cylinder push rod.
2. Place one spacer (Ford Part No. C5DZ-2B129-A) on the shoulder bolt. Install stop light switch over the push rod, and insert the shoulder bolt through the switch and push rod.
3. Place the second spacer (Ford Part No. C5DZ-2B129-A) over the shoulder of the bolt and lightly tape in place with masking or transparent tape.

NOTE: Taping the second spacer is important to assure that the spacer does not slip off the shoulder. If the spacer slips, the switch may be installed in a cocked position, causing the stop light switch to remain on with no brake application.

4. Insert the shoulder bolt through the brake pedal and retain with the self-locking nut.

BRAKE SHOE RETRACTING ASSIST SPRING

1966-67 Mercury Intermediates and Cougars With Ten Inch Front Drum Brakes

Installing the brake shoe retracting assist spring improperly, results in a scraping noise emanating from the affected front brake assembly. The proper installation of the spring is with the loop toward the wheel cylinder (see Fig. 2).

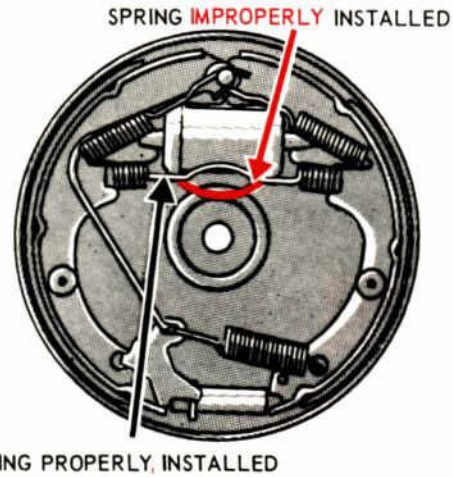


Fig. 2—Brake Shoe Retracting Spring

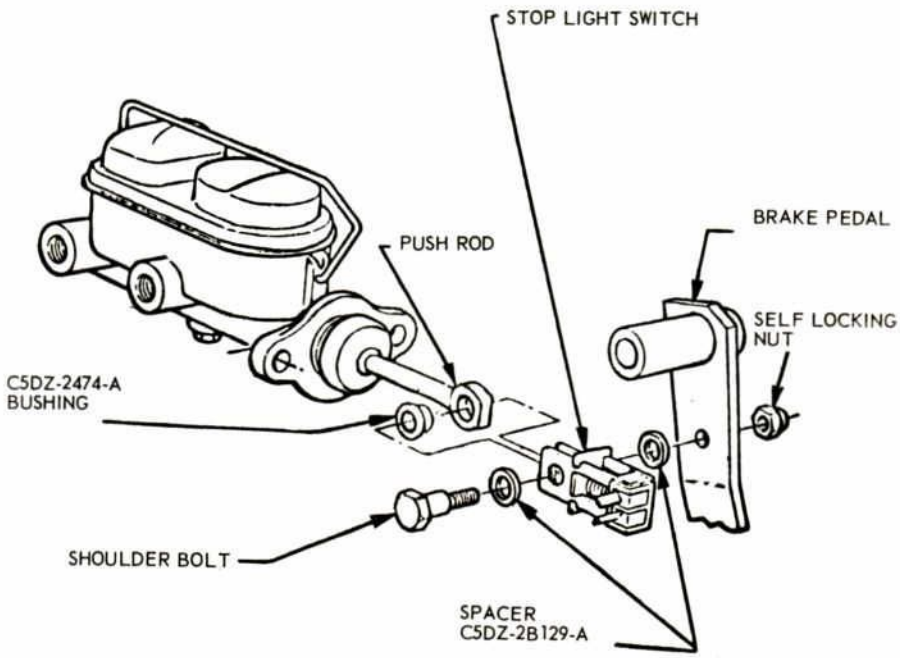


Fig. 3—Stoplight Switch

A/C EXPANSION VALVE DIAGNOSIS PROCEDURE

All 1964-67 Models with AIR CONDITIONING

The following diagnosis procedure must be used, if the air conditioner expansion valve is suspected of malfunction. This procedure can be accomplished without removing the valve from the vehicle.

1. Install suction and discharge pressure gauges on the compressor service valves.
2. Open the valves and operate the engine at 1000 rpm with the air conditioner system on high blower and maximum cooling.
3. Observe the pressure gauges.

A. If the suction pressure does not stabilize (varies more than 10 psi.), then,

1. Stop the engine, remove the expansion valve thermal bulb and clamp; clean the bulb, clamp and suction line thoroughly; reinstall the bulb and clamp SECURELY and reinsulate.
2. If the problem still exists, proceed with step C-1.

B. If the pressure remains above 50 psi, and the compressor knocks, then

1. Check the thermal bulb for looseness and perform Step A-1.
2. If the problem still exists, proceed with step C-1.

C. If the pressure goes below 0 psi., then

1. Stop the engine, exhaust the Refrigerant-12 charge slowly through the suction service valve gauge port and observe the discharge pressure gauge. If the discharge pressure does not drop below 70 psi., the valve is stuck shut, and the valve should be replaced.
2. If the discharge gauge pressure does drop, exhaust the entire charge, evacuate the system and recharge with the prescribed weight of refrigerant (2½ pounds for most models.)
3. If the system now functions normally, the problem was caused by a low charge and, therefore, the leak must be found and repaired.
4. If the system does not function normally, the problem is elsewhere. It is suggested that the compressor function and oil level be checked.

