

Chapter 8 Driveshafts

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Degrees of difficulty

Easy , suitable for novice with little experience		Fairly easy , suitable for beginner with some experience		Fairly difficult , suitable for competent DIY mechanic		Difficult , suitable for experienced DIY mechanic		Very difficult , suitable for expert DIY or professional	
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Specifications

Lubrication (overhaul only - see text)

Lubricant type/specification. Use only special grease supplied in sachets with gaiter kits - joints are otherwise pre-packed with grease and sealed

Torque wrench settings

	Nm	ibf ft
Driveshaft retaining nut:		
1124 cc and 1360 cc models.	240	177
1580 cc and larger-engined models.	320	236
Right-hand driveshaft intermediate bearing retaining bolt nuts.	10	7
Lower suspension arm balljoint retaining nuts.	45	33
Roadwheel bolts.	90	66

1 General information

Drive is transmitted from the differential to the front wheels by means of two solid-steel driveshafts of unequal length.

Both driveshafts are splined at their outer ends, to accept the wheel hubs, and are threaded so that each hub can be fastened by a large nut. The inner end of each driveshaft is splined, to accept the differential sun gear.

Constant velocity (CV) joints are fitted to each end of the driveshafts, to ensure the smooth and efficient transmission of power at all suspension and steering angles. On 1124 cc and 1360 cc models, the outer constant velocity joints are of the spider-and-yoke type; on all 1580 cc and larger-engined models, they are of the ball-and-cage type. The inner constant velocity joints are of the tripod type on all models.

On the right-hand side, due to the length of the driveshaft, the inner constant velocity joint is situated approximately halfway along the shaft's length, and an intermediate support bearing is mounted in the engine/transmission rear mounting bracket. The inner end of the

driveshaft passes through the bearing (which prevents any lateral movement of the driveshaft inner end) and the inner constant velocity joint outer member.

2 Driveshafts - removal and refitting

Removal

1 Chock the rear wheels of the car, firmly apply the handbrake, then jack up the front of the car and support it on axle stands. Remove the appropriate front roadwheel.

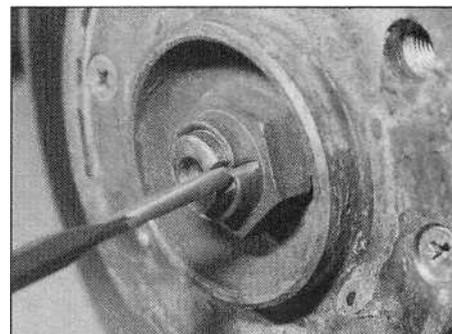
2 Drain the transmission oil or fluid as described in Chapter 1.

3 On models equipped with ABS, trace the wiring connector back from the wheel sensor, freeing it from its retaining clips, and disconnect it at its wiring connector.

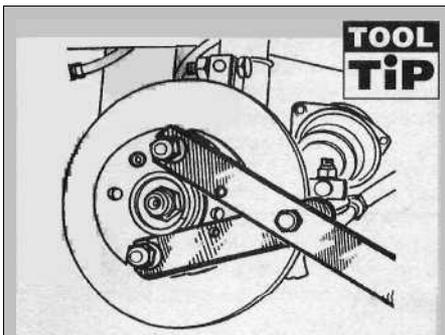
4 On 1124 cc and 1360 cc models, using a hammer and a chisel or similar tool, tap up the staking securing the driveshaft retaining nut in position (**see illustration**). Note that a new retaining nut must be used on refitting.

5 On all 1580 cc and larger-engined models, withdraw the R-clip and remove the locking cap from the driveshaft retaining nut.

6 Refit at least two roadwheel bolts to the front hub, and tighten them securely. Have an assistant firmly depress the brake pedal to prevent the front hub from rotating, then using a socket and a long extension bar, slacken and remove the driveshaft retaining nut. This nut is very tight; make sure that there is no risk of pulling the car off the axle stands. (If the roadwheel trim allows access to the driveshaft nut, the initial slackening can be done with the wheels chocked and on the ground.)



2.4 On 1124 cc and 1360 cc models, relieve the retaining nut staking with a suitable chisel-nosed tool



A tool to hold the front hub stationary can be fabricated from two lengths of steel strip (one long, one short) and a nut and bolt; the nut and bolt forming the pivot of a forked tool. Bolt the tool to the hub using two wheel bolts, and hold the tool to prevent the hub from rotating as the driveshaft retaining nut is undone.

