

# Shop Tips

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

## GENERAL CLUTCH DIAGNOSIS AND SERVICE PROCEDURE

(See page 2)



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.

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# GENERAL CLUTCH DIAGNOSIS and Service Procedure

This article is designed to assist you in recognizing clutch trouble symptoms and their possible causes so as to avoid expensive, time consuming and unnecessary transmission work and parts replacement. By correctly diagnosing and isolating the trouble spot, you can avoid customer complaints and expensive "comebacks", and do both yourself and your customers a favor.

## Trouble Symptoms and Possible Causes

On all clutch problems, it is best to road test the car to determine the cause of the problem. Before or during the road test, check the clutch pedal total travel, free travel, pedal reserve and spin time. (See Table on page 3.) Also make certain that all clutch and transmission linkages are operating freely and are properly adjusted. In general, there are eight major areas of clutch problems:

1. Excessive amount of noise
2. Clutch chatter or grab when engaging
3. Clutch slipping when engaged
4. Clutch drag or failure to release completely
5. Clutch pedal pulsation
6. Rapid friction disc wear
7. Transmission gear lock up or hard shifting
8. Clutch pedal stiffness

### EXCESSIVE NOISE EMANATING FROM THE CLUTCH AREA

Usually, there are four major types of clutch noises: release bearing noise, transmission input shaft noise, engine transfer noise and clutch linkage noise.

Release bearing noise can be detected by depressing the clutch pedal to the end of free travel with the release bearing just contacting the pressure plate release fingers. (See figures 2, 3 and 4 on pages 4 and 5 for parts identification.) This is usually a scraping or knocking noise. Usually, the audibility of the noise will change partially as the clutch pedal is fully depressed. The majority of the time, release bearing noise can only be heard at the end of free travel. The major causes of release bearing noise are:

- Lack of lubricant on the face of the release bearing where the bearing contacts the release levers.
- Lack of lubricant in the release bearing which causes a scraping or squealing noise.
- The release bearing being cocked on the bearing hub which causes a knocking noise.
- The release bearing hub being cocked on the transmission bearing retainer.



Figure 1—Clutch Pedal Travel Check

Transmission input shaft bearing noise can be heard only when the clutch pedal is all the way out and the transmission is in neutral. This noise should completely disappear as the clutch is completely disengaged. Be careful, however, not to confuse this noise with release bearing noise.

Engine noise from another area may be transferred to the clutch area through the clutch linkage. This can be heard only when the release bearing is contacting the pressure plate release fingers at any of the clutch pedal positions. Usually this noise will stay at the same pitch completely through clutch pedal travel.

**NOTE:** Only after you have determined that the noise is not in the transmission input shaft bearing or the result of engine transfer noise, should you proceed to replace the release bearing. The release bearing hub and the transmission bearing retainer must be replaced as a unit when a knocking noise is heard. Caution must be used to make sure that the release bearing is

not cocked when installed on the hub.

Clutch linkage noise is usually a clicking noise in the clutch pedal itself when the pedal is moving up or down. The most normal areas where this noise occurs are:

- The clutch assist spring bushing when not lubricated.
- The retracting spring pulling the release spring at an angle.
- The transmission bearing retainer and release bearing hub not lubricated.
- The release bearing lever cocked so as to move the release bearing at an angle, or the release bearing cocked on the hub or the hub cocked on the transmission bearing retainer.

**NOTE:** The retracting spring will usually have to be repositioned to prevent the release bearing lever from being pulled at an angle when retracting. If it is necessary to install the assist spring, the following procedure should be used:

- Install a jam nut on the retainer.
- Lubricate the assist spring eyes and nylon bushings.
- Depress the clutch pedal and install the assist spring, nylon bushings and retainer.
- Install the lock nut on the retainer.
- Adjust total pedal travel according to specifications.
- Adjust free pedal travel according to specifications.
- Adjust the overcenter spring nuts until the pedal returns to the top of travel completely.
- Lock the jam nut against the pedal support plate.

### CLUTCH CHATTER OR GRAB WHILE ENGAGING

As a rule, in all cases of clutch chatter, the trouble is within the clutch itself and the clutch will have to be removed. In order to isolate the cause of the



problem, the following points should be checked in the order listed:

- See if the clutch linkage is binding or needs adjusting. If so, disconnect linkage and operate each part individually.
- Check for worn, loose or spongy engine or transmission mounts.
- Look for wear or looseness of universal joints and attaching bolts on the pressure plate, transmission and bell housing.
- Check the clutch release bearing to determine if it is binding on the transmission bearing retainer due to being cocked. Make sure that the release bearing is well lubricated, and finally, be sure that the release lever and the transmission bearing retainer are not cocked on the release bearing hub.
- See that there is no grease or oil on the friction disc, flywheel or pressure plate due to engine rear main bearing seal leaks, intake manifold gasket leaks, rocker cover gasket leaks, transmission bearing retainer seal or gasket leaks, or excess grease on the transmission bearing retainer or release bearing. It may be necessary to clean the pressure plate and flywheel or even replace the friction disk.
- Check the friction disc hub to see if it is binding on the splines of the transmission input shaft due to dirt, rust or roughness of the splines.
- Make sure that the friction disc is not broken.

### CLUTCH SLIPPING WHEN ENGAGED

Clutch slippage is particularly noticeable during acceleration from a standing start. A good test for clutch slippage is to start the engine, set the parking brake and depress the service brake pedal; shift the car into high gear and release the clutch while accelerating the engine. If the clutch is in good condition, it should hold so that the engine stalls immediately when the clutch is fully engaged. If the clutch slips, the cause may be one of the following:

- Improper clutch linkage adjustment (free play and total travel). See Table and Service Notes.
- Broken or missing parts such as the equalizer bar weld, retracting spring, assist spring nut or the release lever bracket.
- Clutch linkage binding and not allowing the clutch to engage completely due to bushings binding in the pedal support or in the equalizer bar; or the release lever cocked or the assist spring not properly adjusted.

- Improper clutch linkage adjustment.
- The friction disc binding on the splines of the transmission input shaft due to corrosion or excessive dirt or rough splines.
- A warped or distorted friction disc or pressure plate; or a loose friction disc facing.
- The transmission input shaft may be sticking or binding in the pilot bearing.
- Improper alignment of the transmission to the engine.

