

Section H1

Front sub-frame and suspension

Introduction

This section describes the removal of the front sub-frame, engine, and torque converter transmission as one unit. Details for removal of the engine only are given in Chapter E.

Before removal, reference should also be made to Chapter C and Chapter G. These chapters give details of the procedures necessary to discharge the air conditioning refrigeration system and depressurize the hydraulic braking and levelling systems. On cars fitted with an exhaust gas emission control system, reference should also be made to Chapter U.

The following operations are the basic requirements for removal of the sub-frame as a complete unit. It should be noted that the operations given relate to varying types of engine and car model. Modifications may also have been introduced as a result of improvements to the vehicle.

Always ensure that all relevant looms, pipes, hoses, etc., are disconnected prior to raising the body from the sub-frame and engine unit.

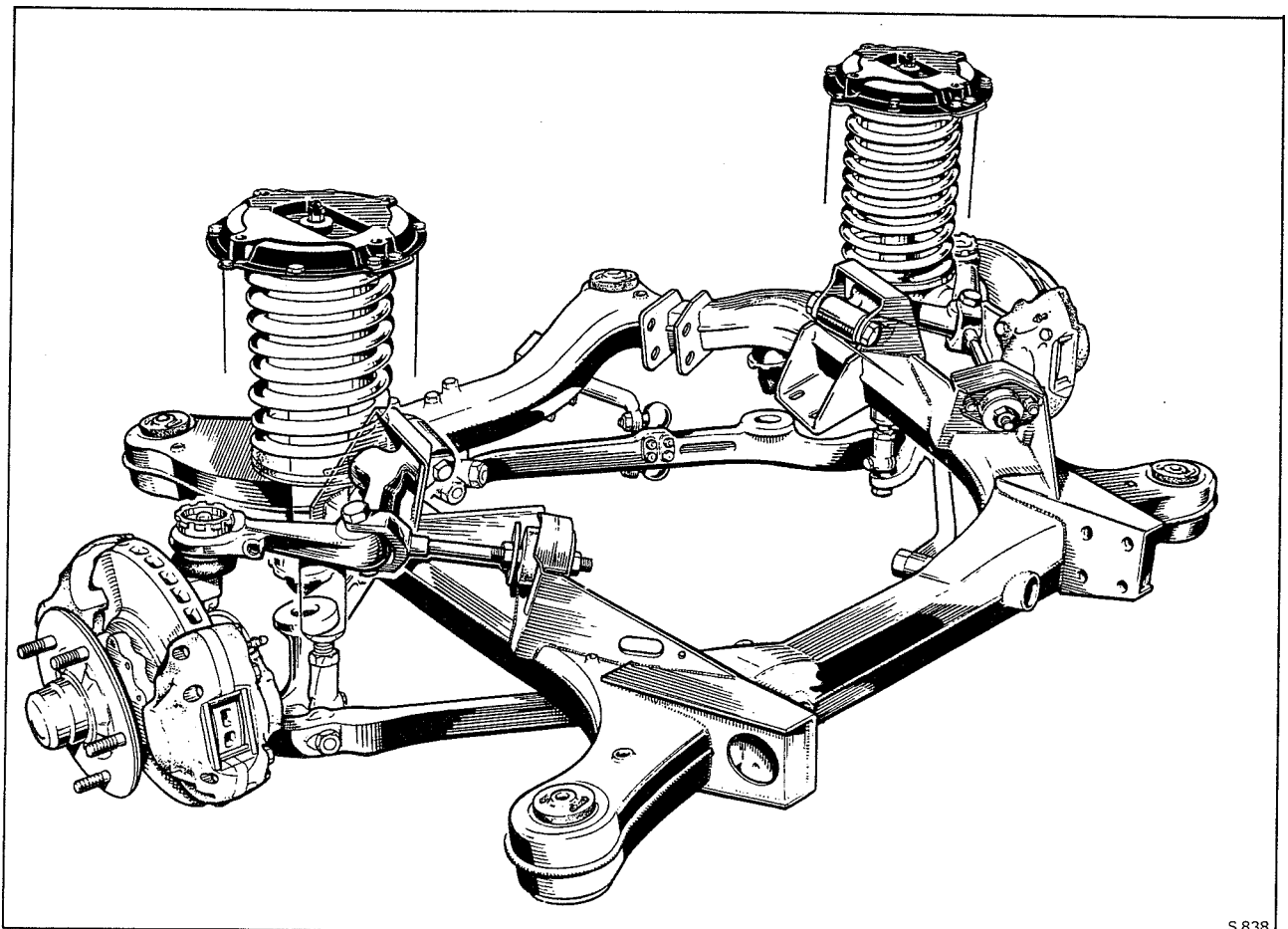
When disconnecting hose and pipe connections, suitable blanks should always be fitted to prevent the ingress of foreign matter and the loss of lubricants and fuel.

