PACKARD
Service Counselor
PARTS ★ ACCESSORIES ★ PRODUCT ★ PROFITS
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Correct Diagnosis Saves Time and Money

Clutches

When diagnosing clutch troubles and making repairs a great deal of time and expense can be saved by a thorough understanding of the parts involved. Many times parts of the clutch are changed which have no bearing on the trouble for which the repairs are being made.

For example, a car is brought in to the service department for a chattering or grabbing clutch. Many service men install a complete clutch, both driven plate and cover plate assemblies. This is the easy way out since it is not necessary to think. Just replace all of the parts and the condition will be corrected.

Since chatter is set up by the surface of the driven plate facing against the pressure plate and flywheel there is no necessity for replacing either the pressure plate or the flywheel.

When renewing a driven plate the surface of the pressure plate should be lightly sanded with fine sandpaper to remove any resins which might have come out of the facings. If necessary, the surface of the flywheel should also be sanded.

Clutch spinning after disengagement is another condition which can quite accurately be diagnosed and correction made in many cases without replacement of any parts.

The number of causes of clutch spin are not very numerous and can be quite easily checked.

Jack up the car and remove the flywheel lower cover and while watching the clutch have someone start the car and operate the clutch pedal. When the clutch is disengaged notice whether or not the driven member frees itself from both the flywheel and the pressure plate. If not the difficulty is probably in the clutch shaft and driven plate hub splines. The correction of this condition appears in the Service Counselor of June 1.

Check with the clutch disengaged for driven plate run-out. When a plate runs out it will usually start to rotate again after being stopped by putting the transmission in gear and then again returning to neutral. When this condition exists the driven plate should be renewed.

If the clutch starts to spin after having been stopped by placing the transmission in gear, then shifting back to neutral and there is no evidence of plate run-out, it is quite possible that the clutch shaft front bearing (pilot bearing) is not turning freely and is rotating the clutch shaft with the engine.

The only case in which it is necessary to renew the pressure plate and cover assembly for a spinning condition is when either a finger has become bent, the pressure plate cracked, or a failure of some of the rollers or pins in the finger linkage.

In cases of clutch slipping the fault is generally to be either pedal play adjustment or weak cover plate springs. Unless a driven plate is thoroughly saturated with oil it will not cause slipping. In most cases clutch slippage can be traced to the driving habits of the owner or to some time when it was necessary that he slip the clutch to get out of deep snow, sand, or some like condition. This slippage caused overheating of the pressure plate and a consequent loss of pressure plate spring tension. It will be noticed that invariably the coils of the springs are either touching or are very close at the end nearest the pressure plate.

Occasionally a driven plate is changed because the facing does not show full engagement but appears to have high spots. This is a normal condition and these high spots indicate a plate that is not yet broken in.

Another reason sometimes given for replacement is loose torsional springs in the hub. These springs do not necessarily fit tightly and if some can be turned with the fingers it is quite all right. These springs are compressed when operating the car since the power of the engine is transmitted to the transmission through them. Thus it is impossible for them to rattle when the car is being operated.

When the clutch pedal is depressed until the throwout bearing just contacts the fingers a rattle may sometimes be heard. If this rattling sound disappears after placing a slight pressure against the bearing the noise is undoubtedly caused by one finger being slightly lower than the other two. There is a tolerance allowed in this setting and unless very pronounced no correction should be attempted.

If the noise continues or becomes louder as the pedal is depressed the throwout bearing is doubtless at fault.

When the noise is evident at all times when the clutch is engaged, is no louder when driving the car, and disappears when the clutch is disengaged, the clutch shaft rear bearing is indicated as the offender.

If the noise is only heard when the clutch is disengaged the clutch shaft front (pilot) bearing is the offender.

Let's reduce customer and warranty expense by determining just what is necessary rather than replacing all parts just to be sure that you get the right one.

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Installing Trunk Lid Weatherstrips

The new "skin type" trunk lid weatherstrips used on 23rd Series cars will reduce the rusting of the channel and the lid edge if properly installed.

The lower surface and a narrow strip on both sides of the rubber are not covered with the rubber skin. When installing these rubbers all of the uncovered surface should be covered with cement. Use a good grade of weatherstrip cement applying one coat to both the channel and the rubber and after allowing the cement to dry place the rubber in position and allow to dry.