7 Slacken and remove the three nuts securing the balljoint to the lower suspension arm, then withdraw the bolts and free the balljoint from the arm. Discard the nuts - new ones must be used on refitting.

Left-hand driveshaft

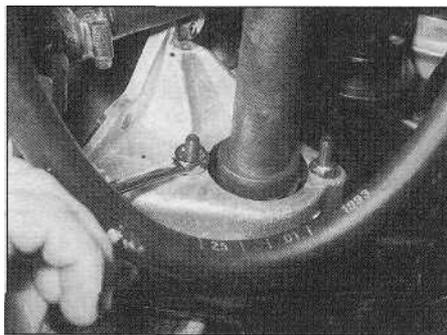
8 Carefully pull the swivel hub assembly outwards, and withdraw the driveshaft outer constant velocity joint from the hub assembly. If necessary, the shaft can be tapped out of the hub using a soft-faced mallet.

9 Support the driveshaft, then withdraw the inner constant velocity joint from the transmission, taking care not to damage the driveshaft oil seal. Remove the driveshaft from the vehicle.

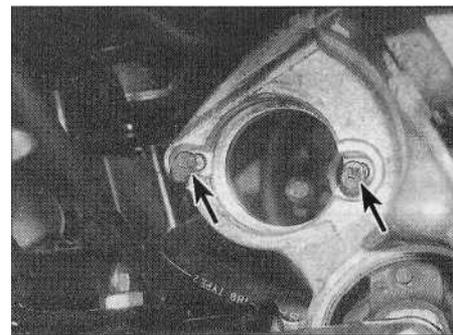
Right-hand driveshaft

10 Loosen the two intermediate bearing retaining bolt nuts, then rotate the bolts through 90°, so that their offset heads are clear of the bearing outer race (see illustrations).

11 Carefully pull the swivel hub assembly outwards, and withdraw the driveshaft outer constant velocity joint from the hub assembly.



2.10a On the right-hand driveshaft, slacken the two intermediate bearing retaining bolt nuts ...



2.10b ... then rotate the bolts through 90° to disengage their offset heads (arrowed) from the bearing (shown with driveshaft removed)

If necessary, the shaft can be tapped out of the hub using a soft-faced mallet.

12 Support the outer end of the driveshaft, then pull on the inner end of the shaft to free the intermediate bearing from its mounting bracket.

13 Once the driveshaft end is free from the transmission, slide the dust seal off the inner end of the shaft, noting which way around it is fitted, and remove the driveshaft from the vehicle.

Refitting

14 Before installing the driveshaft, examine the driveshaft oil seal in the transmission for signs of damage or deterioration and, if necessary, renew it, referring to Chapter 7A for further information. (Having got this far it is worth renewing the seal as a matter of course.)

15 Thoroughly clean the driveshaft splines, and the apertures in the transmission and hub assembly. Apply a thin film of grease to the oil seal lips, and to the driveshaft splines and shoulders. Check that all gaiter clips are securely fastened.

Left-hand driveshaft

16 Offer up the driveshaft, and locate the joint splines with those of the differential sun gear, taking great care not to damage the oil seal. Push the joint fully into position.

17 Locate the outer constant velocity joint splines with those of the swivel hub, and slide the joint back into position in the hub.

18 Align the balljoint with the lower arm, and fit the three retaining bolts. Fit new retaining nuts to the bolts, and tighten them to the specified torque setting.

19 Lubricate the inner face and threads of the driveshaft retaining nut with clean engine oil, and refit it to the end of the driveshaft. Use the method employed on removal to prevent the hub from rotating, and tighten the driveshaft retaining nut to the specified torque. Check that the hub rotates freely.

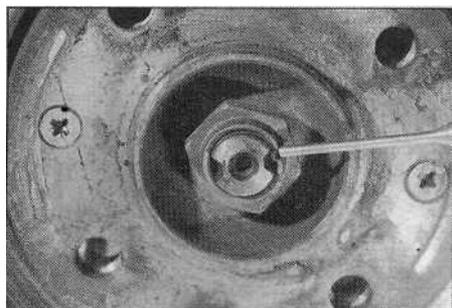
20 On 1124 cc and 1360 cc models, stake the nut into the driveshaft grooves using a hammer and punch (see illustration).

