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Shop Tips FROM FORD

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SERVICING CONVERTIBLE TOPS

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also . . . the Ford Speed Control System . . . . . .

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PLUS

Be sure to 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: Ford Division of Ford Motor Company, Parts and Service Promotion and Training Dept., P. O. Box 658, Dearborn, Michigan 48121.

FoMoCo GENUINE PARTS

ROTUNDA

From Your Ford Dealer

SERVICING CONVERTIBLE TOPS

This article is designed to provide diagnosis and adjustment tips for servicing conventional convertible tops. The information applies to the Mustang, Comet, Ford, Falcon, and Mercury. The illustrations as shown are typical of all vehicles since they are similar in construction and operation.

CONVERTIBLE TOP SYSTEMS

The convertible top operation is accomplished by the coordinated functioning of an electrical system, a hydraulic system and a mechanical system. It is important that each system perform in an approved manner in order that the top operate satisfactorily. Because convertible top problems can occur in any one of the three systems, each should be examined carefully using the following suggested steps. Each system will be described, its operation explained, and procedures given for checking for defects or troubles.

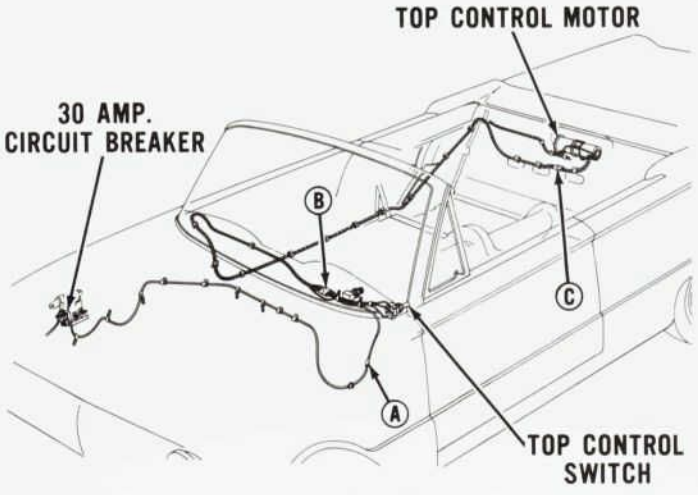

Figure 1–Convertible Top Electrical System

THE CONVERTIBLE TOP ELECTRICAL SYSTEM

The conventional convertible top electrical system uses an electric motor, a control switch, a circuit breaker and the necessary wiring to complete the circuit as shown in the illustration (Fig. 1).

A 12-volt motor is used to drive a hydraulic pump. The motor is reversible so that the pump can be driven in either a clockwise or a counterclockwise direction. The motor and pump assembly is mounted behind the rear seat back. The top switch is mounted in the instrument panel.

A 30-amp circuit breaker, attached to the battery terminal of the starter relay, protects the circuit against overloads. A single switch is used to control the electrical circuit for raising and lowering the top. As the switch is operated, current flows through the single wires that connect the switch terminals to a motor. The motor then drives the hydraulic pump which delivers fluid under pressure to the cylinders. The single switch will have two positions causing the motor to go in opposite directions for either raising or lowering the top.

CONVERTIBLE TOP CHECKS

If the convertible top fails to operate or operates unsatisfactorily and the trouble is not readily apparent, it may be necessary to make several checks to find the causes of the trouble. Each system should be examined separately. The electrical system is arbitrarily selected for the first analysis.

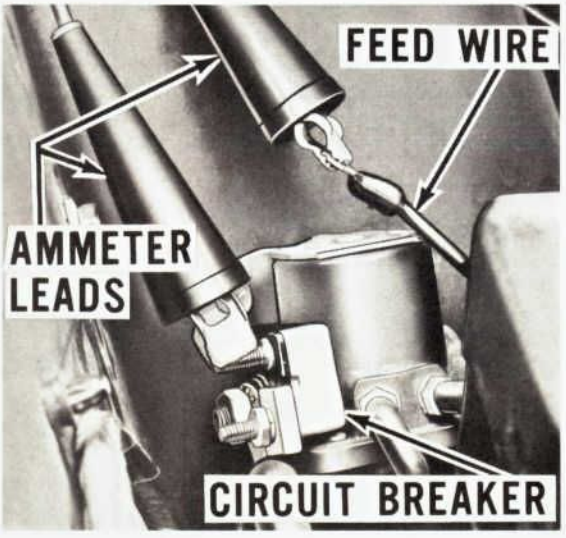

Figure 2–Current Draw Check

ELECTRICAL CHECKS

The battery charge should be determined before making any electrical checks because a partially discharged battery will cause slow motor and pump operation.

Current Draw Check

To check the current draw in the top operating circuit, disconnect the black wire at the circuit breaker (located on the starter relay), and connect an ammeter in series in the circuit (Fig. 2).

Operate the top control switch and note ammeter reading. The current draw should be 20 to 40 amperes for Ford and Mercury; 25 to 30 amperes for Falcon, Mustang and Comet; and 40 to 50 amperes stalled, with a reading of 9-10 volts.

Make the stall test with the top in the stacked position. A current draw in excess of 75 amps indicates a frozen pump or cylinder or a mechanical obstruction. A low amperage reading with the motor running and no top movement indicates a defective pump or low fluid level in the reservoir.

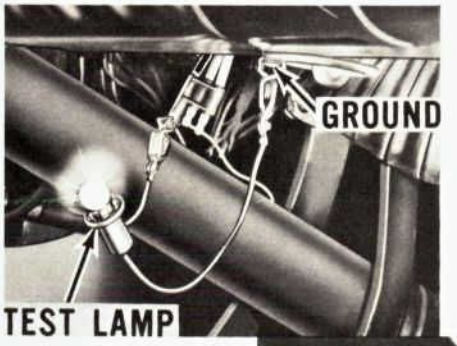

Figure 3–Test Lamp For Switch Wiring

Figure 4–Jumper Wire For Switch Wiring

Top Control Switch Test

1. Connect one test lamp lead to the black (feed) wire of the top control switch, connect the other lead to a good ground (Fig. 3). The illustration, Fig. 1, shows the approximate location of the top control switch. If the test lamp lights there is power at the switch. If the test lamp fails to light, there is an open or short circuit between the battery and the switch.

2. If there is power to the switch, connect a jumper wire between the black (feed) wire and the red wire, and then between the black and the yellow wire (Fig. 4). If the top motor operates, the switch is faulty and must be replaced.

Circuit Breaker Check

If there is no voltage at the top control switch, connect a jump wire across the terminal of the circuit breaker (located on the starter relay, Fig. 5) and operate the switch. If the top motor operates the circuit breaker is faulty and must be replaced.

If the motor does not operate check for power at the black wire terminals, at the circuit breaker, and at the starter relay. If there is power at the starter relay, but none at the circuit breaker, the wire is defective and should be replaced.

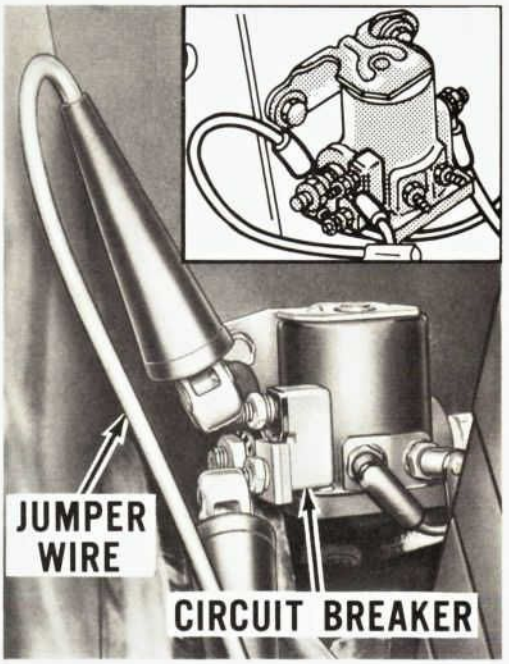

Figure 5–Circuit Breaker Test

Switch-To-Motor Wires

Disconnect the yellow and red switch-to-motor leads at the junction block near the motor. Connect a test lamp between the yellow wire and a good ground (Fig. 6). Operate the top control switch. If the lamp lights there is current to the junction block.

