MAY, 1966

Shop Tips

FROM Ford

VOL. 4, NO. 5

Technical parts and service information published by Ford Division to assist servicemen in Service Stations, Independent Garages and Fleets.

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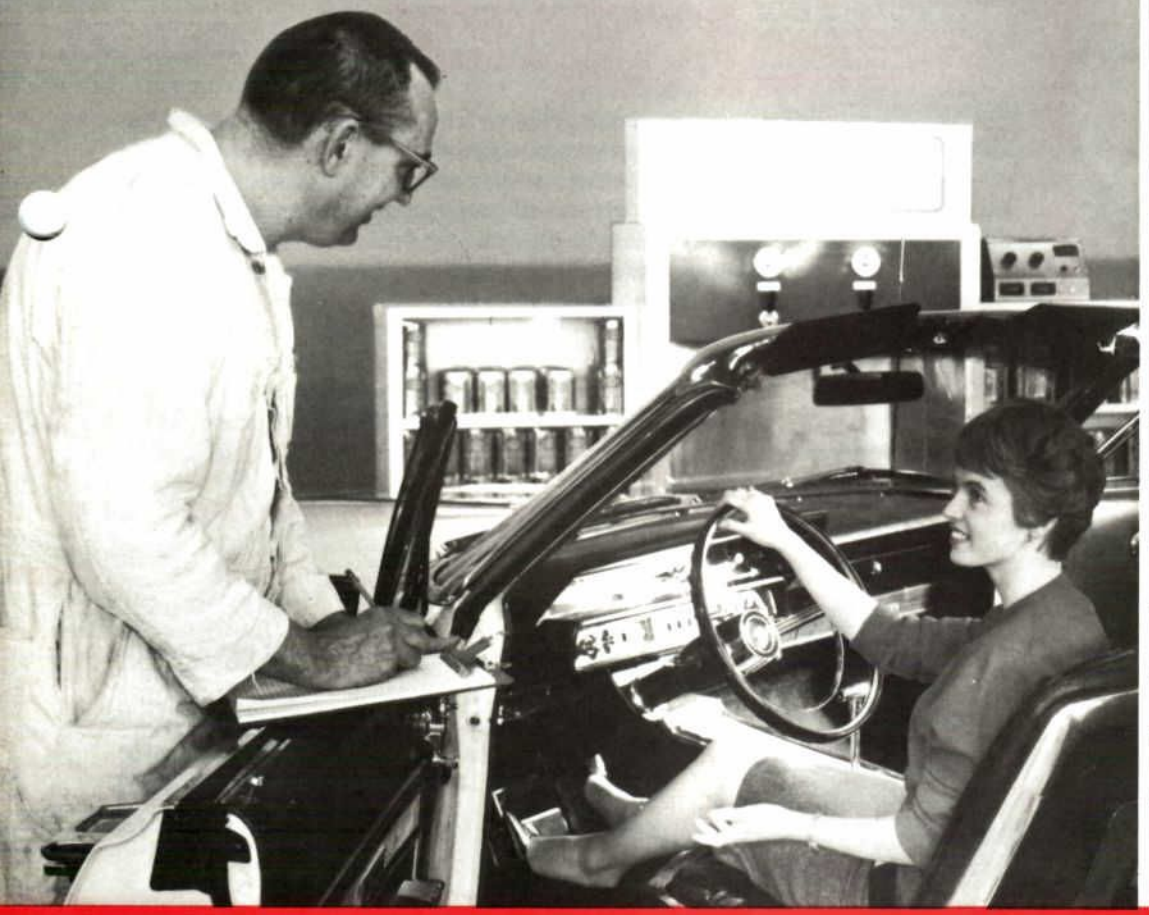

SAFETY ✓ CHECKED 1966

1 BRAKES
2 ALL LIGHTS FRONT and REAR
3 STEERING
4 TIRES
5 EXHAUST
6 GLASS
7 WIPERS & WASHERS
8 MIRRORS
9 HORN
10 SEAT BELTS

From Your Ford Dealer

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 598, Dearborn, Michigan 48121.

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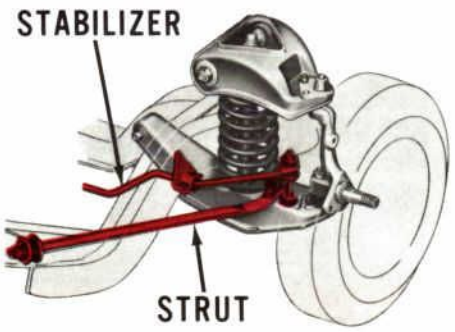
SAFETY CHECKS—PART II . . .

IN THIS ISSUE

Safety is important year-round, but it takes on added significance during the summer months when millions of extra miles are rolled-up by vacationers. As a leader in automotive safety, the Ford Motor Company is presenting a timely, two-part series of Safety Checks—to help every service technician to quickly and accurately diagnose potential problems, or inoperative components and recommended to the customer what service is needed to assure a safe operating car. As noted in last month's issue of Shop Tips under Safety Checks—Part I, entitled: "Brakes and Tires", the owner has a responsibility of keeping his car in good running order by having it serviced at the recommended intervals. Safety Checks—Part II in this issue covers: Suspension, Steering and Visibility and completes the items that are the most important to a safe car. We believe this information should give every service man a better knowledge of safety maintenance.

SUSPENSION

The suspension system (springs, shocks, control arms, bushings, and linkage) supports the weight of the car on the four wheels to give the best combination of stability, ride and handling. Together, these characteristics are commonly called "feel". See Figures 1 & 2. Normally, wheels, tires and suspension components do not require a lot of attention. However, they should be inspected periodically or whenever a "feel" complaint is encountered, to insure a safe operating car. The table on page 4 lists a number of trouble symptoms and their possible causes.



