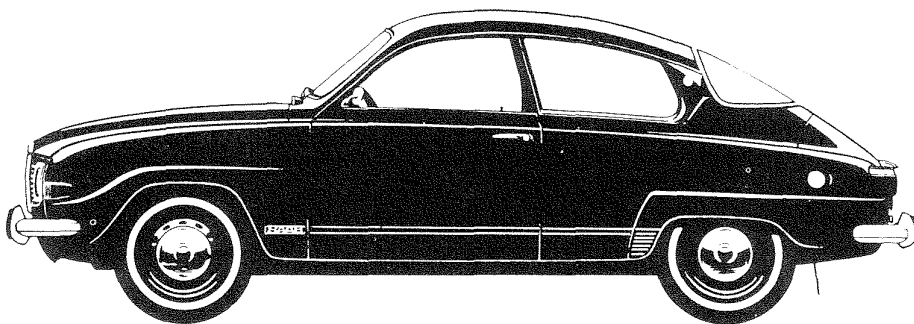
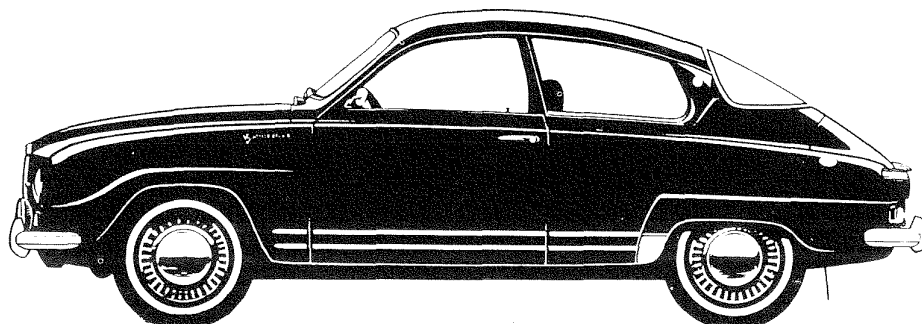


SAAB 95 (SAAB STATION WAGON)



SAAB 96 (SAAB 2 DOOR SEDAN)



SAAB MONTE CARLO

S 2967

TROUBLE SHOOTING

General

The localization of faults in a car is often the most difficult part of the service work, and no written instruction on the subject can replace familiarity with the car and knowledge of its construction. The information contained in this section has been prepared with the object of facilitating systematic diagnosis, but does not claim to be exhaustive. Under each heading, the most likely sources of trouble are listed in order of probability, together with the appropriate corrective measures. Since a number of different auxiliary apparatuses may be used to facilitate trouble shooting, the instructions given for each individual problem should be followed.

Engine

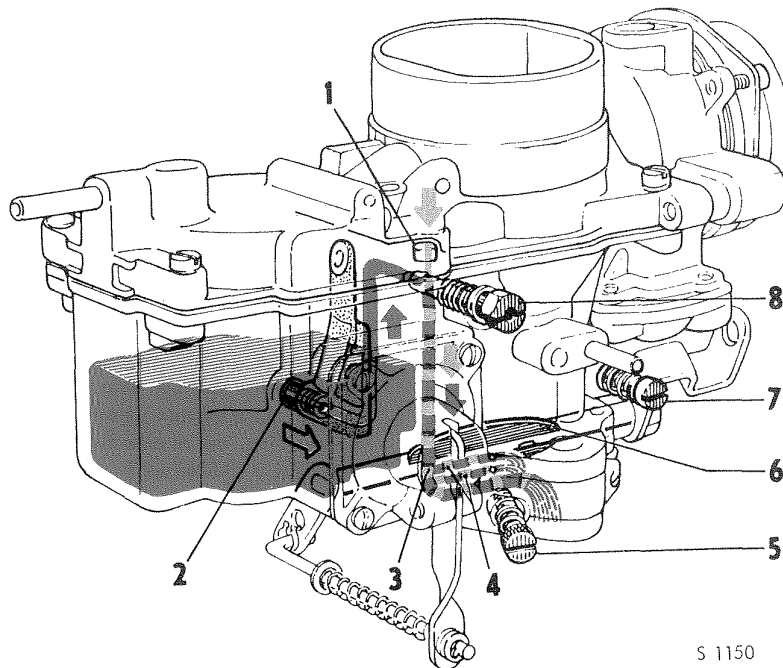
Source of trouble	Remedy
STARTING DIFFICULT, COLD ENGINE	
Faulty spark plugs. Gaps too wide.	Clean, adjust and test or replace.
Faulty distributor.	Check, adjust.
Poorly charged battery.	Check condition of battery. Recharge if the specific gravity of the electrolyte has dropped to 1.23.
Faulty capacitor.	Test.
Weak ignition coil.	Test.
Faulty interference suppressors on spark plugs.	Replace.
No fuel in the carburetor.	Check that the pump is feeding fuel by pulling off hose at carburetor and running with starter motor. If no fuel is supplied, check pump filter, pipes, hoses and fuel filter for leaks and clogging. If fuel supply still fails after a new test, running with starter motor for about 12–15 sec., the pump itself is probably defective. Remove the pump for examination, and repair if necessary.
Clogged jets and passages.	Blow jets and passages clean with air.
No primary current to coil and distributor. No secondary current.	Check cable connesctions, and especially the starter switch, to confirm that current is supplied to ignition system when starter motor is on. The cable may be ruptured at the ignition switch.