21 On 1580 cc and larger-engined models, engage the locking cap with the driveshaft nut so that one of its cut-outs is aligned with the driveshaft hole. Secure the cap in position with the R-clip (see illustrations).

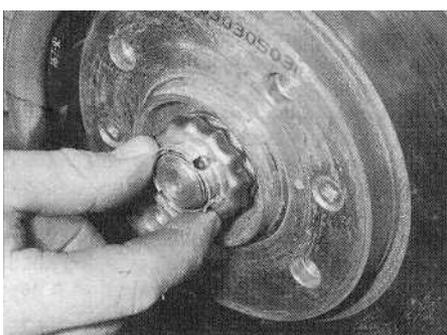
22 Where necessary, reconnect the ABS wheel sensor wiring connector, ensuring that the wiring is correctly routed and retained by all the necessary clips and ties.

23 Refit the roadwheel, then lower the vehicle to the ground and tighten the roadwheel bolts to the specified torque.

24 Refill the transmission with the specified type and amount of fluid/oil, and check the level using the information given in Chapter 1.



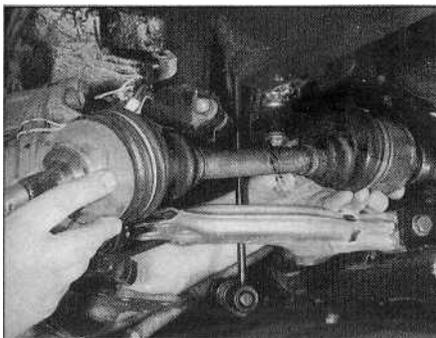
2.20 On 1124 cc and 1360 cc models, tighten the nut and stake it firmly into the driveshaft groove



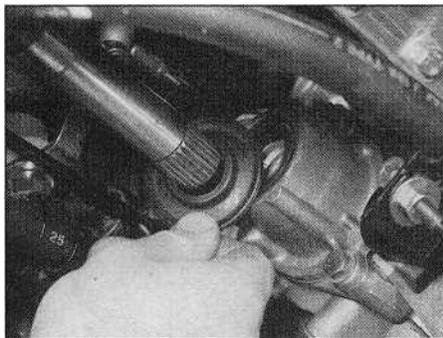
2.21a On 1580 cc and larger-engined models, refit the locking cap ...



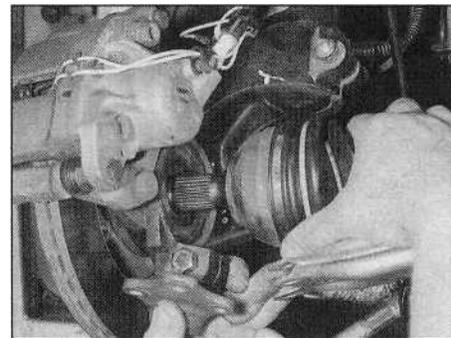
2.21 b ... and secure it in position with the R-clip



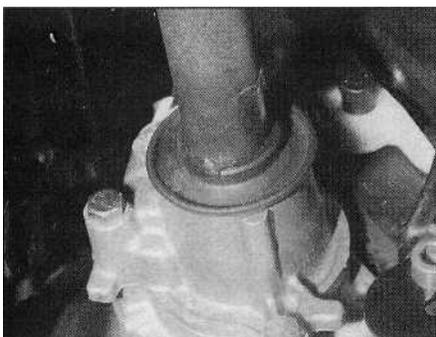
2.27a Manoeuvre the right-hand driveshaft into position ...



2.27b ... and locate the dust seal to its inner end, ensuring it is fitted the correct way round



2.29 Pull out the swivel hub assembly, and locate the outer constant velocity joint splines with those of the swivel hub



2.30 Secure the intermediate bearing in position, then slide the dust seal up tight against the driveshaft oil seal

Right-hand driveshaft

25 Check that the intermediate bearing rotates smoothly, without any sign of roughness or undue free play between its inner and outer races. If necessary, renew the bearing as described in Section 5. Examine the dust seal for signs of damage or deterioration, and, renew if necessary.

26 Apply a smear of grease to the outer race of the intermediate bearing, and to the inner lip of the dust seal.

27 Pass the inner end of the shaft through the bearing mounting bracket, then carefully slide the dust seal into position on the driveshaft, ensuring that its flat surface is facing the transmission (**see illustrations**).

