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CHAPTER P

CHASSIS FRAME

SECTION P1 — GENERAL DESCRIPTION

On all S1 and S2 cars, the chassis frames are of exceptional stiffness yet light in weight. A notable feature of their design is the use of light gauge steel pressings, arc welded to form box section assemblies. On S1 and S2 cars with the exception of the coach-built cars, the steel in general use for the pressings is 16 S.W.G. (0·064 in., 1·626 mm.) with angle stiffeners of 14 S.W.G. (0·080 in., 2·032 mm.) steel.

S1 and S2 chassis frames comprise two side members, a front crossmember or pan, a cruciform centre section, a rear crossmember and a transverse tubular member to which the rear spring shackle brackets are welded.

Bentley Continental S1 cars with the synchromesh gearbox have a chassis frame which is stiffer than the other S1 frames and which has a supporting strut for the gearbox rear mounting. This strut is welded in position diagonally between the front left-hand cruciform member and the left-hand side member.

On all chassis frames, the side members comprise two lengths of channel plate, reinforced on the inside and arc welded along the seams to form an airtight box section assembly (see inset, Fig. P1). An angle stiffener plate is spot welded inside the front half of each side member, between a point just ahead of the front crossmember and the point where the cruciform assembly is arc welded to the inner side member.

On all chassis frames except the Phantom V, construction of the cruciform member is similar to the construction of the side members. The point of intersection of the members of the cruciform structure is reinforced above and below by plates, shaped like a Maltese Cross, which are arc welded along their edges. Lugs are welded to the inner sides of the cruciform structure to provide a mounting for the gearbox rear supporting bracket.

The Phantom V chassis frame (see Fig. P4) differs from all other S1 and S2 cars in chassis frame length and cruciform construction. The cruciform structure consists of two 'Vee'-shaped members, the apexes of which are welded to a tube, 8 in. (20·320 cm.) in diameter and 18 in. (45·720 cm.) long. The tube is supported at the centre by a box section crossmember. An additional feature of the Phantom V chassis frame is the provision of arc welded stub tubes to support the rear of the fuel tank (see Fig. P4).

Later Phantom V chassis frames are provided with angled tunnels through the left-hand side member and the rear left-hand cruciform member to accommodate the 'through-the-frame' exhaust pipe run (see inset, Fig. P4). These tunnels are lined with seamed steel tubing arc welded into position in the frame. The rear silencer front support bracket is positioned immediately behind the tunnel in the rear left-hand cruciform member.

The front and rear crossmembers are of similar construction to that of the side members in that they are of arc welded box section.

A 1½ in. (3·810 cm.) diameter stiffening tube to which the rear spring shackle brackets are welded passes through both side members approximately 20½ in. (52·070 cm.) from the rear of the frame [in the case of the **Phantom V chassis frame,** this distance is approximately 12 in. (30·480 cm.)]. The tube is arc welded to the inner and outer faces of the side members and steel discs are welded in position to seal the ends of the tube.

A jacking bracket and two adjacent stiffeners are arc welded to each side member; the stiffeners prevent 'springing' and subsequent damage to the chassis frame around the jacking points.