Connect the test lamp between the red wire and a ground, and check by operating a switch. If the test lamp does not light, the wire from the junction block to the switch is defective.

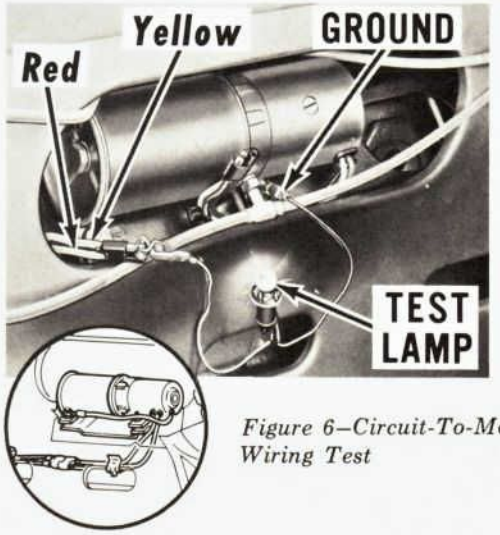

Figure 6–Circuit-To-Motor Wiring Test

SERVICING CONVERTIBLE TOPS

CONTINUED

Motor Check

Check the operation of the motor by connecting first one motor lead and then the other directly to battery positive terminal (Fig. 7). If the motor operates in either case, but will not operate when hooked to the wiring harness, check the wiring harness again for short or open circuits. If the motor will not work when hooked directly to the battery, check the black (ground) wire from the motor. If the motor still does not operate, it must be replaced.

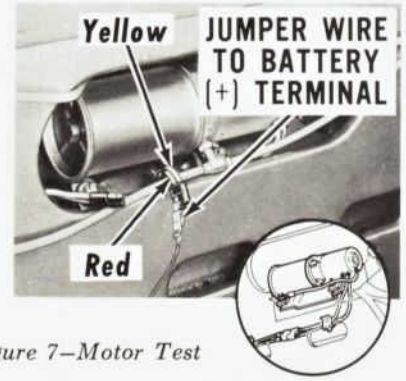

Figure 7–Motor Test

HYDRAULIC CHECKS

Faulty hydraulic system operation can be caused by lack of fluid, leaks, air in the system, obstructions or kinks in the lines or faulty operation of a cylinder or the pump.

A pump repair kit and cylinder repair kit are available at your Ford dealer.

Figure 8–Fluid Level Check

Fluid Level Check

To check the fluid level, raise the top and remove the rear seat cushion and seat back. Place absorbent cloths below the filler plug to absorb any spillage of hydraulic fluid. Remove the filler plug and check the fluid level (Fig. 8). It should be level with the bottom edge of the hole. Do not attempt to operate the top with the filler plug removed, If the level is low check the system for leaks, then add the required amount of fluid and replace the filler plug.

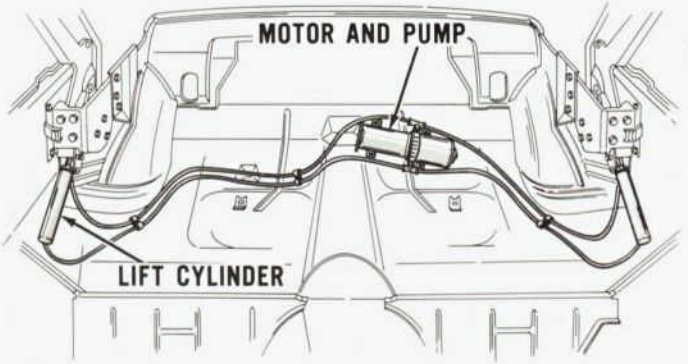

Figure 9–Lift Cylinder Check

Lift Cylinder Check

Remove the rear seat cushion, seat back and quarter trim panels. Operate the top control switch, and observe the operation of the lift cylinders. If the movement of the piston rods is sluggish or uneven, check the lines from the pump to the cylinders for kinks or obstructions (Fig. 9). If one piston rod moves more slowly than the other, the cylinder with the slower rod is defective and should be replaced. If both rods move slowly, or do not move at all, and the motor and pump are operating, the pump is defective and should be disassembled and repaired.

MECHANICAL ADJUSTMENTS

BALANCE LINK ADJUSTMENTS

The balance link adjusting bracket is mounted on the main pivot bracket support (Fig. 10). Two adjustments are provided at the bracket. Sliding the bracket in the elongated mounting holes permits proper stacking of the top in the well. Turning the Allen head adjusting screw in the bracket corrects sag in the side rails.

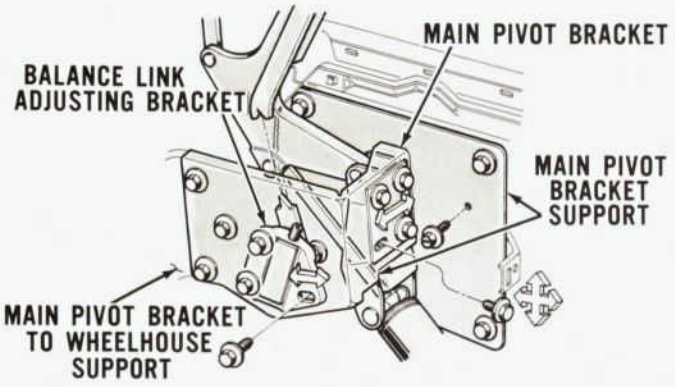

Figure 10—Linkage Adjustments

Top Stack Adjustment

When the top is stacked, it may be too high or too low in the well. If the top stacks too high, it will be difficult to fasten the boot. If the top stacks too low, the folded side rails may pinch the top material, and the resultant chafing may wear a hole in the fabric.

To lower the top stack in the well, loosen the balance link adjusting bracket mounting screws, and slide the bracket forward (Fig. 11A). To raise the top stack in the well, loosen the balance link adjusting bracket mounting screws, and slide the bracket rearward.

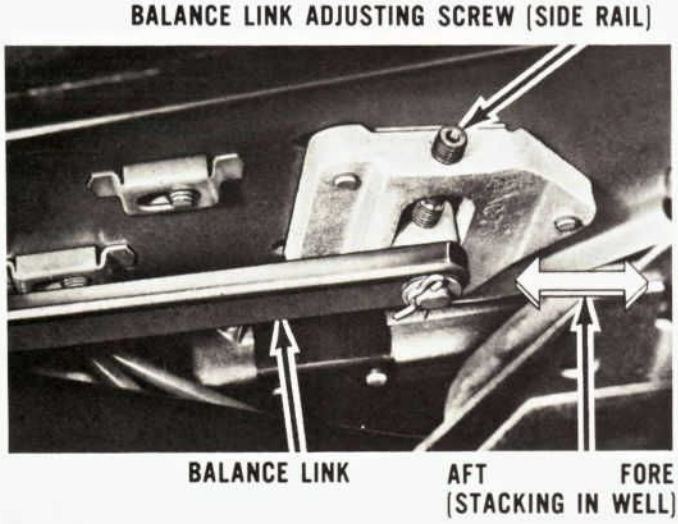

Figure 11A—Balance Link Adjustment

Side Rail Sag

If the side rail sags above the door glass, raise the top and lock it in full up position. Using the top of the door and quarter glass as reference points, determine the proper level of the side rail. With an Allen wrench turn the adjusting screw in the balance link adjusting bracket down to raise the side rail to the proper level (Fig. 11B).

If the side rail is too high, or crowned, above the window (this does not usually occur), turn the adjusting screw up to lower the side rail.

Vertical Adjustment

This adjustment moves the top assembly up or down to obtain a good fit between the rear and the side rail weather strip and the top of the quarter and door glass.

To adjust the top up and down loosen the screws that retain the main pivot bracket support (Fig. 11-B). Shift the main pivot bracket up or down as necessary to level the side rails with the quarter glass and door glass. Making sure the weather strip is not bottomed on the glass, tighten the screws.