28 Carefully locate the inner driveshaft splines with those of the differential sun gear, taking care not to damage the oil seal. Align the intermediate bearing with its mounting bracket, and push the driveshaft fully into position. If necessary, use a soft-faced mallet to tap the outer race of the bearing into position in the mounting bracket.

29 Locate the outer constant velocity joint splines with those of the swivel hub, and slide the joint back into position in the hub (**see illustration**).

30 Ensure the intermediate bearing is correctly seated, then rotate its retaining bolts back through 90°, so that their offset heads are resting against the bearing outer race. Tighten the retaining nuts to the specified

torque. Ensure that the dust seal is tight against the driveshaft oil seal (**see illustration**).

31 Carry out the operations described above in paragraphs 19 to 24.

3 Driveshaft rubber gaiters - renewal

Outer joint

1 Remove the driveshaft from the car as described in Section 2.

1124 cc and 1360 cc models

2 Remove the inner constant velocity joint and gaiter as described below in paragraphs 24 to 29. It is recommended that the inner gaiter is also renewed, regardless of its apparent condition.

3 Release the two outer gaiter retaining clips, then slide the gaiter off the inner end of the driveshaft.

4 Thoroughly clean the outer constant velocity joint using paraffin, or a suitable solvent, and dry it thoroughly. Carry out a visual inspection of the joint.

5 Check the driveshaft spider and outer member yoke for signs of wear, pitting or scuffing on their bearing surfaces. Also check that the outer member pivots smoothly and easily, with no traces of roughness.

6 If on inspection, the spider or outer member reveal signs of wear or damage, it will be necessary to renew the complete driveshaft as an assembly, since no components are available separately. If the joint components are in satisfactory condition, obtain a repair kit from your Citroen dealer, consisting of a new gaiter, retaining clips, and the correct type and quantity of grease.

7 Tape over the splines on the inner end of the driveshaft, then carefully slide the outer gaiter onto the shaft.

8 Pack the joint with the grease supplied in the repair kit. Work the grease well into the bearing tracks whilst twisting the joint, and fill the rubber gaiter with any excess.

9 Ease the gaiter over the joint, and ensure that the gaiter lips are correctly located in the

grooves on both the driveshaft and constant velocity joint. Lift the outer sealing lip of the gaiter, to equalise air pressure within the gaiter.

10 Fit the large metal retaining clip to the gaiter. Remove any slack in the gaiter retaining clip by carefully compressing the raised section of the clip. In the absence of the special tool, a pair of side cutters may be used. Secure the small retaining clip using the same procedure. Check that the constant velocity joint moves freely in all directions before proceeding further.

11 Refit the inner constant velocity joint as described in paragraphs 32 to 39.

1580 cc and larger-engined models

12 Secure the driveshaft in a vice equipped with soft jaws, and release the two rubber gaiter retaining clips. If necessary, the gaiter retaining clips can be cut to release them.

13 Slide the rubber gaiter down the shaft, to expose the outer constant velocity joint. Scoop out the excess grease.

14 Using a hammer and suitable soft metal drift, sharply strike the inner member of the outer joint to drive it off the end of the shaft. The joint is retained on the driveshaft by a circlip, and striking the joint in this manner forces the circlip into its groove, so allowing the joint to slide off.

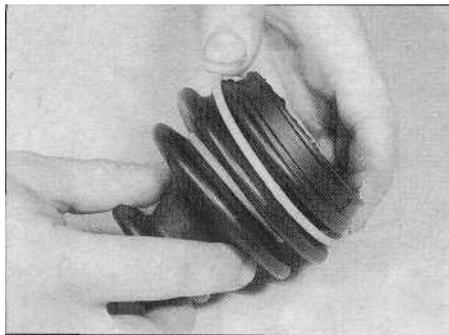
15 Once the joint assembly has been removed, remove the circlip from the groove in the driveshaft splines, and discard it. A new circlip must be fitted on reassembly.