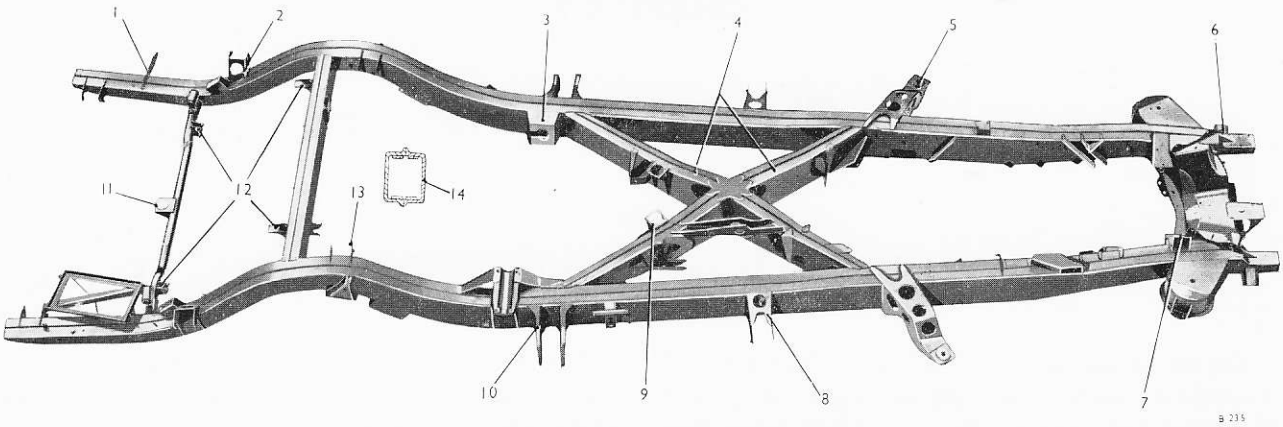

Fig. P1 S1 chassis frame (early)

1. TAIL PIPE SUPPORT
2. BODY MOUNTING BRACKET
3. REAR SHACKLE ANCHORAGE
4. CRUCIFORM
5. BODY MOUNTING BRACKET
6. STABILISER ROD BRACKET
7. ENGINE MOUNTING
8. BODY MOUNTING BRACKET
9. BODY MOUNTING BRACKET
10. BODY MOUNTING AND JACKING SUPPORT
11. BODY MOUNTING BRACKET
12. FUEL TANK MOUNTING
13. BODY MOUNTING BRACKET
14. INSET SHOWING REINFORCED 'BOX' CONSTRUCTION

There are fifteen body mounting brackets welded to the chassis of all cars except the **Phantom V,** which has thirteen only. Ten of the mountings are adjustable as described in Chapter S (Body Section).

Special attention has been paid to bumper bar mountings at both ends of the chassis frame. In order to prevent collapse of the box structure at these points when tightening the mounting bolts, steel distance tubes are welded in position in the side members.

On early S1 chassis frames, six distance tubes are used for mounting the front bumper bar and four tubes are used in the rear mounting.

With the introduction of the Refrigeration System as an optional extra on later S1 and all subsequent cars, the front bumper bar mountings have been splayed out at an angle from the front pan (see Fig. P2) and indentations have been made in the pan to accommodate components of the Refrigeration Unit.

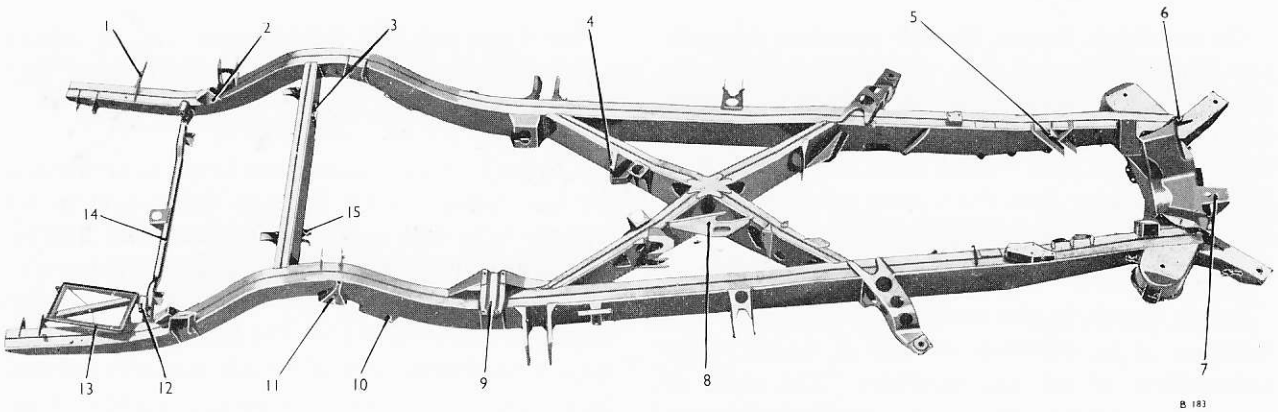

Fig. P2 S1 chassis frame (late)

