

# SHOP MANUAL

SAAB  
93

SVENSKA AEROPLAN AKTIEBOLAGET

Trollhättan

Sweden

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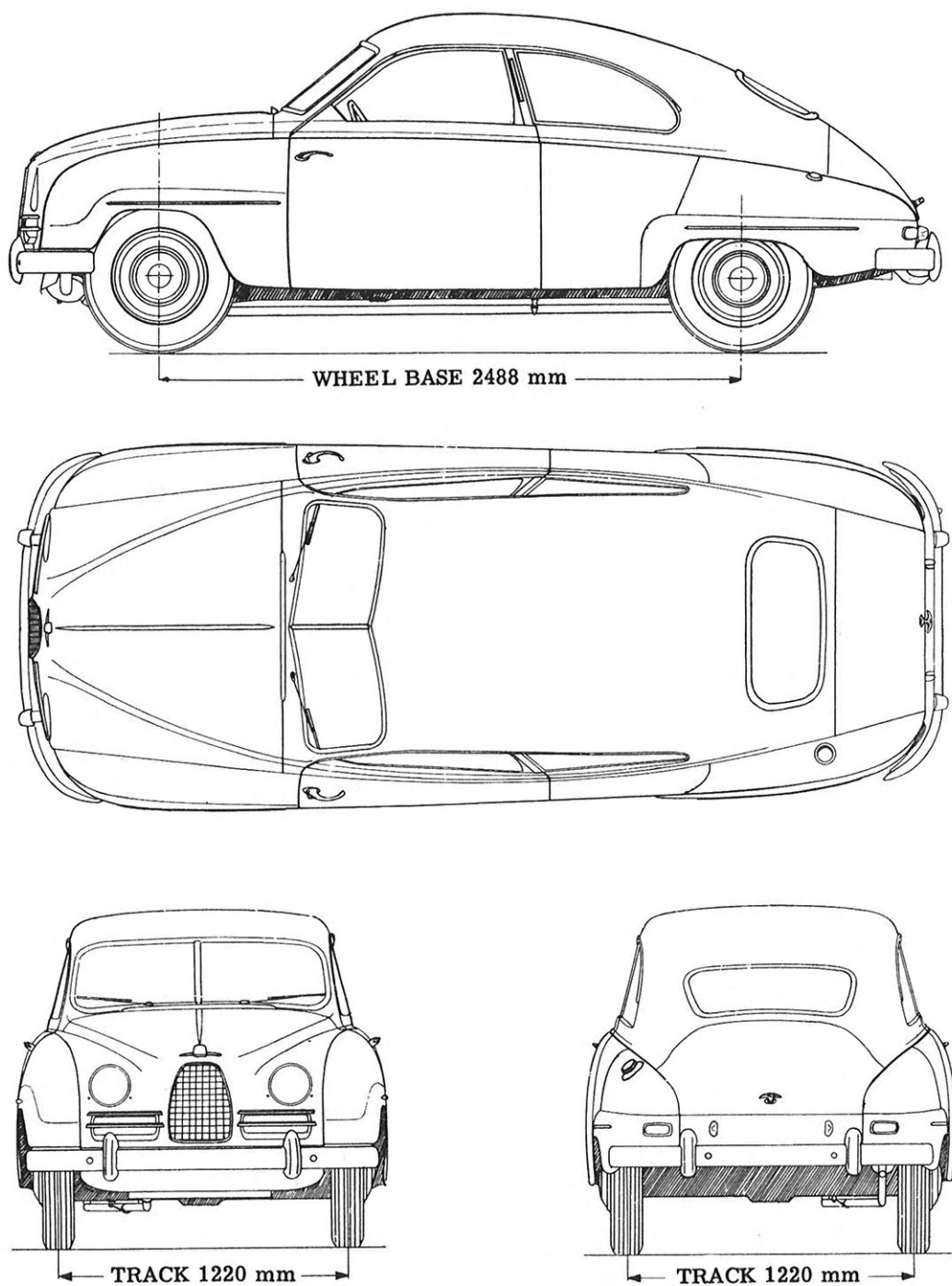


Fig. 1. General arrangement

## I. TECHNICAL DATA

Overall length bumpers, approx.	mm 4010 13 ft 2 in	Radius of turning circle, approx.	m 5.5 18 ft
Overall width, approx.	mm 1570 5 ft 2 in	Weight empty, incl. fuel, water, oil, tools and spare wheel, approx.	kg 800 1775 lbs
Overall height, unloaded, approx.	mm 1470 4 ft 2 in	Weight empty, excl. fuel and water, approx.	kg 787 1710 lbs
Ground clearance (2 in front seat) approx.	mm 190 7 1/2 in	Weight distribution:	
Track, front and rear	mm 1220 4 ft	Weight empty (800 kg 1775 lbs)	front 58 %
Wheel base	mm 2488 8 ft 2 in	Total weight (1180 2600 lbs) incl. 4 occupants and 80 kg (176 lbs) luggage	front 49 %

## 2. DO'S AND DO'NTS FOR SERVICE WORK

All serveshop personnel know the importance of orderly, systematic work, and every experienced mechanic knows how vital it is that certain parts of the car should be treated carefully and protected from dirt during servicing. Anyone unfamiliar with work of this kind should take note of the following:

1. Protect fenders and other painted surfaces with suitable covers when working on the car. It's easy to make grease-marks or scratches on the paint, but much more difficult to get rid of them.

