SECTION XII

UNIVERSAL JOINTS AND PROPELLER SHAFT

CONTENTS

DATA AND SPECIFICATIONS

Models	C-71	C-72	C-73	C-70
Propeller Shaft				
Number used	1	1	2	2
Diameter				
With Standard Transmission	3.25 in.	—	—	—
With PowerFlite Transmission	3.00 in.	3.00 in.	2.50 in.	2.50 in.
With TorqueFlite Transmission	2.75 in.	2.75 in.	2.75 in.	2.75 in.
Diameter with Air Conditioning				
And Standard Transmission	3.50 in.	—	—	—
And PowerFlite Transmission	3.00 in.	3.50 in.	2.50 in.	2.50 in.
And TorqueFlite Transmission	3.00 in.	3.00 in.	2.75 in.	2.75 in.
Length				
Centerline to Centerline of "U" Joints				
With Standard Transmission	**59.72	—	—	—
With PowerFlite Transmission	**59.72	59.41	Front 28.94 Rear 38.88	Front 53.84 Rear 29.31
With TorqueFlite Transmission	56.27	56.00	Front 25.49 Rear 38.88	Front 50.39 Rear 29.31

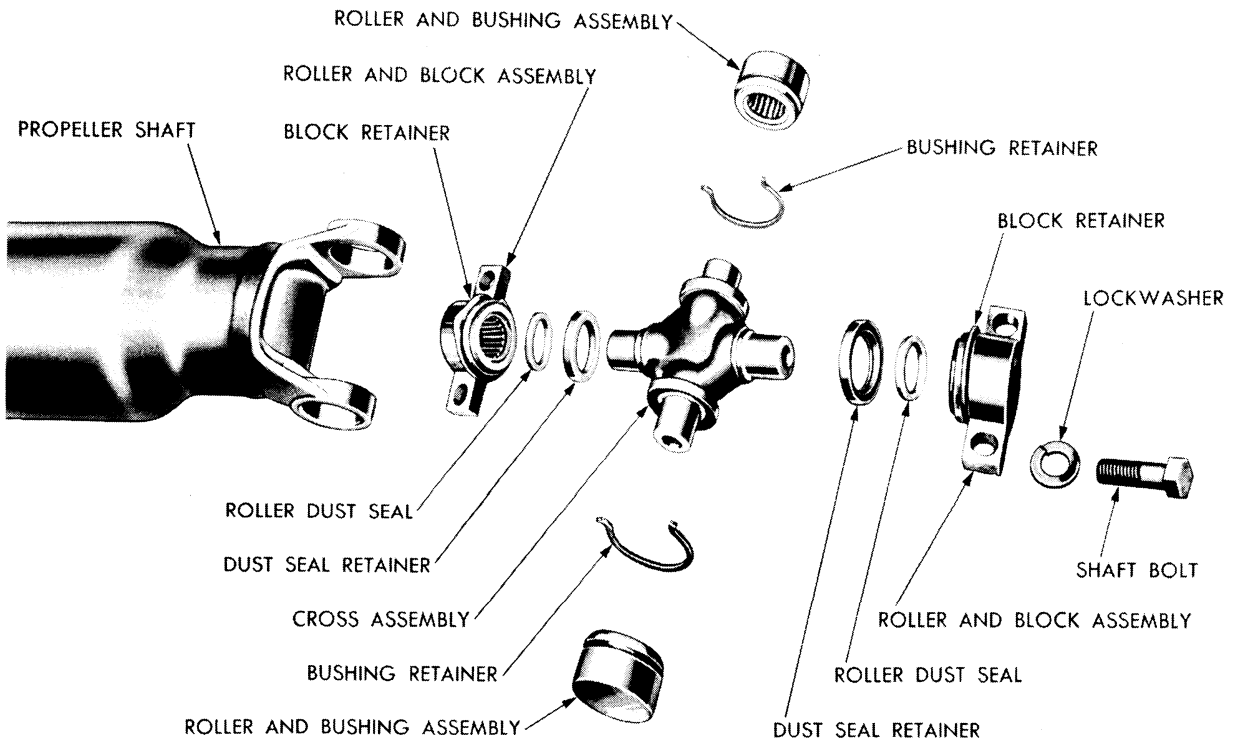

Fig. 1—Rear Universal Joint—Cross Type (Disassembled View)