1. TAIL PIPE SUPPORT
2. REBOUND BRACKET
3. REAR SILENCER MOUNTING
4. DRIVE SHAFT CENTRE BEARING SUPPORT
5. STEERING MOUNTING
6. FRONT SHOCK DAMPER MOUNTING
7. RADIATOR SUPPORT
8. MASTER CYLINDER BRACKET
9. 'Z' BAR BRACKET
10. REAR SHOCK DAMPER
11. BUMP STOP BRACKET
12. REAR SHACKLE EYE
13. BATTERY CARRIER
14. TUBULAR MEMBER
15. FUEL FILTER MOUNTING

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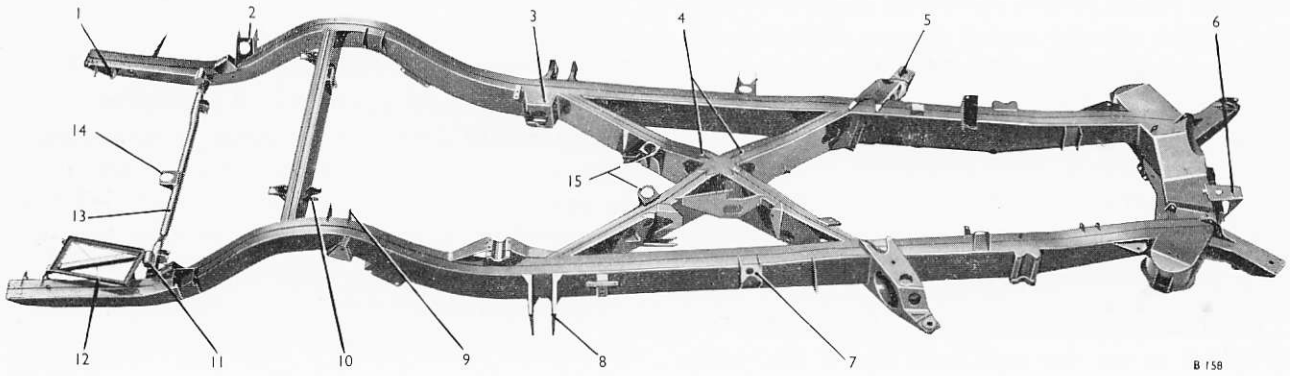

Fig. P3 S2 chassis frame

1. BODY MOUNTING BRACKET
2. BODY MOUNTING BRACKET
3. REAR SHACKLE ANCHORAGE
4. CRUCIFORM
5. BODY MOUNTING BRACKET
6. RADIATOR SUPPORT BRACKET
7. BODY MOUNTING BRACKET
8. BODY MOUNTING BRACKET
9. BODY MOUNTING BRACKET
10. FUEL FILTER MOUNTING
11. REAR SHACKLE EYE
12. BATTERY CARRIER
13. TUBULAR MEMBER
14. BODY MOUNTING BRACKET
15. BODY MOUNTING BRACKET

Four distance tubes are used in the front bumper bar mountings on these cars; the rear mountings remain unchanged.

Rubber bump stops are fitted to the rear of each side member; compression of the rubber provides an increasing rate of resistance to movement of the rear axle towards the end of its travel, so preventing damage to the suspension or chassis frame.

Rubber bump stops are also bolted to the front crossmember to act on the lower triangle levers and restrain excessive movement of the front suspension.

The Long Wheelbase chassis frame is identical to the standard frame except that the wheelbase is 4 in. (10·16 cm.) longer; the additional length is obtained between the rear end of the cruciform structure and the centre of the rear wheel arch.