CLUTCH ADJUSTMENT SPECIFICATIONS			
ADJUSTMENT	FORD	FAIRLANE	FALCON
Clutch Pedal Free Travel	1"	7/8-1 1/8"	1 1/16"-1 1/8"
Clutch Pedal Total Travel	6 5/8-6 7/8"	6 1/2"	6 5/8-6 7/8"
Clutch Spin Time	3 seconds	3 seconds	3 seconds
Clutch Reserve	Sufficient distance for pedal travel from point of disengagement to end of travel, approximately 1 1/2."		

- Excessive grease or oil on the friction disc, flywheel or pressure plate due to outside leakage.
- The friction disc may be excessively worn or the pressure plate springs may be broken or overheated in which case they will be blue in color and lacking proper tension.

### CLUTCH DRAG OR FAILURE TO RELEASE COMPLETELY

The clutch friction disc spins briefly after disengagement so normal clutch action should not be confused with a dragging clutch. (Allow about three seconds for normal spinning time). Gear clash might take place if a shift is made to reverse or first (non-synchronized low) very quickly after clutch disengagement. However, when the clutch actually drags, such clashing will be noted even after a normal pause before shifting gears. Clutch dragging or failure to release fully may result from one of the following causes and these should be checked in this order:

### CLUTCH PEDAL PULSATION

This is sometimes called a "nervous pedal" and can be detected either by applying light foot pressure to the clutch pedal with the engine running or by running the engine at high speed with the transmission in neutral. In either case, a definite pedal pulsation will be noticed. This may be due to any of the following:

- Improper clutch linkage adjustment (Check Table for free play and total travel adjustment.)
- Release bearing cocked on the transmission bearing retainer.
- Uneven pressure plate release levers (one release finger excessively higher than the others).
- Excessive flywheel runout due to the flywheel not being seated on the crankshaft flange or the flange being bent.
- Improper alignment of the transmission with the engine.



# GENERAL CLUTCH DIAGNOSIS and Service Procedure—Continued

## RAPID FRICTION DISC FACING WEAR

With a complaint of this nature, it is best to inquire into the owner's particular driving habits. A common cause of this problem is "riding the clutch" (keeping the foot on the clutch continuously and partially depressing it and thus causing it to slip). Other common causes of wear are:

- Habitual overloading, hauling of heavy equipment or drag strip operation.
- Improper pedal linkage adjustment (free play and pedal height).
- Loose bolts on the pressure plate.
- Heated or broken pressure plate springs.
- Rough flywheel or pressure plate.
- Warped friction disc.
- Improper alignment of the transmission to the engine.
- Broken or missing parts such as the retracting spring, assist spring, levers on the equalizer bar or release bracket.

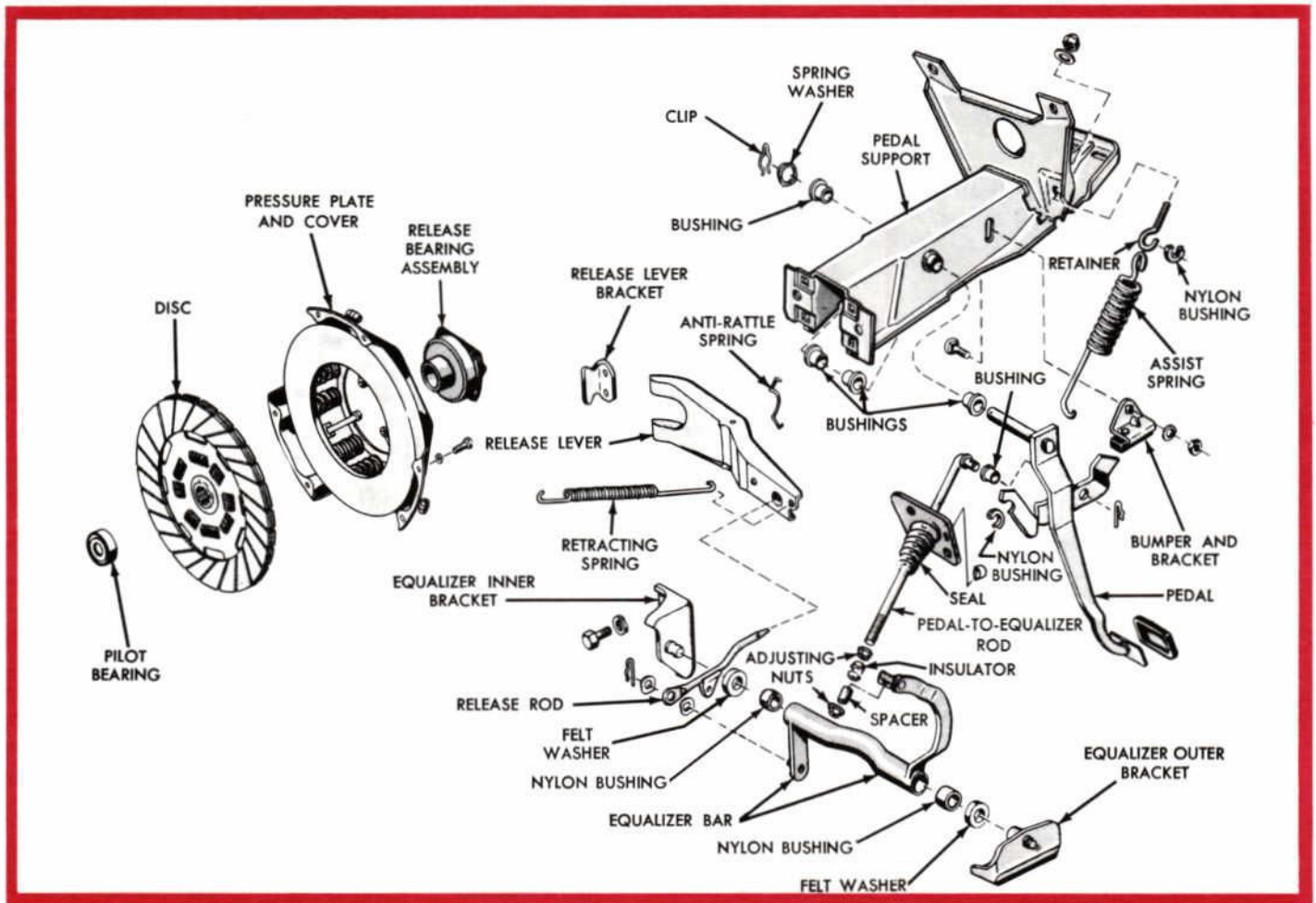


Figure 2—Ford Clutch And Linkage Assembly Parts Identification

## TRANSMISSION GEAR LOCK-UP OR HARD SHIFTING

This condition can also be caused due to clutch drag or failure to release completely or by defective shift linkage. If after these areas have been checked, the transmission still locks up or is hard to shift, it will be necessary to remove and disassemble the transmission.

