



# Issue record sheet

The dates quoted below refer to the issue date of individual pages within this chapter.

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# Propeller shaft

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## Propeller shaft

### Introduction

Two types of propeller shaft are fitted dependent upon the specification of the car.

A single piece type is fitted to Bentley Turbo R cars, and a rubber jointed type is fitted to cars other than Bentley Turbo R.

The single piece propeller shaft incorporates universal joints, fitted onto each end of the shaft. The complete assembly is dynamically balanced to 0,14g mm (0.125 oz in) at a speed of 3000 rev/min.

If the propeller shaft assembly is dismantled and new universal joints fitted, the shaft should be rebalanced after assembly. If required, a fully balanced assembly can be obtained as a service exchange unit.

The rubber jointed type propeller shaft has a rubber flexible coupling fitted to each end of the shaft, together with a spigot flange. The spigot flange fits into a centralizing bush/lip seal. This seal is an interference fit in the shaft.

This propeller shaft is balanced prior to assembly to 0,14g mm (0.125 oz in) at a speed of 3000 rev/min, without the flexible rubber coupling arrangement fitted.

The transmission output flange and final drive pinion flange vary, dependent upon which type of propeller shaft is fitted.

### Single piece propeller shaft

#### Propeller shaft – To remove

1. Drive the car onto a ramp and carry out the usual workshop safety precautions.
2. *On cars conforming to a Japanese specification*, remove the exhaust system grass-fire shields from around the catalyst area.
3. Support the weight of the exhaust system rearward of the front silencer/catalyst assembly. Remove the rubber hangers from the front support bracket.
4. Remove the mounting bolts securing the exhaust front mounting bracket to the centre crossmember.
5. Ensure that the parking brake is in the off position.
6. Unhook the parking brake return spring from the operating lever.
7. Remove the bolts securing the rear brake cables abutment bracket to the body.
8. On Corniche/Continental cars remove the nuts and bolts securing the transmission tunnel strengthening plate.
9. Remove the securing bolts from both sides of the centre body crossmember section and free the assembly. The centre section, together with the parking brake pivot mounting brackets and lever should be moved to the side of the car, but must be suitably supported to avoid strain or kinking of the parking brake cables. **Under no circumstances should**

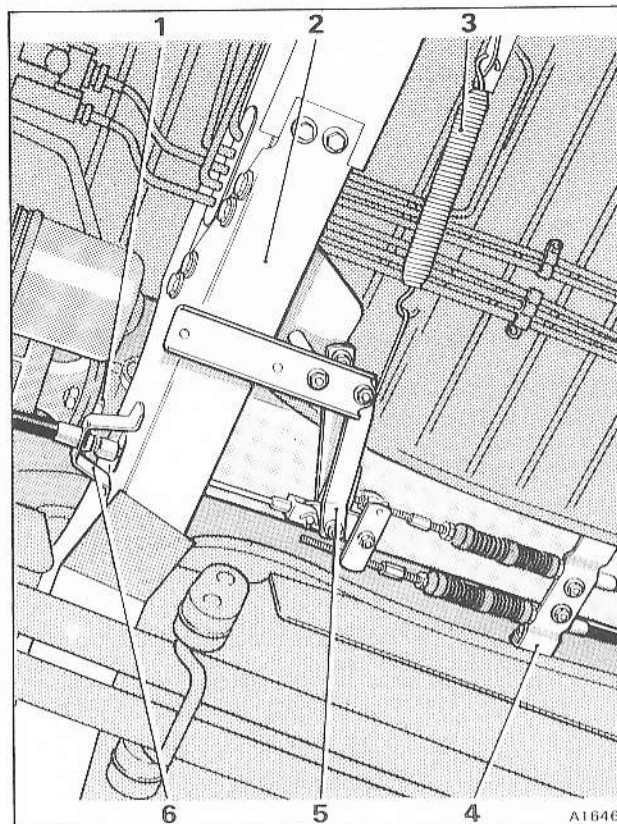


Fig. F2-1 Centre crossmember and parking brake linkage

- 1 Propeller shaft flange bolts
- 2 Removable centre body crossmember
- 3 Return spring
- 4 Abutment bracket – rear cables
- 5 Operating lever
- 6 Mounting bracket – front cable