16 Withdraw the rubber gaiter from the driveshaft, and slide off the gaiter inner end plastic bush.

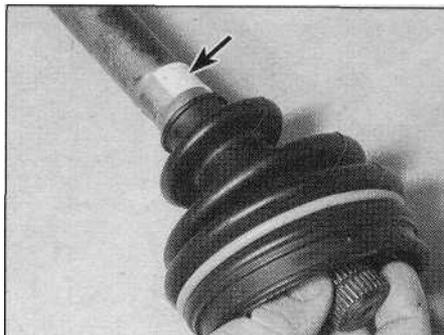
17 With the constant velocity joint removed from the driveshaft, thoroughly clean the joint using paraffin, or a suitable solvent, and dry it thoroughly. Carry out a visual inspection of the joint.

18 Move the inner splined driving member from side to side, to expose each ball in turn at the top of its track. Examine the balls for cracks, flat spots, or signs of surface pitting.

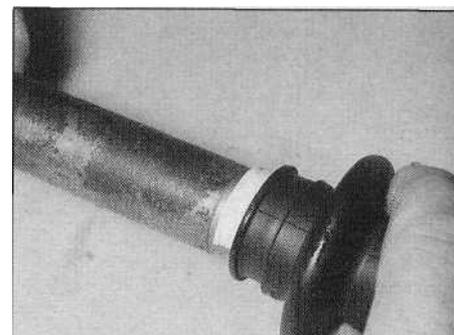
19 Inspect the ball tracks on the inner and outer members. If the tracks have widened, the balls will no longer be a tight fit. At the



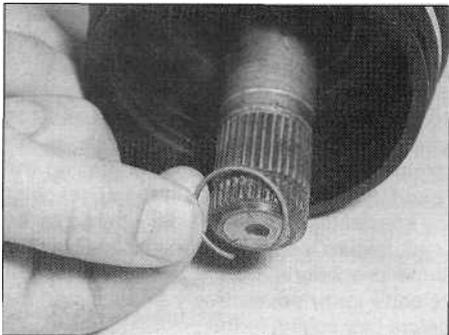
3.21a Fit the hard plastic rings to the outer CV joint gaiter ...



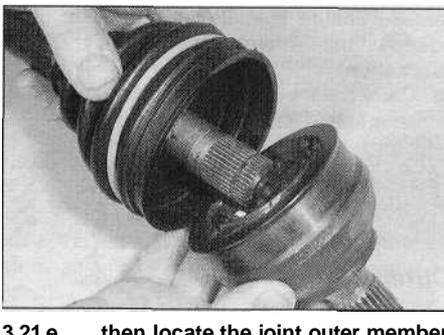
3.21b ... then slide on the new plastic bush (arrowed), and seat it in its recess in the shaft. Slide the gaiter onto the shaft...



3.21c ... and seat the gaiter inner end on top of the plastic bush



3.21 d Fit the new circlip to its groove in the driveshaft splines ...



3.21 e ... then locate the joint outer member on the splines, and slide it into position over the circlip. Ensure that the joint is securely retained by the circlip before proceeding

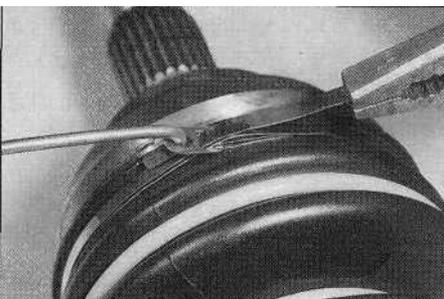
same time, check the ball cage windows for wear or cracking between the windows.

20 If on inspection, any of the constant velocity joint components are found to be worn or damaged, it will be necessary to renew the complete joint assembly (where available), or even the complete driveshaft (where no joint components are available separately). Refer to your Citroen dealer for further information on parts availability. If the joint is in satisfactory condition, obtain a repair kit consisting of a new gaiter, circlip, retaining clips, and the correct type and quantity of grease.