## CLUTCH PEDAL STIFFNESS

The final trouble spot, a stiff clutch pedal or one that is hard to depress may result from one of the following:

- Lack of lubricant on the clutch bushings.
- Improper alignment of clutch linkage.
- Improper retracting spring.
- No lubricant on the transmission bearing retainer or the release bearing hub.
- Assist spring improperly adjusted.

# SERVICE NOTES

1. When assembling the clutch, apply a light film of heat resistant lubriplate, Ford Part Number C0AZ-19584-A to the following areas:

- The outside diameter of the transmission bearing retainer.
- On both sides of the release lever fork where contact is made with the release bearing hub and hub spring clips.
- On the release bearing surface which contacts the pressure plate release fingers.

2. When adjusting the clutch pedal total travel, simply adjust the bumper and bracket bolted on the pedal support.

3. When installing the transmission onto the engine, never put any grease on the end of the transmission input shaft. Place only a small amount on the pilot bearing.

4. The release bearing should never be cleaned in any cleaning solvent or degreasing compound since this will remove the lubricant that is placed in the bearing in original assembly.

5. The retracting spring will usually have to be repositioned if it is found that the release spring is pulling the release bearing lever at an angle.

6. When checking the clutch linkage for binding, disconnect the linkage and operate each unit individually.

7. If you discover oil or grease on the clutch assembly and the cause is a leaking engine rear main seal or transmission bearing retainer gasket or seal, make sure that the lubricant level is not too high. Also check to see that the crankcase emission system is functioning correctly.

8. Avoid dropping the parts or contaminating them with oil or grease. Do not handle parts with greasy hands.

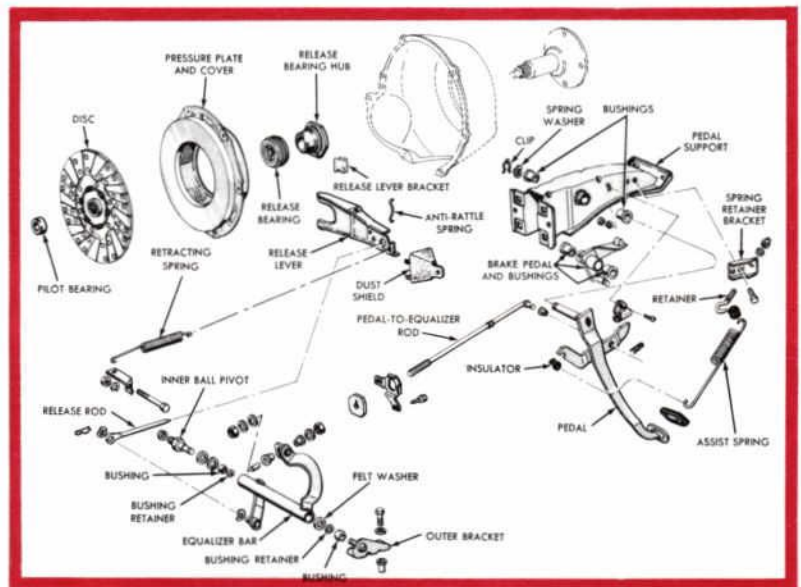


Figure 3—Fairlane Clutch And Linkage Assembly Parts Identification

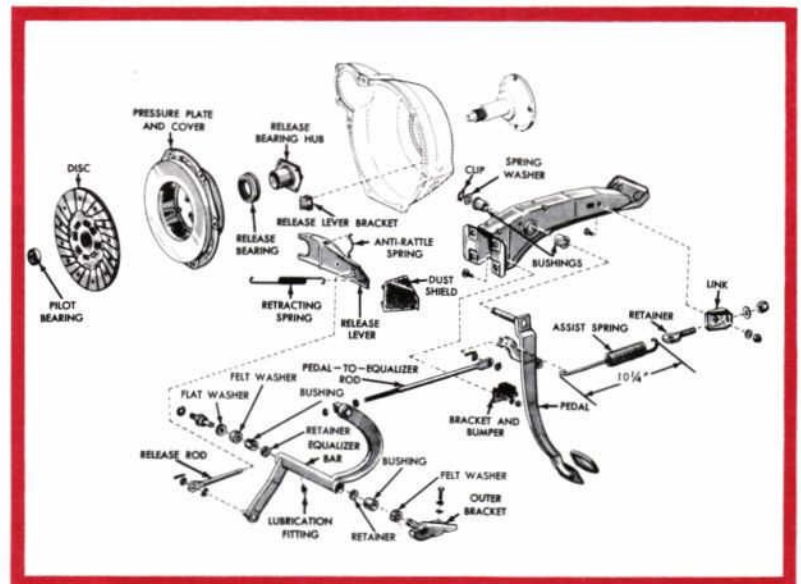


Figure 4—Falcon Clutch And Linkage Assembly Parts Identification



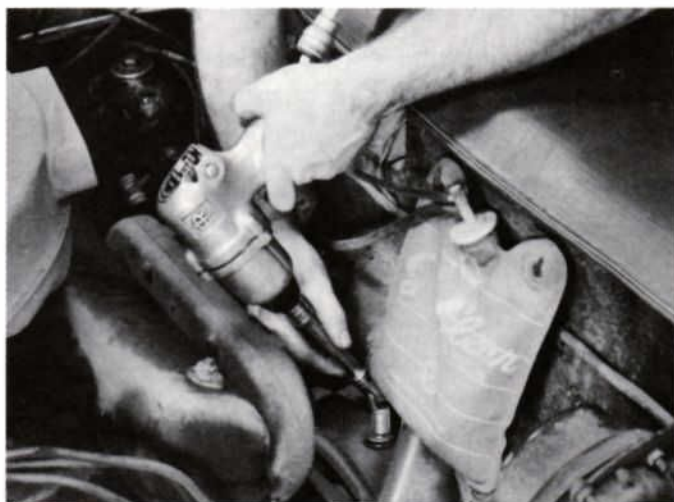
# QUICK SERVICE—*Shock Absorbers*

In conjunction with participating Ford Dealers' special on Rotunda Shock Absorbers, here is a valuable safety service that you can provide for your customers with a minimum amount of waiting while his shock absorbers are being replaced. With the proper service tools and the properly equipped service shop, this "Quick Service" replacement can be completed in less than one half hour. The following illustrated procedure will help you to attain maximum efficiency and customer satisfaction. This "Quick Service" can be a valuable asset to your operation, and so can top quality FoMoCo and Rotunda parts.