Low-speed system

To facilitate the transfer from the idling system to the main system, i.e. from idling to normal driving, the carburetor is fitted with a transitional system known as a low-speed system. This latter system communicates with the idling system and receives all its fuel-air mixture from the idling passage of the latter.

The fuel-air mixture of the low-speed system is supplied to the engine through two holes drilled in the neck of

the carburetor. These holes are located immediately above the closed position of the throttle flap. As the flap opening is slowly increased from idling, the mixture of fuel and air is drawn not only from the idling system but also through one or both of these holes, depending on the position of the throttle flap. The low-speed system cannot be adjusted or altered, as its function is set exactly by the manufacturer.



LOW-SPEED SYSTEM

1. Idling air jet
2. Main jet
3. Idling duct
4. Transition hole
5. Air-regulating screw, idling mixture
6. Throttle flap
7. Adjusting screw, idling
8. Idling fuel jet

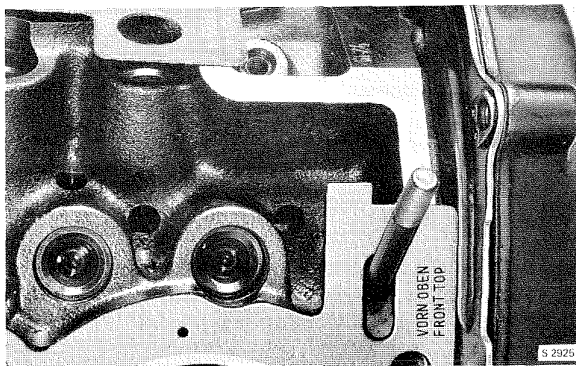
CYLINDER HEADS

Disassembly (engine removed)

1. Remove the air filter.
2. Take off the distributor cap and disconnect the ignition cables.
3. Disconnect the vacuum line from the distributor.
4. Remove the distributor.
5. Remove the valve cover.
6. Detach the fuel line from the carburetor.
7. Remove the carburetor.
8. Back off and remove the induction manifold bolts and nuts. Separate the induction manifold from the gasket and remove it.
9. Remove the rocker arm assembly by alternate slackening of the two bolts and remove the oil return plates.
10. Remove the push rods and keep them in the correct sequence.
11. Remove the cylinder head.
12. Take away the cylinder head gasket.

Reassembly

1. Remove all residual gasket material from the contact surfaces.
2. Place the cylinder head gasket over the two locating sleeves on the engine block. The lefthand and righthand cylinder head gaskets are different. They are marked "Front" and "Top" respectively.



INSTALLATION OF CYLINDER HEAD GASKET

3. Install the cylinder head on the locating sleeves. Tighten the bolts in three stages to the prescribed torque in the indicated sequence. See fig.

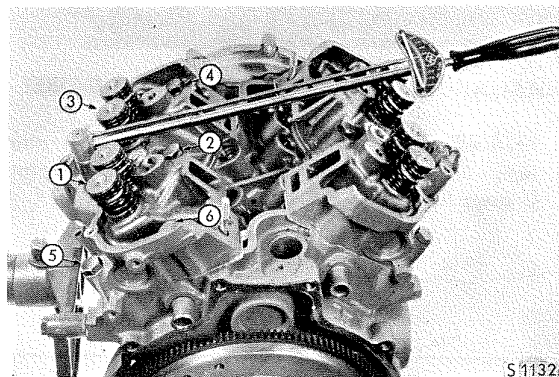
	Nm	kpm	ft-lb
1.	54	5.5	40
2.	69	7.0	50
3.	93	9.5	68

IMPORTANT

To ensure effective sealing, the bolts must be tightened in three stages to the prescribed torque in the sequence indicated.