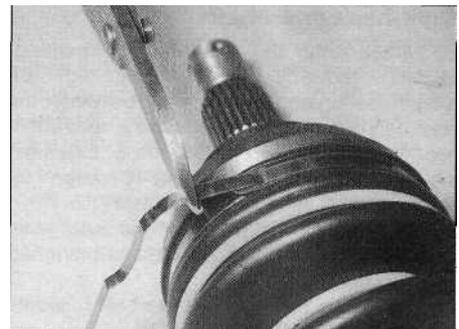
21 To install the new gaiter, refer to the accompanying illustrations, and perform the operations shown (see illustrations 3.21a to 3.21k). Be sure to stay in order, and follow the



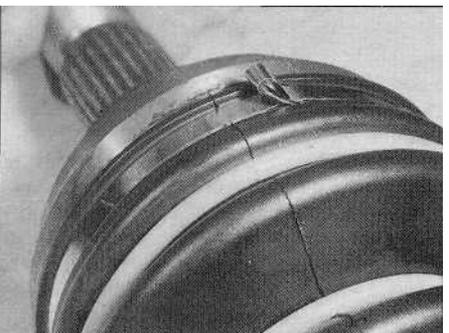
3.21 f Pack the joint with the grease supplied, working it well into the ball tracks while twisting the joint, then locate the gaiter outer lip in its groove on the outer member



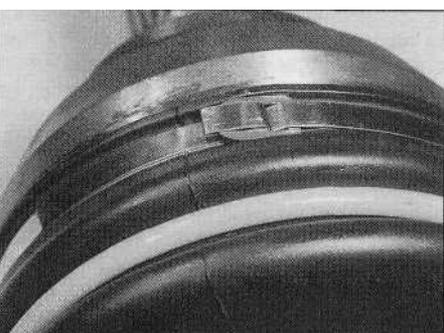
3.21 g Fit the outer gaiter retaining clip and, using a hook fabricated out of welding rod and a pair of pliers, pull the clip tightly to remove all slack



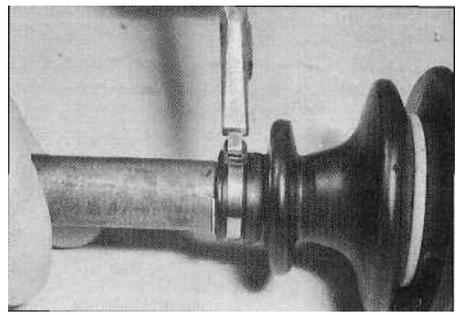
3.21 h Bend the clip end back over the buckle, then cut off the excess clip



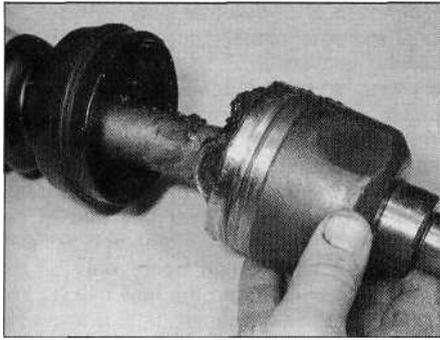
3.21 i Fold the clip end underneath the buckle...



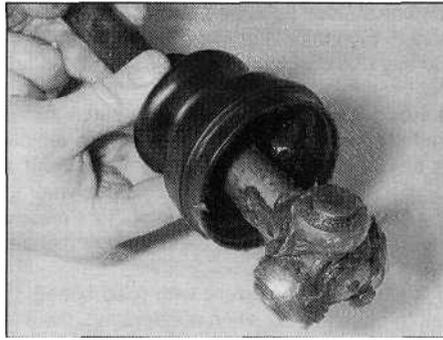
3.21 j ... then fold the buckle firmly down onto the clip to secure the clip in position



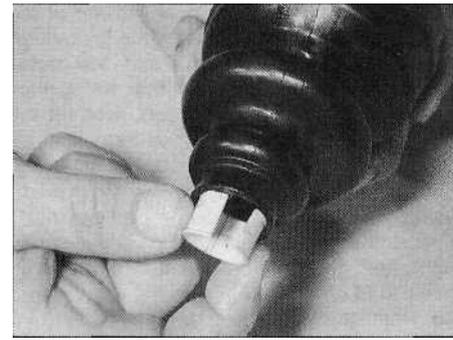
3.21k Carefully lift the gaiter inner end to equalize air pressure in the gaiter, then secure the inner gaiter retaining clip in position using the same method



3.42a Release the inner gaiter retaining clips, and remove the joint outer member



3.42b Slide the gaiter off the end of the driveshaft...



3.42c ... and remove the plastic bush

captions carefully. Note that the hard plastic rings are not fitted to all gaiters, and the gaiter retaining clips supplied with the repair kit may be different to those shown in the sequence. To secure this other type of clip in position, lock the ends of the clip together, then remove any slack in the clip by carefully compressing the raised section of the clip using a pair of side cutters.