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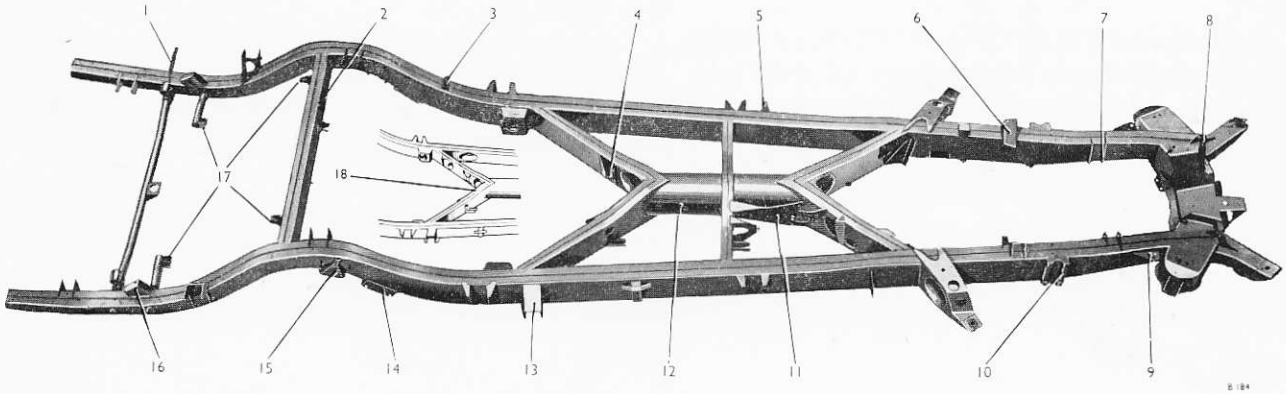

Fig. P4 Phantom V chassis frame

1. TAIL PIPE SUPPORT BRACKET
2. REAR SILENCER MOUNTING
3. EXHAUST LINE SUPPORT BRACKET
4. DRIVE SHAFT CENTRE BEARING SUPPORT BRACKET
5. EXHAUST LINE SUPPORT BRACKET
6. ENGINE MOUNTING BRACKET
7. ENGINE MOUNTING BRACKET
8. FRONT SHOCK DAMPER MOUNTING
9. STEERING MOUNTING ARM BRACKET
10. STEERING MOUNTING
11. MASTER CYLINDERS SUPPORT BRACKET
12. CENTRE TUBE
13. JACKING SUPPORT
14. REAR SHOCK DAMPER MOUNTING BRACKET
15. BUMP STOP BRACKET
16. REBOUND BRACKET
17. FUEL TANK MOUNTINGS
18. 'THROUGH-THE-FRAME' EXHAUST LINE APERTURES

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On S2 chassis frames, mountings to accommodate the V-eight cylinder engine are arc welded to the side members (see Fig. P3). Mounting brackets for the power-assisted steering box are similarly welded to the outside of the side members.

Mounting brackets for such components as the gearbox and shock dampers are arc welded to the chassis frame at the appropriate points.

On all cars except the Phantom V, the battery carrier is welded to the rear right-hand side of the chassis frame. The battery on **Phantom V cars** is fitted in a recess in the boot floor.

Nuts and studs are welded at various points on the chassis frame to provide securing positions for pipes, hose clips and wiring looms.

The electrical system earthing points are tinned to ensure a good electrical connection; they should be masked before enamel is applied to the chassis frame.

The chassis frame should also be masked wherever components fit directly to the frame. If components were fitted directly to an enamelled surface, it is probable that the components would become loose as the enamel peeled from beneath the securing nuts and bolts, etc.

On completion, the chassis frame is finished in black enamel containing corrosion inhibitors.

Chassis Frame Serial Number

The chassis frame serial number will be found on the identification plate fixed to the front of the bulkhead. The number is also stamped on the left-hand side frame member, just forward of the bulkhead.

SECTION P2 — CHASSIS FRAME AND BODY MOUNTING CHECKING DIMENSIONS

Should damage occur to the chassis frame as the result of an accident and this damage is not so severe as to necessitate renewal of the frame, the body mounting brackets should be checked to the dimensions as shown in Figures P5 to P8 inclusive.

The tabulated figures given are measured across a horizontal plane.

A tolerance of $\frac{1}{8}$ in. (0·125 in., 0·3175 cm.) is acceptable in measurements taken between the front body mountings and each of the body mounting brackets on their respective sides.

The diagonal dimensions are given as a check of the relative positions of the side members to one another.

On all S2 chassis frames, with the exception of the Phantom V, it should be noted that the No. 2 body mountings are not symmetrical about the centre line of the chassis frame; the diagonal checking dimensions from No. 1 to No. 2 and from No. 2 to No. 3 mountings should therefore only be checked as shown in Figure P7.