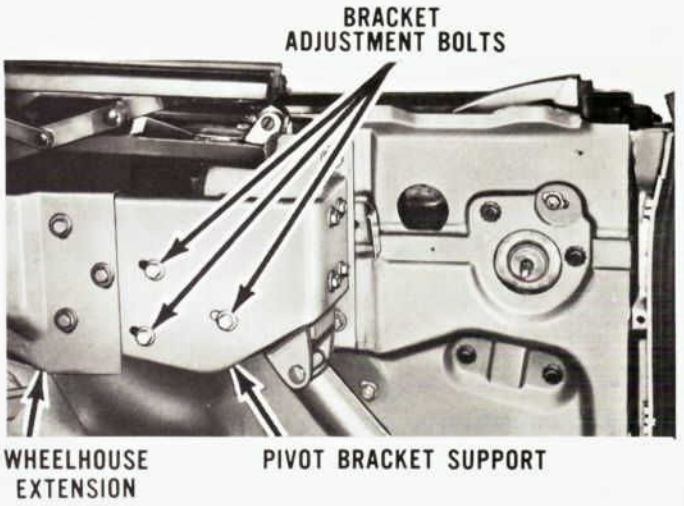

Figure 11B—Bracket Adjustments

Lateral Adjustment

This adjustment shifts the top assembly sidewise to obtain a good seal between the side of the rear side rail weatherstrip and the side of the quarter glass frame.

To adjust the top assembly sidewise, loosen the screws which retain the main pivot bracket to its support. Shift the main pivot bracket to either side as necessary to obtain the proper interference fit between the side of the rear side rail weatherstrip and the side of the quarter glass frame.

Check the operation of the quarter glass, and adjust the main pivot bracket as necessary to relieve any binding condition. Tighten the mounting screws. If the proper sealing and quarter glass operation cannot be obtained with the top adjustment, adjust the quarter glass guides.

SERVICING CONVERTIBLE TOPS

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MAIN PIVOT BRACKET ADJUSTMENTS

The main pivot bracket is mounted on the main pivot bracket support (Fig. 10). The support is mounted to the inner quarter panel and the wheelhouse extension. The main pivot bracket and its support provide for the shifting of the entire top assembly, fore and aft, vertically and laterally. Because the movement of the main pivot bracket will disturb several adjustments, move this bracket only after other adjustments have failed to solve a specific problem.

Fore-and-Aft Adjustment

This adjustment moves the top assembly straight forward or rearward to obtain a good fit between the rear side rail weatherstrip and the rear edge of the quarter glass.

To make a fore-and-aft adjustment, loosen the screws which retain the main pivot bracket support to the inner quarter panel and the wheelhouse extension. Shift the entire pivot bracket support fore or aft as required to bring the rear side rail in proper relationship to the quarter glass.

Check the quarter glass for satisfactory operation, and tighten the mounting screws.

WEATHERSTRIP ADJUSTMENT

The side rail weatherstrips can be adjusted laterally and also fore and aft (Fig. 12). Lateral adjustment of the weatherstrip is necessary to assure full contact between the sealing lips and the door and quarter window frames.

Fore-and-aft adjustment of the weatherstrip is necessary to butt the ends of the weatherstrip together to provide a watertight seal. At times it may be necessary to trim the ends of the weatherstrip to prevent bulges at the joints which may prevent proper sealing.

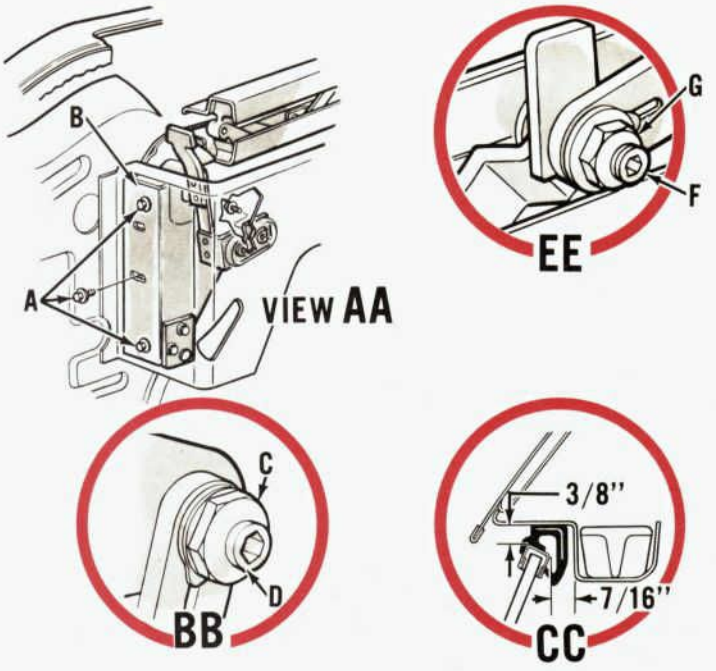

Figure 12–Folding Top Adjustment

FABRIC ADJUSTMENTS

Folding Top Assembly

The following adjustments must be made with the folding top assembly disconnected from the counterbalance assembly or lift and pump assembly.

1. Loosen the screw and washer assemblies at "A" and adjust bracket assembly "B". Move the bracket in or out to obtain 5/16-inch clearance between the rear side rail and quarter outer panel molding.
2. Tighten all screw and washer assemblies (View AA). The bracket assembly "B" must be adjusted and secured in vertical position.
3. Adjust doors and quarter windows so that there is 7/16-inch clearance between the top inside edge of the window and the inside edge of the side rail.
4. Loosen the nut "C" and rotate eccentric "D" to obtain 3/8-inch parallel dimension to the front door glass assembly at the joint of the front and center side rails only. Hold the eccentric from rotating and secure the nut (View BB and View CC).

The main balance link marking and washer pointer is the mean dimension of the adjustment. Rotation of the eccentric will raise or lower the side rails to obtain the correct design height dimension between the side rails and door glass assembly.

No. 1 Bow Assembly to Windshield Header Adjustment

To align dowel "H" to engage the windshield header assembly and obtain a 3/16-inch parallel dimension, loosen crown nut "J" and the nut shown at "K". Adjust the No. 1 bow assembly fore or aft as required (View DD). When the No. 1 bow fore-or-aft adjustment is required, the top cloth is to be removed from No. 1 bow, adjusted and then retracked.

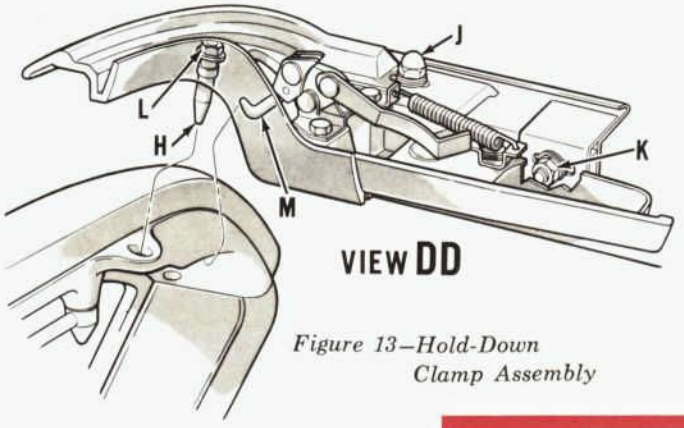

Figure 13—Hold-Down Clamp Assembly

Loosen nut "L" and adjust the dowel in or out to engage the windshield header assembly (View DD). After completing the No. 1 bow assembly adjustment, tighten the crown nut "J" and nuts "K" and "L".

Hold Down Clamp Assembly Adjustment

To maintain a 5/16-inch parallel clearance dimension between No. 1 bow assembly and windshield header assembly, rotate toggle hook "M", which is part of the roof hold-down clamp assembly in or out as required.

Adjustment of the No. 2 Bow

To obtain the correct design height of No. 2 bow, loosen nut "G" and rotate eccentric "F" up or down from the mean adjustment marking to increase or decrease the height of No. 2 bow. Hold the eccentric from rotating and tighten the nut after the adjustment has been made (View "EE").