Figue 1-A—Spring Above Lower Arm With Strut

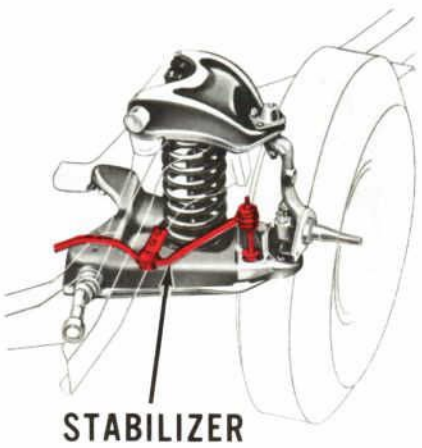


Figure 1-B—Spring Above Lower Arm Without Strut

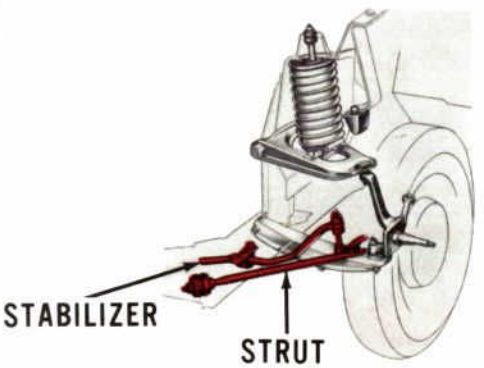


Figure 1-C—Spring Above Upper Arm With Strut

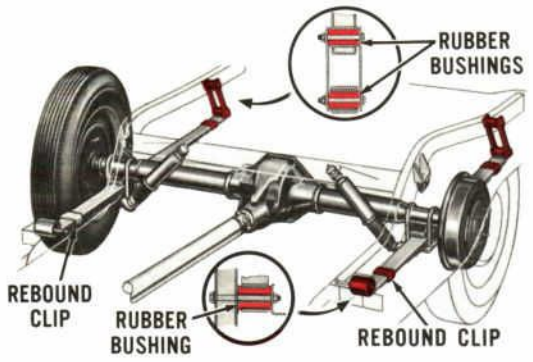


Figure 2-A—Leaf Spring Suspension

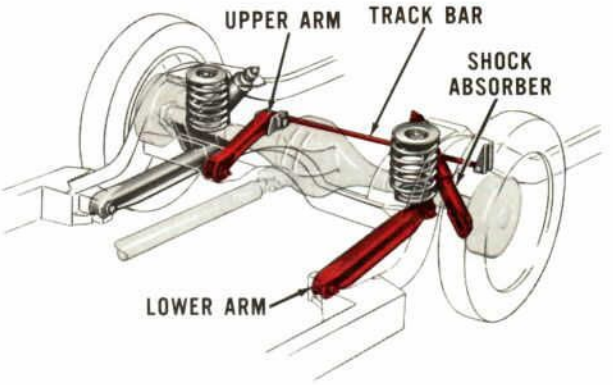


Figure 2-B—Coil Spring Suspension

WHEELS AND TIRES

The importance of wheels and tires to auto safety, in terms of blow-out protection, has long been recognized. However, an equal if not more important fact, often overlooked, is that each tire has only about one square foot of rubber contacting the road at any one time. This area is called the "patch area" or "footprint". All the forces that affect stability, ride and handling of a 4000 lb. car are transferred to the road by this relatively small area. At 60 M.P.H. they can be considerable. For this reason, it's most important that each tire make as continuous and equal a contact with the road at all times as possible.

Abnormal tire wear, front end vibrations or noises are indications that an alignment or wheel balance problem may exist, which should be corrected for safe operation of the car. Safety Checks—Part I, pictured several types of tire wear and their causes. Tire wear because of overinflation or underinflation, of course, can be easily corrected by adhering to the tire inflation specifications in the owners manual. Tire wear due to misalignment can be corrected by many types of reputable alignment equipment. See Figure 3 for typical adjustment locations. Likewise, unbalance can be corrected with accurate balancing equipment. Always be sure and follow the manufacturer's instructions.

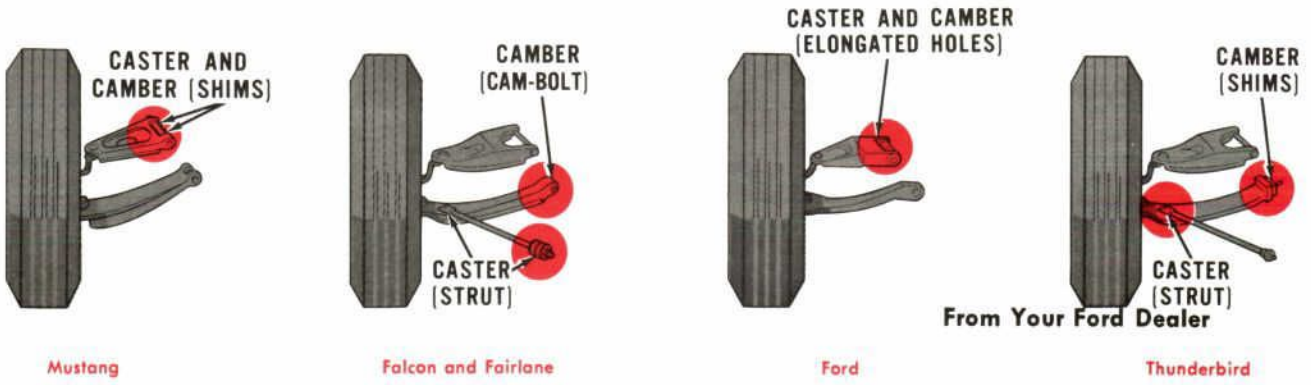


Figure 3—Caster-Camber Adjustment Locations

SAFETY CHECKS—PART II . . .

TABLE 1 — Trouble Symptoms and Possible Causes

POSSIBLE CAUSES OF TROUBLE / TROUBLE SYMPTOMS	Jerky Steering	Loose Steering	Hard Steering and/or Loss of Power Assist	Hard Turning When Stationary	Steering and Suspension Noises	Shimmy or Wheel Tramp	Pull to One Side	Side-to-Side Wander	Body Sway or Roll	Tire Squeal on Turns	Binding or Poor Recovery	Abnormal or Irregular Tire Wear	Sag at One Wheel	Hard or Rough Ride	Rear Suspension Misalignment (Dog-Tracking)
Incorrect Tire Pressure			X	X	X	X	X	X	X	X		X	X	X	
Tire Sizes Not Uniform			X	X		X	X	X				X	X		
Overloaded or Unevenly Loaded Vehicle								X				X	X	X	
Power Steering Fluid Level Low-Leak	X		X	X	X										
Sagging Spring					X	X	X	X	X			X	X	X	
Glazed, Loose or Broken Power Steering Pump Belt	X		X	X	X										
Bent Spindle Arm							X	X		X		X			
Bent Spindle							X	X		X		X			
Lack of Lubrication			X	X	X						X			X	
Air in Power Steering System	X		X		X	X									
Obstruction in Power Steering Lines			X	X	X										
Loose or Weak Shock Absorber					X	X			X			X		X	
Loose or Worn Suspension Arm Bushings					X	X						X		X	
Binding Front Suspension Ball Joints or Steering Linkage	X		X	X	X						X			X	
Loose, Worn, or Damaged Steering Linkage or Connections	X	X			X	X		X		X		X			
Loose Steering Gear Mountings	X	X			X	X		X	X						
Insufficient Steering Pump Pressure			X	X							X				
Incorrect Steering Gear Adjustment	X	X	X	X	X	X		X	X		X	X			
Incorrect Brake Adjustment	X				X		X					X			
Incorrect Front Wheel Bearing Adjustment	X	X			X	X	X	X				X			
Wheel Out of Balance	X				X	X						X		X	
Incorrect Front Wheel Alignment			X		X	X	X	X		X	X	X			
Out-of-Round Wheel or Brake Drum						X						X		X	
Frame or Underbody Out of Alignment							X					X			X
Bent Rear Axle Housing					X		X					X			X
Excessive Wear of Steering Pump Internal Parts					X										
Steering Gear Valve Spool Binding or Out of Adjustment			X	X							X				
Obstruction Within Steering Gear			X	X							X				

Suspension, Steering and Visibility (Continued)

DIAGNOSIS CHART

SYMPTOM	PROBABLE CAUSE
Excessive tire wear on outside shoulder	Excessive positive camber
Excessive tire wear on inside shoulder	Excessive negative camber
Excessive tire wear on both shoulders	Rounding curves at high speeds Under-inflated tires
Saw tooth tire wear	Too much toe-in or toe-out
One tire wears more than the other	Improper camber Defective brakes
Front wheels shimmy	Out-of-round tires Out-of-balance condition Excessive Positive caster Uneven caster Defective tires One or more of all 4 tires out-of-round One or more of all 4 tires out-of-balance Drive shaft bent Drive shaft sprayed with undercoating

SYMPTOM	PROBABLE CAUSE
Car tends to wander from side to side	Improper toe setting Looseness in steering assembly or ball-joints Uneven caster
Vehicle swerves or pulls to side when applying brakes	Uneven caster Too much negative caster Out-of-round brake drum Defective Brakes Under-inflated tire
Car is hard to steer	Under-inflated tires Steering defective Too much positive caster
Car tends to pull from side to side when taking hands off steering wheel	Improper camber Unequal caster Tires worn unevenly Tire pressure unequal