22 Check that the constant velocity joint moves freely in all directions, then refit the driveshaft to the car as described in Section 2.

Inner joint

23 Remove the driveshaft from the vehicle as described in Section 2.

1124 cc and 1360 cc models

24 Secure the driveshaft in a vice equipped with soft jaws then, using a suitable pair of pliers, carefully peel back the lip of the constant velocity joint outer member cover.

25 Once the lip of the cover is fully released, pull the joint outer member out from the cover, and recover the spring and thrust cap from the end of the shaft. Remove the O-ring from the outside of the outer member, and discard it.

26 Fold the gaiter back, and wipe away the excess grease from the tripod joint. If the rollers are not secured to the joint with circlips, wrap adhesive tape around the joint to hold them in position.

27 Using a dab of paint, or a hammer and punch, mark the relative position of the tripod joint in relation to the driveshaft. Using circlip pliers, extract the circlip securing the joint to the driveshaft.

28 The tripod joint can now be removed. If it is tight, draw the joint off the driveshaft end, using a two- or three-legged bearing puller. Ensure that the legs of the puller are located behind the joint inner member, and do not contact the joint rollers. Alternatively, support the inner member of the tripod joint, and press the shaft out of the joint using a hydraulic press, ensuring that no load is applied to the joint rollers.

29 With the tripod joint removed, slide the gaiter and inner retaining collar off the end of the driveshaft.

30 Thoroughly clean the constant velocity joint components using paraffin, or a suitable solvent, and dry them thoroughly - take great care not to remove the alignment marks made on dismantling, especially if paint was used. Carry out a visual inspection of the joint.

31 Examine the tripod joint, rollers and outer member for any signs of scoring or wear, and for smoothness of movement of the rollers on the tripod stems. If any component is worn, the complete driveshaft assembly must be renewed; no joint components are available separately. If the joint components are in good condition, obtain a repair kit from your Citroen dealer, consisting of a new rubber gaiter and outer cover, circlip, thrust cap, spring, O-ring, and the correct quantity of the special grease.

32 Slide the gaiter into position inside the metal outer cover, then tape over the splines on the end of the driveshaft, and carefully slide the inner retaining collar and gaiter/cover assembly onto the shaft.

33 Remove the tape then, aligning the marks made on dismantling, engage the tripod joint with the driveshaft splines. Use a hammer and soft metal drift to tap the joint onto the shaft, taking great care not to damage the driveshaft splines or joint rollers.

34 Secure the tripod joint in position with the new circlip, ensuring that it is correctly located in the driveshaft groove.

35 Remove the tape (where fitted), and evenly distribute the special grease contained in the repair kit around the tripod joint and outer member. Pack the gaiter/cover with the remainder, then draw the cover over the tripod joint.

36 Fit the new O-ring, spring and thrust cap to the joint outer member.

37 Position the outer member assembly over the tripod joint, and locate the thrust cap against the end of the driveshaft. Push the outer member onto the shaft, compressing the spring, and locate it inside the outer cover. Secure the outer member in position by peening the end of the cover evenly over the joint outer edge.

38 Briefly lift the inner gaiter lip, using a blunt instrument such as a knitting needle, to equalise the air pressure within the gaiter.

Secure the inner clip in position.

39 Check that the constant velocity joint moves freely in all directions, then refit the driveshaft to the car as described in Section 2.

1580 cc and larger-engined models

40 Remove the outer constant velocity joint as described above in paragraphs 1 to 5.

41 Tape over the splines on the driveshaft, and carefully remove the outer constant velocity joint rubber gaiter, and the gaiter inner end plastic bush. It is recommended that the outer joint gaiter is also renewed, regardless of its apparent condition.

42 Release the retaining clips, then slide the gaiter off the shaft, and remove its plastic bush. As the gaiter is released, the joint outer member will also be freed from the end of the shaft (**see illustrations**).

43 Thoroughly clean the joint using paraffin, or a suitable solvent, and dry it thoroughly. Check the tripod joint bearings and joint outer member for signs of wear, pitting or scuffing on their bearing surfaces. Check that the bearing rollers rotate smoothly and easily around the tripod joint, with no traces of roughness.