2. Protect the upholstery and trim from oil marks, etc. Use protective covers.

3. Clean under the fenders and around the rear axle before working on hubs and axles. This makes the work easier and prevents grit and dirt from getting into bearings and other easily-damaged parts.

4. Before removing a spark-plug, clean the well round it thoroughly.

5. The first essential for good service work is a suitable place for every job. For instance, it is not good practice to dismantle an engine or a transmission on a bench where filing or similar work is done, or in the immediate vicinity of such a place.

### 3. INSTRUCTIONS FOR JACKING UP

As integral construction is used in this car there are no natural lifting points for applying jacks as in conventional cars with chassis frames.

Two special pick-up points, one on each side, are provided for the jack included in the car tool-kit. They are intended to be used when changing wheels, etc.

The thresholds, to which these pick-up points are attached, form a beam on either side and also permit the application of an ordinary shop jack if one side of the car is to be lifted.

A pick-up point for a shop jack is welded onto the front edge of the underside of the engine compartment floor, just behind the front muffler. See Fig. 2. This should be used when the front end is raised for lubrication of the ball joints.

There is a corresponding jacking point under the rear end, where the floor is reinforced. This point is located on the centre line of the car immediately in front of the rear-axle tunnel. As most garage jacks have a jacking plate shaped like a low "fork", a suitably sized block of wood should be placed on the "fork" before applying it as shown in Fig. 3. This prevents damage to the floor.

Either the front or rear end has to be blocked up for certain jobs. Suitable trestles of many types are available, and most of them should fit the Saab 93. A simple wooden trestle expressly intended for use on the Saab 93 and how the trestle should be placed is shown in Fig. 4. It is important that the shape and placing of the trestle should be such as to avoid damage to the exhaust pipe. The car should rest on the strongest parts of the thresholds, that is, immediately adjacent to the wheel housings.