ALIGNMENT SPECIFICATIONS 1960-1965

YEAR & MODEL	Caster Angle (Degrees)	Camber Angle (Degrees)	Toe-In (Inches)
1965			
Ford	0° to +2°	−¼° to +1°	⅛" to ¼"
Fairlane	−1° to +1°	−½° to +1°	3/32" to 11/32"
Thunderbird	−1¼° to −3¼°	+¾° to +1°	1/32" to 9/32"
Falcon—6 Cyl.	−¼° to +1¾°	−¼° to +1¼°	5/32" to 13/32"
8 Cyl.	−1¼° to +¾°	−¼° to +1¼°	5/32" to 13/32"
Mustang—6 Cyl.	0° to +2°	+¼° to +1¼°	3/32" to 11/32"
8 Cyl.	−1° to +1°	+¼° to +1¼°	3/32" to 11/32"
1964			
Ford	−1° to +1°	0° to +1¼°	⅛" to ¼"
Fairlane	−1° to +1°	−¼° to +¼°	3/16" to 5/16"
Thunderbird	−¾° to −2¼°	0° to +¾°	⅛" to ¼"
Falcon	−½° to +1½°	−¼° to +1¼°	¼" to 5/16"
1963-62			
Ford	−½° to +½°	+¼° to +1°	⅛" to ¼"
Fairlane	−½° to +½°	0° to +1°	3/16" to 5/16"
Thunderbird	0° to −1½°	0° to +¾°	1/16" to 3/16"
Falcon	0° to +1°	0° to +1°	¼" to 5/16"
1961			
Ford	−½° to +½°	+¼° to +1°	⅛" to ¼"
Falcon	0° to +1°	0° to +1°	¼" to 5/16"
Thunderbird	−1¼° to +¼°	0° to +1°	1/16" to ⅛"
1960			
Ford	+¾° to +1¼°	+½° to +1°	⅛" to ¼"
Falcon	0° to +1°	0° to +1°	5/32" to 7/32"
Thunderbird	+½° to +1½°	+½° to +1½°	1/16" to ⅛"

ALIGNMENT SPECIFICATIONS

1966 FORD

Wheel Alignment	Checking Specifications Min.	Checking Specifications Max.	Maximum Variation Between Wheels	Optimum Re-Setting Specifications Desired Alignment
Caster[1]	0°	+2°	½°	+1°
Camber[1]	−¼°	+1¼°	½°	+½°
Toe-In	1/16"	5/16"	—	3/16"

[1] At controlled curb height . . . Front Alignment spacer—4.20 inches from frame side member to top center of strut mounting bolt. Rear Alignment Spacer—6.70 inches from bottom of frame outer side rail to axle.

1966 MUSTANG

Caster[1]—6 Cyl.	0°	+2°	½°	+1°
Caster[1]—8 Cyl.	−1°	+1°	½°	0°
Camber[1]—All	−¼°	+1¼°	½°	+½°
Toe-In	⅛"	⅜"	—	¼"

[1] At controlled curb height . . . Front Alignment spacer—6.50 inches from bottom surface of spring tower to flat surface of upper control arm midway between ball joint rivets. Rear Alignment spacer—5.50 inches from side rail member to axle housing.

1966 FALCON-FAIRLANE

Caster[1]	−1°	+1°	½°	0°
Camber[1]	−½°	+1°	½°	+¼°
Toe-In	⅛"	⅜"	—	¼"

[1] At controlled curb height . . . Front Alignment spacer—6.50 inches from bottom of rebound bumper mounting surface to upper control arm midway between rivets. Rear Alignment spacer—6.72 inches from bottom of side rail member to axle housing.

1966 THUNDERBIRD

Caster[1]	−2½°	−½°	½°	−1½°
Camber[1]	−¼°	+1¼°	½°	+½°
Toe-In	1/16"	5/16"	—	3/16"

[1] At controlled curb height . . . Front Alignment spacer—10.70 inches from underside of spring seat to center of top surface of ball joint. Rear Alignment spacer—6.55 inches from side rail member to axle housing.

SAFETY CHECKS—PART II . . .

Front End General Inspection

DO NOT CHECK AND ADJUST FRONT WHEEL ALIGNMENT WITHOUT FIRST MAKING THE FOLLOWING INSPECTION FOR FRONT-END MALADJUSTMENT, DAMAGE, OR WEAR.

1. Check for specified air pressure in all four tires.
2. Raise the front of the car off the floor. Shake each front wheel, grasping the upper and lower surfaces of the tire. Check the front suspension ball joints and mountings for looseness, wear and damage. Check the brake backing plate mountings. Torque all loose nuts and bolts to specifications. Replace any worn parts.
3. Check the steering gear mounting and all steering linkage connections for looseness. Torque all mountings to specifications. If any of the linkage is worn or bent, replace the parts.
4. Check the front wheel bearings. If any in-and-out free play is noticed, adjust the bearings to specifications. Replace worn or damaged bearings.
5. Spin each front wheel with a wheel spinner, and balance each wheel as required. (Figure 4.)
6. Check the action of the shock absorbers. If the shocks are not in good condition, the car may not settle in a normal level position.

Figure 4—Balance Equipment

Wheel Inspection

Wheel hub nuts should be inspected and tightened to 70 to 115 ft. lbs. Loose wheel hub nuts may cause shimmy and vibration. Elongated stud holes in the wheels may also result from loose hub nuts. Be sure wheels and hubs are clean. Stones wedged between the wheel and drum and lumps of mud or grease can unbalance a wheel and tire assembly. Check for damage that would affect the runout of the wheels. Wobble or shimmy caused by a damaged wheel will eventually damage the wheel bearings. Inspect the wheel rims for dents that could cause air to leak from the tires.

Upper Ball Joint Inspection (Ford)

1. Raise the car on floor jacks placed beneath the lower control arms.
2. Ask an assistant to grasp the lower edge of the tire and move the wheel in and out.
3. As the wheel is moved in and out, observe the upper end of the spindle and the upper control arm.
4. Any movement between the upper end of the spindle and the upper arm indicates ball joint wear and loss of preload. If any such movement is observed, replace the upper ball joint.

DURING THE FOREGOING CHECK, THE LOWER BALL JOINT WILL BE UNLOADED AND MAY MOVE. DISREGARD ALL SUCH MOVEMENT OF THE LOWER BALL JOINT. ALSO, DO NOT MISTAKE LOOSE WHEEL BEARINGS FOR A WORN BALL JOINT.

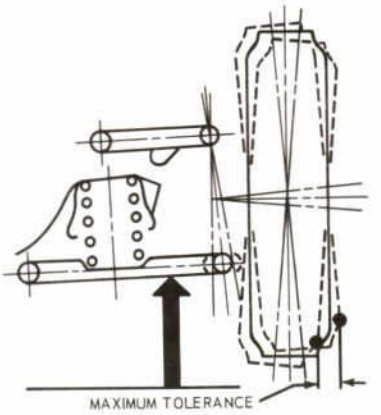


Figure 5—Measuring Lower Ball Joint Radial Play

Lower Ball Joint Inspection (Ford)

1. Raise the car on jacks placed under the lower control arms as shown in Figure 5. This will unload the ball joint.
2. Adjust the wheel bearings.
3. Attach a dial indicator to the lower arm. Position the indicator so that the plunger rests against the upper surface of the spindle at the lower ball joint stud.
4. With the dial indicator attached to the lower arm, position the indicator so that the plunger rests against the inner side of the wheel rim adjacent to the lower ball joint.
5. Grasp the tire at the top and bottom and slowly move the tire in and out. Note the reading (radial play) on the dial indicator. If the reading exceeds 0.250 inches, replace the lower ball joint.

Upper Ball Joint Inspection (Fairlane, Falcon, Mustang, T-Bird)

1. Raise the car on a frame contact hoist or by floor jacks placed beneath the underbody until the wheel falls to the full down position as shown in Figure 6. This will unload the upper ball joint.
2. Adjust the wheel bearings.