## FRONT SHOCK ABSORBERS



1. For front shock absorber replacement, position a special shock absorber clamp on the shock absorber and spring coil, and tighten firmly with an impact wrench.



2. Use the impact wrench with an extension and a universal socket to remove the upper shock absorber nuts.



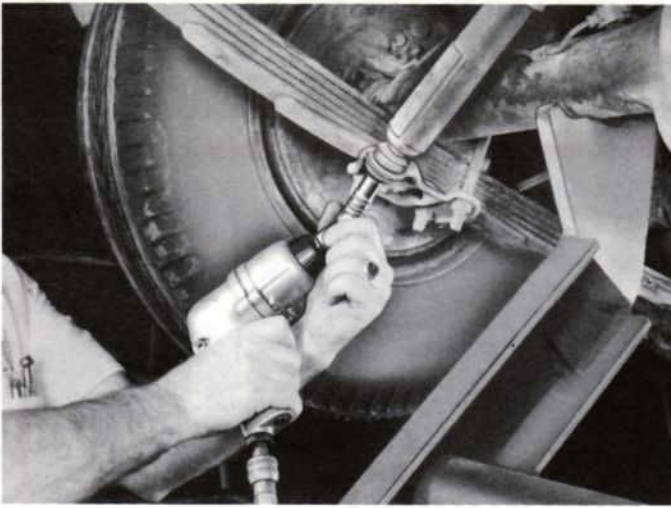
3. Remove the lower shock absorber nuts with the impact wrench. Remove the special clamp and discard the old shock absorber.



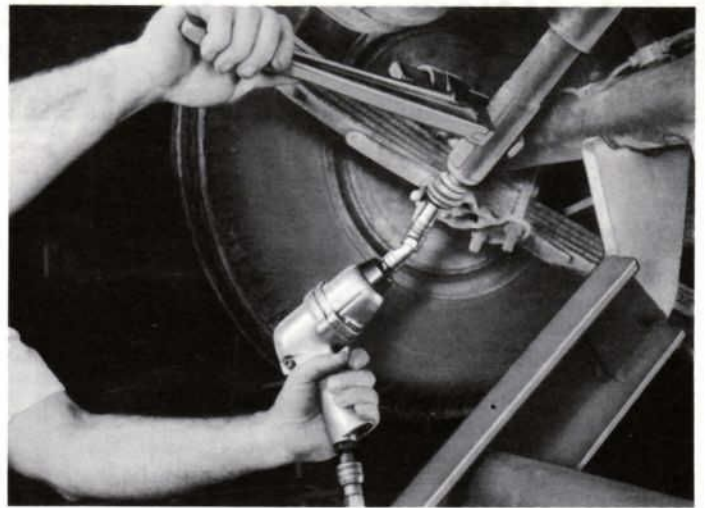
4. Position the new shock absorber and bushings, and tighten the upper and lower nuts with the impact wrench.



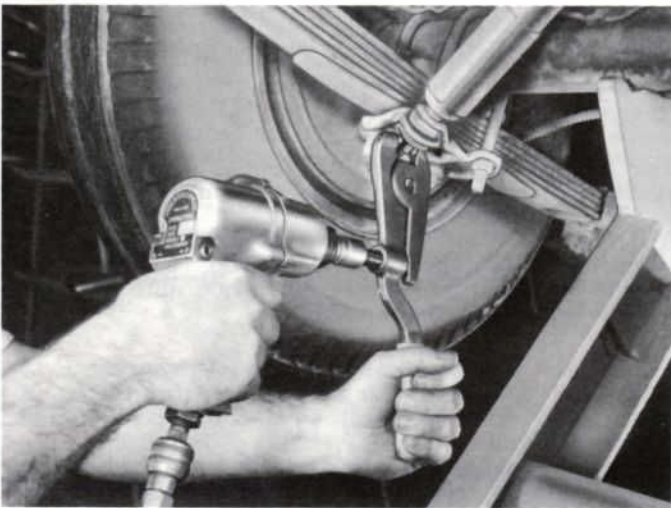
## REAR SHOCK ABSORBERS



1. For rear shock absorber replacement, use the impact wrench with a universal socket to remove the lower stud nut.



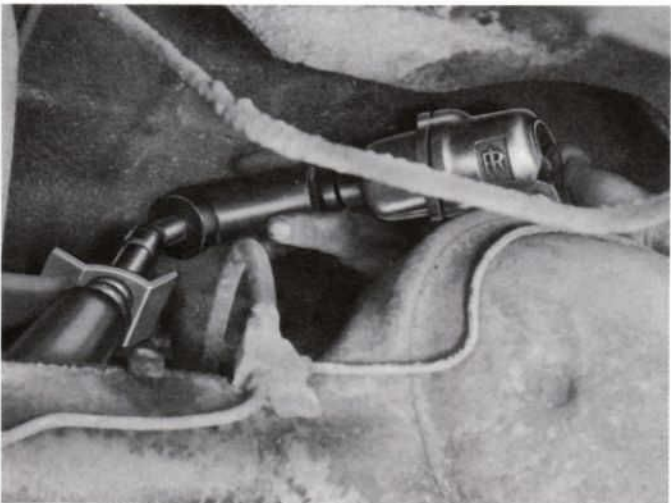
2. A pipe wrench may be used to hold the shock absorber if it turns while removing the nut.