Phantom V and all S1 chassis frames are symmetrical and therefore the diagonal dimensions may be checked from the left-hand to the right-hand side as shown (and vice versa).

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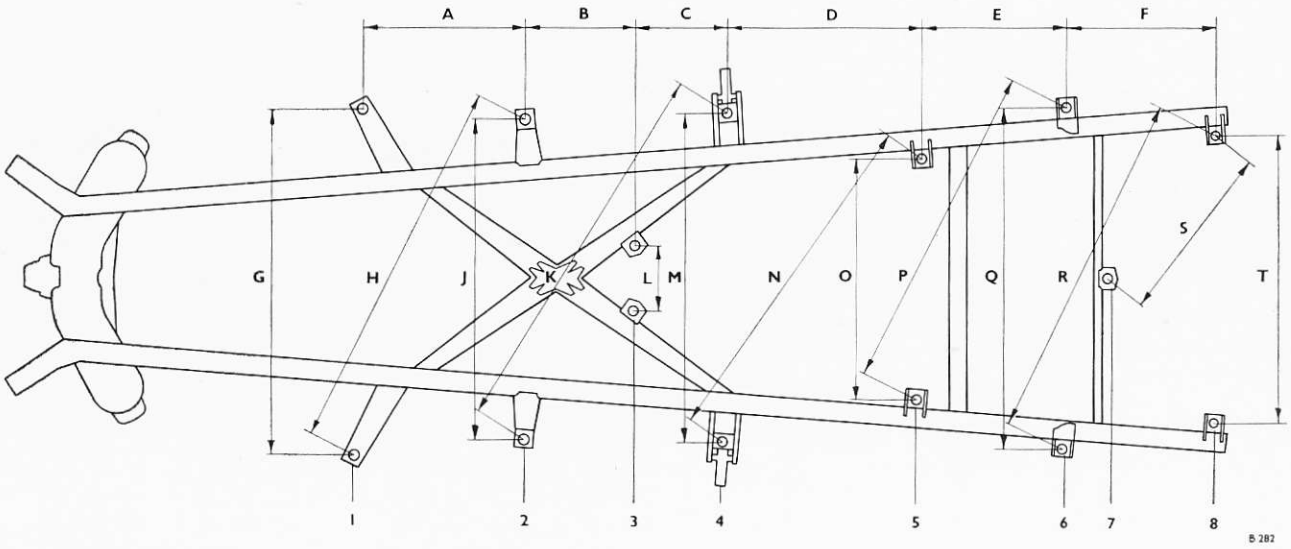

Fig. P5 Chassis frame and body checking dimensions for all S1 cars except Long Wheelbase

DIMENSION	SILVER CLOUD BENTLEY S1		BENTLEY CONTINENTAL S1	
	INCHES	CENTIMETRES	INCHES	CENTIMETRES
A	26·775	68·0085	26·775	68·0085
B	15·975	40·5765	15·975	40·5765
C	15·250	38·7350	15·250	38·7350
D	29·875	75·8825	29·875	75·8825
E	22·625	57·4675	19·375	49·2125
F	24·000	60·9600	17·250	43·8150
G	53·750	136·5250	53·750	136·5250
H	58·180	147·7772	58·180	147·7772
J	49·550	125·8570	49·550	125·8570
K	59·450	151·0030	59·450	151·0030
L	9·500	24·1300	9·500	24·1300
M	51·625	131·1275	51·625	131·1275
N	52·905	134·3787	52·905	134·3787
O	35·700	90·6780	35·700	90·6780
P	49·520	125·7808	49·910	126·7714
Q	52·400	133·0960	56·300	143·0020
R	53·400	135·6360	51·850	131·6990
S	26·130	66·3702	21·310	54·1274
T	43·000	109·2200	41·500	105·4100