3. Attach a dial indicator to the upper control arm. Position the indicator so that the plunger rests against the underside of the spindle at the upper ball joint stud.
4. With the dial indicator attached to the upper arm, position the indicator so that the plunger rests against the inner side of the wheel rim adjacent to the upper arm ball joint.

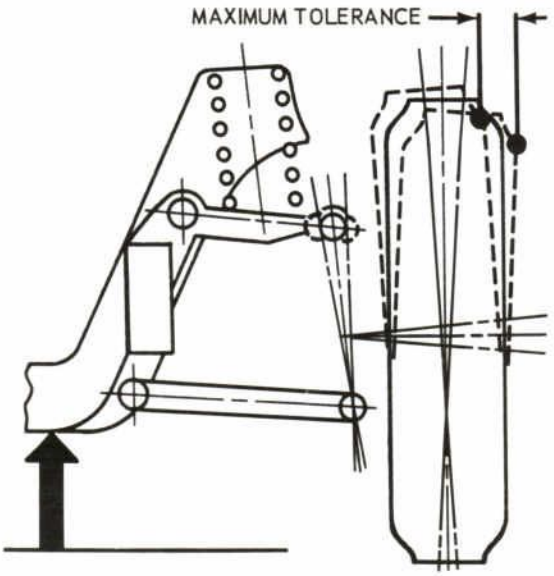


Figure 6—Measuring Upper Ball Joint Radial Play

Lower Ball Joint Inspection (Fairlane, Falcon, Mustang, T-Bird)

the dial indicator. If the reading exceeds 0.250 inches, replace the upper ball joint.

Lower Ball Joint Inspection (Fairlane, Falcon, Mustang, T-Bird)

1. Raise the car on a frame contact hoist or by floor jacks placed beneath the underbody until the wheel falls to the full down position.
2. Ask an assistant to grasp the lower edge of the tire and move the wheel in and out.
3. As the wheel is moved in and out, observe the lower end of the spindle and lower arm.
4. Any movement between the lower end of the spindle and the lower arm indicates ball joint wear and loss of preload. If any such movement is observed, replace the lower arm and ball joint assembly.

SPRINGS

Springs have two jobs to accomplish in the suspension system. First, they support the car at the proper height. If the car has no unusual loads, but a corner is sagging, then the spring is probably either weak or broken. Cars with several miles on them usually set a little lower than new cars because springs have a tendency to take a "set" with usage.

Secondly, springs absorb and dampen-out road shocks to achieve a smooth controlled ride and handling. To accomplish this, requires a compromise between stiffness and flexibility. Too soft a spring results in continued flexing and rebounding after passing over an irregularity in the road which causes a rough ride and loss of control. If the spring is too stiff, the rebounding and flexing after a bump is passed over will be greatly reduced, however, it will transmit too much road shock, giving a stiff, jolting ride.

The most obvious solution for this problem is to use a spring which is flexible enough to absorb road shock and some device to control the rebounding and flexing oscillations of the spring. See Figure 7. The device, of course, is the shock absorber.

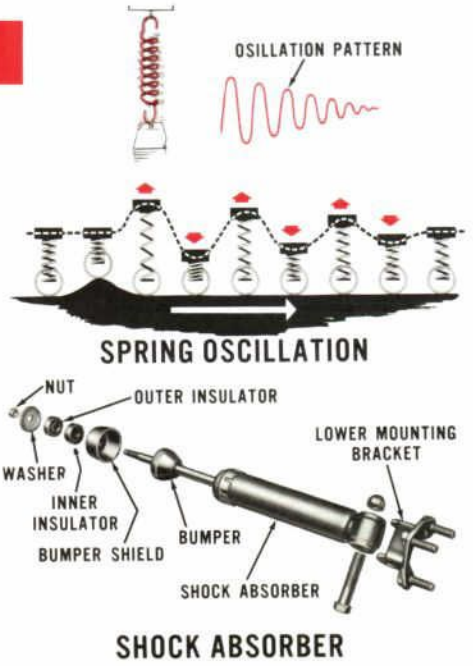


Figure 7—Spring Oscillation and Shock Absorber

SAFETY CHECKS—PART II . . .

SHOCK ABSORBERS

All Ford cars use the direct, double-action type to provide a continous damping effect on both compression and rebound. They are nonadjustable, nonrefillable and can not be repaired. Shock absorbers do not affect vehicle riding heights (springs determine riding height) and should not be replaced because of sagging, bottoming, etc. Before replacing a shock, check the action of the shock absorbers by grasping the bumper and jouncing the car up and down. If the shock absorbers are in good condition the car will immediately settle to a normal position after the bumper is released.

A weak or leaking shock can be caused by loss of fluid, or an internal defect. Internal defects should be obvious within the first few miles of usage. Weakness due to leaking should be verified by obvious wetting of fresh oil on the shock. Loss of shock control can be detected by excessive oscillations while driving or jouncing each corner of the vehicle.

NOTE: Softer shock action is one means by which a plusher ride has been achieved on 1965-66 models. This softer action in comparison with previous models, for example, should not be misinterpreted as a weak shock absorber.

Noise such as metallic rattles are most commonly caused by shock absorber mounting attachment or other chassis components, such as: exhaust system, bumper attachment, or fuel line. Before replacing a shock for noise, check for proper mounting attachment, as well as other possible sources listed above. By following this procedure, shock absorbers will not be replaced unnecessarily to correct problems caused by alignment or related suspension problems.

To check a shock absorber removed from a car proceed as follows:

1. Hold the shock absorber in the vertical position with the piston (lower end) up. Pull out the piston rod until the shock is extended to its full length.
2. With the shock absorber held in the same position, push in the piston rod until the shock is compressed to its shortest length.
3. Repeat steps 1 and 2 several times until all the air is expelled.
4. Clamp the lower end (small diameter) in a vise in the vertical position.
5. Extend the shock to its full length and then compress it to its shortest length. There should be a constant drag during the complete cycle. Any sudden loss of drag indicates air in the system or faulty internal valve operation.

BUSHINGS

Control arm, spring, steering linkage and shock absorber bushings insulate and dampen road shocks from the car body. Bushings which are loose, hardened, or deteriorated can cause a generally "loose" feel in the suspension system. Check to see that the bolts passing through the bushings are tight before condemning the bushings.

STEERING SYSTEM

The steering system is an extension of the suspension system in that they are connected together by the steering linkage. Movement of the steering gear is thereby transmitted to the front wheels. The first requirement of a good steering system is that it handles the car easily and absorbs road shock; otherwise the driver becomes fatigued, and is prone to accident. To achieve these goals, most cars are equipped with power steering. Two types are used by Ford, the integral power cylinder-type using a torsion-bar hydraulic assist system, Figure 8 and the linkage-type, (Figure 9).

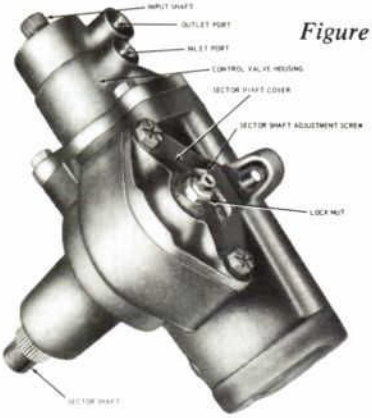


Figure 8—Integral-Torsion Bar Type Power Steering

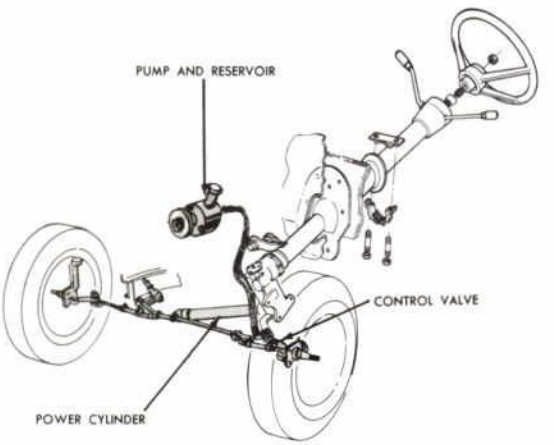


Figure 9—Linkage-Type Power Steering

Manual Steering

The chart on page 4 lists steering gear and linkage trouble symptoms and possible causes. Several of these symptoms are also common to suspension, wheel and tire troubles. For this reason, always double-check to be sure the cause of the trouble is in the steering gear or linkage before adjusting, repairing, or replacing any steering parts.