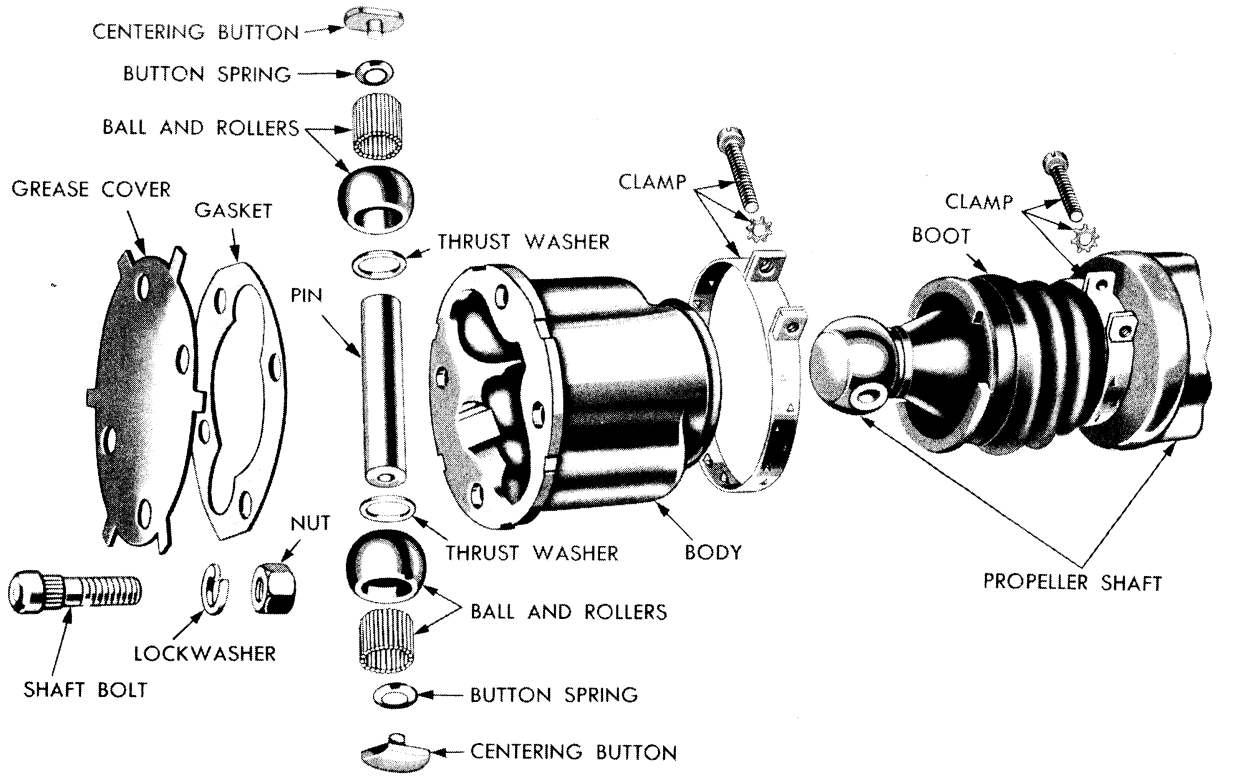

Fig. 2—Front Universal Joint—Ball and Trunnion Type (Disassembled View)

DATA AND SPECIFICATIONS (Cont'd)

Models	C-71	C-72	C-73	C-70
Flange to Flange Length				
With Standard Transmission	61.78	—	—	—
With PowerFlite Transmission	61.78	61.50	68.37	83.50
With TorqueFlite Transmission	58.33	58.05	64.92	80.05
Lubrication		*PRE-PACK		
Universal Joints				
Type	(Front) Ball and Trunnion (Rear) Cross Type		Cross Type (Only)	Cross Type (Only)
Bearing Type		ANTI-FRICTION		

*Every 20,000 miles.
**Town & Country Wagon 59.41—Power Package 59.41.

SECTION XII

UNIVERSAL JOINTS AND PROPELLER SHAFT

UNIVERSAL JOINTS

Two types of Universal Joints are used on 1956 Chrysler Models and are as follows: The Cross Type, as shown in Figure 1, and Ball and Trunnion Type, as shown in Figure 2.

The ball head of each joint of Ball and Trunnion Type, is an integral part of the tubular propeller shaft and is covered by the joint body. The pin, with balls, needle bearings, thrust washer, centering button, and button spring at each end, extends through propeller shaft ball and rides in ball channels in body of joint assembly. This balanced installation is designed to absorb thrust and torque of the drive line. This type of joint is used in Models C71, C72 at front universal joint.

The Cross Type universal joint is used at rear joint of all models, and front and center bearing joints of C-70 and C-73 Models. The C-70 and C-73 Models are equipped with center bearing and two propeller shafts.

No adjustments are provided to compensate for wear in universal joint assembly. Parts that show excessive wear must be replaced.

CAUTION

When disassembling universal joints, keep parts identified as to original position. Failure to assemble parts in their original positions may cause an unbalanced condition in propeller shaft.

CROSS TYPE

1. SERVICING CROSS TYPE UNIVERSAL JOINTS (Fig. 1)

Disconnect front end of propeller shaft at transmission flange. Disconnect rear end of propeller shaft and remove propeller shaft. Remove two bushing retainers and remove bushings. Tilt cross so that it may be removed from propeller shaft yoke. Straighten out end of retainer lock and remove two roller and block assemblies. Remove dust seals and retainers. Inspect parts and replace parts that show wear. Lubricate roller and bushings with universal joint grease (extreme pressure) and assemble joint in reverse order of disassembly.