The clamp assembly is adjusted up or down to engage the center side rail when the folding top assembly is in the stacked position, for manually operated folding top assembly only (View "AA").

QUICK DIAGNOSIS GUIDE

To assist you in solving convertible top difficulties quickly and easily, this handy reference guide has been provided. Find the proper symptom on the horizontal column and concentrate your inspection and adjustments in the areas of the indicated possible causes.

SYMPTOMS / CAUSES	TOP DOES NOT RETRACT	TOP ACTION SLUGGISH	TOP SIDES OPERATE UNEVENLY	TOP DOESN'T STACK	SIDE RAILS DON'T FIT	TOP WON'T RISE FROM STACK	TOP WON'T LATCH	TOP LEAKS
TOP CONTROL SWITCH	X					X		
INADEQUATE BATTERY CHARGE	X	X				X		
MOTOR AND PUMP	X	X				X		
CIRCUIT BREAKER	X					X		
FAULTY WIRING	X	X				X		
HYDRAULIC CYLINDERS	X	X	X			X		
AIR IN HYDRAULIC SYSTEM	X	X				X		
INSUFFICIENT HYDRAULIC FLUID	X	X				X		
BENT LINKAGE	X	X	X			X		
TOP LOWERED WHEN WET (SHRINKAGE)							X	
NO. 2 & NO. 3 BOW ADJUSTMENTS					X			
HOLD-DOWN CLAMP ADJUSTMENT							X	X
WEATHERSTRIPPING								X
BALANCE LINK BRACKET ADJUSTMENT				X	X			

SERVICING THE FORD SPEED

The Ford Speed Control System automatically holds the car speed at any selected setting. It has an operating range from 25 to 80 mph. It operates effectively on hills as well as on the level.

When the speed control switch button in the control head on the console is pulled to energize the control, it is held in the position magnetically. It will return to the OFF position only if it is pushed in manually or the ignition is turned off. The large, speed adjusting wheel control, also located in the control head, should be turned to the extreme forward position. This provides a control speed of approximately 25 mph.

When the car is accelerated to slightly over the speed setting, a click will be heard at the engagement relay. (Figure 1).

When the foot is removed from the accelerator the car will go on automatic speed control. The large speed adjusting wheel control also can be used as a throttle and can be turned until the desired cruising speed is reached. Turning this wheel rotates a cam in the metering valve (Figure 2) which varies the spring pressure exerted on a pilot valve.

A low friction sensor pump (Figure 3) driven by the speedometer cable converts road speed to pressure which applies a balancing force to the pilot valve. The sensor pump operates whenever the car is in motion, whether or not the speed control is energized and in operation. Because of the car motion, the sensor pump is a sealed unit containing a nonvolatile lubricant of high viscosity stability.

Figure 1–Engagement Relay–attached to a bracket above the brake pedal.

Figure 3–Sensor Pump–mounted on the dash panel. It is connected by flexible cable to the speedometer and transmission.

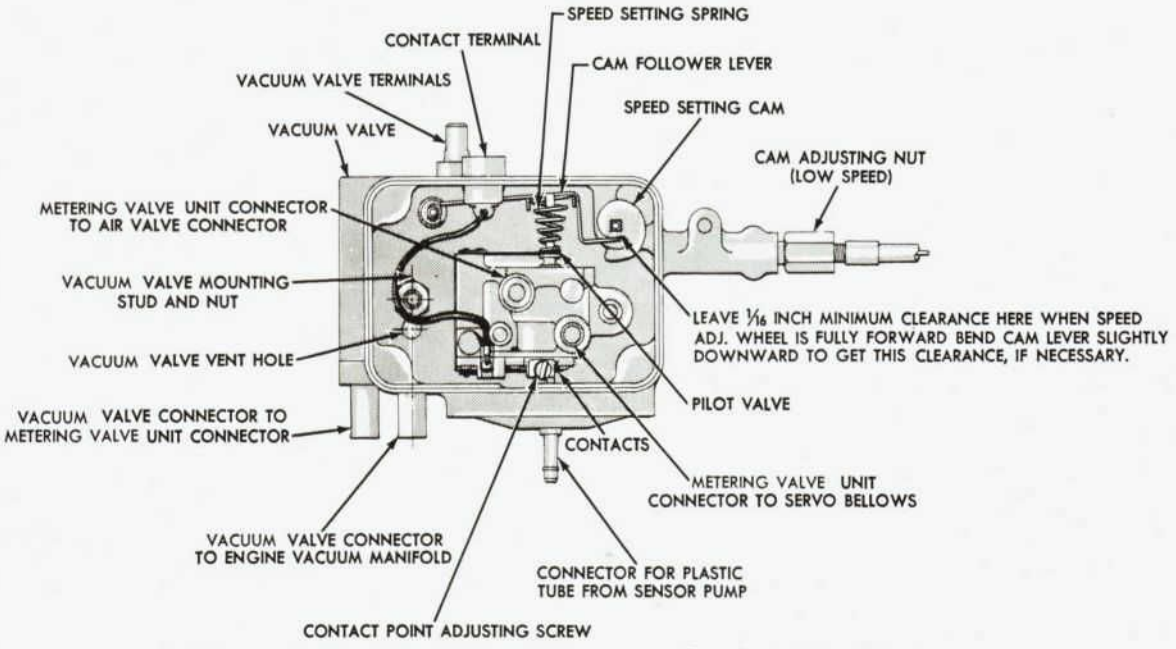

Figure 2–Metering Valve Unit– mounted on the left-hand fender well.

CONTROL SYSTEM

Figure 4–Vacuum Valve–mounted on the left-hand fender well. It is connected by vacuum hoses to the metering valve and car vacuum.

When the car is accelerated to the set speed, pressure from the sensor pump increases to balance the spring pressure exerted on the pilot valve. This causes the vacuum valve to snap open (Figure 4), and the points in the metering valve unit to close. Manifold vacuum is thus available to the valve which meters vacuum to the servo attached to the throttle linkage (Figure 5). Because the pilot valve is now in equilibrium position, the servo does not move the throttle. If for any reason the sensor pump is removed from the car it must be kept in the normal vertical position or the lubricant will leak out.

When climbing a hill, the car speed and sensor pump pressure are reduced. This reduces the pressure of the pilot valve. The spring force which is constant for the set speed, moves the valve which meters more vacuum to the servo. This opens the throttle, accelerating the car until the equilibrium force is again reached. On the downgrade the same principle applies, reversing the action. As the speed rises so does the pressure of the sensor pump. The car throttle closes slightly until pressures are again even.

Figure 5–Vacuum Servo–mounted on a bracket under the instrument panel on the brake pedal support. The servo is linked to the carburetor throttle shaft. The links are held on by the use of snap rings.

Figure 6 – Brake Switch – attached to a bracket above the brake pedal.

If the brake pedal is applied even slightly, the speed control is immediately disconnected. This is done through a small pushbutton switch which remains closed until the pedal is depressed (Figure 6). The speed control will resume control of the vehicle as soon as it is again accelerated to the set speed. The driver also has the option of turning the system on or off at any speed by using the switch in the control head.

ADJUSTMENTS AND REPAIRS

The following is the proper procedure for light adjustment and repair of the Ford Speed Control System. It should be used with the diagnosis chart found at the end of the section (page 11).

BRAKE SWITCH ADJUSTMENT

Adjust the brake switch so that the plunger is depressed ¼ inch with the brake pedal in the normal release position. Refer to Brake Switch Illustration (Figure 6).

SERVO LINKAGE ADJUSTMENT

Be sure that the fast idle cam does not hold the throttle open even slightly. Adjust the length of the connecting cable, or rod, between the servo and the throttle linkage so that from ⅛ to ¼ inch movement of servo bellows is allowed before it moves the throttle linkage.