**the centre body crossmember be allowed to hang on the parking brake cables.**

10. Switch on the ignition and move the gear range selector lever to the neutral position. Switch off the ignition.
11. Raise a rear wheel of the car to enable the propeller shaft to be turned.
12. Correlate the propeller shaft flanges to the final drive pinion flange and the transmission output flange.
13. Support the propeller shaft and remove the nuts and bolts from the front and rear flanges.
14. Remove the propeller shaft by lowering the front end, and then lift the shaft forward and downward through the rear crossmember aperture.

#### Universal joint – To dismantle (see fig. F2-2)

If a universal joint cannot be serviced, it must be dismantled and a new joint fitted.

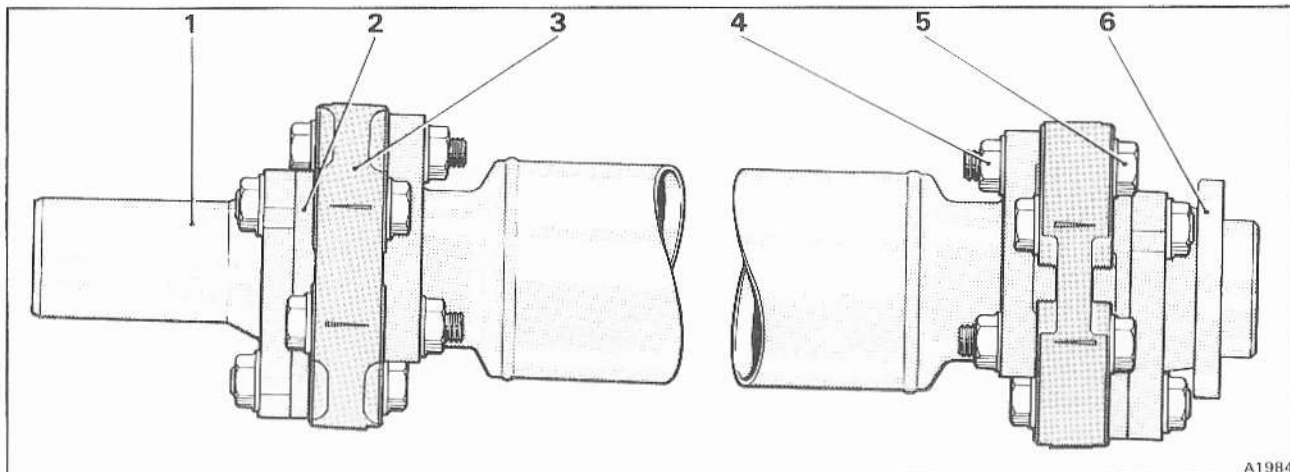


Fig. F2-4 Propeller shaft/rubber flexible couplings – Gearbox and final drive

- |                            |                                     |
|----------------------------|-------------------------------------|
| 1 Output flange – Gearbox  | 4 Durlok nut                        |
| 2 Spigot flange            | 5 Durlok bolt                       |
| 3 Rubber flexible coupling | 6 Pinion drive flange – Final drive |

**Note** Two types of securing bolts are fitted. The later type (Durlok) are black in colour and have serrations under the head to stop anti-clockwise rotation. Therefore, ensure that the correct torque tightening figures are used.

All other nuts and bolts must be torque tightened in accordance with the figures quoted in Chapter P.

2. Reference should be made to Chapter Q, before fitting the exhaust system components.
3. Check the parking brake operation and adjust if necessary (see Chapter G).