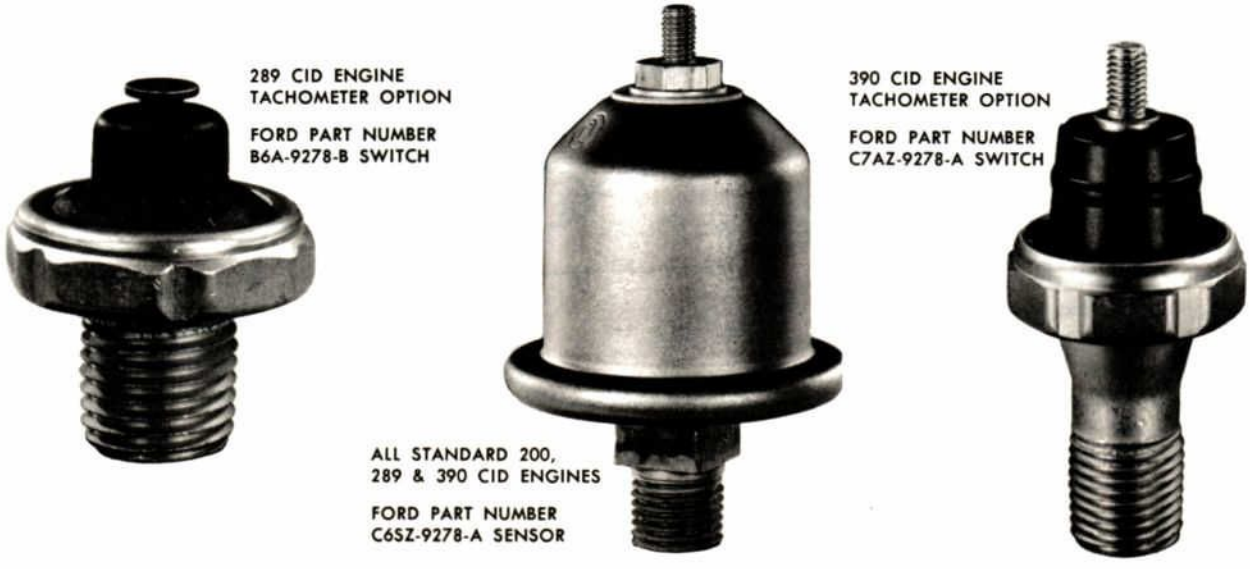
OIL PRESSURE INDICATOR SYSTEMS (1967 Mustang)

Two distinctly different types of oil pressure indicator systems are used on 1967 Mustangs. Mustangs *without a tachometer* are equipped with a *standard system;* utilizing an oil pressure sensor and a pressure indicator gauge. Mustangs *with a tachometer* have it installed in the pressure indicator gauge location, and use an *optional system;* consisting of an oil pressure switch and a warning light to indicate oil pressure status.

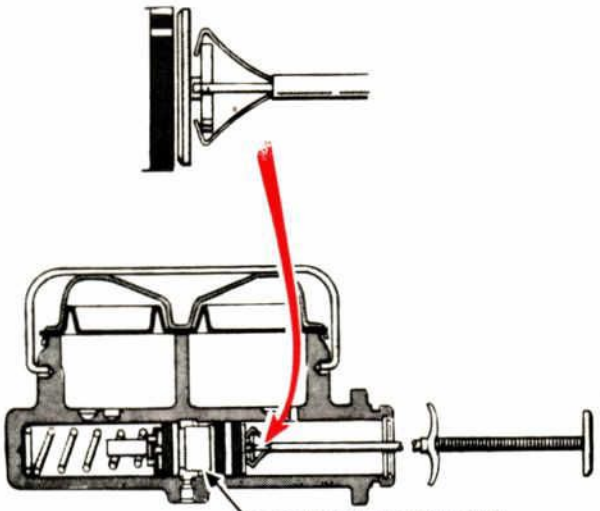
The oil pressure sending units of the two systems are NOT interchangeable. Misuse of the sending units causes the following malfunctions:

- The indicator gauge (standard system) will be damaged if it's used with the pressure switch (optional system).
- The warning light (optional system) will not glow if it's used with the oil pressure sensor (standard system).

If necessary to replace the oil sending unit of a 1967 Mustang, be sure the correct type is installed (as illustrated) to avert the above conditions.



SECONDARY PISTON ASSEMBLY REMOVAL ON THE DUAL MASTER CYLINDER



1967 All Car Lines

It is possible to remove the dual master cylinder secondary pistons by pressurizing the master cylinder and forcing the piston out of the assembly. This method of removing the secondary piston from the master cylinder is *not* recommended.

The approved method for removing the secondary piston is to use a Snap-On Flexible "Grip-It" or similar tool to pull the piston from the housing (see illustration).

CAUTION: When using the tool, use care to avoid scratching or otherwise marking the wall of the master cylinder piston bore.

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