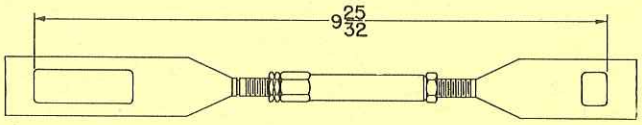
If there is a tendency for the rubber to roll at the top when closing the lid to hold the rubber in position, place a piece of paper over the weatherstrip before closing the lid. After the cement has set remove the paper and coat the surface of the weatherstrip with powdered graphite to lubricate the surface and prevent rolling when closing the lid.

Clutch Pedal to Relay Lever Link

23rd Series Type

The 23rd Series type clutch pedal to relay lever link assembly, part number 418534, will be shipped by the Parts Warehouse when the present stock of links, part number 387540, for earlier models is exhausted.

The new link assembly (418534) is adjustable whereas the superseded link (387540) is of the solid type and non-adjustable.



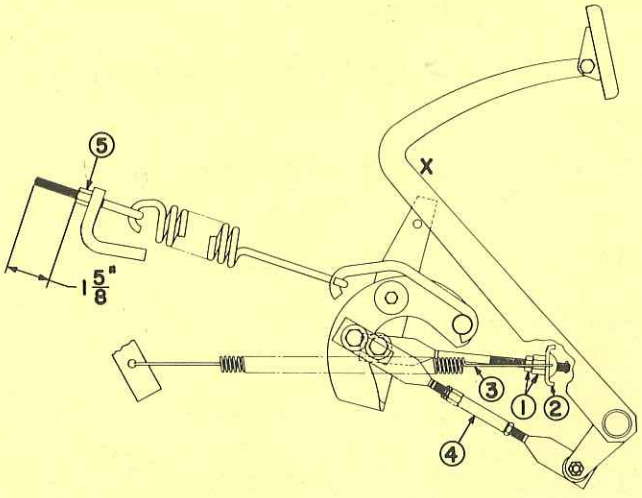
When the adjustable link is used to replace a solid link, the new link first should be adjusted to the dimension shown in the accompanying illustration. After the link is installed, the clutch pedal action should be checked. If the pedal does not fully retract, the link should be lengthened by turning the turnbuckle until proper pedal retraction is obtained.

The practice of installing a supplementary spring to obtain full pedal retraction can be eliminated by installing the new type link in place of the solid type when complaints of this nature are received.

Clutch Pedal Linkage and Adjustment

23rd Series

The clutch pedal linkage on 23rd Series vehicles differs from that of previous models in that the pedal pressure and the booster spring over-center point are variable. In previous models, both the pedal pressure and the over-center point were fixed.