BALL AND TRUNNION TYPE

2. SERVICING BALL AND TRUNNION TYPE UNIVERSAL JOINTS

To disassemble universal joint for repair or inspection of all component parts, refer to Figure 2 and proceed as follows:

Remove joint body metal cover and gasket by bending tabs of cover away from body; then remove cover and gasket. Slide body down on propeller shaft exposing two centering buttons. Remove centering buttons and springs from ends of trunnion pin. Side two balls, rollers, and thrust washers off trunnion pin. Wash all parts with solvent and blow dry with compressed air. Inspect and replace worn parts.

NOTE

Reconditioning of ball and trunnion type universal joints will only be necessary when excessive free backlash exists between balls and trunnion. In some instances, it will be found that universal joint body has worn, and it will be necessary to replace all parts, including body pin, thrust washers, and centering buttons. Worn rollers should also be replaced.

3. UNIVERSAL JOINT MAINTENANCE (BALL AND TRUNNION)

The universal joints, propeller shaft, and hand brake drum are accurately balanced during process of manufacture. Care should be exercised to maintain this condition of balance by close adherence to the following: Do not use more than 2½ ounces of lubricant in a universal joint (ball and trunnion type) of the C-72 and 2 ounces in the C-71 at any time. Keep propeller shaft, hand brake drum, flanges, etc. free from undercoating, dirt, and ice.

CAUTION

When installing trunnion pin in propeller shaft care should be taken to see that trunnion pin is centered in shaft. Each end of pin should protrude the same distance, with variation of no more than .003 inch. If one side of pin extends more than .003 inch farther than the other, propeller shaft will be out of balance. Tool C-3534-C-71 Models, Tool C-3211 on the C-72) as shown in Figure 3, will facilitate removal, installation, and centering of trunnion pin.

Failure to observe these recommendations

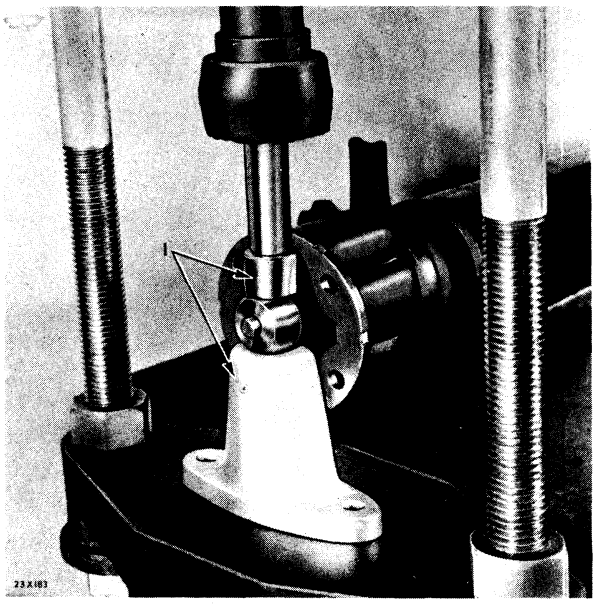

Fig. 3—Installing Universal Joint Pin

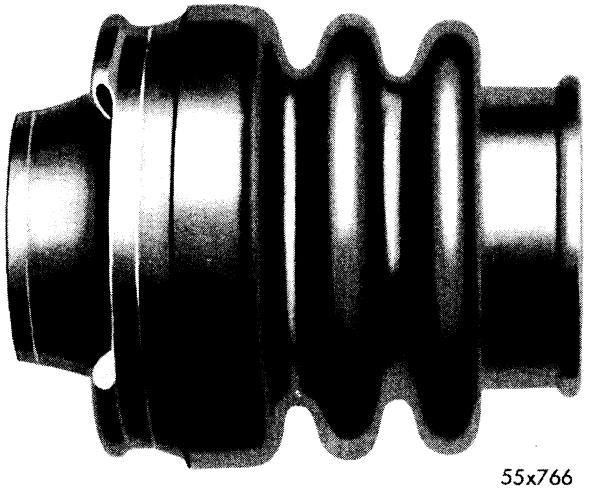

Fig. 4—External Type Dust Cover

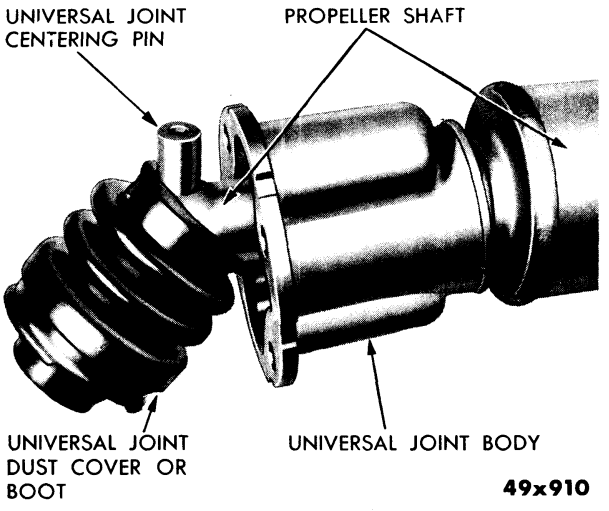

Fig. 5—Sliding Cover Over Ball Head and Pin

may result in an out-of-balance condition causing vibration.