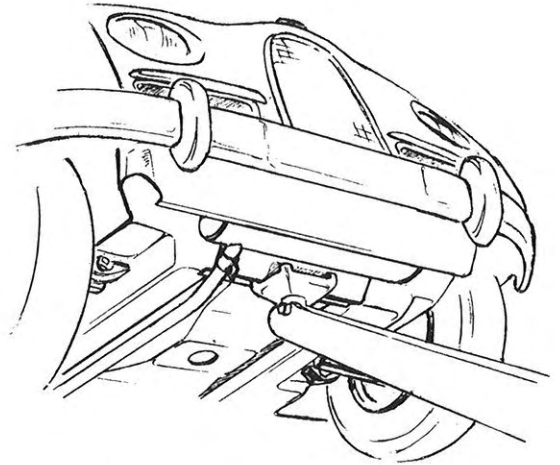


Fig. 2. Jacking up front end

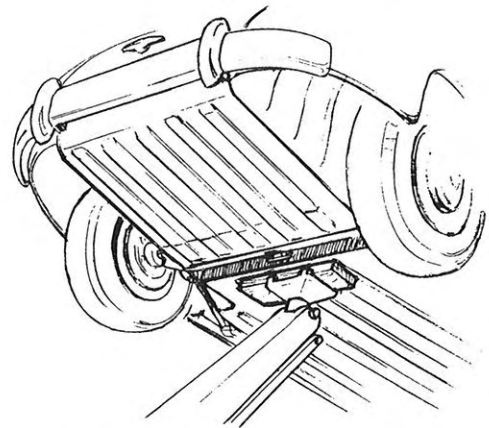


Fig. 3. Jacking up rear end

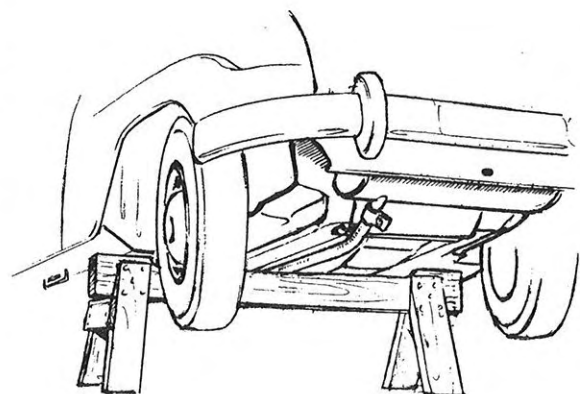


Fig. 4. Blocking up front end

## 4. LOCATION OF CHASSIS AND ENGINE NUMBERS

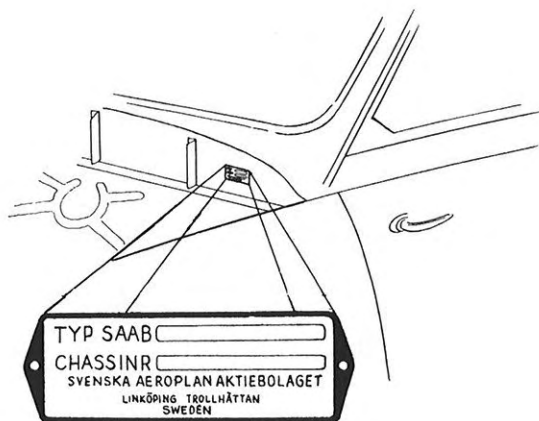


Fig. 5. Location of chassis number

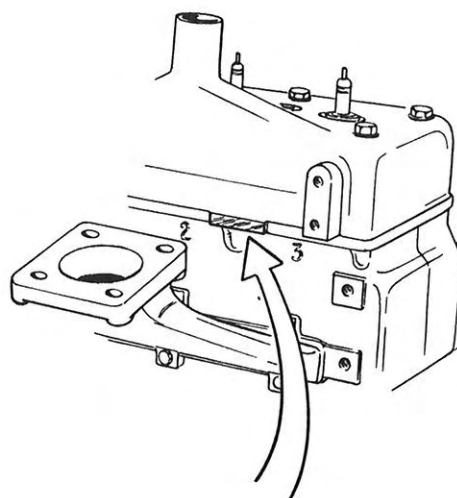


Fig. 6. Location of engine number

Figs. 5 and 6 show the locations of the chassis and engine numbers. It may be useful to note the chassis number of a car for possible correspondence.

NOTE. When a new engine or a new cylinder block is fitted, the original engine number must be stamped into the appropriate place on the new block.

## 5. WRENCH TORQUES

### 5.1. Normal wrench torques for BS 3 and BS 8 bolts, and BS 9 and BS 12 nuts.

NOTE. Not applicable to special nuts and bolts.

Diam.	Wrench torque		
	kgm	lb. -in.	lb. -ft.
1/4"	0.7 - 1.0	61 - 87	5 - 7
5/16"	1.5 - 2.5	130 - 220	10 - 18
3/8"	2.5 - 4.0	220 - 350	18 - 28
7/16"	4.0 - 7.0	350 - 600	28 - 50
1/2"	7.0 - 10.0	600 - 850	50 - 72
9/16"	10.0 - 14.0	850 - 1200	72 - 100
5/8"	14.0 - 20.0	1200 - 1700	100 - 145



## 5.2. Wrench torques for important nuts and bolts.

Location	Bolt		Wrench torque $\pm 10\%$		
	Qty.	Diam.	kgm	lb. -in.	lb. -ft.
Cylinder head	8	7/16"	6 - 7	530 - 600	44 - 50
Flywheel	8	5/16"	2.7 - 3.3	250 - 300	20 - 24
Crankcase halves	9	5/16"	1.5 - 2.5	130 - 220	11 - 18
	8	3/8"	3 - 4	270 - 340	22 - 28
Crankshaft belt pulley	1	1/2"	4.5 - 5.5	400 - 480	32 - 40
Transmission end cover	6	5/16"	2 - 2.5	180 - 220	15 - 18
Differential, journal bearing	4	3/8"	3.5 - 4.5	300 - 380	25 - 32
Differential case bolts	12	5/16"	2 - 2.5	180 - 220	15 - 18
Nut, pinion shaft	1	7/8"	5 - 6	440 - 530	36 - 44
Nut, main shaft	1	3/4"	12 - 15	1050 - 1200	87 - 100
Nut, intermediate shaft	1	9/16"	7 - 10	600 - 850	50 - 72
Nut, front wheel hub	2	3/4"	17 - 20	1450 - 1700	125 - 200
Nut, rear wheel hub	2	3/4"	9 - 10	800 - 850	65 - 72
Nut, drag link pivot	2	7/16"	3 - 3.5	270 - 300	22 - 25

This Service Manual is compiled for the benefit of service shops in order to facilitate the service work and contribute towards receiving a satisfactory result of this. Recommendations and directions given in this Manual are the results of observations and experiences made up to now and the Manual will be completed gradually as new experiences or possible alterations in the design give cause for this.