### Rubber jointed type propeller shaft

#### Propeller shaft – To remove

1. Carry out Operations 1 to 11 inclusive as described under the heading Propeller shaft - To remove (Single piece propeller shaft).
2. Correlate the propeller shaft rubber flexible couplings/spigot flanges to the final drive pinion flange and to the transmission output flange.
3. Support the propeller shaft and remove the Durlok nuts and bolts from the final drive and transmission coupling flanges.
4. Unscrew the Durlok nuts and bolts securing the rubber coupling to the rear end of the propeller shaft. Then, carefully remove the spigot flange and rubber coupling.
5. Remove the propeller shaft by lowering the front end. Then, lift the shaft forward and downward through the rear crossmember aperture.
6. If necessary, unscrew the nuts and bolts securing the rubber coupling to the front end of the propeller shaft and carefully remove the spigot flange and rubber coupling.

#### Centring bush/lip seal(s) – To renew

1. Remove the propeller shaft as described under the heading Propeller shaft - To remove (Rubber jointed type).

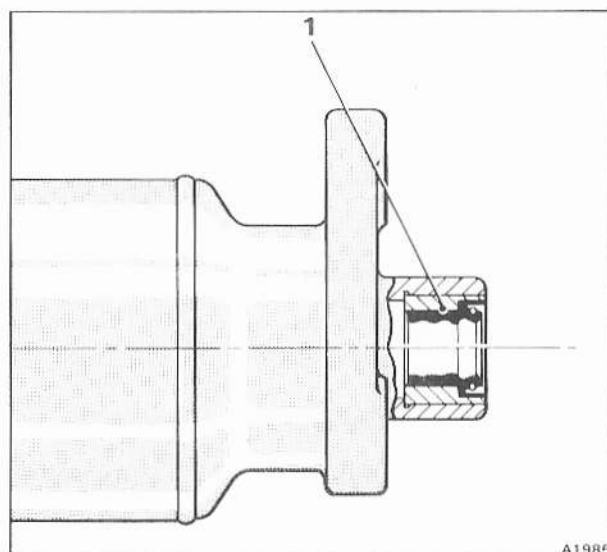
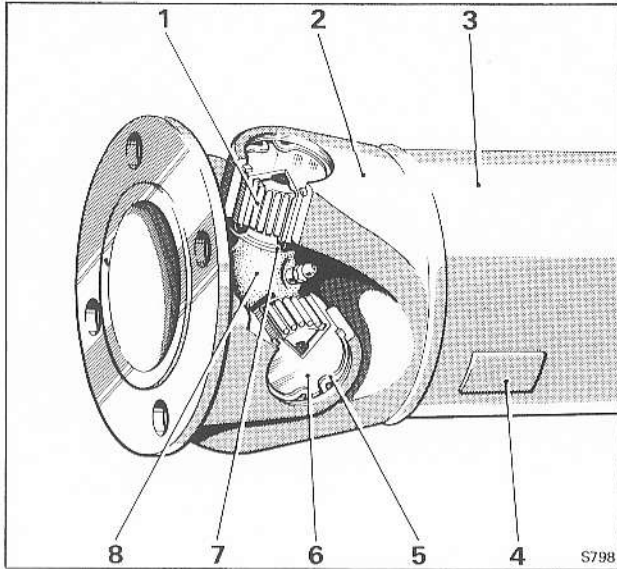


Fig. F2-5 Propeller shaft, centring bush/lip seal assembly (Flexible coupling)

- 1 Centring bush/lip seal

2. Fill the centring bush with as much grease as possible.
3. Using a soft headed mallet, drive the spigot flange into the centring bush. The grease will then force the centring bush from the end of the shaft.
4. Remove the grease from the end of the propeller shaft.
5. Fit a new centring bush/lip seal, noting that it must be an interference fit in the end of the propeller shaft.

When fitting the bush/seal ensure that the lip portion of the seal is on the outside of the shaft as shown in figure F2-5.