4. SERVICING EXTERNAL TYPE UNIVERSAL JOINT DUST COVER

To replace an external type universal joint dust cover (Fig. 4) that is damaged, remove propeller shaft assembly from car and clamp lightly in vise. One end of shaft should be resting on bench in a horizontal position, and proceed as follows: Disassemble joint, removing all parts except body and pin. Clean body, ball head, and pin thoroughly.

A complete coating of grease (or suitable rubber lubricant) must be smeared on outside and inside of dust cover, entire surface of ball head, pin, and inside of body. **(It is very important that this instruction be followed.)**

Stretch grease-soaked boot or dust cover over pin and ball head as shown in Figure 5. Work dust cover into body as far as possible.

CAUTION

USE NO TOOLS FOR THIS OPERATION.

With body in position so pin can enter ball channels, pull body sharply over pin, thereby forcing dust cover into body. With one hand, grip end of dust cover, protruding through back end of body. With other hand, pump body back and forth, as shown in Figure 6, until entire dust cover has passed through body.

During operation cone may have reversed itself inside dust cover. Pull it out to its normal position.

Slide dust cover in ball head groove and over neck of body, then secure with clamps provided.

Insert 2½ ounces of heavy fiber, universal joint grease in joint of C-72 (2 ounces in the C-71) and install cover.

Install shaft, using new lockwashers. Be sure to double check flange bolts for tightness, to insure against grease leakage. Recheck after 1,000 miles of operation.

CAUTION

Never attempt to use a needle-like arrangement for forcing lubricant into boot (or dust cover) on universal joints. Excessive grease can be forced into boot and cause shaft to be thrown

Fig. 6—Working Dust Cover Through Body

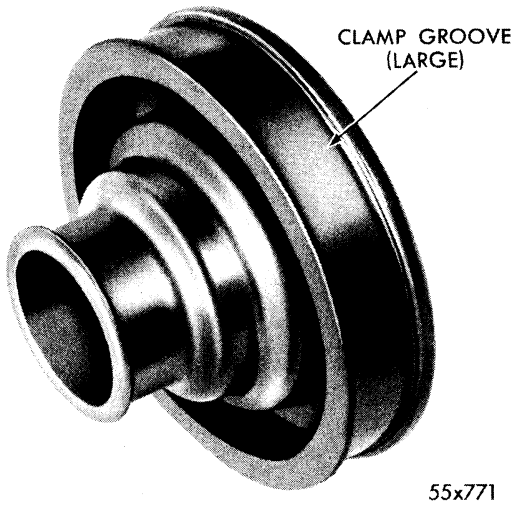

Fig. 7—Internal Type Dust Cover

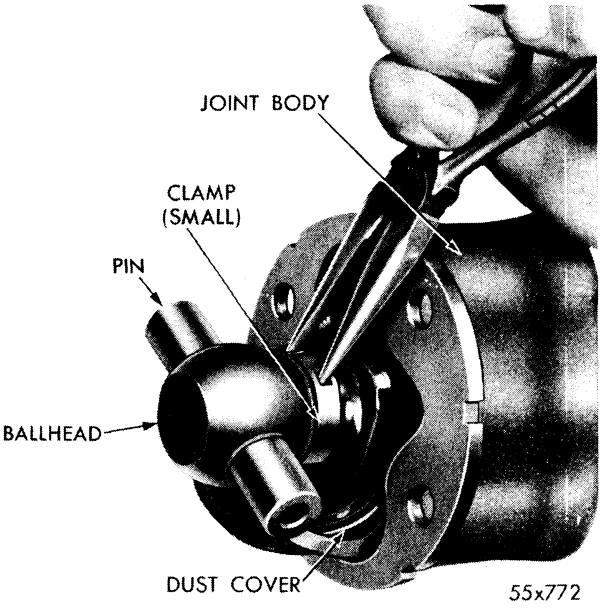

Fig. 9—Installing Small Clamp on Dust Cover

out of balance, burst boot, or lubricant can be lost through injection hole during high speed operation. The joints must be disassembled and packed with universal joint grease.

5. SERVICING INTERNAL TYPE UNIVERSAL JOINT DUST COVER

The propeller shaft incorporating internal type dust covers (Fig. 7) are standard on New Yorker Models equipped with air conditioning.