Power Steering

The power steering diagnosis guide on page 9 lists possible causes for power steering troubles. Before performing any trouble-shooting operations, the following checks should be made.

Check Pump Belt. If it is broken, glazed, or worn, replace with a new belt. Also check belt tension. Used belts (run for more than 15 minutes) should be adjusted to 90-120 lbs. New belts (run for less than 15 minutes) should be adjusted to 120-150 lbs.

WHEN ADJUSTING THE POWER STEERING BELT TENSION, DO NOT PRY AGAINST THE RESERVOIR. OBTAINING THE PROPER BELT TENSION IN THIS MANNER MAY DAMAGE THE RESERVOIR RESULTING IN LEAKS. INSTEAD, PRY UPWARDS ON THE ½" INCH BOSS (FIGURE 10) WITH AN OPEN-END WRENCH.

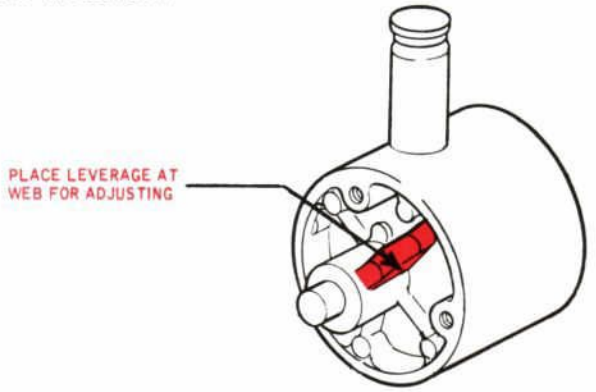


Figure 10—Power Steering Belt Tension Adjustment Lug

Check Fluid Level. Run the engine long enough to bring the fluid to normal operating temperatures. After making sure the reservoir is filled to the proper mark, turn the steering wheel several times all the way to the left and to the right several times to expel or bleed any air out of the system. DO NOT HOLD THE WHEELS AGAINST THEIR STOPS. Check the fluid level again. The fluid should be at the F mark on the dip stick, or to the bottom of the filler neck on a pump with a straight filler tube (Figure 11). If the level is low, add power steering lube, Ford Part Number C3AZ-19578-A or automatic transmission fluid, Ford Part Number C1AZ-19582-A. DO NOT OVERFILL THE RESERVOIR.

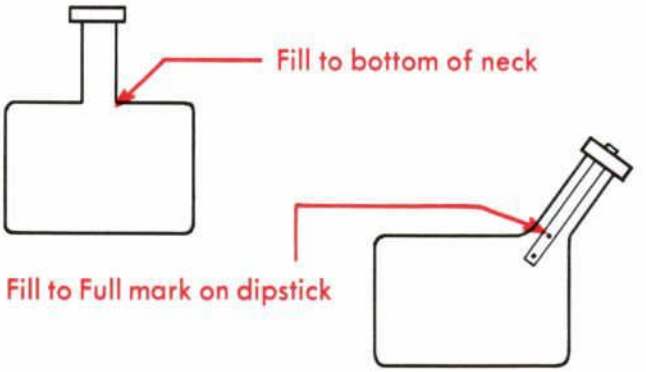


Figure 11—Full Marks—Power Steering Reservoir

POWER STEERING DIAGNOSIS GUIDE

JERKY STEERING	Low fluid level or fluid leakage. Obstruction in power steering lines or within the steering gear.	Loose steering gear mountings. Incorrect steering gear adjustment.
HARD STEERING AND/OR LOSS OF POWER ASSIST	Low fluid level or fluid leakage. Air in power steering system. Obstruction in power steering lines or within the steering gear.	Insufficient power steering pump pressure. Incorrect steering gear adjustment. Steering gear valve spool binding or out of adjustment.
HARD TURNING WHEN STATIONARY	Low fluid level or fluid leakage. Obstruction in power steering lines or within the steering gear.	Insufficient power steering pump pressure.
STEERING AND SUSPENSION NOISES	Low fluid level or fluid leakage. Air in power steering system. Obstruction in power steering lines or within the steering gear.	Loose steering gear mountings. Insufficient power steering pump pressure. Incorrect steering gear adjustment.
LOOSE STEERING SHIMMY SIDE-TO-SIDE WANDER OR WHEEL TRAMP OR	Loose steering gear mountings.	Incorrect steering gear adjustment.
BINDING OR POOR RECOVERY	Insufficient power steering pump pressure. Incorrect steering gear adjustment.	Steering gear valve spool binding or out of adjustment. Obstruction within the steering gear
BODY SWAY OR ROLL	Incorrect steering gear adjustment.	
HARDER STEERING IN ONE DIRECTION	Steering gear valve spool binding or out of adjustment.	
ABNORMAL OR IRREGULAR TIRE WEAR	Incorrect steering gear adjustment.	

SAFETY CHECKS—PART II . . .

VISIBILITY

The ability to see and be seen is an important part of safety. Items that should be checked in this area are lights, turn signals, horns, wipers, windshield washers, and instruments that might distract the driver if inoperative.

HEADLIGHTS

Headlights are generally either inoperative or misaligned. Refer to the Lighting Trouble Diagnosis Guide to correct inoperative lights.

LIGHTING TROUBLE DIAGNOSIS GUIDE

ALL HEADLIGHTS DO NOT LIGHT	1. Loose Battery Cable. 2. Loose quick disconnect or broken wire from the battery to the headlight switch. 3. Defective headlight switch. 4. Disconnected or broken wire from the headlight switch to the beam selector switch.	5. Loose or broken wire to the bulbs. 6. Defective beam selector switch. 7. All headlights burned out. This may be caused by a defective or improperly adjusted alternator voltage regulator.
INDIVIDUAL LIGHTS DO NOT LIGHT	1. Burned out bulb. 2. Loose or broken wires to the bulb.	3. Poor ground.
LIGHTS BURN OUT REPEATEDLY	1. Loose or corroded electrical connections. 2. Excessive vibration.	3. Improperly adjusted or defective alternator or generator voltage regulator.
BOTH LOW BEAM HEADLIGHTS DO NOT LIGHT	1. Defective beam selector switch. 2. Loose or broken wire to the bulbs.	3. Both low beam filaments burned out.

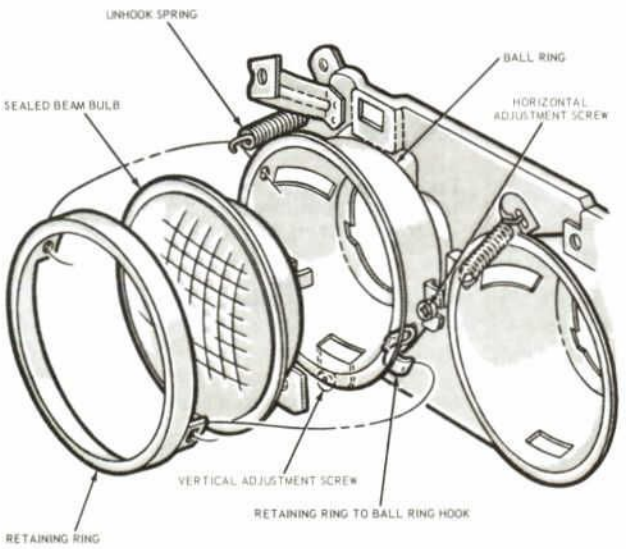


Figure 12—Headlight Adjustment—Typical

Headlight Alignment

If a headlight needs alignment, it should be made with a half-full tank of gas, a driver and one passenger, no loads, empty trunk except for a spare tire and jacking equipment, and the tires at the recommended pressures. Also, level the car by bouncing it at all four corners. Figure 12 shows a typical headlight adjustment.