Warning

The hydraulic systems of Corniche and Camargue cars from car serial number 50 001 are filled with hydraulic system mineral oil (LHM).

Use only Hydraulic System Mineral Oil to replenish the braking and levelling systems of these cars.

Do not use Brake Fluids (Castrol RR363, Universal, or any other type). The use of any type of brake fluid, even in very small amounts will cause component failure necessitating extensive



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Fig. H1 Front sub-frame and suspension assembly

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rectification to the brake and levelling systems of the car.

Always ensure before fitting any hoses, pipes, etc., that they are suitable for a mineral oil system. For details of correct component identification reference should be made to Chapter G.

Front sub-frame, engine, and torque converter transmission - To remove

1. Reverse the car onto a ramp and chock the rear

road wheels.

2. Fit car protection kit (RH 2662), wing covers (RH 2684), and wing cover liners (RH 2685).
3. Discharge the air conditioning refrigeration system as described in Chapter C.
4. Depressurize the hydraulic systems as described in Chapter G.
5. Drain the engine cooling system as described in Chapter L.
6. Switch on the ignition and move the gear range

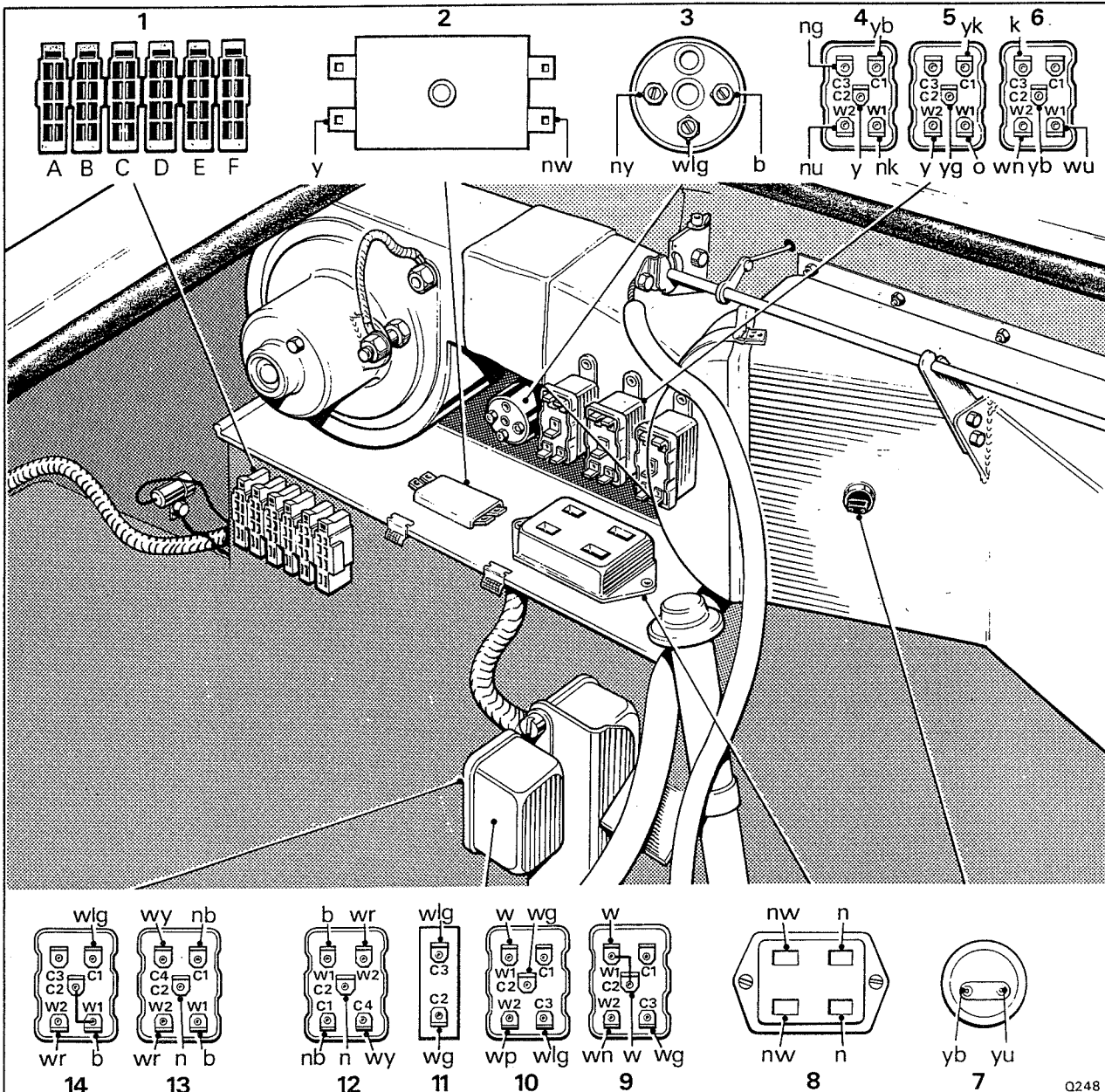


Fig. H2 Electrical disconnection points for engine and sub-frame removal

- | | | |
|----|-------------------------------------|---------------------------------|
| 1 | Toeboard sockets D, E, and F | |
| 2 | Fan and compressor fuse | |
| 3 | Choke thermal delay | |
| 4 | Fan and compressor relay | |
| 5 | Fan delay relay | |
| 6 | Servo isolation relay | |
| 7 | Compressor ambient thermostat | |
| 8 | Ammeter shunt | |
| 9 | Choke on start relay | On cars with Solex carburetters |
| 10 | Choke heater resistor relay | |
| 11 | Choke heater resistor | |
| 12 | Starter relay | On cars with SU carburetters |
| 13 | Starter relay | |
| 14 | Choke-on-start relay | |
| 15 | Valve earth and smoothing capacitor | |

selector to the neutral position. Switch off the ignition.

7. Disconnect the battery.
8. Remove the bonnet as described in Chapter S.
9. Remove the radiator top and bottom hoses; also remove the small hose from the radiator header tank.
10. Remove the engine fan as described in Chapter L.
11. Disconnect the heater tap feed hose from the tap and the heater return hose from the crankcase.