CONTROL CABLE ADJUSTMENT

1. Rotate the selector dial to the low speed stop, the number 3 should just be visible at the cover plate. If the number is out of position it may be corrected by using the following procedure:

Loosen the control cable nut and remove the control cable from the actuator assembly. Rotate the selector dial a few degrees in the direction that will bring the number into the proper position. Insert the control cable rack into the actuator assembly. Again rotate the selector dial to the low speed stop and check the position of the number. If it is still not correct perform

SERVICING THE FORD SPEED CONTROL SYSTEM

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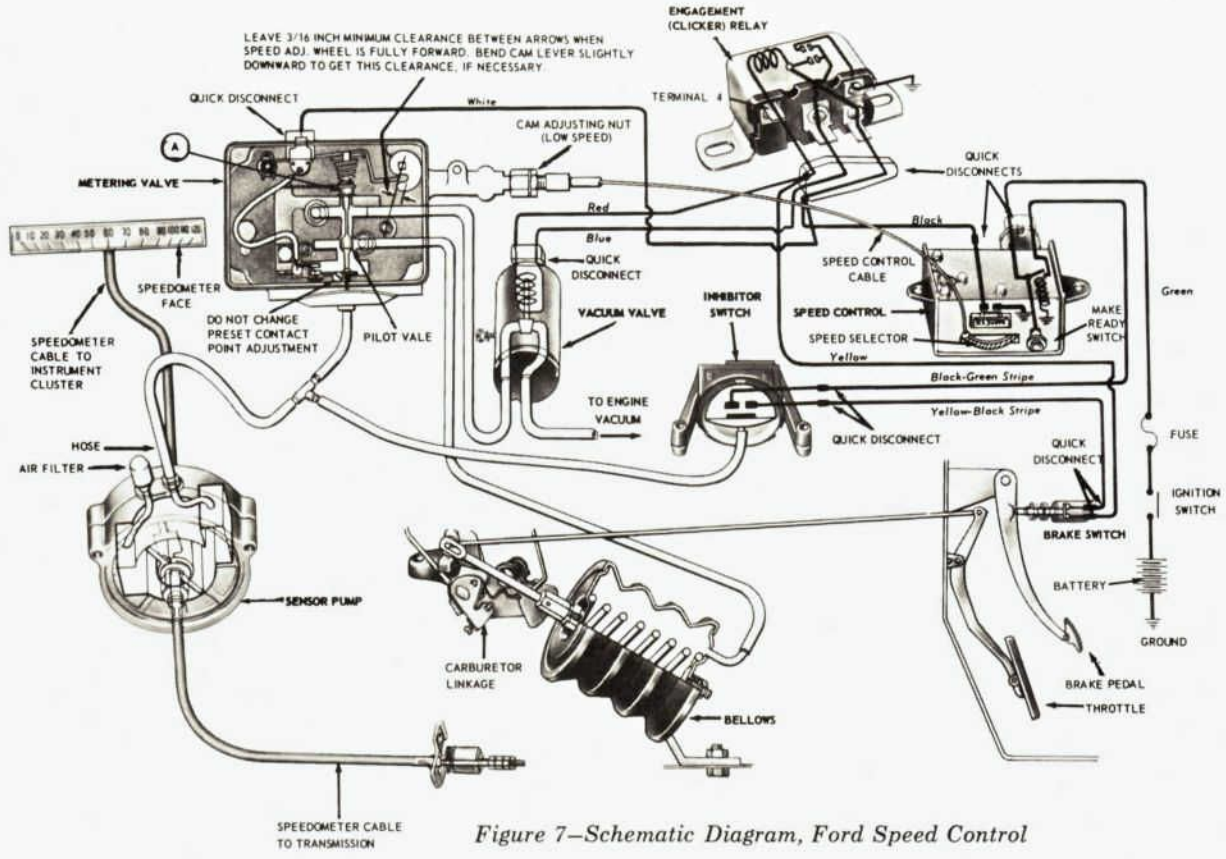


Figure 7—Schematic Diagram, Ford Speed Control

the adjustment again. Tighten the control cable nut to the actuator assembly.

2. Remove the two screws from the plate covering the rack and pinion on the metering valve, and disengage the control meter rack. Remove the filter from the front of the metering valve.

3. Position the speed setting cam so that there is approximately $3/16$-inch clearance between the end of the cam follower lever and the bottom of the notch in the speed setting cam.

4. Check the adjusting nut on the end of the control cable. The nut should be in the mid-position on the threaded portion. Approximately three threads should be visible beyond the jam nut. Adjust the nuts as required.

5. Recheck the selector dial to be sure that it is against the low speed stop. Engage the control cable rack onto the speed setting cam pinion, and place the adjusting nut shank in the slot provided for it.

6. Install the plate covering the rack and pinion. Install and tighten the two screws into the plate. Loosen the jam nut from the adjusting nut.

7. Recheck the clearance between the cam follower lever and the speed setting cam, and using the adjusting nut set the clearance at $3/16$-inch. Tighten the jam nut. Install the filter on the front of the metering valve.

8. Road test the vehicle and correct any difference in speedometer to selector dial reading by rotating the adjusting nut.

METERING VALVE UNIT ADJUSTMENT FOR SET SPEED

Adjustments can be made without removing the metering valve unit from the car. The system should be adjusted to engage at approximately two miles per hour above the set speed.

1. Remove the two vacuum hoses from the front face (screen side) of the metering valve unit.

2. Carefully remove the air filter screen from the face of the metering valve unit using a small screwdriver.

3. If the system engages at less than the set speed, rotate the small plastic cam screw slightly clockwise to open the contact points. If the system engages at more than the set speed, rotate the small plastic cam screw slightly counterclockwise to close the contacts.

4. Install the air filter screen.

SPEED CONTROL ELECTRICAL CHECK

The speed control make ready switch stays out, but the system is inoperative.

CHECKING INHIBITOR VALVE

1. Disconnect the inhibitor valve and install an ohm meter across the valve leads.
2. Disconect the inhibitor valve pressure line at the "T".
3. Apply a slight pressure to the inhibitor valve by blowing into the pressure line. Inhibitor switch contacts should close, which would be indicated by the ohm meter.

CHECKING METERING VALVE, VACUUM VALVE AND ENGAGEMENT (CLICKER) RELAY

1. Install a jumper wire across the inhibitor valve leads at the valve. Current will now by-pass the inhibitor valve so that further checks may be continued.
2. Remove the metering valve unit filter.
3. Raise the pilot valve manually at point A shown in the Speed Control Schematic. Move the valve against the spring. If the vacuum valve is actuated, noted by an audible thump, raise the pilot valve again. If no thump is heard the second time, the engagement (clicker) relay could be defective due to closed points that will not open or the relay may not be properly grounded.
4. If the vacuum valve is not activated, disconnect the metering valve unit feed wire and touch or ground it to the valve case.
5. If the vacuum valve is activated, the metering valve is defective.
6. If the vacuum is not activated, check the brake switch should be closed when the brake pedal is released. Check the engagement (clicker) relay by applying current to terminal number 4 (Fig. 7). Check the vacuum valve by applying current to one terminal and grounding the other. The valve should open. Check all wiring connections.
7. Other things that may contribute to a non-activated vacuum valve are: low fluid level in the sensor pump, pressure line leak between the sensor pump and metering valve or the inhibitor valve, ruptured bellows, leaking vacuum lines, or a ruptured metering valve diaphragm.

INSPECTION AND CLEANING OF METERING VALVE CONTACT POINTS

1. Carefully remove the hoses and air filter screen.
2. Insert a piece of paper approximately ¼ inch wide by 2 inches long between the contact points. Use typewriter bond paper for this. *Do not under any condition use emery paper, sandpaper, or a point file between these gold contact points.*
3. Lift up the pilot valve gently with a small screwdriver or similar tool. To do this, insert the tool under the leaf spring just below the small end of the speed setting spring. (This will close the contacts and hold the paper between them).
4. Pull the paper through to wipe both of the contacts.
5. Repeat steps 2, 3 and 4 until the paper shows no markings of dirt from the contacts.
6. To complete this operation repeat 2, 3 and 4, but before the paper is pulled all the way through, allow the contacts to open slightly to prevent any possibility of paper fragments being left between them.
7. Use all possible caution not to bend the contacts, as this will affect the speed at which the speed control will go into operation.