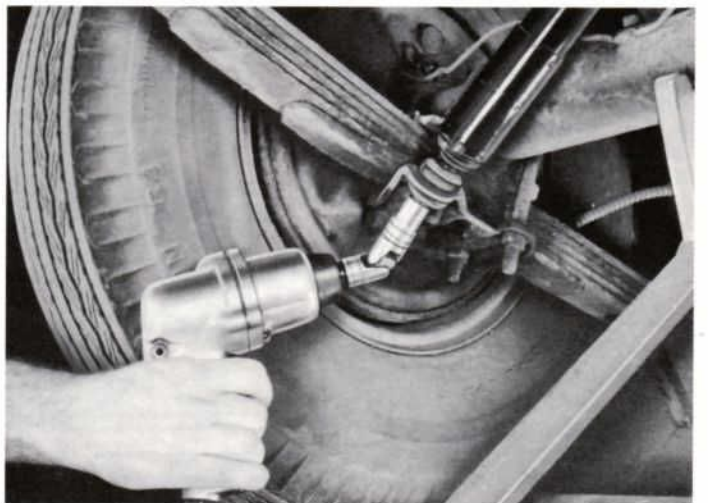
3. In the event the attachment nuts have stripped threads, use a nut splitter to split the nut and remove it.



4. On Station Wagons only, use an impact wrench with an extension and, holding the upper bolt with a box wrench, remove the upper nut.



5. On other models, use an angle drive attachment with the impact wrench to remove the upper nut.



6. Position the bushings and install new shock absorber, tighten the lower nuts with the impact wrench and the upper nuts with the angle drive attachment and the impact wrench.



# FORD'S STUDIOSONIC SOUND SYSTEM...

Ford owners can now enjoy "concert hall listening" right in their cars with the Studiosonic Sound System. This system reproduces music with the full tonal quality experienced when listening to actual live music and is one of the latest advancements in unique car radio systems. Tonal richness results when the rear seat speaker reverberator working in consonance with the radio's front speaker, delays a first set of sound waves 3/100 of a second to create a delayed sound. These delayed sound waves blend with those from the normal speaker to deliver a rich dimensional effect. The system can be operated by a choice of two switches.

One on the instrument panel controls the reverberator effect and varies the rear speaker volume. Also the instrument panel switch can be pushed in to remove the reverberator effect and allow the rear seat speaker to operate in the conventional manner. A floor switch is provided for turning the system on and off.

In order to provide a basic knowledge of the complete system, the principles of operation, and diagnosis are outlined below, along with some important service notes.

## OPERATION

The system's reverberator converts the radio output signal to a mechanical rotary motion. This motion is transmitted by way of springs, which introduce a pre-calculated delay. Then the signal is reconverted into an electrical signal. This delayed signal is amplified by the reverb amplifier and reproduced through the automobile rear speaker. The delays are of millisecond duration.

Two different springs are used in order to obtain the repeated reflections of the concert hall. If only a single spring were used, flutter and echo effects would occur. These are especially noticeable on percussive sounds.

If the time interval between the main signal and the delayed signal is excessive (above 50 milliseconds) a separate and very distinct echo will occur, which is highly objectionable for the reproduction of both voice and music. Too little delay does not provide the feeling of spaciousness associated with a large hall. Also, no matter

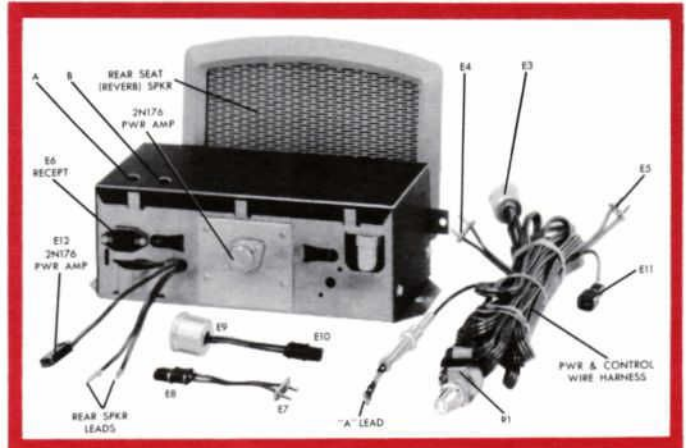


Figure 1—Parts Identification—1963 Models

how well a set reproduces the sound, the "live" characteristic can be altered by the acoustical properties of the car.

## DIAGNOSIS

Prior to returning any reverberator as defective, it is suggested that the following checks be made as part of the normal diagnosis.

### HARNESS:

As an initial test, check the fuse, make certain that a signal is being fed into the reverberation unit and that power is being applied to the unit.

Check the electrical power supply. Disconnect E-11 and E-12 (1963) or E-9 and E-10 (1964); turn the on-off switch (reverberation control) to the "on" position and measure the voltage at E-11 (1963) or E-9 (1964). The voltmeter should read approximately test bench (14.4) vdc. or battery voltage. (See Reverberator Schematic Diagrams.)

Check the radio signal input plug and receptacle E-5 (1963 and 1964) for a good connection.

### REAR SPEAKER:

Check the rear speaker input leads for possible open circuits.

In many cases a distorted or garbled reverberated sound will be due to a torn speaker cone or damaged voice coil. Check the speaker and replace with a new service stock speaker of the proper type if necessary. **NOTE:** Do not turn the reverberation system on without a speaker connection; to do so will damage the reverberation amplifier.

### CHASSIS:

As a first check, make certain that no metal objects are touching the power output transistor case and shorting it to ground, disabling the system.

The applied signal takes two paths before it is fed into the amplifier. One path is through the reverberation unit, the other path by-passes