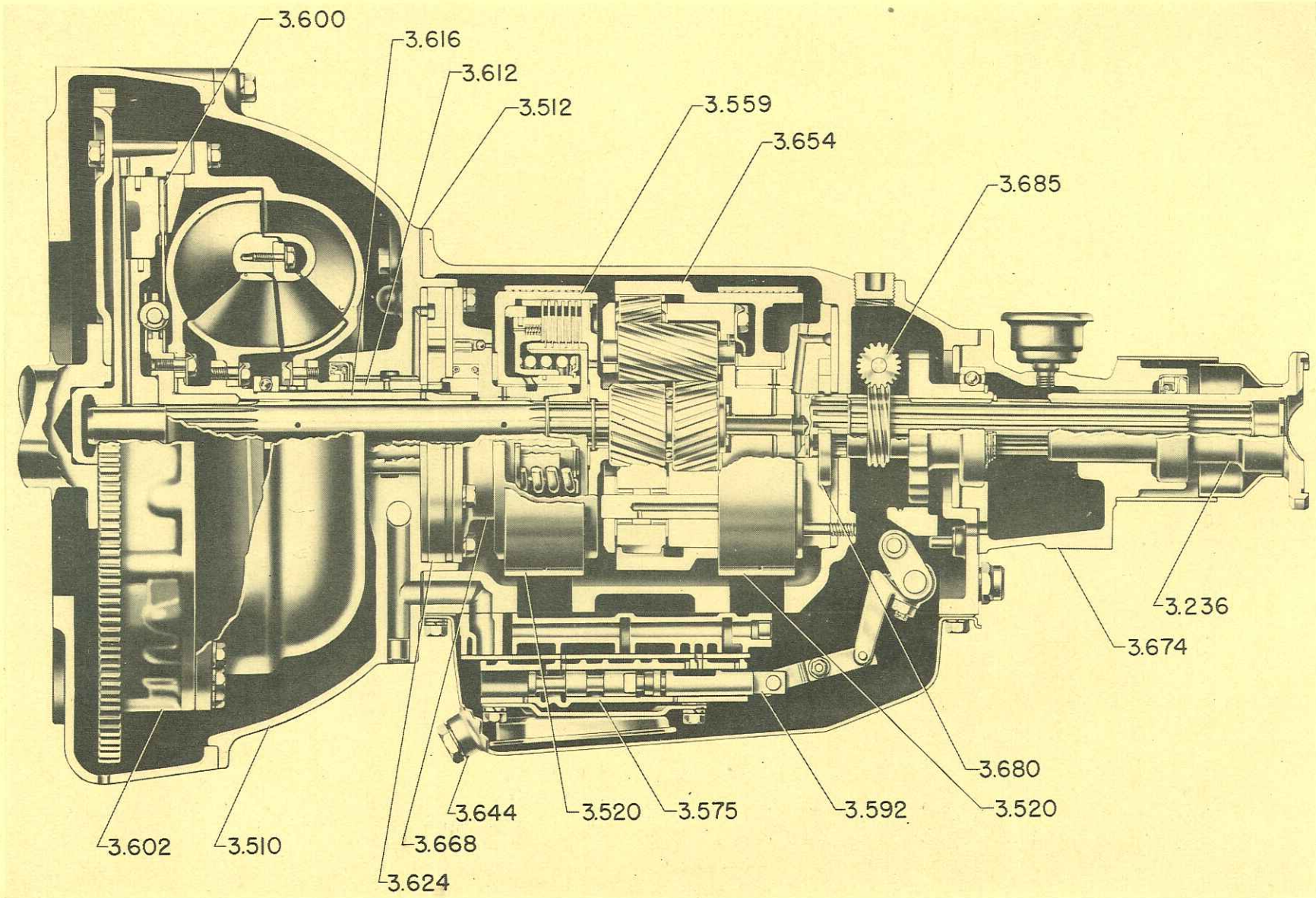
The pedal pressure is governed by the setting of the booster spring eye bolt nut (5) in the accompanying illustration. On some of the previous models, an eye bolt and nut were used but the pedal pressure