12. Disconnect the two refrigeration pipes from the rear of the compressor.
13. Clamp the hydraulic system reservoir to brake pump hoses to prevent reservoir drainage, then disconnect the hoses from the pump inlet pipes. Fit blanks to the pipe ends.
14. Disconnect the steering pump to oil cooler hoses. Allow the oil to drain into a container.
15. On cars fitted with SU carburettors remove the air intake and hot air intake trunks. Disconnect the vacuum hose from the air blending valve.
16. On cars fitted with Solex carburettors, remove the air cleaner assembly.
17. On cars fitted with petrol injection engines, remove the air intake trunk and air meter adapter.
18. Disconnect the body to engine fuel hoses.
19. Disconnect the accumulator to body hoses.
20. Disconnect the sub-frame to body hydraulic system hoses.
21. Disconnect the accelerator down rod from the equalizer linkage. Remove the setscrews securing the equalizer bracket to the body, and the equalizer pivot bolt. Remove the equalizer bracket.
22. Disconnect the relevant electrical connectors (see Fig. H2).
23. On left-hand drive cars, disconnect the parking brake front cable from the equalizer assembly. Release the outer cable from its securing bracket on the centre body member. Detach the cable clips and move the cable away from the transmission.
24. Disconnect the propeller shaft from the transmission unit as described in Chapter F.
25. Disconnect the gearchange actuator loom and speedometer transmitter connection.
26. Remove the two bolts securing the steering link to the steering column.
27. Disconnect the two transmission to oil cooler flexible pipes situated on the right-hand side of the transmission unit. Allow the oil to drain into a container.
28. On left-hand drive cars, remove the accelerator cross-shaft.
29. On right-hand drive cars, remove the accelerator lever securing bolt and slide the lever along the pivot shaft, away from the transmission unit filler tube.
30. Remove the front sections of the exhaust system.
31. Disconnect the sub-frame to body earth braids.
32. Detach the mixture weakener and emission canister (if fitted) hoses on the left-hand valance.
33. Remove the front road springs as described in Section H2. Fit the wooden support blocks (see Fig. H3) between the bump stop and the lower triangle levers. Lower the car onto its wheels ensuring that the wooden blocks remain in position.
34. Ensure that all relevant components have been