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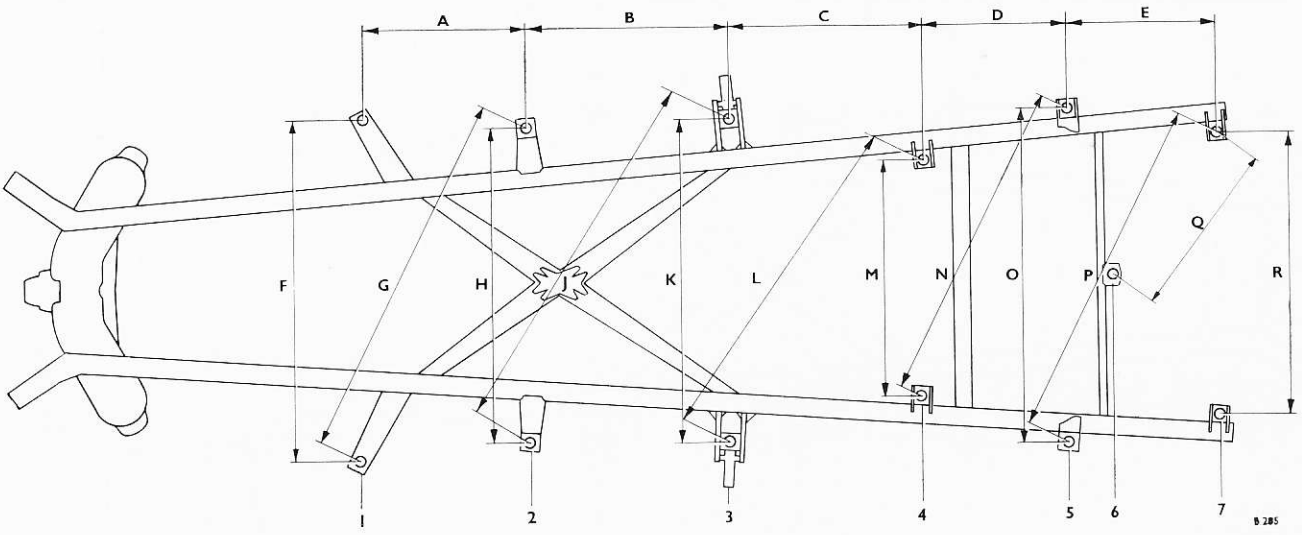

Fig. P6 Chassis frame and body checking dimensions S1 Long Wheelbase cars

DIMENSION	SILVER CLOUD L.W.B. BENTLEY S1 L.W.B.	
	INCHES	CENTIMETRES
A	26·750	67·9450
B	35·250	89·5350
C	29·875	75·8825
D	22·625	57·4675
E	24·000	60·9600
F	53·750	136·5250
G	58·145	147·6883
H	49·500	125·7300
J	61·880	157·1752
K	52·225	132·6515
L	53·420	135·6868
M	36·350	92·3290
N	50·080	127·2032
O	53·000	134·6200
P	53·935	136·9949
Q	26·380	67·0052
R	43·600	110·7440

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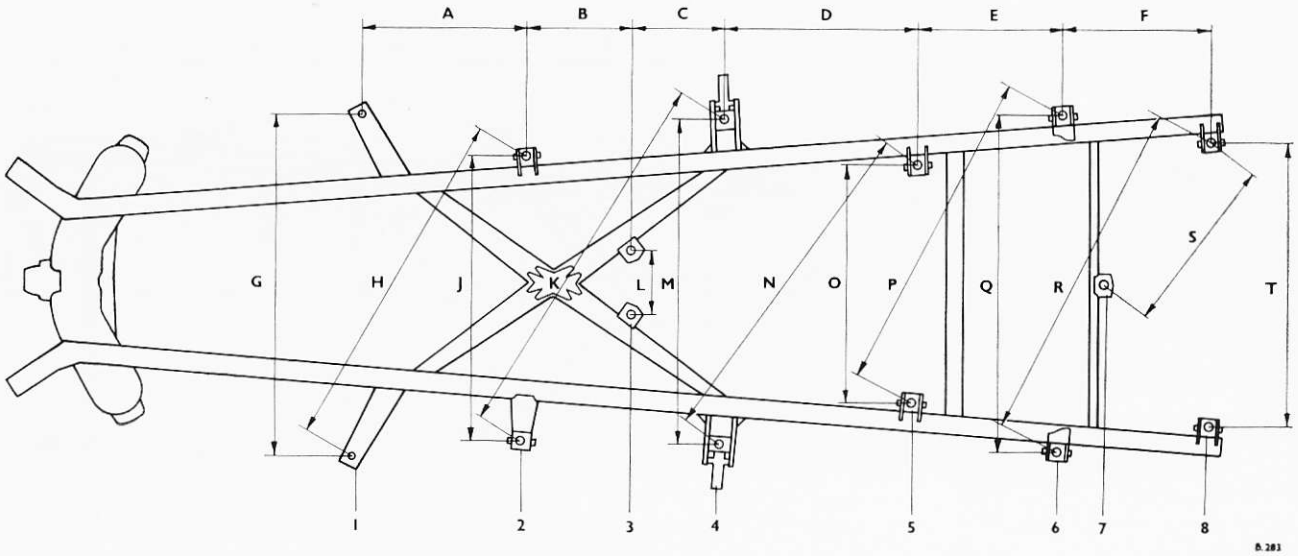