SPEED CONTROL DIAGNOSIS GUIDE

TROUBLE	POSSIBLE CAUSE	TROUBLE	POSSIBLE CAUSE
Speed Control Make Ready Switch Won't Stay Out, System Is Inoperative.	1. Blown Fuse 2. Wire off back of switch or ignition or wiring is defective. 3. Make ready switch burned out.	System Hunts (Speed Continuously Changes Up and Down).	1. Vacuum hose split between manifold and vacuum valve, vacuum valve and metering valve unit or metering valve unit and bellows. 2. Ruptured bellows. 3. Defective metering valve unit. 4. Sticky carburetor or accelerator linkage.
Speed Control Make Ready Switch Stays Out, But System is Inoperative.	See Speed Control Electrical Check.		
Speed Control Engages Below Desired Speed.	1. Resume Speed Switch Shorted. 2. Metering Valve points shorted.	System Sluggish, Will Not Hold Speed On Hills.	1. Linkage between bellows and accelerator not properly adjusted. 2. Defective Sensor Pump. 3. Sticky carburetor or accelerator linkage. 4. Vacuum leak in hoses or bellows.
Speed Control Will Not Resume When Resume Speed Switch Is Activated.	1. Resume speed switch defective. 2. Switch not properly grounded. 3. Wire off back of switch or defective wiring.	While Operating, Vehicle Over Speeds The Speed Setting.	1. Hose between sensor pump and metering valve unit leaking. 2. Defective metering valve unit diaphragm. 3. Hoses to metering valve unit reversed.
Speed Control Will Not Disengage When Brake Pedal Is Depressed.	1. Brake switch improperly adjusted or defective. 2. Defective resume speed switch.	Slow Response When Adjusting Speed and Speed Drops Excessively On Hills.	1. Linkage between bellows and accelerator, not properly adjusted. 2. Kinked or leading vacuum hoses between manifold and vacuum valve, vacuum valve and metering valve unit or metering valve unit and bellows. 3. Small leak in bellows.
Speed Control Inoperative And Speedometer Does Not Register.	1. Broken speedometer cable between transmission and sensor pump.		
Speed Control Regulates But Speedometer Does Not Register.	1. Broken speedometer cable between sensor pump and speedometer. 2. Inoperative speedometer mechanism.		

POSITIVE CRANKCASE VENTILATION MAINTENANCE

As of April 1965 all Ford cars and trucks will no longer be equipped with the previously standard road draft crankcase ventilation system. The road draft type will be replaced completely by a positive crankcase ventilation system that uses a jiggle pin type regulator valve. See illustration.

There are two types of positive crankcase ventilation. One in which the oil filler cap is open directly to the atmosphere, referred to as an open system and a closed system in which the air enters at the carburetor and passes through a hose to a sealed oil filler cap.

Since a clean crankcase ventilation system is important to the efficient functioning of the modern engine, it is important that you remind your customers of the maintenance and periodical servicing that it requires. Make it clear to him that crankcase ventilation maintenance is as important to the efficiency of his engine as the periodical tune-ups it requires.

To assist you in your servicing of positive crankcase ventilation Ford has provided a list of recommended procedures and a maintenance schedule. For best results follow carefully the listed procedures below and use the schedule to recommend crankcase ventilation servicing at proper intervals.

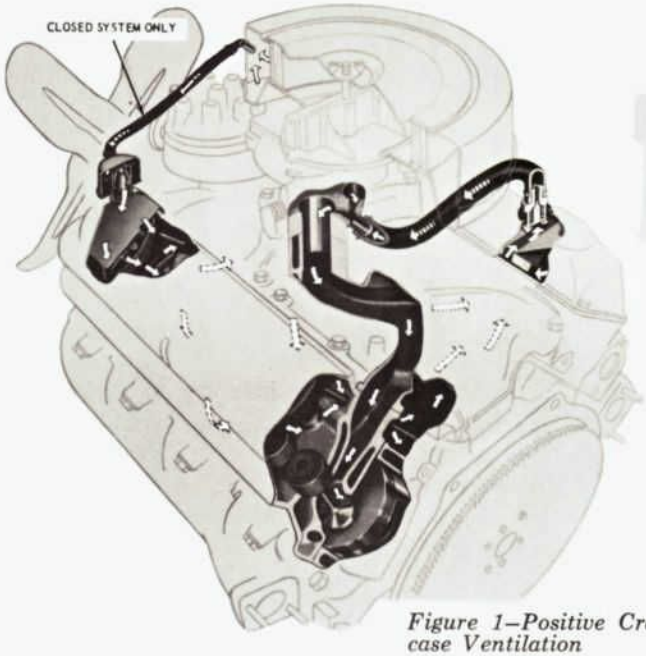


Figure 1—Positive Crankcase Ventilation

Jiggle Pin Type Regulator Valve

HOSE—Crankcase Valve to Carburetor Spacer or Intake Manifold

Remove the hose and soak in a low volatility petroleum base solvent. Clean the hose by passing a brush or a piece of cloth through the hose with the aid of a rod or wire. Dry with compressed air.

Clean the system connection on the carburetor spacer inlet passage or intake manifold fitting by probing with a flexible wire or bottle brush.

When servicing the closed system, clean the hose from the oil filler cap to air cleaner in the same manner as described above using a low volatility petroleum base solvent.

MAINTENANCE SCHEDULES

Service intervals more frequent than those indicated in the following schedules, will be required if the vehicle is operated in extremely dusty areas, for extended periods of idling, or for short runs which prevent the engine from reaching normal operating temperature.

Passenger Cars, Econoline, P-100, and 100-250 Except 4-Wheel Drive Models	EACH 6000 MILES	EACH 12,000 MILES	EACH 36,000 MILES
Clean Carburetor Air Cleaner & Filter Paper Type—open system*	X		
Replace Carburetor Air Cleaner Filter Paper Type—open system*			X
Replace Carburetor Air Cleaner Filter Polyurethane Type—closed system*		X	
Clean Carburetor Air Cleaner—Oil Bath**	X		
Clean Crankcase Breather Filler Cap	X		
Replace Positive Crankcase Ventilation Regulator Valve		X	
Clean Hose—Crankcase Regulator Valve-to-Manifold		X	
Clean Carburetor Spacer or Intake Manifold Fittings		X	
Clean Hose—Oil Filler Cap-To-Air Cleaner Body (Closed System Only)		X	
Or Monthly Interval Whichever Comes First	6	12	36

*Passenger Cars Only **Econoline and Trucks Only.

F-100-250 Equipped With 4-Wheel Drive, and all 350-800 Series Trucks	EACH 4000 MILES	EACH 12,000 MILES
Clean Oil Filler Cap	X	
Clean the Carburetor Air Cleaner	X	
Clean Hose—Crankcase Regulator Valve-to-Manifold		X
Clean Carburetor Spacer Or Intake Manifold Fitting		X
Replace Positive Crankcase Ventilation Regulator Valve		X
Or Monthly Interval Whichever Comes First	4	12

850-1100 Series Trucks	EACH 4000 MILES	EACH 8000 MILES	EACH 12,000 MILES
Clean Oil Filter Cap(s) (Closed System Only)	X		
Clean Carburetor Air Cleaner	X		
Replace Crankcase Breather 2 Elements (Open System Only)		X	
Clean Hose—Crankcase Regulator Valve-to-Manifold			X
Clean Carburetor Spacer or Intake Manifold Fitting			X
Replace Positive Crankcase Ventilation Regulator Valve			X
Or Monthly Interval Whichever Comes First	4	8	12

OIL FILLER CAP

Remove the cap and wash in a low volatility petroleum base solvent. Shake the cap dry. Do not dry with compressed air as air pressure may damage the filter element. Also to assure the removal of any accumulated deposits from the cap of the closed system type, probe the opening of the hose connection tube, and from the underside of the cap probe the 1/16-inch drain hole.