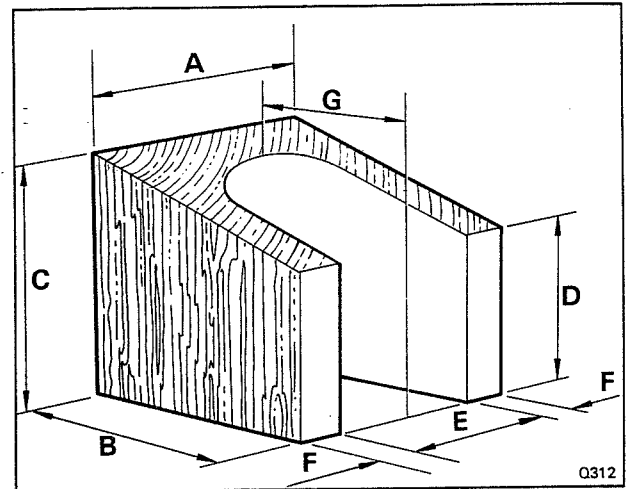


Fig. H3 Wooden support block

- | | |
|------------|-----------------|
| A, B and C | 76 mm. (3 in.) |
| D | 51 mm. (2 in.) |
| E | 38 mm. (1½ in.) |
| F | 19 mm. (¾ in.) |
| G | 57 mm. (2¼ in.) |

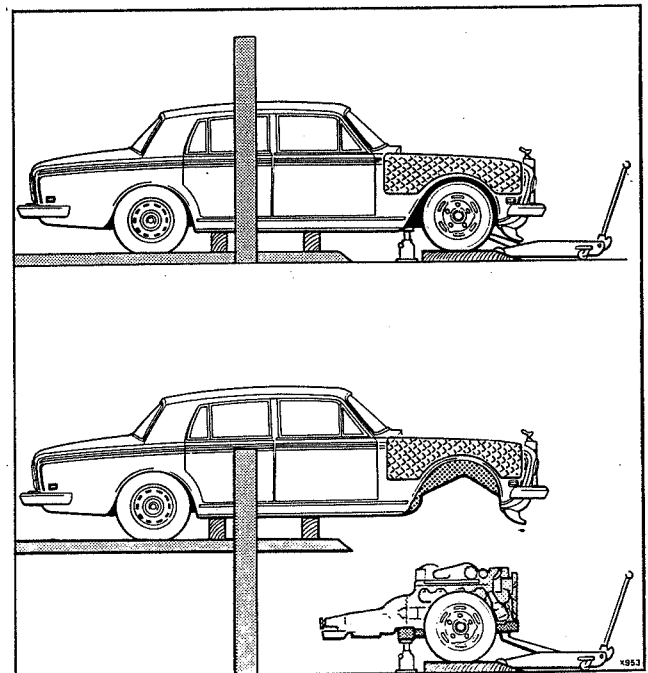


Fig. H4 Sub-frame, engine, and transmission unit removal

disconnected and that any component that will prevent the raising of the car body off the sub-frame and engine unit has been removed.

The sub-frame mounting bolts should not be removed at this stage.

35. Lower the ramp to the ground. Carefully push the car forward off the ramp, until the front of the car overhangs the ramp sufficiently to allow the ramp to be raised, without any crossbeam or part of the ramp fouling the transmission unit (see Fig. H4). Place

blocks beneath the car body sills as far forward as possible to maintain the body on the ramp in the horizontal position (see Fig. H4).

37. To prevent any possibility of the body pivoting forward when the ramp is raised, secure the rear of the car to the ramp by passing ropes over the final drive crossmember on each side of the axle case and suitably securing them to the ramp. This can be achieved for example, by placing a steel bar across the underside of the ramp and securing the ropes to the bar.