Fig. P7 Chassis frame and body checking dimensions for all S2 cars except Phantom V

DIMENSION	SILVER CLOUD II BENTLEY S2 BENTLEY CONTINENTAL S2		SILVER CLOUD II L.W.B. BENTLEY S2 L.W.B.	
	INCHES	CENTIMETRES	INCHES	CENTIMETRES
A	26·750	67·9450	26·750	67·9450
B	16·000	40·6400	16·000	40·6400
C	15·250	38·7350	19·250	48·8950
D	29·875	75·8825	29·875	75·8825
E	22·625	57·4675	22·625	57·4675
F	24·000	60·9600	24·000	60·9600
G	53·750	136·5250	53·750	136·5250
H	53·780	136·6012	53·780	136·6012
J	44·530	113·1062	44·530	113·1062
K	59·440	150·9776	61·880	157·1752
L	9·500	24·1300	9·500	24·1300
M	51·625	131·1275	52·225	132·6515
N	52·925	134·4295	53·420	135·6868
O	35·750	90·8050	36·350	92·3290
P	49·540	125·8316	50·080	127·2032
Q	52·400	133·0960	53·000	134·6200
R	53·400	135·6360	53·935	136·9949
S	26·130	66·3702	26·380	67·0052
T	43·000	109·2200	43·600	110·7440

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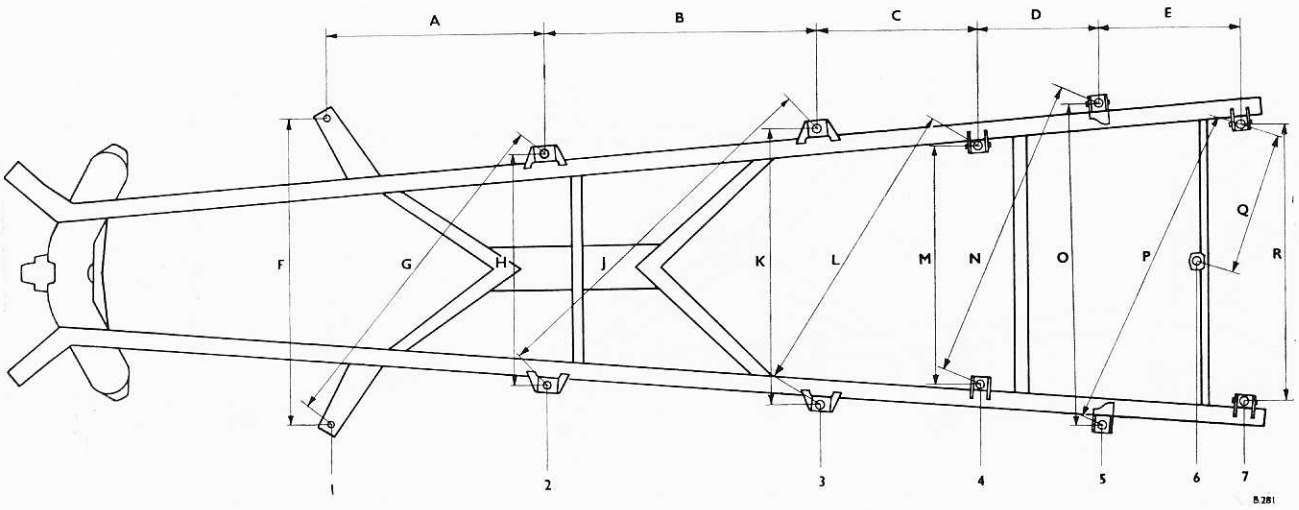