AIR CLEANER FILTER REPLACEMENT OR CLEANING

Removal

1. Remove the wing nuts retaining the air cleaner assembly to the carburetor and air duct (if equipped with air duct).

2. Remove the air cleaner assembly from the carburetor. (To prevent dirt from entering the carburetor, the filter element must never be removed when the air cleaner body is mounted on the carburetor.)

3. Remove the cover and filter element. Discard or clean the filter element. Discard the air cleaner mounting gasket on the carburetor if it is excessively worn or damaged. (If the air cleaner element is the polyurethene type it can not be cleaned and therefore if dirty must be replaced.)

There are two alternate proceedures that may be used to clean the air filter element. (The filter element must never be cleaned with a solvent or cleaning solution. Also oil must never be added to the surface of the paper filter element or the air cleaner body.)

1. Direct a stream of air through the element in a direction opposite that of the intake air flow, that is from the inside outward. Take extreme care not to rupture the element material.

2. The tapping method requires holding the element in a vertical position and tapping it lightly against a horizontal surface to shake the dust and dirt out. Do not deform or damage the gasket surfaces by tapping too hard. Rotate the filter after each tap until the entire outer surface has been cleaned.

Inspection

Hold the filter in front of a back-up light and carefully inspect it for any splits or cracks. If the filter is split or cracked it should be replaced.

Clean the air cleaner body and cover with a solvent or compressed air. Wipe the cleaner dry if solvent is used. Inspect the air cleaner body and cover, for distortion or damage at the gasket mating surface. Replace the cover or body if they are damaged beyond repair.

After necessary cleaning or replacement, install the filter element using the following procedure:

1. Install a new air cleaner mounting gasket on the carburetor if necessary.

2. Install the air cleaner body so the word front faces the front of the car.

3. Place the new element in the air cleaner body. Make sure the element gasket is properly sealed.

4. Install the cover and connect the air duct to the air cleaner (if equipped with air duct) and tighten the retaining wing nuts.

OIL BATH TYPE AIR CLEANER (Econoline and Trucks)

1. Remove the wing nut retaining the air cleaner to the carburetor and remove the air cleaner.

2. Remove the cover and drain the oil from the reservoir. Wash all the cleaner parts in a suitable cleaning solvent. Dry them with compressed air.

3. Inspect the gasket between the oil reservoir chamber and the cleaner body and replace it if necessary.

4. Saturate the filter element with engine oil.

5. Fill the oil reservoir to the full mark with the recommended engine oil.

6. Install the air cleaner on the carburetor.

SERVICING FORD'S LOW FUEL LEVEL WARNING SYSTEM

(1965 FORD-MERCURY)

A thermistor assembly is attached to the fuel sender outlet tube and is kept cooled when covered with gasoline. However, the thermistor will heat up when the fuel gets low enough to expose the thermistor to air. The thermistor resistance then drops and allows current to flow through a warning signal relay. The relay contacts then close to light the warning light. See Schematic Diagram.

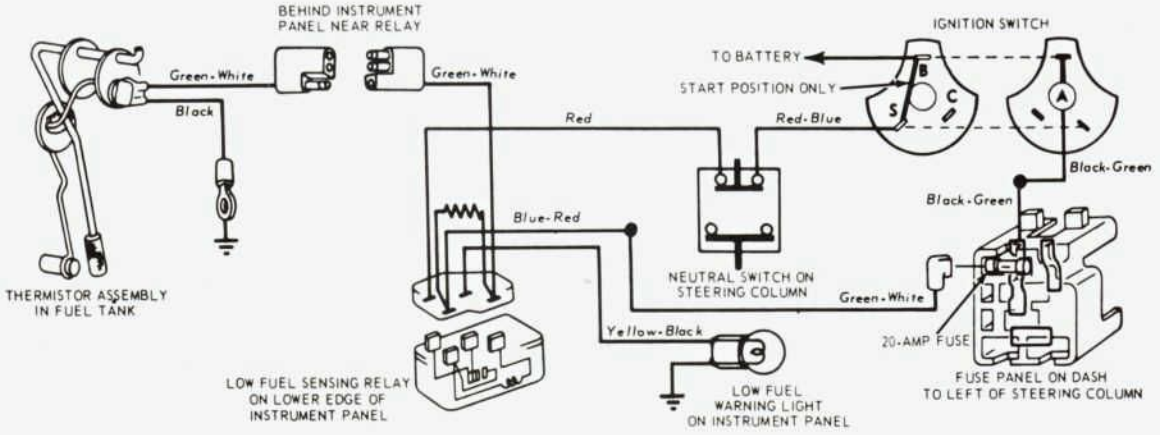
The low fuel warning light circuit is tested each time the ignition switch is turned to the start position. When the ignition switch is turned from On to Start, the warning light is illuminated. This indicates both the light circuit and the light are functioning properly.

The system consists of three components: the fuel sender assembly, the warning relay, and the warning light. In the event of system failure, the following tests can be made:

1. Check to see that the bulb lights with the switch in start position.

2. Check for loose connections, broken wires, blown fuse, or the neutral switch out of adjustment.

3. With the ignition switch on ACC or ON position, disconnect the wiring at the sender assembly and ground the relay to the thermistor wire (Green-White Stripe). If the warning light lights, replace the sender assembly. If the warning light does not light, replace the relay.



SPEEDOMETER

System Diagnosis

This article is designed to aid you in the servicing of speedometer systems. It is recommended that you use the accompanying diagnostic chart to trace the problem to the correct areas of the system and then use the outlined procedures in servicing the prescribed areas.

Defective Or Broken Cable Core

1. Replace the cable core and repair the speedometer system binding or cable routing that caused the core to break.

2. Routing of the cable housing is particularly important as the cable leaves the speedometer head. The optimum routing would provide that the cable and housing take virtually a straight path for at least a length of 8 inches from the speedometer head.

3. When replacing the cable core, proper routing and careful handling of the core are extremely important. Any severe bend in the cable, even if only for a brief period during installation, can result in permanent damage to the core and recurrence of the complaint that was being corrected in the first place. The best method of installation is to feed the cable from under the vehicle through the floorboard while it is being guided through the correct routing under the panel by another person. Neither end of the cable should be attached until the cable is in place.

4. To check for kinked cable core lay the core out straight on a flat surface and roll it back and forth. Any kinks or damages will be seen. Then take an end in each hand, allowing the core to bend in approximately a 9 inch loop. Rotate both ends to be sure the core turns evenly.

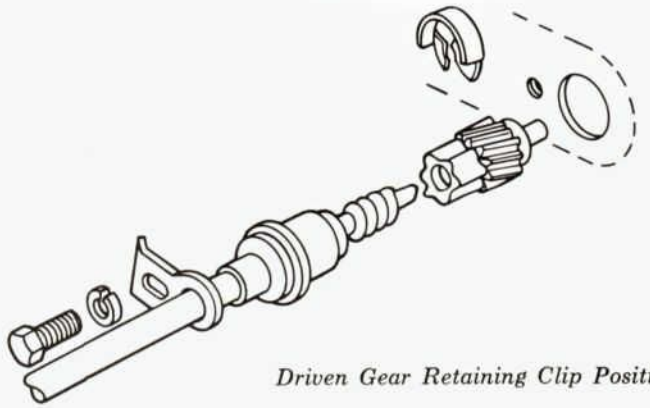
5. Proper lubrication of the cable core is accomplished by a light application of B5A-19581-A lubricant after the cable has been wiped clean. A light film is all that is required.

Defective Speedometer Head

Before removing the speedometer head, disconnect the cable at the head and insert a short section of cable in the head. Rotate the short section of core to check for inoperative speedometer head.

Defective Drive and Driven Gears

1. A scored, nicked, or gouged driven gear could indicate a defective drive gear. On those vehicles that have the drive gear integral with the transmission output shaft; the output shaft should be carefully inspected for imperfections and replaced if necessary.



Driven Gear Retaining Clip Position

2. Whenever a drive gear is replaced, a new driven gear should also be installed.

Interfering Gear Retaining Clip

When diagnosing speedometer noise complaints that indicate a gear problem, the driven gear retaining clip position should be examined to confirm proper orientation. See illustration.