ULTRAMATIC DRIVE

Preliminary Parts List
Models 2306-33

CODE NO.	PART NO.	DESCRIPTION AND MODELS	PER CAR
3.505		**TRANSMISSION ASSEMBLY (ULTRAMATIC DRIVE)**	
	902380		1
3.510		**BELL HOUSING AND BUSHING ASSEMBLY**	
	421111		1
3.512		**GASKET—BELL HOUSING**	
	421127		1
3.514		**OIL SEAL—BELL HOUSING**	
	421112		1
3.516		**PIVOT—BELL HOUSING RELAY LEVER**	
	421265		1
3.520		**BAND ASSEMBLY—BRAKE**	
	421770		2
3.522		**SCREW—BRAKE BAND ADJUSTING**	
	421716		2
3.524		**SEAL—BRAKE BAND ADJUSTING SCREW**	
	421717		2
3.526		**LINK—BRAKE BAND TO ADJUSTING TEE**	
	421160		2
3.528		**PLUG—BRAKE BAND REVERSE LEVER SHAFT HOLE**	
	G117918		1
3.530		**PISTON—BRAKE**	
	421959	inner	2
	421210	outer	2
3.532		**VALVE—BRAKE PISTON INNER VENTING**	
	421957		2
3.534		**RING—BRAKE PISTON INNER VENTING VALVE RETAINING**	
	421958		2
3.536		**SPRING—BRAKE PISTON INNER VENTING VALVE**	
	421960		2
3.540		**COVER—BRAKE PISTON**	
	421206		2
3.542		**SEAL—BRAKE PISTON**	
	421848	large	4
	421207	small	2
3.544		**RING—BRAKE PISTON SEAL RETAINER**	
	421202		2
3.546		**VALVE—BRAKE PISTON**	
	421200		2
3.548		**PLATE—BRAKE PISTON VALVE**	
	421209		2
3.550		**SEAT—BRAKE PISTON VALVE**	
	421208		2
3.552		**SPRING—BRAKE PISTON VALVE**	
	421749		2
3.555		**PLATE—TRANSMISSION CLUTCH DRIVEN**	
	421073		6
3.557		**PLATE—TRANSMISSION CLUTCH DRIVING**	
	421128		6
3.559		**HOUSING ASSEMBLY—TRANSMISSION CLUTCH**	
	421638		1
3.561		**SNAP RING—TRANSMISSION CLUTCH HUB**	
	421089		2
3.563		**THRUST WASHER—TRANSMISSION CLUTCH HUB**	
	421675		1
3.565		**RING—TRANSMISSION CLUTCH PISTON**	
	421072	inner	1
	421074	outer	1
3.567		**SPRING—TRANSMISSION CLUTCH PISTON VENT**	
	421969		2
3.569		**SNAP RING—TRANSMISSION CLUTCH PRESSURE PLATE**	
	421071		1
3.571		**SNAP RING—TRANSMISSION CLUTCH SPRING RETAINER**	
	421088		1
3.573		**THRUST WASHER—TRANSMISSION CLUTCH**	
	421330	.085	x
	421331	.095	x
	421332	.105	x
	421333	.115	x
	421334	.125	x
	421335	.135	x
3.575		**CONTROL ASSEMBLY (TRANSMISSION HYDRAULIC)**	
	421900		1
3.585		**SHAFT AND VALVE ASSEMBLY—CONTROL THROTTLE**	
	421934		1
3.587		**SEAL—CONTROL THROTTLE VALVE LEVER SHAFT**	
	421372		1
3.590		**SEAL—CONTROL VALVE LEVER SHAFT**	
	421326		1

CODE NO.	PART NO.	DESCRIPTION AND MODELS	PER CAR
3.592		**VALVE AND LINK ASSEMBLY—CONTROL**	
	421880		1
3.594		**SWITCH—CONTROL VALVE STARTER SAFETY**	
	421319		1
3.596		**GASKET—CONTROL VALVE STARTER SAFETY SWITCH**	