Headlight and Beam Selector Switch Tests

The following tests may be made to determine whether the headlight switch or the beam selector switch is defective:

Set the headlight switch to the headlight position, and operate the beam selector switch. If none of the headlights operate, yet the instrument panel lights operate, the headlight switch or the red-yellow stripe wire from the headlight switch to the beam control switch is probably defective. Substitute a known good switch, to determine whether the switch or wiring is at fault.

If the headlights operate only with the beam control switch in one position, the switch or the wiring from the switch to the headlight is defective. Substitute a known good switch to determine if the switch or wiring is at fault.

HORN

HORN TROUBLE DIAGNOSIS GUIDE		
HORNS DO NOT SOUND	1. Loose connection at horn button contact. 2. Open wire (yellow-green stripe) from horn to horn button. 3. Open wire (yellow) from horn button to circuit breaker in headlight light switch.	4. Horns defective or out of adjustment. 5. Defective relay on cars so equipped. 6. Horns not properly grounded.
ONE HORN FAILS TO OPERATE	1. Broken or loose wire to the horn. (Black wire)	2. Horn not properly grounded. 3. Horn defective or out of adjustment.
HORN OPERATES CONTINUOUSLY	1. Horn button defective.	2. Shorted relay on cars so equipped.

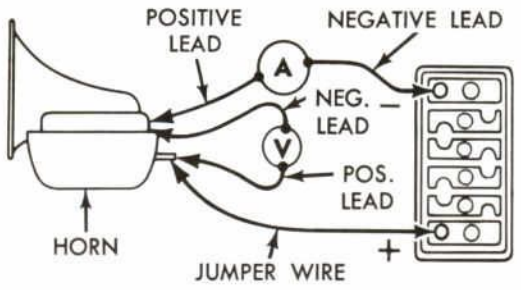


Figure 13–Horn Current Draw Test

Horn Test

The only test for horns is the current draw. Connect a voltmeter and ammeter to the horn and to a voltage supply as shown in Figure 13. The normal current draw for horns at 12 volts is 4.0-5.0 amperes. If not within specifications, turn the self-locking adjusting nut until the current draw is within the limits.

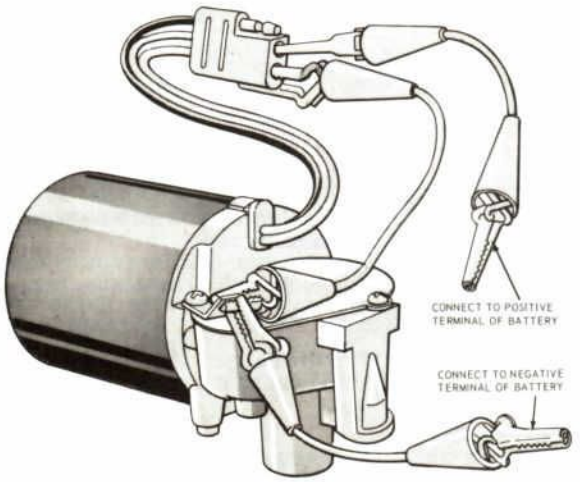


Figure 14–Wiper Motor Park Switch Test

Windshield Wiper Motor

Improper or erratic parking of the wiper blades or wipers that will not shut off can be caused by a maladjusted park switch. To check the park switch and adjustment connect jumper wires as shown in Figure 14. The motor should move to the park position. If it does the motor is all right and the trouble is in the panel switch or wiring. If the motor does not park, perform the following park switch adjustment, Figure 15.

- Remove the motor thru bolts and remove the motor cup and armature.
- Rotate the output shaft until the park switch lower contacts are firmly closed as shown.
- Rotate the adjusting screw clockwise until the park switch lower contact just opens.
- Rotate the adjusting screw counterclockwise one full turn.
- Check the bridge to assure that the legs are contacting the brush plate when the lower contacts are closed.
- Install the armature, motor cup and thru bolts.

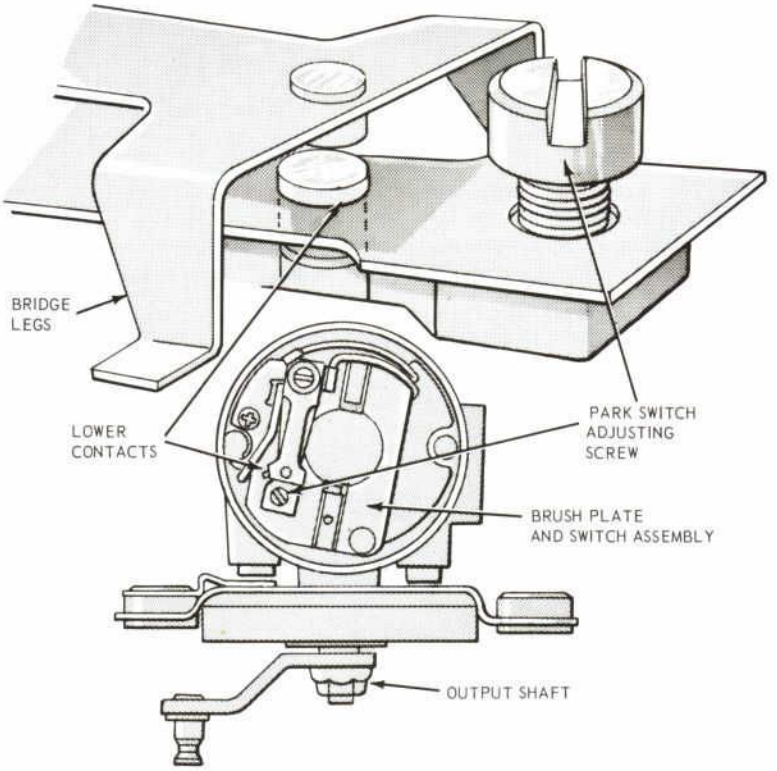
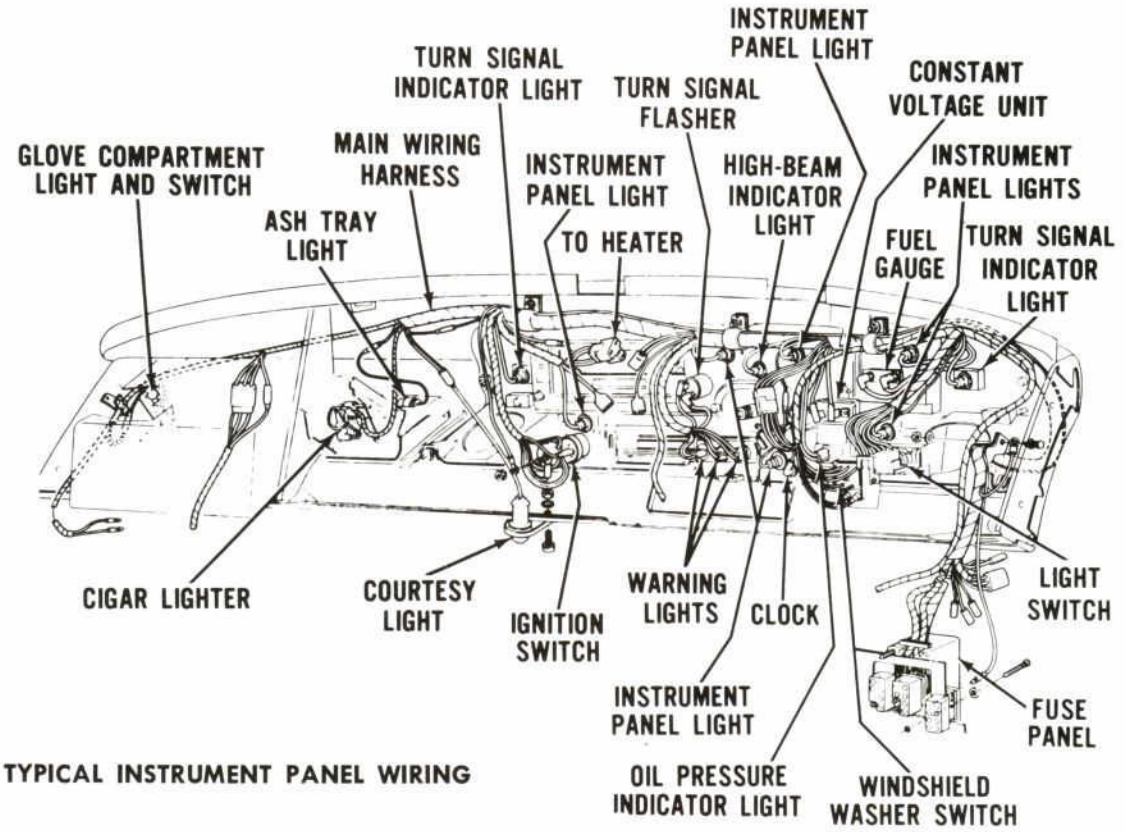