Loose Speedometer Head Cable Attaching Nuts

1. The cable should be tightened with pliers to approximately 18 to 25 in. lbs. (finger tight plus ¼ turn).

2. Cable nuts should start and run up freely by hand for at least three or four turns.

3. A loose cable nut can cause a bent cable core. Tightening will not always correct the problem.

Excessive Lubrication In Speedometer Head

1. Clean excessive lubricant out of instrument cluster.

2. If "right spiral" speedometer core is causing transmission lubricant to be pumped into the speedometer head, replace it with the "left spiral" speedometer core B9AZ-17262-A.

Cable Needs Lubrication

Proper lubrication of the cable core is accomplished by a light application of B5A-19581-A lubricant after the cable has been wiped clean. A light film is all that is required.

CAUSES ▶ / SYMPTOMS	BROKEN OR DEFECTIVE CABLE CORE & HOUSING	DEFECTIVE SPEEDOMETER HEAD	DEFECTIVE DRIVE & DRIVEN GEARS	INTERFERING GEAR RETAINER CLIP	LOOSE SPEEDOMETER CABLE ATTACHING NUTS	EXCESSIVE LUBRICATION IN SPEEDOMETER HEAD	CABLE NEEDS LUBRICATION
SPEEDOMETER INOPERATIVE	X	X	X				
SLIGHT NEEDLE FLUCTUATION		X			X		
SEVERE NEEDLE FLUCTUATION	X	X			X	X	
CLICKING OR TICKING NOISE		X	X	X	X		
GRINDING NOISE			X				X
RINGING NOISE		X					

TECHNICAL SERVICE BRIEFS

CRANKSHAFT OIL SEAL REPLACEMENT PROCEDURES

(All 1952-1965 Gasoline Engines)

Prior to installation of a new front or rear crankshaft oil seal, it is mandatory that the seal contact surface of the crankshaft be cleaned with solvent to remove all corrosion, sludge or varnish deposits which may be present. Also, the surface should be polished with crocus cloth to remove excess deposits, sharp edges, burrs or other imperfections which may damage the seal during installation or cause premature seal wear.

If the seal contact surface has imperfections, excessive wear and/or corrosion which cannot be removed by cleaning and polishing, it may be necessary to replace the crankshaft.

Prior to installation, the front and/or rear oil seals and the seal contact surface of the crankshaft should be lubricated with lubriplate (Ford Part No. COAZ-19584-A) to prevent damage to the seal(s) during installation or initial engine start.

POWER STEERING HISSING NOISE

(1965 Vehicles Equipped With Ford Thompson Power Steering Pump)

The 1965 Ford Thompson power steering pump is subject to a certain amount of hissing noise when the pump is cold, but diminishes as temperature increases. Drivers should be informed that the noise is caused by the pressure relief valve in the pump and is not a defect or malfunction of any type.

The noise level of pumps installed on vehicles built as of October 20, 1964 has been reduced by revision to the pump relief valve assembly. The new improved pump can be indentified by a number "1" stamped after the model number on the identification tag attached to the pump.

NOTE: Do not disassemble pumps in an effort to reduce noise level.

REVISED HYDRAULIC TAPPET VALVE CLEARANCE ADJUSTMENT PROCEDURE

(1962-1965 Cars and Trucks with 221-EEU, 260-EEY, 289-EGA, 240-EHA, 240-EGW, 300-EGY and 300-EGZ CID Series Engines)

The following new hydraulic tappet clearance procedure specified for the subject engines minimizes the possibility of holding valves open, thus causing a valve burning condition:

"When the push rod to rocker arm clearance has been eliminated, tighten the rocker arm stud nut an additional ¾ turn" (The previous procedure was 1½ additional turns).

OUTSIDE REAR VIEW REMOTE CONTROL MIRRORS

(1964 Ford, Fairlane, Thunderbird Models)

If the problem of rattle is encountered on some outside rear view remote control mirrors, the cause may be the glass touching the guide pins or mirror frame. To correct this problem, increase the guide pin diameter and thus reduce the mirror free motion. The following procedure should be used.

1. Remove the screws which hold the mirror to the base.

2. Pull the mirror glass away from the frame.

3. Clean the grease off of the guide pins.

4. Wrap two layers of ½" wide thin plastic electrical tape on each guide pin.

5. Reassemble the mirror glass into the frame and make sure that the tape covered pins are inserted into the nylon bushings on back of the mirror glass assembly.

NOTE: On Thunderbirds, it may be necessary to remove the mirror assembly and wrap tape around the control cables as shown in Figure 1.

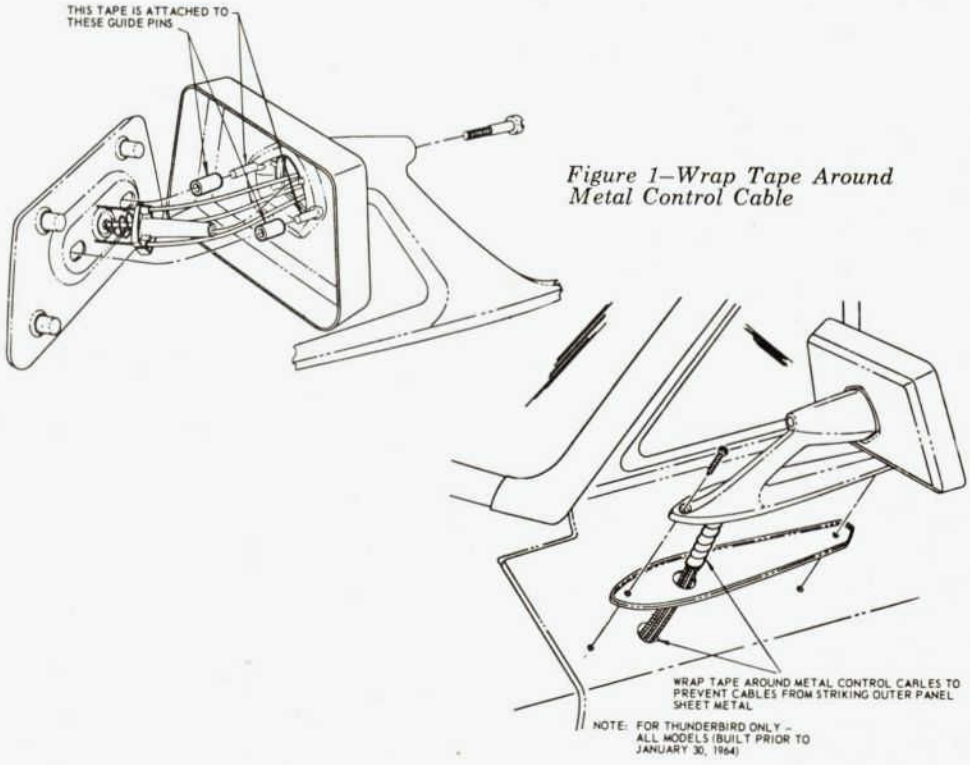


Figure 1—Wrap Tape Around Metal Control Cable

FORD'S JULY-AUGUST SPOTLIGHT PROMOTION FEATURES

A BIG DISCOUNT ON ROTUNDA OIL FILTERS

If you're looking for a Big Discount on the top oil filter, the place to look is your Ford Dealer's Parts Department, Now!

During July and August, participating Ford Dealers are offering eligible wholesale accounts a big, big discount on sales of Rotunda 6000-Mile Oil Filters.

Here's your chance to really save on the Oil Filter that's specified and preferred by owners of late model Fords. Today's automobile and truck engines demand top efficiency in engine lubrication. This is why Ford Dealers remind you of the importance of using a top grade engine oil; one that meets or exceeds car manufacturers' requirements for most severe service.

And, remember, using a top quality oil filter is as important as using a top grade engine oil. Use the Rotunda 6000-Mile Oil Filter with top quality motor oil as a means of providing efficient, long lasting engine life and quality service for your customers.

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