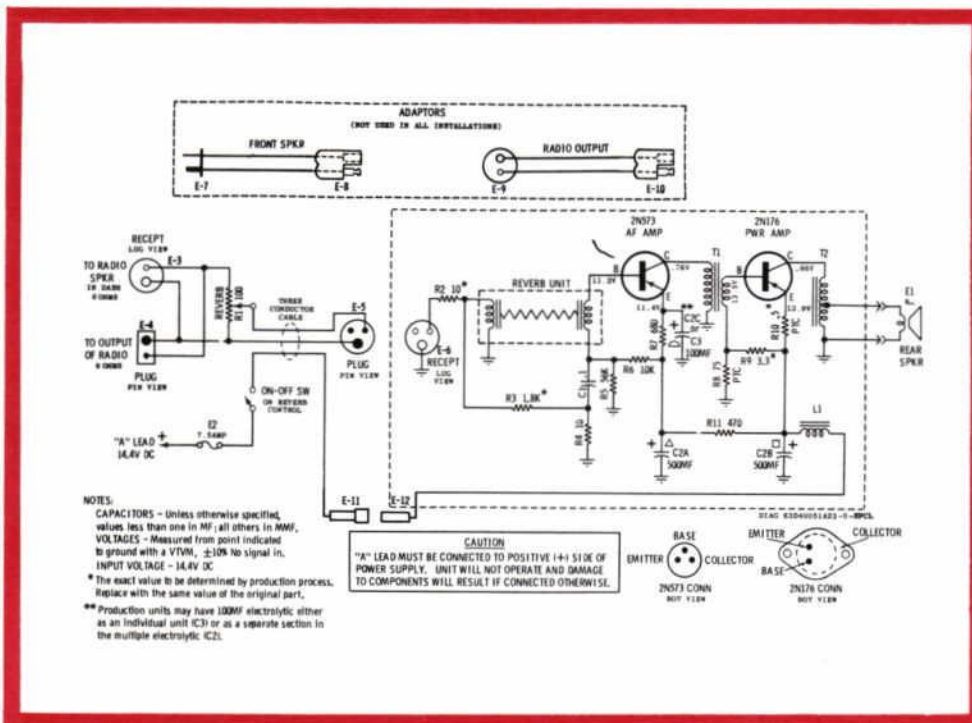


Figure 2—Reverberator Schematic Diagram—1963 Models



# OPERATION, DIAGNOSIS and SERVICE NOTES

the reverberation unit through the high frequency by-pass network comprised of R-3, R-4, and C-1 in 1963 and R-5 and R-6 in 1964. If the reverberation unit is inoperative, the output of the rear speaker will consist mainly of high frequency sound and no reverberated sound will be present. If the high frequency by-pass network is faulty, the system will lack the presence of high frequency sound.

To check the amplifier, lightly tap the time delay springs. The sound output will be similar to that produced when a musical instrument such as a piano is jarred. The amplifier test (tapping the time delay spring) will also ascertain if the output transducer of the reverberation unit is functioning properly.

To check input transducer, feed a signal into the input of the reverberation unit. Short out R-4 (1963) and R-6 (1964) to ground. If there is an output from the amplifier, the reverberation unit is good. If not, check the leads and input transducer with an ohmmeter to determine an open circuit. If leads or reverberation unit are faulty, replace.

Conventional tracing or the signal injection method may be used to locate faulty components in the amplifier.

Visual inspection to determine condition of the reverberation unit delay springs and permanent magnet is sufficient. The spring tension is predetermined and should not be changed. The spring tension is sufficient when the permanent magnet is suspended between the transducer pole pieces. Unless the delay springs have been mutilated or stretched to a point where the springs sag and the permanent magnets lay upon or touch the transducer pole pieces during normal shock vibration, the reverberation unit will operate satisfactorily. Replace entire unit if it is determined that the reverberation unit is inoperative.

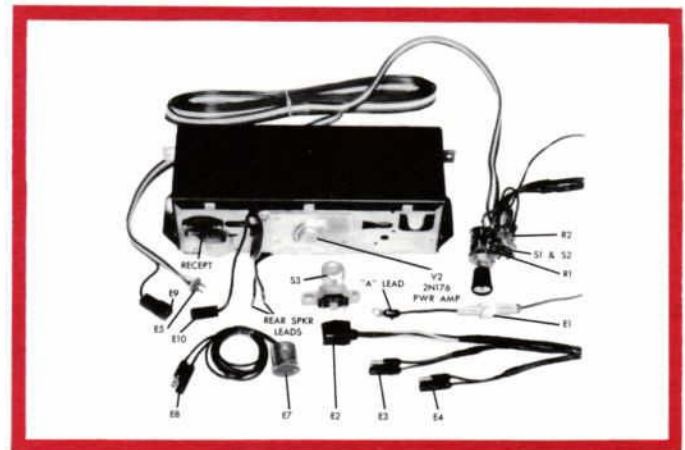


Figure 3—Parts Identification—1964 Models

The spring suspension of the reverberation unit is important to eliminating noise being generated due to shock. The soft polyethylene sponge pads dampen the shock transmitted to the unit during normal car movement. The cover must be in place to realize the full benefit of the shock absorbing quality of the sponge pads.

If for any reason, the reverberation unit must be removed, extreme care must be exercised. Do not stretch or distort the suspension spring. If springs are stretched or distorted in any fashion, replace.

## SERVICE NOTES:

1. Polarity—When servicing this amplifier, the "A" lead must be connected to the positive side of the power

source. If connected otherwise, the amplifier will not operate and damage to components may result.

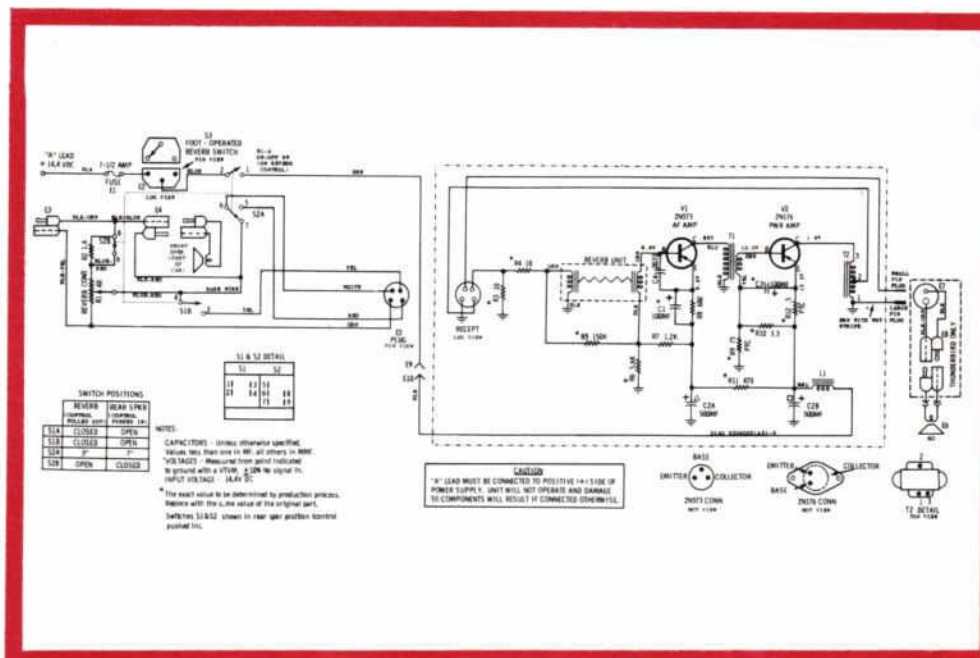


Figure 4—Reverberator Schematic Diagram—1964 Models

2. Power Supply Requirements—It is preferable to use a storage battery (without a battery charger) in place of a battery eliminator. If a battery eliminator is used, it must be well filtered and regulated.