NOTE

The outer, rear bolt for the righthand cylinder head is specially adapted for the engine earth cable.



TIGHTENING SEQUENCE, CYLINDER HEAD BOLTS

Draining the cooling system

1. Remove the filler cap of the radiator. As from the 1969 model, remove also the pressure cap of the expansion tank.
2. The coolant is first drained off through the drain valve in the lower part of the radiator. If the system is to be drained completely, loosen also the two hexagon plugs, one on each side of the lower part of the cylinder block.
Empty the expansion tank by loosening it and then holding it so high that the fluid pours into the radiator.
3. The heat control of the fresh-air heater should point to maximum heat, otherwise the system cannot be fully drained.

Refilling the cooling system

Coolant is filled through the radiator opening. When doing this, make the heat control point to maximum heat and open the bleeding nipple of the heat exchanger, in order to have the system filled completely. As from the 1969 model, fill the expansion tank up to the maximum mark or — at the most — 0.79 in. (20 mm) above it. Once the cooling system is completely full, start the engine and run it at a varying speed for approx. a minute or until coolant escapes through the open bleeding nipple of the heat exchanger. Now, shut the bleeding nipple.

Pour additional coolant into the radiator, as required, then put both the caps on.

Only clean coolant is permissible. Never fill much of cold water, if the engine is hot, or the cylinder block may crack.

Check the level in the expansion tank after driving for a few days, as a complete bleeding is achieved only when the system has been warmed up and cooled off a few times.

Top up once the level is at the minimum mark again.

Use a recommended coolant only.

Cleaning the cooling system

The cooling system is cleaned in accordance with the following procedure:

1. Drain off the water.
2. Flush the system with clean water.
3. Fill the system with clean water to which a suitable commercial solvent has been added. Follow the solvent manufacture's instructions.
4. Shield the radiator and run the engine until warm.
5. Stop the engine and, after waiting a few minutes, drain off the water.
6. Flush the system again with clean water, treating the engine jacket and radiator separately. This time, flush against the normal direction of coolant flow,

i.e. flush the engine jacket from the cylinder head and downwards, and the radiator through the lower connection pipe and upwards.

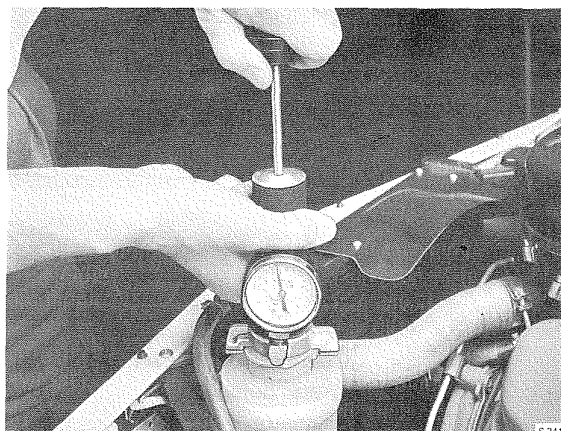
Before flushing the system this time, back off the upper water neck and remove the thermostat.

7. Flush the heater element, also against the normal direction of circulation.
8. Check the function of the tap in the line to the heater element.
9. Refit the thermostat, water neck and hoses. Test the system for leaks. When cleaning the cooling system, also check that the radiator overflow pipe is not choked up with foreign matter. If the cleaning method described does not suffice to clear all deposits from the radiator, take the radiator out of the car and send it to a specialist.

Pressure testing the cooling system for leaks

It is often difficult to discover leakage in the cooling system, as the pressure in the system reaches its full value only while the car is being driven. One good method is to put the system under pressure with the aid of a pressure tester, whereupon the radiator, hoses and seals can be checked. The maximum permissible pressure is 1 bar (kp/cm², 14 psi).