Fig. P8 Chassis frame and body checking dimensions for Phantom V cars

DIMENSION	PHANTOM V	
	INCHES	CENTIMETRES
A	37·875	96·2025
B	47·625	120·9675
C	26·250	66·6750
D	20·750	52·7050
E	23·875	60·6425
F	53·750	136·5250
G	60·810	154·4574
H	41·400	105·156
J	65·520	166·4208
K	48·590	123·4186
L	51·220	130·0988
M	39·375	100·0125
N	51·900	131·8260
O	55·780	141·6812
P	56·340	143·1036
Q	25·080	63·7032
R	46·280	117·5512

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CHAPTER P

CHASSIS FRAME

SECTION P 1 — GENERAL DESCRIPTION

(Page P1 in Workshop Manual)

For S3 cars the following three paragraphs should be read in place of the seventh.

All S3 chassis frames are provided with angled tunnels through the left-hand side member and the rear left-hand cruciform member to accommodate the 'through-the-frame' exhaust pipe run (see Figure P1 (S) of this Supplement). These tunnels are lined with seamed steel tubing, arc welded into position in the frame.

The rear silencer front support bracket is positioned immediately behind the tunnel in the rear left-hand cruciform member.

The remaining information in this Section which applies to S2 cars is also applicable to S3 cars.

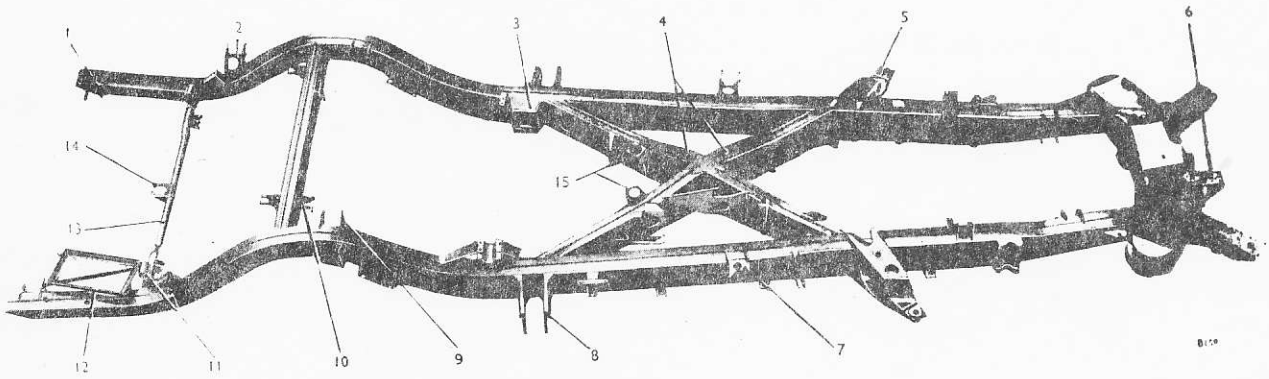

Fig. P1 (S) S3 chassis frame

1 BODY MOUNTING BRACKET
2 BODY MOUNTING BRACKET
3 REAR SHACKLE ANCHORAGE
4 CRUCIFORM
5 BODY MOUNTING BRACKET
6 RADIATOR SUPPORT BRACKET
7 BODY MOUNTING BRACKET
8 BODY MOUNTING BRACKET
9 BODY MOUNTING BRACKET
10 FUEL FILTER MOUNTING
11 REAR SHACKLE EYE
12 BATTERY CARRIER
13 TUBULAR MEMBER
14 BODY MOUNTING BRACKET
15 BODY MOUNTING BRACKETS