3. Driver Transistor Replacement—When replacing a driver transistor, grasp the transistor leads (between transistor body and chassis) with a pair of long nose pliers to prevent excessive heating of transistor body during soldering operation.

4. Power Transistor Replacement—When replacing a power transistor, be sure to:

- Use the transistor specified in the Replacement Parts List.
- Coat sides of transistor insulator with DC-4 grease (Motorola Part No. 11M490487) to insure proper heat dissipation.
- Securely and evenly tighten the transistor mounting screws.



# ACRYLIC ENAMELS... Major and Minor Repairs



A recent improvement in automotive finishes is the development of a thermo-setting acrylic resin enamel. These acrylic enamels exhibit better hardness, mar resistance and gloss retention in metallic colors than ordinary enamels. The major advantage of these paints is that minor scratches, mars and other paint defects

can be corrected by polishing rather than by expensive and time consuming repainting operations. Because of the simplified repair procedures, minor paint repairs can be accomplished quickly and easily. Acrylic enamels have been used on 1964 Thunderbirds.

The following chart lists the colors available and their Ford Part Numbers. These paints are available through your local Ford dealer's parts department.

ACRYLIC ENAMELS	
FORD PART NUMBER	COLOR
AR60-921-C	Platinum
AR60-1070-C	Med. Turquoise Metallic
AR60-1226-C	Light Blue
AR60-1446-C	Silver Blue Metallic
AR60-1453-C	Cascade Green
AR60-1515-C	Rangoon Red
AR60-1544-C	Caspian Blue
AR60-1555-C	Pink Metallic
AR60-1619-C	Wimbledon White
AR60-1620-C	Dark Gray Metallic
AR60-1621-C	Silver Smoke Gray
AR60-1622-C	Guardsman Blue
AR60-1623-C	Skylight Blue
AR60-1624-C	Med. Blue Metallic
AR60-1625-C	Dynasty Green
AR60-1629-C	Light Green Metallic
AR60-1630-C	Chantilly Beige
AR60-1631-C	Navajo Beige
AR60-1632-C	Vintage Burgundy
AR60-1633-C	Phoenician Yellow
AR60-1635-C	Aztec Gold
AR60-1636-C	Prairie Tan
AR60-1637-C	Bittersweet
AR60-1638-C	Pagoda Green
AR60-1724-C	Raven Black
AR60-1729-C	Sunlight Yellow
AR60-1730-C	Vermilion Red
AR60-1738-C	Palomino Metallic

In addition, the following refinishing materials are recommended for use in repairing Acrylic Enamels and are available at your Ford Dealer's.

AR60-3789-A	Rubbing Compound
AR60-647-A	Acrylic Thinner
AR60-13-A	Acrylic Primer, Surfacer, Sealer

## MINOR PAINT REPAIRS

With the polishing characteristics and hardness inherent in these enamels, minor paint repairs necessitated by dirt, fall-out, sags, mars, scratches, dry spray, overspray and orange peel can be accomplished by machine or hand polishing, without the necessity of repainting. Repairs of this type basically require the polishing of an entire panel. Spot repairs should be attempted only on relatively isolated and inconspicuous areas.

The proper polishing procedure consists of:

1. Removing the defect by oil or water sanding with 600 grit

abrasive paper.

2. Applying a white or light-colored medium grit machine polishing compound, Ford Part Number AR60-3789-A, to the painted surface with a brush.
3. Polishing the entire panel surface using an 1850 RPM rotary wheel with a carpet pad (approximately  $\frac{5}{8}$ " nap) or a lambs wool pad.
4. Buffing the surface using the rotary wheel and a clean lambs wool pad.

NOTE: In inaccessible areas, the polishing can be accomplished by hand.

## MAJOR PAINT REPAIRS

When the paint defect cannot be repaired by polishing, repainting is required. Acrylic lacquer should be used for refinishing over Acrylic enamels. The use of Acrylic lacquer results in better color match with the added advantage that both the original finish and the repaired area can then be polished to provide the same luster and appearance. It should also be noted that the air-dry Acrylic lacquer will provide better durability in service than will air-dry enamels or nitrocellulose lacquers.

When repainting Acrylic enamels, it is extremely important that the original finish be thoroughly sanded. Use 400 grit abrasive paper and

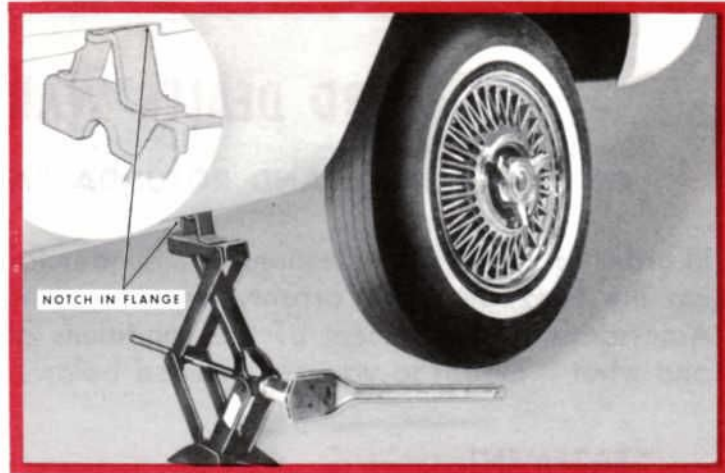
exercise care to insure that all surfaces, including edges and areas adjacent to applied mouldings, are thoroughly sanded in order to provide proper adhesion of the repair topcoat.

After sanding, proceed with the application of Acrylic repair primer surfacer, Ford Part Number AR60-13-A, recommended for use with Acrylic lacquer and reduced according to recommendations, to any bare metal spots that have been exposed. After the recommended dry-time, sand the primer surfacer with 400 grit abrasive paper before the application of the repair Acrylic lacquer.



## CHANGING A WHEEL ON THE FORD MUSTANG

A scissors-type jack with a combination ratchet jack handle-wheel lug wrench has been developed for use on the Ford Mustang. When changing a wheel, the jack must be positioned at the side of the car below a notch provided in the welded flange in the rocker panel. (See Illustration). The ratchet handle is then used to operate the jack. It is most important that the jack be placed in the proper position as pictured.