38. Place a jack beneath the rear crossmember of the front sub-frame and also beneath the front triangle

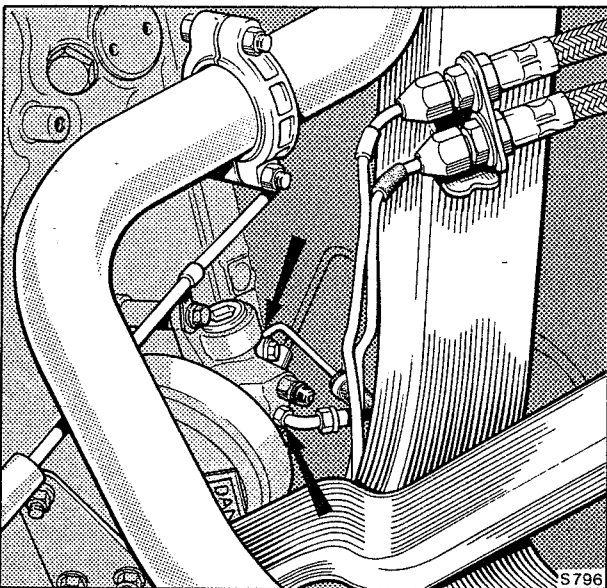


Fig. H5 Hydraulic accumulator disconnection points

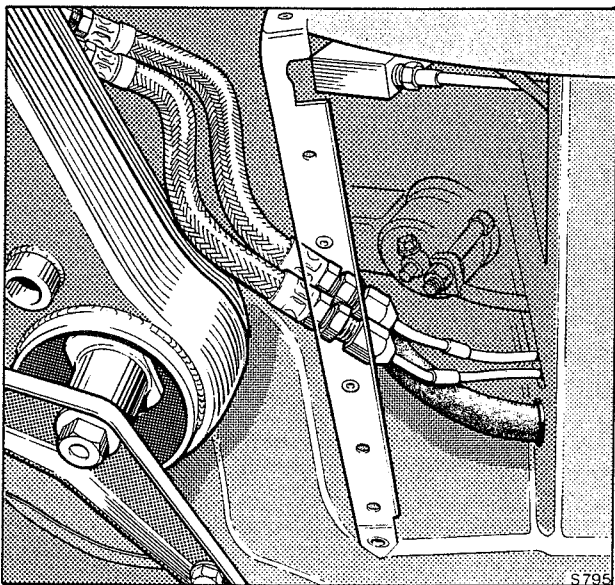


Fig. H6 Disconnection point of sub-frame to body hydraulic pipes (right-hand drive cars)

lever mounting bracket.

39. Carefully remove the bolts and setscrews securing the front sub-frame to the body. Note the positions and quantities of the mount washers.

40. Ensure that all relevant components have been disconnected and that clearance between the sub-frame and engine unit, and the car body has been obtained. Slowly raise the ramp, thus lifting the body off the sub-frame and engine unit. During this operation, continuous observations should be made to ensure that clearance is maintained and that hose or loom connections between the body and the sub-frame and engine unit have not been overlooked. When the body is clear of the engine, fully raise the ramp and carefully wheel the sub-frame and engine unit from beneath the car.

41. Lift the sub-frame and engine unit onto a suitable stand.

Engine and torque converter transmission - To remove from the sub-frame

- 1.** Disconnect the steering pump supply hose from the steering rack. Allow any oil to drain into a container.
- 2.** Carefully position two slings around the engine, one at the front of the crankcase and one at the rear of the transmission casing. Using an overhead hoist, take the weight of the engine and transmission on the slings. Always ensure before taking the full engine load that the slings are not in positions that may cause damage to engine or transmission components.
- 3.** Disconnect the front and rear engine mounts.
- 4.** Carefully check that nothing will impede the removal of the engine, then, lift the engine and transmission unit from the sub-frame. Note the position of the front engine mount stop plate and any other packing plates that may be fitted to the engine mounts.
- 5.** If the front engine mount crossmember or the rear engine mount brackets are to be removed, correlation marks should be made between the component and the sub-frame. These marks will enable the crossmember and mounting brackets to be correctly positioned and the engine to be centralized in the sub-frame when assembly is carried out.

Engine and torque converter transmission - To fit into the sub-frame

Fit the engine and transmission unit into the sub-frame by reversing the removal procedure noting the following.