	421318		1
3.600		**PLATE AND DAMPER ASSEMBLY—CONVERTER CLUTCH DRIVEN**	
	421692		1
3.602		**HOUSING ASSEMBLY—CONVERTER CLUTCH**	
	421740		1
	G110418	Plug ¼ x 7–16	2
3.604		**RING—CONVERTER CLUTCH PISTON**	
	421053	inner	1
	421056	outer	1
3.606		**PLUG—CONVERTER OIL DRAIN**	
	421041		2
3.608		**PUMP—CONVERTER**	
	421967		1
3.610		**GASKET—CONVERTER PUMP**	
	421752		1
3.612		**SHAFT ASSEMBLY—CONVERTER PUMP**	
	421595		1
	421598	Lockplate	3
3.614		**GASKET—CONVERTER PUMP SHAFT**	
	421599		1
3.616		**SHAFT ASSEMBLY—CONVERTER REACTOR**	
	421559		1
	421598	Lockplate, screw	3
3.618		**BEARING—CONVERTER REACTOR THRUST BALL**	
	421596		1
3.620		**THRUST WASHER—CONVERTER REACTOR**	
	421695	.060	x
	421696	.070	x
	421697	.080	x
	421698	.090	x
	421699	.100	x
3.622		**LOCKPLATE—CONVERTER FIRST TURBINE RETAINING SCREW**	
	421691		3
3.624		**OIL PUMP ASSEMBLY—FRONT**	
	421634		1
3.626		**VALVE—FRONT OIL PUMP PRESSURE RELIEF**	
	421881		1
3.628		**SPRING—FRONT OIL PUMP PRESSURE RELIEF VALVE**	
	421882		1
3.630		**GASKET—FRONT OIL PUMP PRESSURE RELIEF VALVE SPRING RETAINER**	
	421115		2
3.632		**GOVERNOR ASSEMBLY—**	
	421834		1
3.634		**GASKET—GOVERNOR COVER**	
	421046		1
3.636		**SHAFT—INPUT**	
	421646		1
3.638		**HOSE ASSEMBLY—OIL COOLER**	
	421902	long	1
	421903	short	3
3.640		**CAP ASSEMBLY—OIL FILLER**	
	421794		1
3.644		**OIL PAN ASSEMBLY**	
	421482		1
	G445084	**Plug,** ⅝-18	1
	G105453	Gasket, plug	1
3.646		**GASKET—OIL PAN**	
	421327		1
3.648		**OIL STRAINER ASSEMBLY**	
	421479		1
3.650		**RING—OUTPUT SHAFT**	
	421622		1
3.654		**PLANETARY ASSEMBLY**	
	421890		1
3.658		**SUN GEAR—PLANETARY FRONT**	
	421644		1
3.660		**THRUST BEARING—PLANETARY SUN GEAR**	
	421141		1
3.662		**THRUST WASHER—PLANETARY SUN GEAR**	
	421076		1
3.664		**CLUTCH—REACTION**	1
	421116		1
3.666		**ADAPTER—REACTION CLUTCH**	
	421971		1
3.668		**HOUSING ASSEMBLY—REACTION CLUTCH**	
	421641		1
3.670		**BALL—REACTION CLUTCH HOUSING AIR VENT**	
	G145629		1
3.672		**RETAINER—REACTION CLUTCH HOUSING AIR VENT BALL**	
	421733		1
3.674		**HOUSING ASSEMBLY—REAR**	
	421951		1
3.676		**GASKET—REAR HOUSING**	
	421290		1
3.678		**OIL SEAL—REAR HOUSING**	
	371876		1
3.680		**OIL PUMP ASSEMBLY—REAR**	
	421234		1
3.685		**PINION AND SHAFT ASSEMBLY—SPEEDOMETER**	
	421220	3.54 to 1 ratio, standard	1
3.687		**GASKET—SPEEDOMETER PINION ADAPTER**	
	421060		1
3.236		**FLANGE ASSEMBLY—UNIVERSAL JOINT**	
	412172		1