To replace a damaged dust cover proceed as follows:

Remove propeller shaft from car, and lightly clamp shaft in vise, with other end supported in horizontal position. Disassemble joint; remove all parts except body and pin. Clean all parts including body, ball head, and pin thoroughly. Push body all the way back, install boot by stretching it over ball head and pin, as shown in Figure 8. **No lubricant applied to any parts thus far.**

Position boot as near to ball head as possible, then form small clamp around boot and thread one end of clamp through slot provided in other end of clamp. Use suitable pliers to constrict clamp as far as possible by hand (Fig. 9). Secure clamp by bending end of clamp completely over. Do not cut off excess amount of clamp.

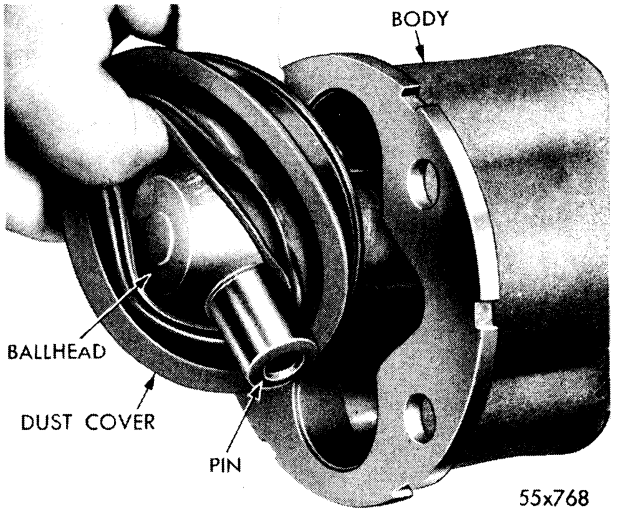

Fig. 8—Sliding Dust Cover over Ball Head and Pin

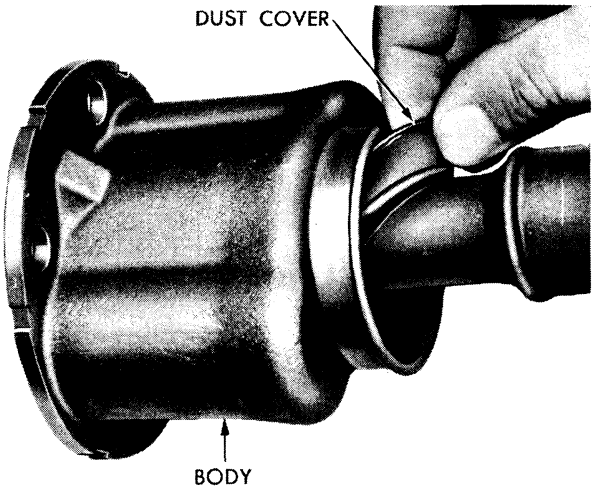

Fig. 10—Working Dust Cover Through Body

Apply light coat of universal joint grease to inside of body. This will aid in working boot through body. Install thrust washers, balls, rollers, etc. on ends of pin. Pull body over ball head and work back and forth until boot protrudes enough to be grasped with fingers; then pull boot through body, as shown in Figure 10.

CAUTION

Do not use any sharp tool for this operation.

Wipe off any lubricant from contacting surfaces on both body and boot (Fig. 11). Clean clamp groove also on outside of boot. **THIS IS IMPORTANT!**

Install clamp, using same procedure as described for the small clamp. Cut off excessive amount of clamp and completely bend end of clamp over. Coat ball head assembly and inside of body with two ounces of universal joint grease. Work body back and forth so that grease will be distributed on all parts. Install gasket and grease cover. Bend tabs of cover over to secure cover.

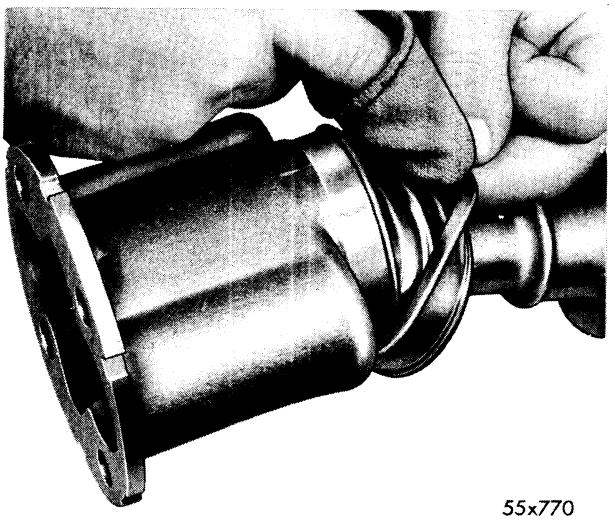

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Fig. 11—Cleaning Lubricant from Contacting Surface of Dust Cover

CROSS AND YOKE TYPE PROPELLER SHAFT

6. SERVICING CROSS AND YOKE TYPE PROPELLER SHAFT

a. Removal

Remove nuts, lockwashers and bolts holding universal joint and propeller shaft to differential and transmission companion flanges. Remove propeller shaft assembly.

b. Disassembly

Place assembly in bench vise and remove cross roller bearing block tie retainer which holds cross roller bearing blocks on cross. Remove bearing blocks, dust seals, and dust seal retainers. Remove retainers from cross roller bearings. Press out bearings and cross. Remove dust seals and retainers from cross. The cross roller bearing block and its component parts, also form an assembly. These parts are **not** serviced separately. After disassembly, clean and inspect parts and replace, as necessary, those worn or damaged.

c. Assembly

Lubricate all parts before assembling. If splined joint at rear of front propeller shaft has been disassembled, fill cavity with one ounce (by weight) of MS 1124. The center bearing is a sealed bearing and does not require lubrication.