- 1.** Attach the front and rear engine mounts, together with any packings that may have been removed, to the engine prior to lowering the engine into the sub-frame. Do not tighten the bolts at this stage.
- 2.** Lower the engine and transmission unit into the sub-frame and fit the bolts securing the engine mounts to the sub-frame. Centralize the engine in the sub-frame then tighten the mounting bolts. Set the stop plate gap on the front engine mount to between 1,52 mm. and 1,77 mm. (0.060 in. and 0.070 in.).
- 3.** Fit any components that will not prevent the car body being lowered onto the sub-frame.

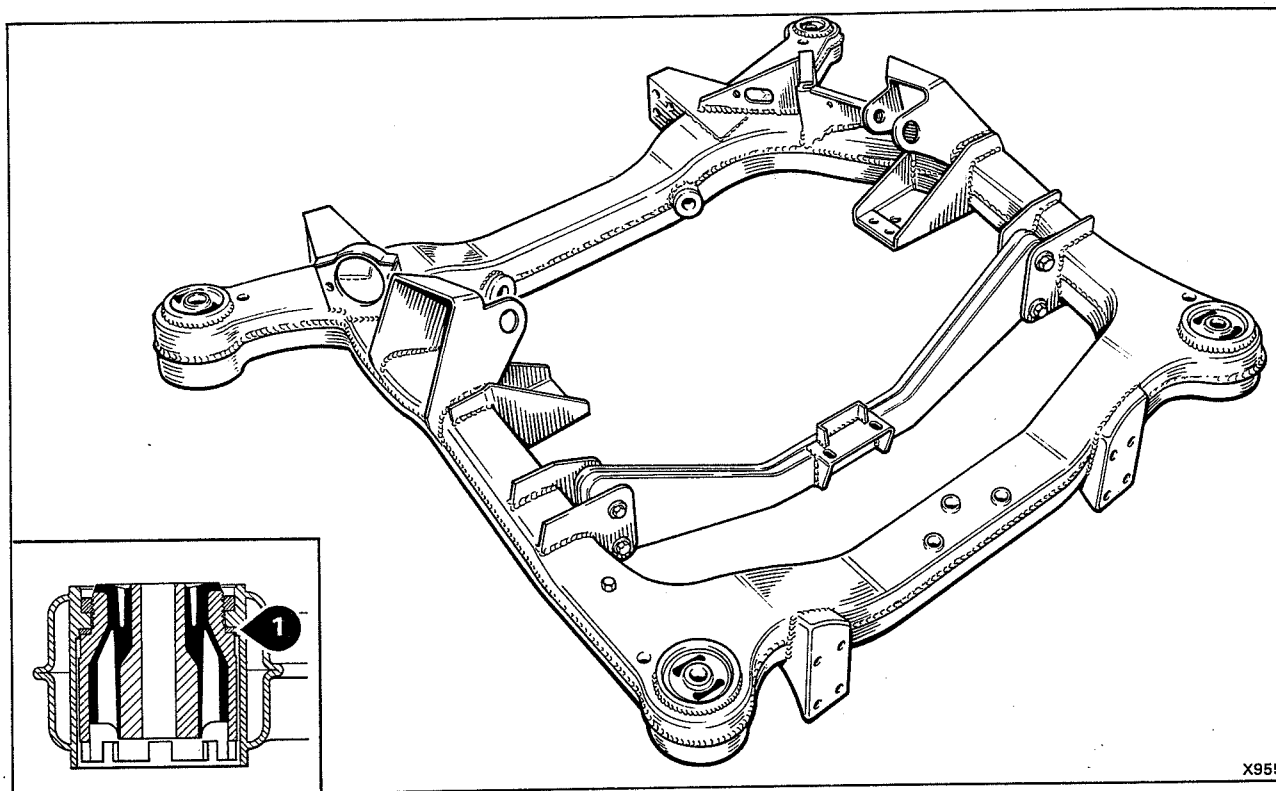


Fig. H7 Front sub-frame assembly
Inset 1 Resilient mount spacer (if fitted)

Engine, torque converter transmission, and sub-frame - To fit into the car

Fit the engine, torque converter transmission, and sub-frame to the body by reversing the removal procedure noting the following.