3.600
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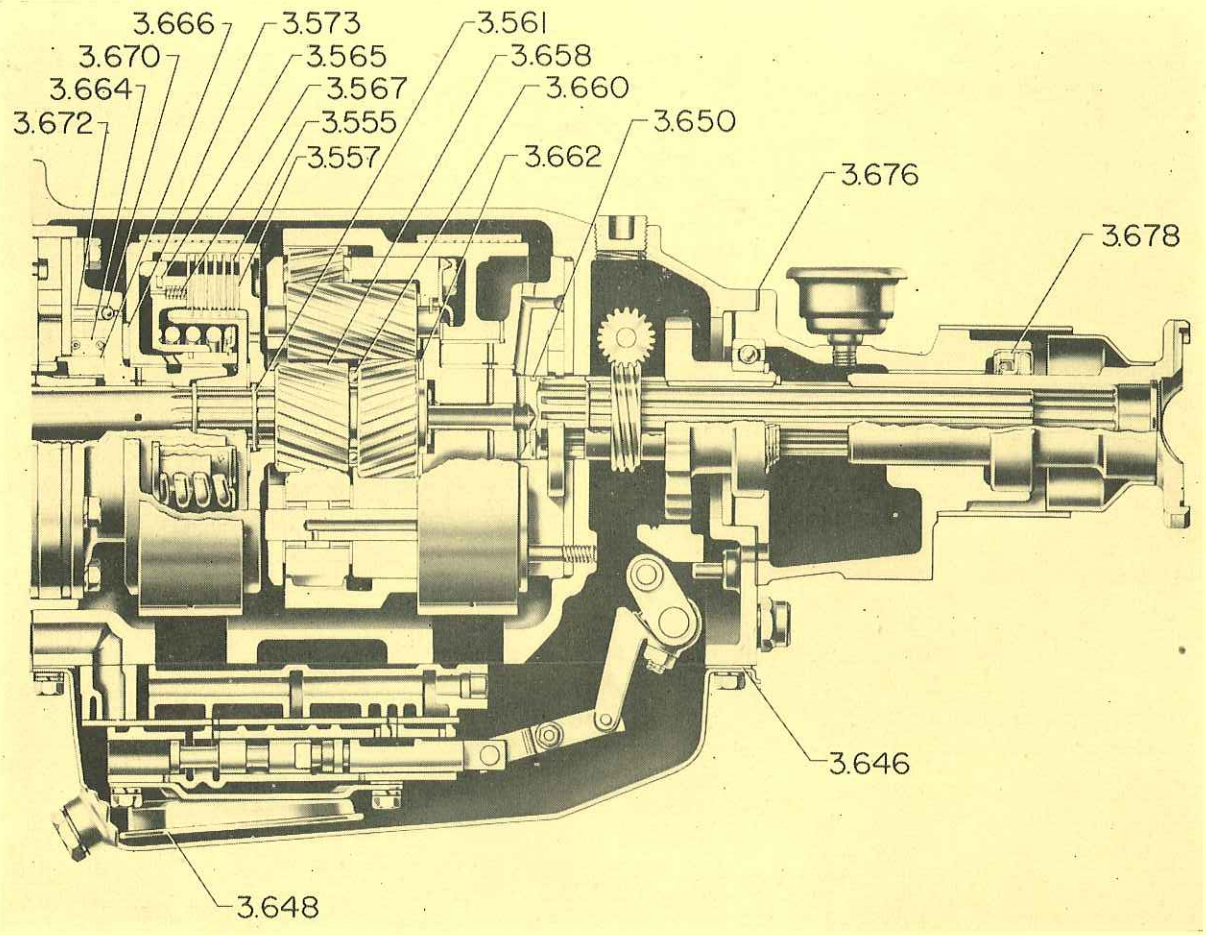
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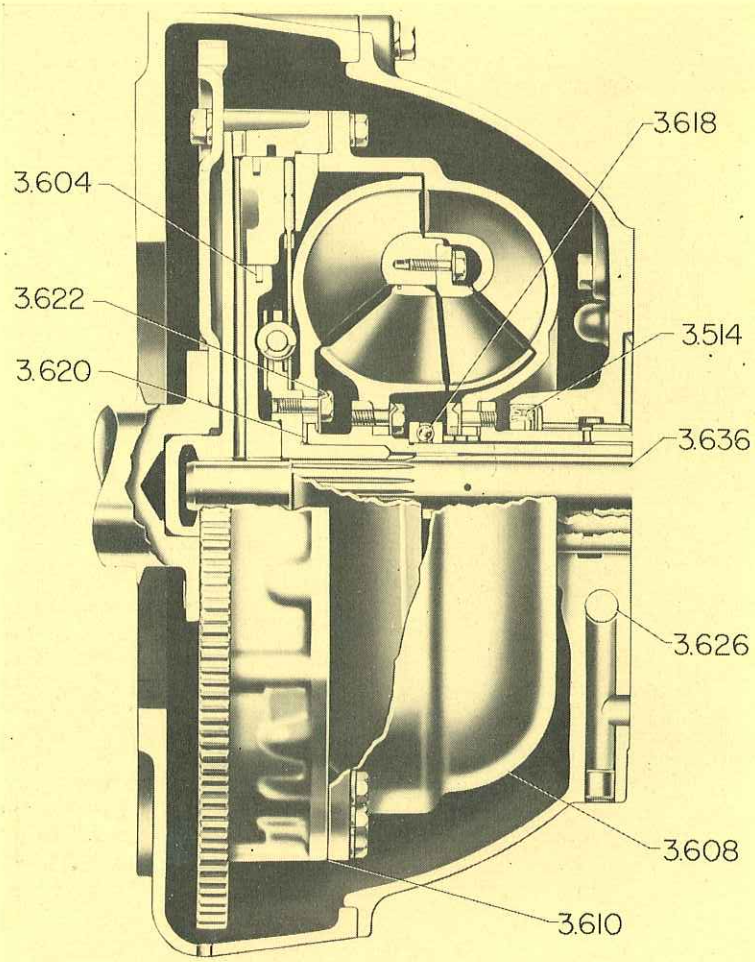
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was fixed because the nut was adjusted to a specified dimension from the end of the eye bolt. On other models the spring was hooked to the frame.