**Fig. F2-2 Single piece propeller shaft universal joint**

- 1 Needle roller bearings
- 2 Yoke
- 3 Centre tube
- 4 Balance weight
- 5 Circlip
- 6 Bearing retainer
- 7 Rubber seal
- 8 Cruciform

1. Clean and remove any paint, underseal, etc., from the yoke eyes.
2. Correlate the flanged yokes to the shaft.
3. Remove the circlips retaining the needle roller bearings.
4. Using a nylon mallet, tap the yoke until the bearing races are driven out of the yoke eyes.

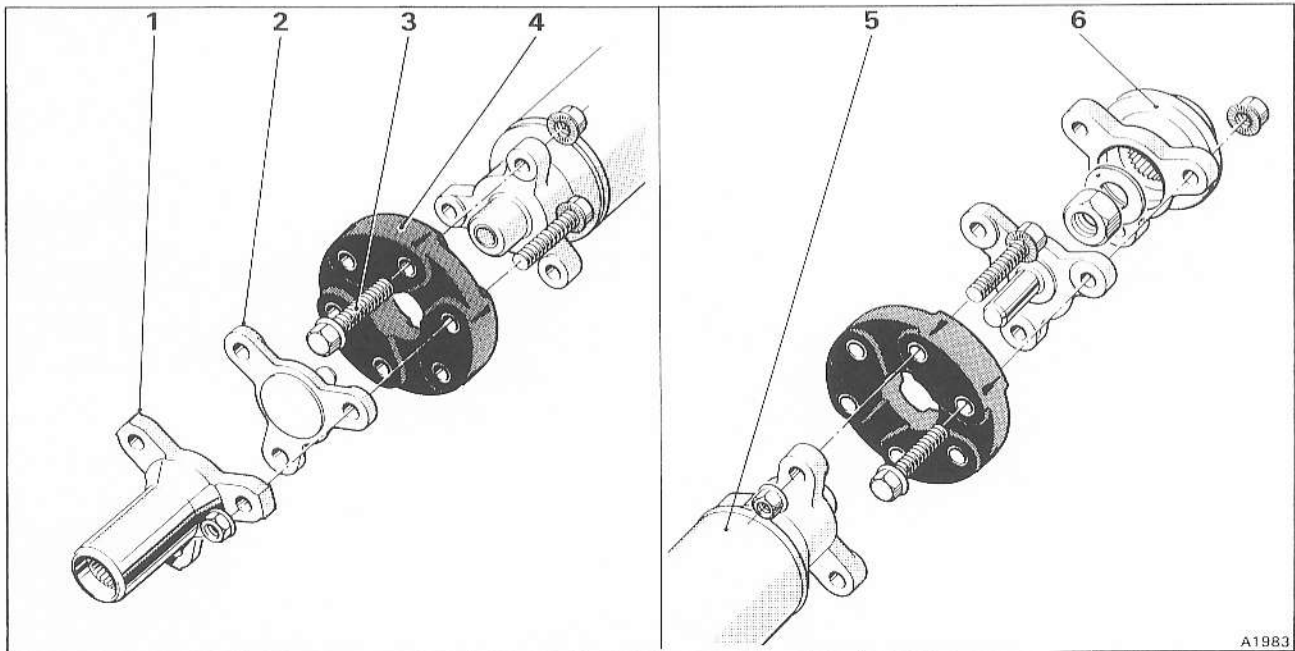
**Universal joint – To assemble**

1. Insert the crosspiece and seals into the yoke eyes. Hold the crosspiece centrally, then carefully press the needle roller bearing assemblies into the yoke eyes, until it is possible to fit the circlips. If this is found difficult to accomplish due to pressurization, release the grease nipple situated between two of the crosspiece trunnions, thus allowing the trapped air to bleed.
2. Fit the circlips, ensuring that the end-float between the yoke and circlips is zero to 0,025mm (zero to 0.001 in).
3. If necessary, tighten the grease nipples.

**Propeller shaft – To fit**

Reverse the procedure given for removal noting the following.

1. The joint faces must be clean and free from damage.
- Torque tighten the flange bolts to the figures quoted in Section F3.