*Proper Position Of The Ford Mustang Jack*

## PROPER INSTALLATION OF FORD AUTHORIZED RECONDITIONED GENERATORS

Like all Ford Authorized Reconditioned Parts, Ford Generators are quality built by Authorized Reconditioners to conform to rigid Ford factory specifications for long life and dependable service. Reconditioned generators are included in the Ford Genuine Parts Distributors Small Parts Warranty and are guaranteed for 90 days or 4,000 miles against failure due to defective material and factory workmanship. However, they are not guaranteed against failures due to improper installation.

Records indicate that most generator failures during the warranty period are caused by bearing failures as a result of improper installation of either the fan pulley or of a worn or bent fan pulley hub contacting the sealing shield which can result in friction, over-

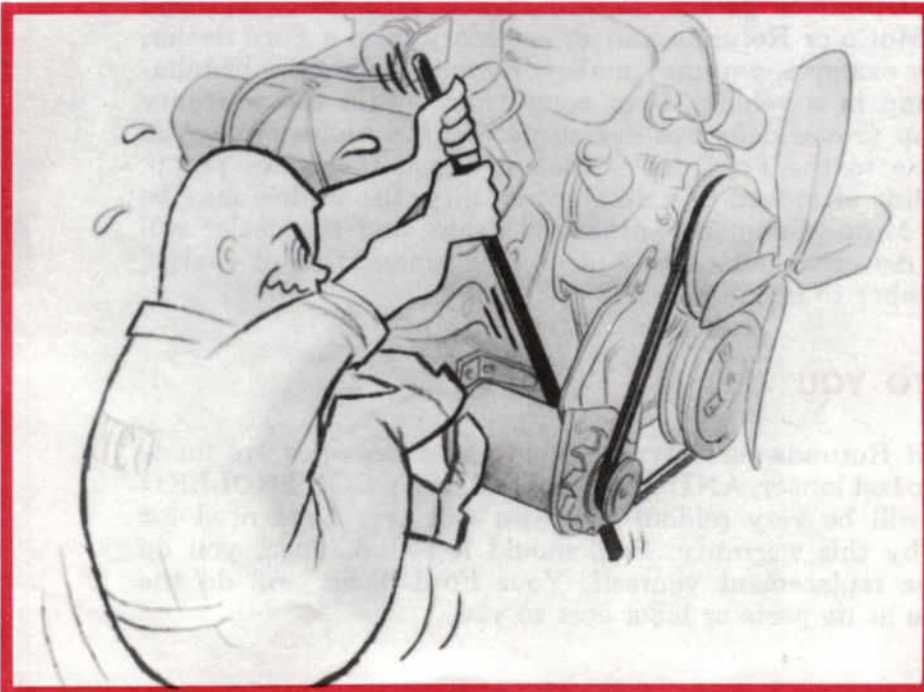
heating or loss of lubricant. Another primary cause of generator failure is excessive fan belt tension. This can occur when fan belt tension is set before the generator mounting bolts are tightened causing the front end of the generator to move toward the fan and the rear to move away from the engine, creating excessive thrust on the bearings. (See Figure 1). Generally, the mounting bolts should be tightened sufficiently to prevent distortion.

In order to insure correct installation, the following steps must be carefully followed:

1. Before installing, check the pulley for wear at the surface contacting the inner bearing race. If the pulley shows any wear or does not assemble on the shaft easily, it

should be replaced. Do not drive the pulley on the shaft. The pulley should slip on easy enough to start the locking nut, which will draw the pulley into proper position.

2. Adjust the fan belt by installing the belt tension tool on the drive belt (See Figure 2) and checking the tension following the instructions of the tool manufacturer.
3. Put a few drops of oil in the oil cup when installing the generator. Do not over oil.
4. Check all wires to be sure they are not broken, oil soaked or loose at the terminal connections. Check all terminals for tightness, especially the battery cables and wires to the armature. Care should be taken that all other parts such as voltage regulators, battery and wiring are in good condition.
5. If the generator does not charge, it should be polarized by disconnecting the field wire and battery wire from the regulator and momentarily contacting the two wires together while the engine is not running.



*Figure 1—Excessive Belt Tension Can Cause Premature Bearing Wear*



*Figure 2—Belt Tension Tool*



# FORD DEALER WARRANTY

## ON NEW FoMoCo AND ROTUNDA PARTS AND ACCESSORIES

In order to clarify any questions or misunderstandings that may exist concerning the Ford Dealer Warranty on New FoMoCo and Rotunda Parts and Accessories, the statement of the conditions of the warranty, how it works and what it means to you are outlined below:

### STATEMENT

The Ford dealer warranty on new FoMoCo and Rotunda parts and accessories runs for 90 days or 4,000 miles of service on the part or accessory, whichever occurs first. If the part or accessory is installed to replace a defective production part on a new Ford within the vehicle warranty period, the warranty on the service part may extend beyond 90 days or 4,000 miles to the unexpired portion of the warranty on the vehicle.

Under the terms of this warranty the selling Ford dealer will replace the defective part free of charge, including the related labor if performed by the selling dealer. If the purchaser has changed residence to a different locality, or is on an extended trip, any of our nearly 8,000 Ford or Lincoln-Mercury dealers will honor this warranty.

This warranty applies to new FoMoCo and Rotunda service parts and accessories which Ford dealers sell over the counter at wholesale or retail as well as those installed by Ford dealers.

### HOW IT WORKS

If you operate an independent garage, service station or a fleet, and you purchase any new FoMoCo or Rotunda part or accessory from a Ford dealer, a new water pump, for example, you may make a normal and proper installation of the water pump in a vehicle. If at some time within the warranty period the water pump proves defective during normal use and service, you may return the vehicle to the Ford dealer that sold you the water pump. If the vehicle is traveling or moved to a different locality, the vehicle may be brought to any Ford Motor Company authorized dealer and the dealer will replace or repair the defective part at his place of business, free of charge, including the related labor to install or repair the part.

### WHAT IT MEANS TO YOU

Genuine FoMoCo and Rotunda new service parts and accessories are made right, to fit right and to last longer, AND, they are **QUALITY CONTROLLED** to the point that it will be very seldom that you will ever have need for replacement covered by this warranty. But, should it ever happen, you do not have to make the replacement yourself. Your Ford dealer will do the warranty work for you at no parts or labor cost to you.