The booster spring over-center point is controlled by the turnbuckle type pedal to relay lever link (4). With this adjustable link, the over-center point or, in other words, the point at which the booster spring actually "goes to work" and begins to pull the pedal downward can be accurately controlled. On previous models, a solid link was used and the over-center point could not be varied.

Clutch linkage adjustment on 23rd Series vehicles is as follows:

a. Check and if necessary adjust nut (5) to obtain the 1⅝" (approximate) dimension as shown.

b. Run nuts (1) back far enough to make certain that they do not contact throwout lever (2) while performing operation "d."

c. Unhook retracting spring (3) from throwout lever (2).

d. Adjust link (4) so that the booster spring will continue to move the pedal downward after it has been moved one inch from its normal position against the toe board.

NOTE—Adjusting nut (1) should not contact throwout lever (2) when this operation is performed.

e. Hook up retracting spring (3) to throwout lever (2).

f. Adjust nuts (1) to obtain 1¼" to 1⅜" free play at pedal pad.

g. Pull the pedal down so that the pedal pad contacts the toe board and hook a spring scale to the pedal arm at the point marked "X." Adjust nut (5) so that pedal will be held in this position when the scale registers a pull of seven pounds.

Intake Manifold Gasket Leaks

We have recently received reports of rough idle due to air leakage at the intake manifold gaskets. Many of these complaints could have been eliminated if the manifold retaining nuts had been properly tightened during pre-delivery inspection.

When the manifold nuts are not properly tightened the movement of the manifold on the gaskets, due to expansion and contraction, causes the gaskets to become chafed.

The simplest check to determine whether or not the manifold gaskets are at fault is to squirt gasoline around the gasket edges with an oil can while the engine is idling. If the engine smooths out or speeds up while the gasoline is being applied the seal at the gasket is not effective.

Your Service Staff

This is another in a series published to acquaint members of the Packard Field Organization with individual members of the Factory Service Department

C. M. "Chuck" Kuhn started investigating the insides of automobiles at 14 with an after school job. He then worked as a mechanic for Jordan and later as a Distributor's Service Manager. Super Service Station operation followed and in 1937 he joined Packard as a service salesman at the Detroit Branch, was appointed shop foreman and then shop superintendent. During the war he served as a civilian technician on Rolls-Royce engines with the USAAF.

After the war he took over the job of Technical Editor for the Service Division and is now Ass't. Service Technical Manager, handling product improvement by means of product report analysis, liaison with Engineering and Manufacturing, technical correspondence with Zones and the conducting of technical meetings for zone service managers and service representatives. And, by the way, as a technical expert he also qualifies at the top on the hobby list of bowling, photography, camping and fishing.

Rough Transmission Driving Shaft Bearings

Service Shaft Assemblies

A number of service replacement transmission driving shaft 1st and 2nd speed gears and bearings assemblies have been returned to the Factory because the bearings felt rough when turned by hand.

We wish to point out that, on assemblies as received from the Parts Warehouse, this feeling of roughness is not due to defective bearings but is caused by the congealed protective lubricant with which the assemblies are covered before wrapping to prevent corrosion. When turned by hand, the bearings are apt to stick or feel rough. However, this roughness will disappear after the assembly has been installed in the transmission and has become thoroughly lubricated with transmission oil.

It is not necessary to remove the protective lubricant before installing a new assembly although it should be dipped in or thoroughly lubricated with transmission oil before installation.

Electromatic Clutch Valve Puppet Valve Seat

A new type of poppet valve seat is now being used in the Electromatic Clutch control valve. The early type and the new type valve seats are shown in figure 1.

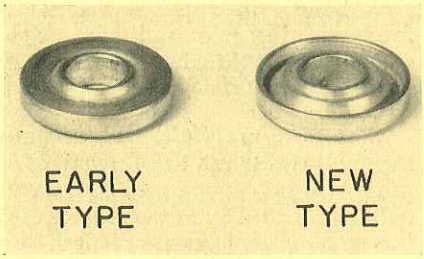


Figure 1

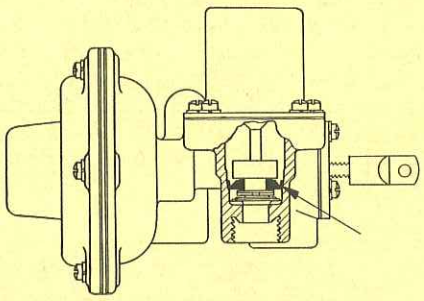


Figure 2

This new valve seat may be installed in place of the earlier type when the seat has loosened and dropped out of position. The new seat has a taper on its outer diameter which allows it to fit tightly even if the bore into which it fits is oversize. It may be installed by tapping into place with a brass drift and a light hammer. Figure 2 shows a cross section of the solenoid and valve body with the new type seat in position.