1. The sub-frame mounting points in the body have a limited amount of movement to allow for centralization of the sub-frame. Ensure that the plain bobbin (front mounts) and threaded bobbin (rear mounts) are free in the longeron to allow sub-frame adjustment to be carried out.
2. Inspect all relevant pipes and hoses prior to fitting the sub-frame into the body and renew any that show signs of deterioration or damage.
3. When fitting the sub-frame to the body mounting points, ensure that the main bearing washer for each mount is in position, together with any additional washers that may have been fitted in order to correct individual differences of the mounting points.
4. With the engine and sub-frame positioned in the engine compartment, assemble the rear steady brackets onto the rear mount centre setscrews, together with any washers previously removed.

Pass the setscrews through the sub-frame mounts and screw them into the threaded body mount bobbins. Fit the bolts, nuts, and washers which secure the steady brackets to the body. Fit the front mounting bolts in a similar manner. Do not tighten the mounting bolts at this stage.

Note

If during dismantling, the upper nut from the front mounting stud is removed, it must be torque tightened

onto the stud to the standard torque figure quoted in Chapter P. This must be done before locating the stud through the body longeron.

5. Centralize the sub-frame by utilizing the movement in the body mounting bobbins. To check the sub-frame position, diagonal and parallel measurements should be taken from the jig location points on the rear sub-frame, to the jig location points on the front sub-frame (see Fig. H29). With the sub-frame centralized, torque tighten the sub-frame mounting bolts and setscrews.
6. Connect the steering column ensuring that the road wheels and steering wheel are in the straight ahead position. Refer to Chapter N for details.
7. Torque tighten all relevant nuts, bolts, and setscrews. Always refer to the special torque figure sections of Chapter P for the correct torque requirements.
8. Fill the engine coolant system and check the engine, torque converter transmission, and steering pump oil levels as described in their respective chapter.
9. Bleed the hydraulic systems as described in Chapter G.
10. Charge the refrigeration system as described in Chapter C.
11. Check all components for leaks and ensure that the necessary clearances have been obtained.
12. Check the standing height of the car as described in Section H5.
13. Ensure the front engine mount stop plate setting is between 1,52mm. and 1,77mm. (0.060in. and 0.070in.). Adjust if necessary.

Sub-frame mount - To remove

The sub-frame mounts can be changed with the sub-frame in position.

1. Position the car on a ramp.
2. Apply the parking brake and chock the rear wheels.
3. Raise the bonnet and fit protective covers and liners on the wings.
4. Support the car body with sill blocks.
5. Fit spring retention tool (RH 8809) onto the road spring nearest to the mount being renewed. Adjust the tool until sufficient pressure is applied to support the road spring.

Warning

Always examine the spring retention tool components for signs of thread wear or damage prior to its use. If you have doubts concerning any parts of the tool and their ability to withstand spring load you should renew those parts.

It is recommended that the use of the tool is restricted to a maximum of 200 applications.

6. Position a jack, as near as possible to the mount being renewed, to support the sub-frame.
7. Remove the bolts securing the mounting point steady bracket to the body.
8. Remove the centre setscrew or bolt (dependent on whether it is a front or rear mount) from the mount. Note the position and quantity of spacing washers that are fitted.
9. Carefully lower the jack situated beneath the sub-frame until sufficient clearance is obtained between the mount and the body to gain access to the mount lock-ring.
10. Using spanner (RH 8576) to restrain the lock-ring, unscrew the mount using spanner (RH 7774) on the lower castellations of the mount.
11. Remove the spacer (if fitted) from the mount.

Sub-frame mount - To fit

1. Ensure that the bore, and upper face of the sub-frame, the threads and faces of the lock-ring, and the threads of the mount are clean.
2. Place the spacer (if fitted) over the thread of the mount. Apply Molytone C grease to the threads of the mount. Ensure the top three or four threads are covered. Do not use mineral based grease as it can have a detrimental effect on the rubber of the mount.
3. Insert the mount through the sub-frame and fit the lock-ring into position in the upper well. Screw the mount into the lock-ring. Adjust the lock-ring such that, when the rubber mount is torque tightened to the figure quoted in Chapter P, the slots in the moulded rubber are at right angles to the centre line of the sub-frame (see Fig. H7).
4. Secure the sub-frame to the body by reversing the removal procedure. Ensure that all the nuts and setscrews are torque tightened to the figures quoted in Chapter P.