44 If on inspection, the tripod joint or outer member reveal signs of wear or damage, it will be necessary to renew the complete driveshaft assembly, since the joint is not available separately. If the joint is in satisfactory condition, obtain a repair kit consisting of a new gaiter, retaining clips, and the correct type and quantity of grease. Although not strictly necessary, it is also recommended that the outer constant velocity joint gaiter is renewed, regardless of its apparent condition.

45 On reassembly, pack the inner joint with the grease supplied in the gaiter kit. Work the grease well into the bearing tracks and rollers, while twisting the joint.

46 Clean the shaft, using emery cloth to remove any rust or sharp edges which may damage the gaiter, then slide the plastic bush and inner joint gaiter along the driveshaft. Locate the plastic bush in its recess on the shaft, and seat the inner end of the gaiter on top of the bush.

47 Fit the outer member over the end of the shaft, and locate the gaiter in the groove on the joint outer member. Push the outer member onto the joint, so that its spring-loaded plunger is compressed, then lift the outer edge of the gaiter to equalise air pressure in the gaiter. Fit both the inner and outer retaining clips, securing them in position using the information given in paragraph 21. Ensure the gaiter retaining clips are securely tightened, then check that the joint moves freely in all directions.

48 Refit the outer constant velocity joint components using the information given in paragraph 21.

4 Driveshaft overhaul - general information



1 If any of the checks described in Chapter 1 reveal wear in any driveshaft joint, first remove the roadwheel trim or centre cap (as appropriate).

2 On 1124 cc and 1360 cc models, if the staking is still effective, the driveshaft nut should be correctly tightened; if in doubt, relieve the staking, then tighten the nut to the specified torque and restake it into the driveshaft grooves. Refit the roadwheel trim or centre cap (as applicable), and repeat the check on the remaining driveshaft nut.

3 On 1580 cc and larger-engined models, if the R-clip is fitted, the driveshaft nut should be correctly tightened; if in doubt, remove the R-clip and locking cap, and use a torque wrench to check that the nut is securely

fastened. Once tightened, refit the locking cap and R-clip, then refit the centre cap or trim. Repeat this check on the remaining driveshaft nut.

4 Road test the vehicle, and listen for a metallic clicking from the front as the vehicle is driven slowly in a circle on full-lock. If a clicking noise is heard, this indicates wear in the outer constant velocity joint. This means that the joint must be renewed; reconditioning is not possible.

5 If vibration, consistent with road speed, is felt through the car when accelerating, there is a possibility of wear in the inner constant velocity joints.

6 To check the joints for wear, remove the driveshafts, then dismantle them as described in Section 3; if any wear or free play is found, the affected joint must be renewed. In the case of the inner joints (and on some models, the outer joints), this means that the complete driveshaft assembly must be renewed, as the joints are not available separately. Refer to your Citroen dealer for information on the availability of driveshaft components.

5 Right-hand driveshaft intermediate bearing - renewal



Note: A suitable bearing puller will be required, to draw the bearing and collar off the driveshaft end.

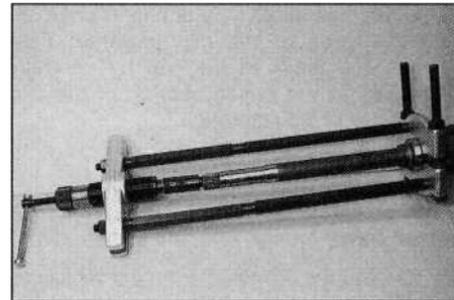
1 Remove the right-hand driveshaft as described in Section 2 of this Chapter.

2 Check that the bearing outer race rotates smoothly and easily, without any signs of

roughness or undue free play between the inner and outer races. If necessary, renew the bearing as follows.

3 Using a long-reach universal bearing puller, carefully draw the collar and intermediate bearing off the driveshaft inner end (**see illustration**). Apply a smear of grease to the inner race of the new bearing, then fit the bearing over the end of the driveshaft. Using a hammer and suitable piece of tubing which bears only on the bearing inner race, tap the new bearing into position on the driveshaft, until it abuts the constant velocity joint outer member. Once the bearing is correctly positioned, tap the bearing collar onto the shaft until it contacts the bearing inner race.

4 Check that the bearing rotates freely, then refit the driveshaft as described in Section 2.



5.3 Using a long-reach bearing puller to remove the intermediate bearing from the right-hand driveshaft