The new seat is carried in Service Stock under part number 410505.

Squeaks—Insert Type Rear Springs

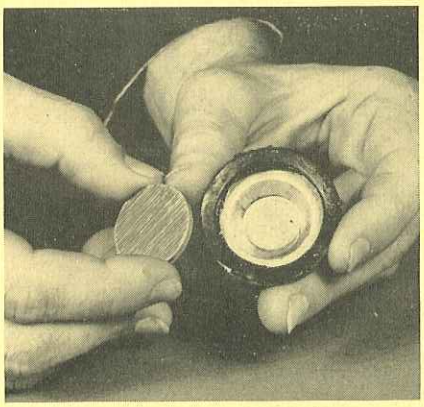
Squeaks in this type of leaf spring are generally caused by steel to steel contact of the leaves, or by oxidation of the antimony-lead inserts..

To get at this trouble, first inspect the springs. Determine whether the rubber and Silenite inserts in the upper leaves have worn to the extent that the leaf tips are not sufficiently separated. A clearance of $\frac{1}{16}$ inch to a heavy $\frac{1}{32}$ inch is considered satisfactory between the leaf tip and the bottom of the leaf above it.

Raise the rear end of the car so that the wheels clear the floor, relieving the springs of the weight of the car. If the rubber and Silenite have worn excessively as determined by the previous inspection, remove the spring clips, wedge the leaves apart for adequate clearance and replace the worn inserts.

If the rubber and Silenite inserts are in good condition, probably the squeaks are caused by oxidation of the antimony-lead inserts. Prolonged contact with the air will cause the outer surfaces of most metals and alloys to oxidize if unprotected. Free oxygen in the air, for instance, will combine with steel to produce iron oxide, or rust, and since oxygen is also present in water, this goes for water, too. Antimony lead is no exception—its outer surface decomposes to a black colored oxide. The antimony-lead inserts are coated with grease for the same reason we paint steel—to slow down or inhibit oxidation.

To recondition the antimony-lead inserts, wedge the leaves apart, one end of each leaf at a time, and remove the insert and its retainer.



Take the insert out of its retainer, as shown in the accompanying illustration, and remove the black oxide from the insert bearing surface with a file. Examine the retainer. If it is distorted or if the rubber seal is damaged, it should be replaced. Now fill the retainer with grease and reinstall the insert in the retainer. After filing the antimony-lead oxide from the bearing surface of the spring above, reinstall the insert and retainer and remove the wedge. Repeat this process until all inserts and spring bearing surfaces have been reconditioned.

Fuel Pump May Cause High Oil Consumption

When cars are reported to be using an excessive amount of oil and at the same time do not idle smoothly the fuel pump vacuum booster diaphragm should be checked for leakage. There have been many cases in which engines have been overhauled due to high oil consumption only to find that after the work was completed the condition was unchanged. The result is customer dissatisfaction and expense.

When these two conditions are present, the fuel pump to intake manifold line should be disconnected at the manifold end and the hole in the fitting covered so that it cannot suck air. If the idle smooths out while the hole is covered it is an indication of air leakage through the fuel pump booster system. If high air consumption is also reported the diaphragm in the booster section of the pump is probably fractured.

This fracture allows oil to be drawn from the crankcase into the intake manifold line. The lower face of the diaphragm is exposed to hot oil and vapor in the crankcase which causes rapid deterioration of the diaphragm material.

In these cases recondition the fuel pump and again make an oil test.

Floor Pan Deflection

Occasionally we receive reports of floor pan deflection. While this is not a serious complaint, it may be annoying to an Owner. The actual deflection may not be annoying but the sound which is set up when the metal is deflected and when it springs back usually is the reason an Owner will want this condition corrected.

This condition may be corrected by folding back the floor mat, locating the center of the deflecting area, and then striking this center point a sharp blow with the ball end of a ball-peen hammer. The hammer blow should be struck from above and should be sharp enough to form a depression or fairly deep dimple in the metal. This dimple then will act as a reinforcement to prevent deflection.

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