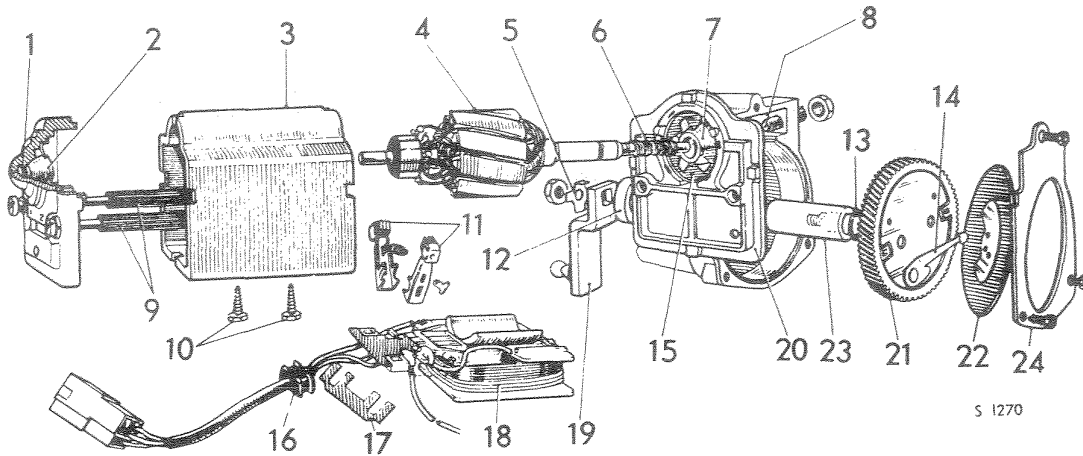
The opening pressure of the pressure cap can also be checked with the pressure tester. Concerning opening pressures, see specifications in chapter O.