Figure 15—Wiper Motor Park Switch Adjustment

WINDSHIELD WIPER TROUBLE DIAGNOSIS GUIDE		
INOPERATIVE OR SLOW WIPER	1. Binding linkage. 2. Defective switch.	3. Defective wiper motor. 4. Defective wiring or circuit breaker.

TURN INDICATOR TROUBLE DIAGNOSIS GUIDE		
TURN INDICATOR LIGHTS INOPERATIVE	1. Burned out bulbs, or loose sockets. 2. Burned out fuse. 3. Loose or broken wire from ignition switch to flasher. 4. Defective flasher.	5. Loose or broken wire from flasher to turn indicator switch. 6. Defective turn indicator switch. 7. Broken, shorted, or loose wires from switch to lights.
TURN INDICATOR LIGHTS OPERATE INCORRECTLY	1. Loose, broken, or shorted wires from switch to light. 2. Defective indicator switch.	3. Defective flasher. 4. Burned out bulb.
TURN INDICATOR CANCELS IMPROPERLY	1. Cam improperly positioned on steering wheel hub.	2. Coil spring on switch plate assembly loose or weak.



TYPICAL INSTRUMENT PANEL WIRING

INSTRUMENT TROUBLE DIAGNOSIS GUIDE

OIL PRESSURE INDICATOR LIGHT INOPERATIVE	1. Indicator bulb burned out. 2. Loose or broken wire from the light to the indicator switch.	3. Defective oil pressure indicator switch.
CHARGE INDICATOR LIGHT INOPERATIVE	1. Burned out bulb. 2. Loose or broken wires to the armature terminal of the voltage regulator, or to the accessory terminal of the ignition switch.	3. Generator armature not grounded. 4. Generator regulator malfunction.
CHARGE INDICATOR LIGHT INOPERATIVE	1. Idle speed too low.	2. Parallel resistance wire burned out.
FUEL GAUGE ERRATIC OR INOPERATIVE	1. Loose or broken wire from the constant voltage regulator to the fuel gauge. 2. Defective fuel gauge. 3. Loose, broken, or shorted wire from fuel gauge to the fuel tank sending unit.	4. Defective constant voltage regulator. 5. Defective fuel tank sending unit. 6. Poor ground between fuel tank and body.
BOTH FUEL AND TEMPERATURE GAUGES ERRATIC	1. Loose or corroded constant voltage regulator ground. 2. Defective temperature gauge.	3. Loose or broken wire from the temperature sending unit to the temperature gauge. 4. Defective ignition switch.

TECHNICAL

VALVE TRAIN PRELUBRICATION

(All Engines with Individually Mounted Rocker Arms)

To preclude premature wear and/or scoring of the contact areas of the rocker arms and push rods, the following precautions should be observed.

Whenever the rocker(s) are removed and/or replaced on the engine, the valve stem tip, fulcrum seat area and push rod socket should be prelubricated with lubriplate or equivalent.

REVISED HYDRAULIC TAPPET VALVE CLEARANCE ADJUSTMENT PROCEDURE

(1962-1965 Cars and Trucks with 221, 240, 260, 289 and 300 CID Engines)

To minimize the possibility of tappet noise and/or valve burning, it is mandatory that the following hydraulic tappet adjustment procedure be applied to the subject engines:

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

ALTERNATOR BELT TENSION SPECIFICATIONS

Loose and slipping alternator drive belts seriously impair the alternator's capacity for supplying vehicle electrical needs, and if not corrected, may lead to repeated discharged batteries. Belts should be adjusted as follows:

1. Check belt tension with a strand type gauge.
2. Adjust tension if:
   - A. **Used Belt Tension** (minimum of 100 miles usage). If belt tension is below 60 lbs. or above 110 lbs., readjust to 100 lbs.
   - B. **New Belt Tension** should be set at 110-140 lbs. when installed.

   NOTE: Throughout the normal operating life of alternator drive belts, tensions in the 60 lbs. range can be expected and do not require adjustment.
3. If the alternator belt adjusting arm bolt must be adjusted to the extreme end of the slot, check to be sure the correct belt and pulley sizes are being used.

REAR AXLE VENT INSTALLATION

Three types of rear axle vent designs are used on 1966 Fords. Improper positioning can cause lubricant loss. Proper installation is as follows:

1. (Figure 1) This straight design vent is properly positioned by locating the external flat midway between the right rear wheel and the rear of the axle housing.
2. (Figure 2) This is the 90 degree external elbow vent design. This vent is properly positioned by pointing the external outlet midway between the left rear wheel and the front of the car.
3. (Figure 3) This vent has a 45 degree difference between the external outlet and the internal slash opening. This vent is properly positioned by pointing the external opening toward the front of the car, as illustrated.

NOTE: Regardless of the vent design, THE VENT IS PROPERLY POSITIONED IF THE INTERNAL 45 DEGREE SLASH OPENING IS POINTED MIDWAY BETWEEN THE LEFT REAR WHEEL AND THE FRONT OF THE CAR.