The Manual is divided into chapters, mainly corresponding to the various units of the car. Each chapter is then generally subdivided into the following sections:

1. DESCRIPTION

In this section the design is briefly described, primarily intended for everyone who wishes to get into the construction of the car.

2. TECHNICAL DATA

Herein has been listed, in each chapter where it has been possible, the most important statements as to measures, tolerances, etc. which is needed by a mechanic for adjustments and repairs.

3. ADJUSTMENTS AND REPAIRS & 4. OVERHAUL

These two sections contain detailed descriptions of service works and are mainly intended for anyone unaccustomed to work on the car. They are rather extensively illustrated, bearing in mind that a good figure often is more instructive than a lot of explanation.

The chapters and their sections are given numbers according to a simple system, thus facilitating references within or between the chapters. The arrangement of this system is evident from the table of contents in the beginning of each chapter.

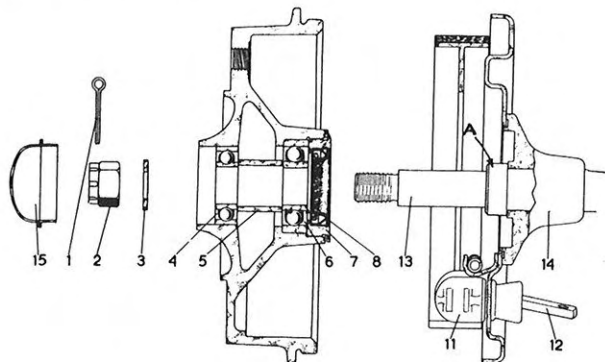
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Insert the following corrected pages:

Chapter 1 page 3 - 4  
Chapter 2 page 5 - 6  
Chapter 2 page 17 - 18  
Chapter 3 page 21 - 22  
Chapter 7 page 17 - 18  
Chapter 8 page 11 - 12  
Chapter 12 page 9 - 10  
Chapter 13 page 13 - 14

Hand corrections:

Chapter 2, Point 1.2. line 4: Amend 22 to 23  
Chapter 2, Page 19: Amend Fig. 22 to Fig. 23  
Chapter 2, Point 3.3.1., item 8 and 11: Amend pulley to puller  
Chapter 2, Fig. 16: Add, "2. Piston pin"  
Chapter 3, Page 15, item 13: Add "... and transmission oil"  
Chapter 3, Page 19, point 4.2.5.1.: Change items 3 and 4  
Chapter 3, Page 27, line 4: Amend 42 to 44  
Chapter 3, Page 28, line 4: Amend 42 to 46  
Chapter 3, Page 32: Change items 25 and 26  
Chapter 4, Fig. 1: Change legend to:  
1. Fuel tank  
2. Float fitting  
3. Fuel pump  
4. Carburetor  
5. Intake muffler with filter insert  
and air preheater connection  
6. Drain plug  
Chapter 4, Fig. 5: Change 1 and 2  
Chapter 4, Page 6: 21 grams = (3/4 ounce)  
20 mm $\pm$ 1 = (0,8 in  $\pm$  0,04)  
21-22 mm = (0,84 - 0,88 in)  
Chapter 5, Fig. 4: 45 mm = (1.7/8")  
Chapter 7, Page 10: "NOTE. The dimension A ...." refers to Fig. 13  
Chapter 7, Fig. 13: See previous correction  
Chapter 7, Fig. 25: Add an arrow and "A", se below



Chapter 8, Fig. 18: Add an arrow and "A", se above  
Chapter 9, Fig. 5 & 6: Change legends between figures  
Chapter 10, Page 3: line 2 from below: Amend 1 to 9  
Chapter 10, Page 5: 160 mm = (6.3/8"), 5-10 mm = (0.2-0.4 in)  
20-25 mm = (0,8-1,0 in), 50 mm = (2,0 in)  
Chapter 10, Fig. 8: Amend 8 $\pm$ 1,5 in to 8 $\pm$ 1,5 mm



Chapter 11, Page 9: "NOTE. The upper ...." refers to Fig. 11  
Chapter 11, Fig. 11: See previous correction  
Chapter 12, Fig. 2: Change items 32 and 33  
Chapter 12, Points 4.5.3. item 17, 4.5.5.2. - 5 and 4.5.6.2. - 11:  
Amend "... 2/3 turn, that is four hole pitches" to  
"... 5-6 hole pitches"  
Chapter 13, Page 6, line 11: Amend downwards to upwards  
Chapter 13, Page 12: Delete ref. to Fig. 11 and tool 93-151  
Chapter 13, Amend ref. to Fig. 12 to Fig. 11  
Chapter 16, Tool no 93-151 cancelled

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