Install dust shields and retainers on cross. Press cross roller bearing and bushing assembly into yoke with cross in proper location.

CAUTION

Make certain that all of roller bearings are correctly placed in roller bushing. Also, be sure balance arrows are in alignment (Fig. 12).

d. Installation

Place propeller shaft in its correct position under car. Make certain that slip-spline end of shaft is located toward front of car. Insert attaching screws and tighten securely.

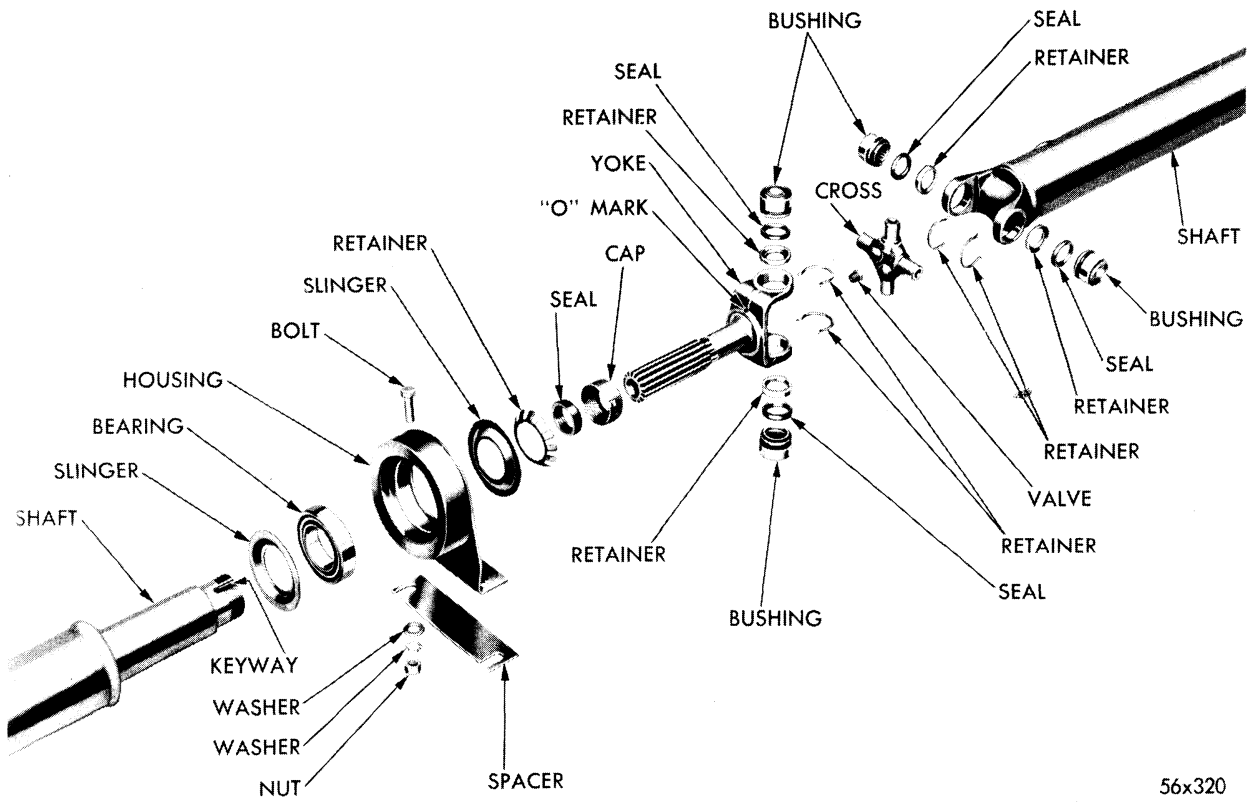

Fig. 12—Propeller Shaft and Center Bearing Assembly (Disassembled View)

7. SERVICING PROPELLER SHAFT CENTER BEARING (FIGURE 12)

The center bearing and housing must be removed as a unit, together with front propeller shaft, for servicing.

CAUTION

Do not extend two piece center bearing propeller shaft to its full length. The seal may be damaged by the splines on universal joint yoke.

With yoke all the way into front propeller shaft, bend up tang on dust seal cover.

Remove cover, seal, lock and dust slinger and remove center bearing assembly. Inspect bearing, bracket, seal. Replace necessary parts and reassemble.