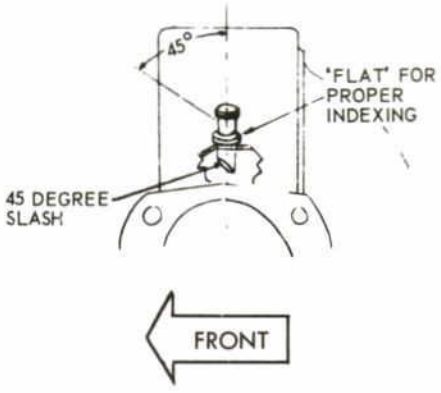


Figure 1—Rear Axle Vent Installation

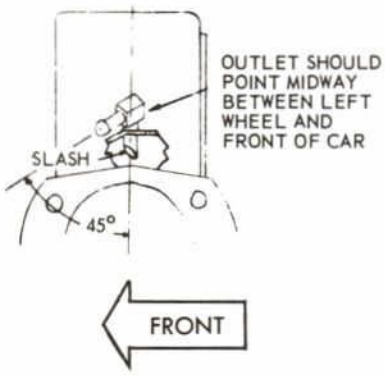


Figure 2—Rear Axle Vent Installation

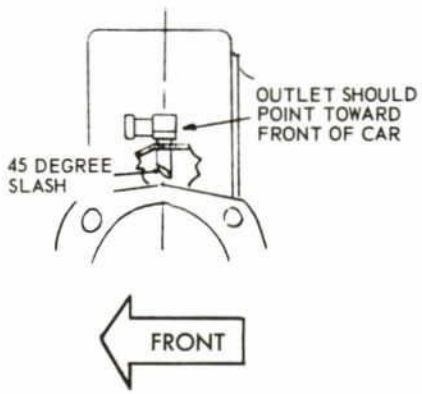


Figure 3—Rear Axle Vent Installation

SERVICE BRIEFS

IMPROPER INSTALLATION OF DIMMER SWITCH

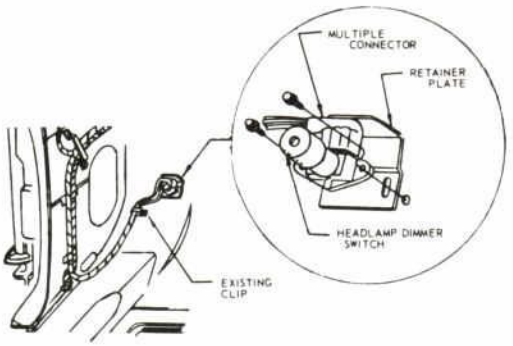


Figure 4—Dimmer Switch

If it is necessary to remove the dimmer switch, be sure it is re-installed in the correct position as shown in Figure 4. A flickering or inoperative headlight condition may develop if it is installed upside down. Over a period of time, the pressure of the driver's foot on the carpet over the harness or connector can result in the connector being pulled away from the dimmer switch contacts.

To prevent this condition, be sure the harness is properly routed thru the clip, (Figure 4) and the connector is located on top, and secured to the switch by the retaining plate.

SEAT BELT WARNING LIGHT OPERATION

This article presents an outline of the various seat belt warning light combinations found on the 1966 models in order that Service personnel may fully understand the proper operation of the warning lights.

FORD

- Without the Parking Brake Warning Light or Safety Convenience Panel a time delay switch will extinguish the separate steadily burning seat belt warning light 30 to 120 seconds after the ignition switch is turned on. (This applies to those units equipped with the deluxe seat belt option only.)
- With the Combined Parking Brake/Seat Belt Warning Light, but without the Safety Convenience Package.

The combined parking brake/seat belt warning light will operate as follows when the ignition is turned on. (This applies to those units equipped with the deluxe seat belt options.)

- If the parking brake is applied, the light will blink until the brake is released and then burn steadily for a period of between 30 to 120 seconds.
- If the parking brake is *not* applied, the light will burn steadily for 30 to 120 seconds.

1966 Fords built after March 1, 1966 have separate lights —a brake light and a seat belt light. Operation is the same.

With the Safety Convenience Package

On some early built 1966 units equipped with the convenience package, the seat belt warning light can be extinguished only by pressing the lens on the convenience panel. Later units have the time delay relay and the seat belt warning light will extinguish automatically 30 to 120 seconds after the ignition switch has been turned on.

Fairlane, Falcon and Mustang

The time delay switch will extinguish the separate steadily burning seat belt warning light 30 to 120 seconds after the ignition switch is turned on. (This applies only to those units equipped with the deluxe seat belt option.)

Thunderbird

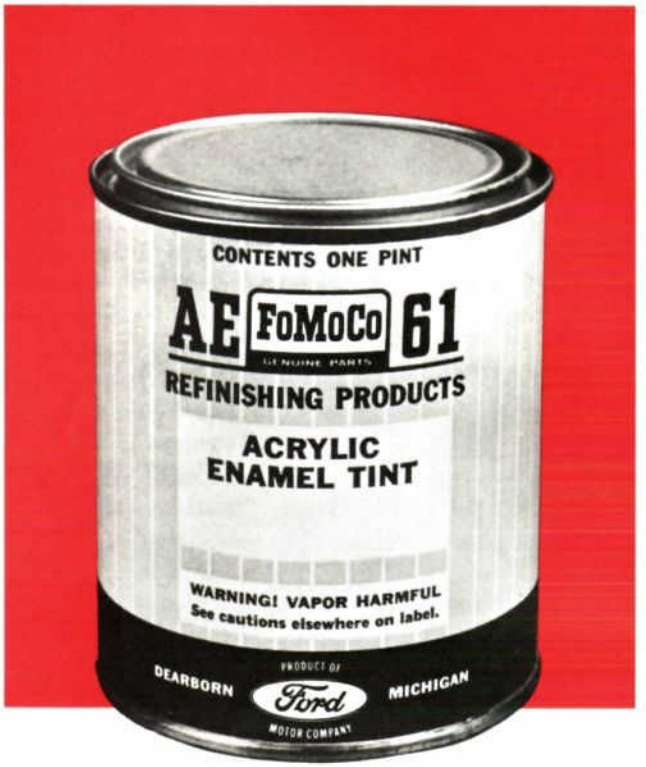
The 1966 Thunderbird contains a switch in the retractable seat belt and the seat belt warning light will only extinguish when the seat belt is connected. A time delay relay is used on all model Thunderbirds built after mid-November of 1965 and thus the seat belt warning light will automatically extinguish 30 to 120 seconds after the ignition switch is turned on.

NEW COLOR TINTING MATERIAL AVAILABLE

Weathering, differences in paints, etc. sometimes makes it difficult to obtain a satisfactory color-match when refinishing a vehicle. To help obtain a closer color-match, Acrylic Enamel Tints AE61 are recommended for use when refinishing cars painted with FoMoCo AE60 Acrylic Enamel. CAUTION: TINTING MATERIAL AE61 IS FORMULATED WITH XYLOL, TOLUOL AND KEYTONES FOR USE ONLY WITH FoMoCo AE60 ACRYLIC ENAMEL.

Eleven colors of Acrylic Enamel Tints are available in one pint cans. The tint is concentrated and only small amounts should be mixed into the color in which they are being used. Since it only takes about 15 minutes for air-dry refinish paints to dry to their true color, a one or two step approach should be used the first time the tints are used; starting with a small amount and adding to it for the next application if necessary. With experience it is usually possible to know how much tint to add the first time, from the color of the wet paint before application.

The following chart indicates the fresh paint color, conditions of match, and the suffix of the tinting material required for a closer match.



(LETTERS SHOWN CORRESPOND TO SUFFIXES OF PART NUMBERS SHOWN BELOW)

Fresh Color	If too Dark Add	If too Light Add	If too Green Add	If too Red Add	If too Yellow Add	If too Blue Add	If too Gray Add
GRAY MET.	E	L	F	H	K	F	—
BLUE MET.	E	K	G	H	—	H	K
GREEN MET.	E	H	K	H	K	J	H
RED	D	F	—	—	F	D	—
MAROON MET.	E	G	—	B	G	C	—
YELLOW	A	J	A & C	H	—	—	—
IVORY OR WHITE	A	—	C	H	A & K	—	A
TAN OR BROWN MET.	E	B	G	B	G	—	—

TINTING MATERIALS AVAILABLE

AE61-1724-A White
AE61-1724-B Gold
AE61-1724-C Indo Orange
AE61-1724-D Moly Orange
AE61-1724-E Aluminum
AE61-1724-F Mono Red
AE61-1724-G Indo Maroon
AE61-1724-H Green Toner
AE61-1724-J Yellow Green
AE61-1724-K Blue Toner
AE61-1724-L Black

Individual one (1) pint cans of the tinting materials may be ordered from your local Ford Dealer. An Acrylic Enamel Tint Kit is also available consisting of each of the above tints under Ford Part #C5AZ-19E548-A.

LITHO IN U.S.A.