**Fig. F2-3 Propeller shaft/rubber flexible couplings – Gearbox and final drive**

- |                           |                                     |
|---------------------------|-------------------------------------|
| 1 Output flange – Gearbox | 4 Rubber flexible coupling          |
| 2 Spigot flange           | 5 Propeller shaft                   |
| 3 Durluk bolt             | 6 Pinion drive flange – Final drive |



6. Apply 5 ml (0.175 fl oz) of Shell Retinax A grease or its equivalent to the bush/seal.
7. Fit the propeller shaft as described under the heading Propeller shaft - To fit (Rubber jointed type).

#### **Propeller shaft – To fit**

Reverse the procedure given for removal noting the following.

1. Durlok nuts and bolts have serrations under the heads which act as a ratchet to eliminate anti-clockwise rotation. Therefore, inspect all faces for damage and rectify as necessary.
2. If removed, fit the front spigot flange together with the rubber coupling to the propeller shaft, prior to fitting the shaft to the car.

Ensure that the spigot flange registers correctly in the mating flange counterbore.

Align the rubber coupling to the propeller shaft ensuring that the arrows moulded into the circumference of the coupling are positioned as shown in figure F2-4.

Fit the bolts through the rubber coupling into the propeller shaft ensuring that they are inserted in the direction of the arrows.

It is recommended that before securing the bolts to the propeller shaft that the remaining bolts are fitted through the rubber coupling. Ensure that these bolts are also fitted in the direction of the arrows.

Smear a small amount of grease onto the spigot locating pin prior to fitting the spigot flange to the propeller shaft.

3. When fitting the propeller shaft to the car, fit the rear spigot flange/rubber coupling in the same manner as that described for the front spigot flange/rubber coupling (see Operation 2).
4. All joint faces must be clean and free from damage. Torque tighten the Durlok nuts and bolts to the figures quoted in Section F3.

All other nuts and bolts must be torque tightened in accordance with the figures quoted in Chapter P.

5. Reference should be made to Chapter Q, before fitting the exhaust system components.
6. Check the parking brake operation and adjust if necessary (see Chapter G).

## Special torque tightening figures

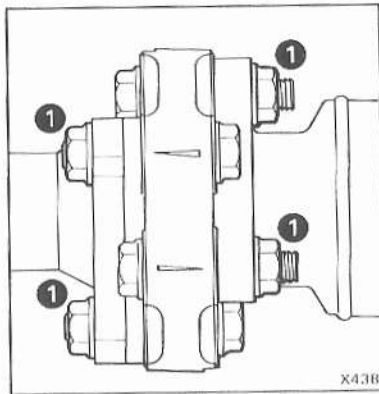
### Introduction

This section contains the special torque tightening figures applicable to Chapter F.

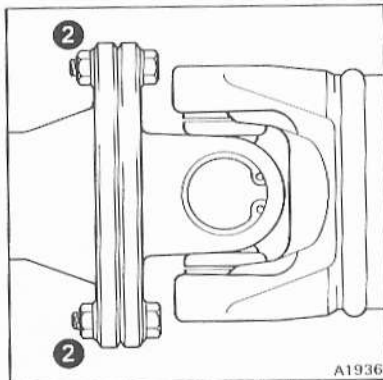
For standard torque tightening figures refer to Chapter P.

Components used during manufacture of the vehicle have different thread formations (Metric, UNF, UNC, etc.). Therefore, when fitting nuts, bolts, and setscrews it is important to ensure that the correct type and size of thread formation is used.

### Section F2



Ref.	Component	Nm	kgf m	lbf ft
1	Flexible rubber coupling assembly – Durlok nut	89-94	8,9-9,6	65-70



2	Single piece propeller shaft coupling – nut (Early cars)	57-61	5,8-6,2	42-45
	Durlok nut – front	129-135	13,1-13,8	95-100
	– rear	82-88	8,3-8,9	60-65