REAR AXLE CONTROL STRUT

The 1956 Imperials are designed with two propeller shafts and a propeller shaft center bearing, as shown in Figure 13. Conditions may arise under certain passenger loads which may create a propeller shaft shudder or vibration at speeds of 15 to 20 miles per hour.

In order to control shudder or vibration a rear axle control strut, as shown in Figure 14, has been incorporated in rear axle design for purpose of controlling rise of nose of rear axle carrier under varying load conditions. Corrections of propeller shaft shudder should be made as follows:

Before diagnosing a shudder condition make sure engine has been tuned and is operating smoothly with no hesitation or stumble on accelerator.

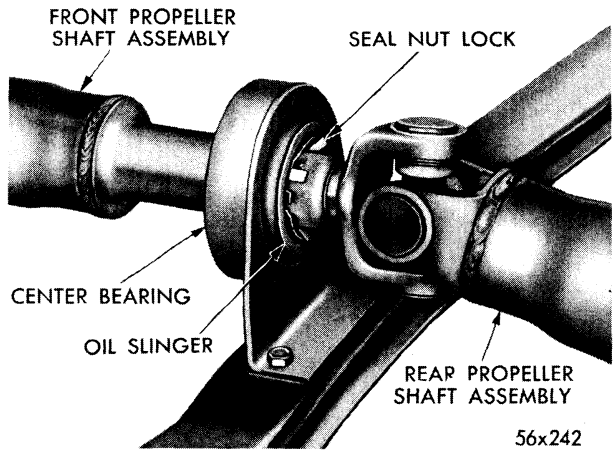

Fig. 13—Center Bearing Installed

NOTE

A rough engine can encourage or produce a shudder.

Check the indexing of universal joints and propeller shafts assembly, as shown in Figure 12. The letter "O" on front face of spline should be lined up with key slot at rear of front shaft.

If car is equipped with a TorqueFlite rather than PowerFlite transmission, inspect rear engine insulator to be sure that there is a $\frac{7}{32}$ inch spacer present between insulator and transmission extension.

NOTE

The seal retainer must be removed to enable seeing of key slot in shaft.

With fuel tank approximately half full, determine under what speed and passenger load a shudder is present, if shudder is light, moderate or heavy.

Measure rear universal joint angle. This angle should be three degrees at zero passenger load. Reasonable care must be exercised to obtain accuracy in this measurment.

If measured angle is not three degrees, correction should be made by either adding or removing spacers between control strut brackets and rear axle brackets. Adding a $\frac{1}{16}$ inch spacer will reduce measured angle about one degree; likewise, removing a $\frac{1}{16}$ inch spacer will increase this angle about one degree.

After rear universal joint angle has been adjusted as near to three degrees as possible, measure middle universal joint angle. This angle should be $2\frac{1}{2}$ degrees for rear universal joint angle of three degrees at zero passenger load. The middle universal joint angle is adjusted by adding or removing shims between center bearing insulator and crossmember. Adding $\frac{1}{8}$ inch shim will increase middle universal joint angle about $\frac{1}{2}$ degree; likewise, removing $\frac{1}{8}$ inch shim will reduce angle about $\frac{1}{2}$ degree.

If large number of shims must be added or removed at center bearing, rear universal joint angle should be rechecked to be assured that it has not been appreciably altered from three degrees.

When these adjustments have been made, the least amount of propeller shaft shudder should occur at a loading of two passengers.

If, after road testing, it is desirable to obtain the least amount of propeller shaft shudder at large passenger loading, center bearing must be raised slightly by means of shimming. Lowering center bearing will move point of least shudder to a lower passenger loading.

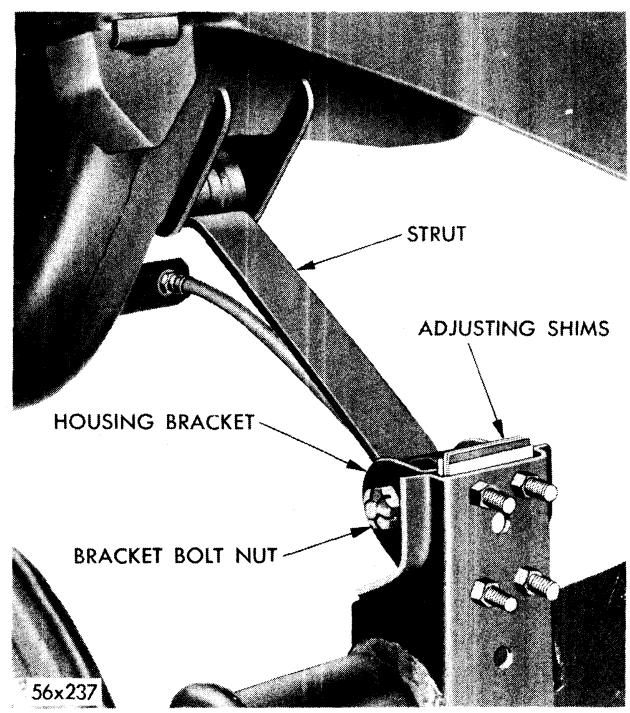

Fig. 14—Rear Axle Control Strut

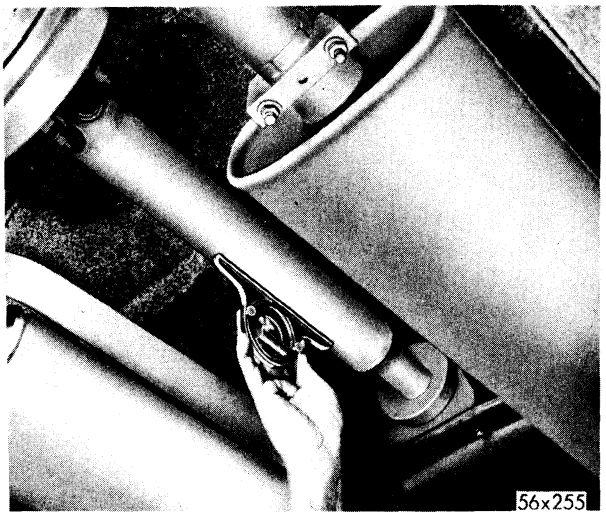

Fig. 15—Checking Front Propeller Shaft Angles

8. CHECKING PROPELLER SHAFT ANGLES

Locate car over pit with wheels supporting car.

NOTE

If car is located on a hoist that supports rear of car on axle angle of axle, the universal joints will be influenced.

Check universal joint angles with a spirit level protractor, as shown in Figures 15 and 16. Measure angles of front propeller shaft, middle propeller shaft, and rear axle pinion drive shaft flange.

(The rear axle drive pinion shaft flange angle should be obtained by removal of rear end of rear propeller shaft, and measuring angle of front face of companion flange, as shown in Figure 17).

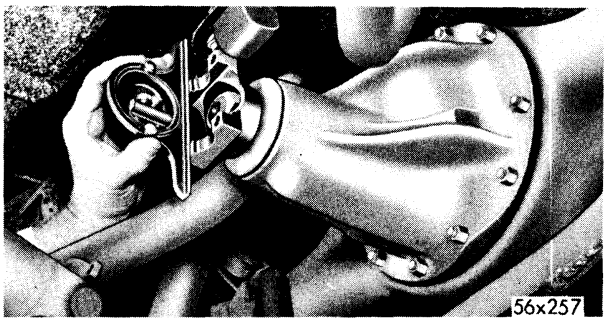

Fig. 17—Checking Companion Flange Angle

The angle of middle universal joint is determined by combining angles of front and rear propeller shaft angles. Care must be taken to determine which direction the shafts are slanted from horizontal. If both shafts are slanted up in front, readings should be subtracted; if they are slanted in opposite directions, readings should be added. The rear universal joint angle is similarly obtained from a combination (addition or subtraction) of rear propeller shaft and rear axle pinion drive shaft angles.

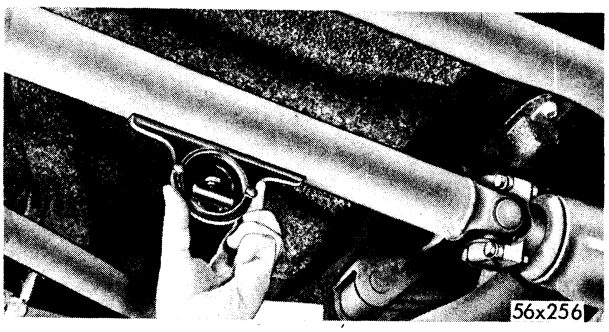

Fig. 16—Checking Rear Propeller Shaft Angles

SERVICE DIAGNOSIS

9. PROPELLER SHAFT VIBRATES

a. If propeller shaft, drum, and flange are not shielded while car is being undercoated, the undercoating material may accumulate on underside of propeller shaft and cause vibration. To remedy such a condition, inspect shaft and remove undercoating material (if present) with solvent.

b. Check transmission flange nuts and rear axle differential flange nuts for looseness. Tighten to Data and Specifications.

c. Check alignment of balance arrows on both shaft and front universal joint. These arrows must be exactly in line. If not, reposition splines so that arrows are properly aligned.

10. UNIVERSAL JOINTS NOISY

a. Check universal joints for possible damage and tighten propeller shaft flange bolts to Data and Specifications.

b. Disassemble universal joints and inspect all parts for wear or damage. Replace parts as required, pack bearings with universal joint grease and reassemble.

c. Inspect universal joint bearings for wear and replace as necessary.

d. Check for flange runout. In many instances, it is possible to correct a flange runout condition by repositioning universal joint 180 degrees with companion flange. Reposition only one universal joint at a time and road test car after each repositioning operation.

e. Check splines. If excessively loose, inspect splines on shaft or in flange for wear or damage. Replace shaft or flange, as necessary, to correct condition.