TESTING THE COOLING SYSTEM FOR LEAKS

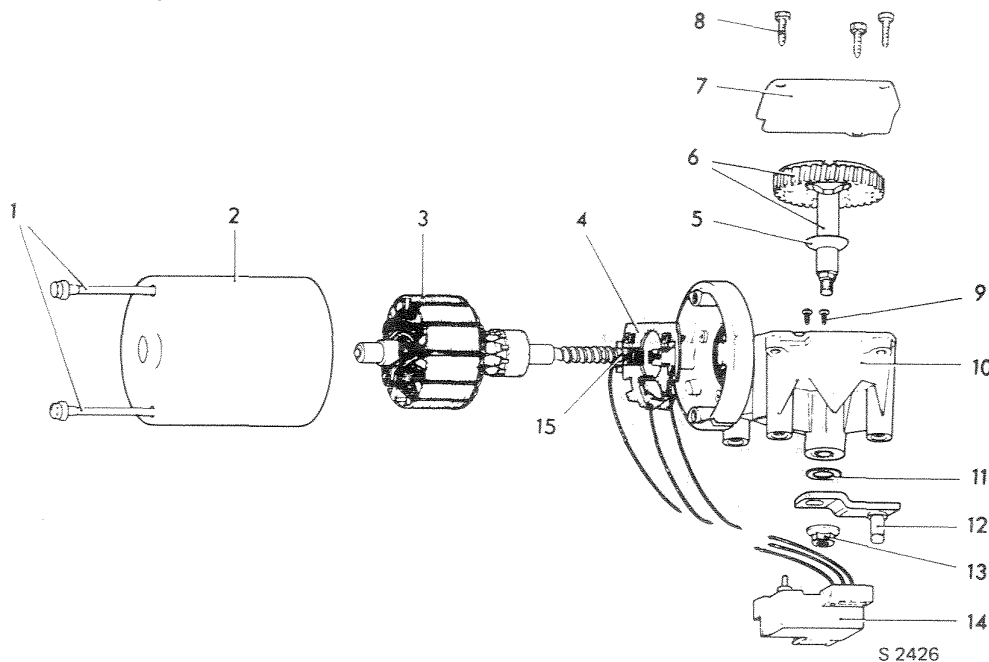
3 ELECTRICAL SYSTEM

ELECTRICAL EQUIPMENT, OTHER Windshield wipers, headlight wipers and -washers



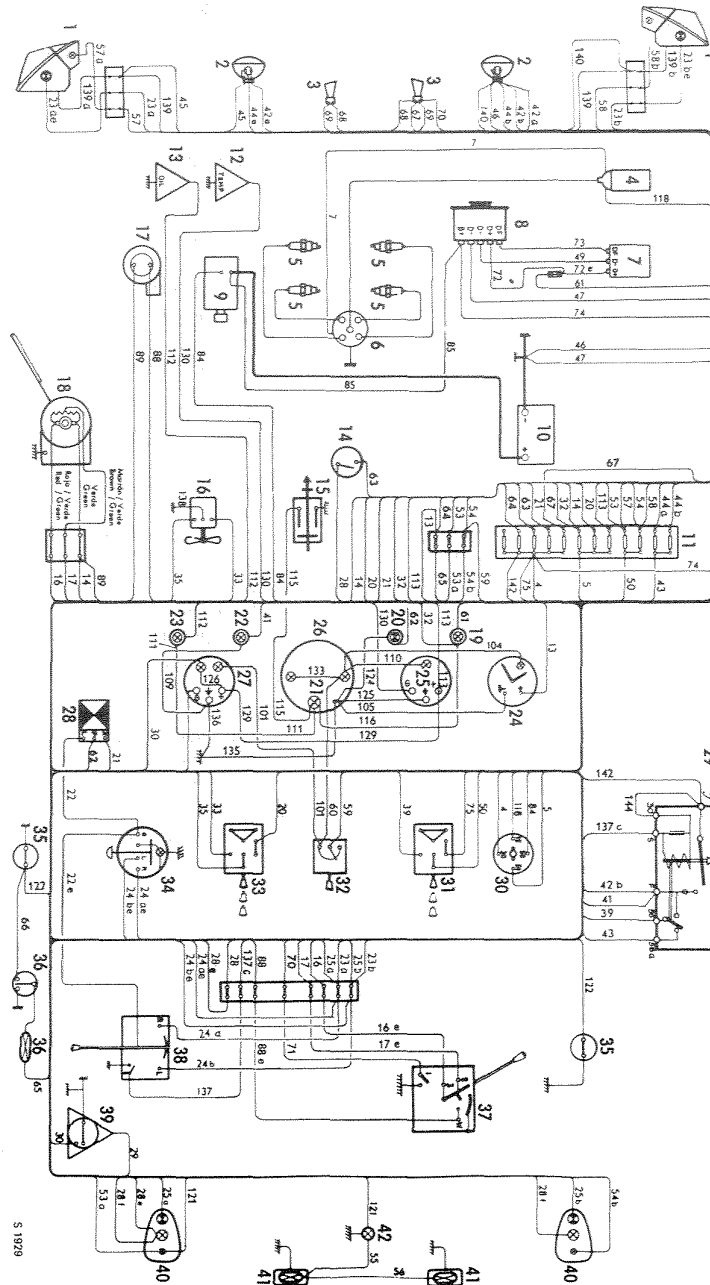
WINDSHIELD WIPER MOTOR, LUCAS UP TO AND INCL. MODEL 1969

- | | |
|---------------------------------------|--------------------------------------|
| 1. Thrust pad | 13. Washer |
| 2. Self-aligning spherical bearing | 14. Limit switch moving contact |
| 3. Yoke | 15. Bearing retaining ring |
| 4. Armature | 16. Grommet |
| 5. Tab washer | 17. Brush lever retainer |
| 6. Worm gear | 18. Field coil |
| 7. Self-aligning spherical bearing | 19. Rotating output crank |
| 8. End play adjuster & thrust pad | 20. Drive end bracket |
| 9. Through bolts & insulating sleeves | 21. Final gear |
| 10. Pole piece securing screws | 22. Limit switch fixed contact plate |
| 11. Brushgear | 23. Porous bronze bushing |
| 12. Bushing | 24. Gear box cover |



WINDSHIELD WIPER MOTOR, LUCAS MODEL 1970

- | | |
|-----------------------------|----------------------------|
| 1. Retaining screws, casing | 8. Retaining screws, cover |
| 2. Casing and bearing | 9. Screws, parking contact |
| 3. Armature | 10. Gear box |
| 4. Brushgear | 11. Flat washer |
| 5. Cupped washer | 12. Drive arm |
| 6. Shaft and gear | 13. Nut, drive arm |
| 7. Gear box cover | 14. Parking contact |



Wiring diagram Saab sedan USA model 1971

The range of the electrical system is shown by the wiring system on the next page. To simplify the identification, the wires have been covered with insulation of different shades, as follows:

Cable numbers

No.	Color	Area mm ²	No.	Color	Area mm ²	No.	Color	Area mm ²
4	grey	1,5	39	yellow	0,75	74	grey	4,0
5	red	1,5	41	blue	0,75	75	red	1,0
7	green	1,5	42a	blue	1,5	76	grey	1,0
13	blue	0,75	42b	white	2,5	80	black	1,0
14	brown	1,0	43	yellow	2,5	84	yellow	1,5
14e	brown	1,0	44a	grey	1,5	85	grey	4,0
14f	brown	1,0	44b	yellow	1,5	88	black	0,75
15	red	1,0	45	black	1,5	88e	black	0,75
15e	red	1,0	46	black	2,5	89	brown	0,75
16	grey	1,0	47	black	4,0	95	white	1,5
16e	grey	1,0	49	black	1,0	97	white	1,5
17	blue	1,0	50	green	1,0	98	white	1,0
17e	blue	1,0	53	blue	0,75	101	green	0,75
18	black	1,0	53a	blue	0,75	104	green	0,75
20	white	1,0	54	green	0,75	105	black	0,75
21	red	1,0	54b	green	0,75	109	black	0,75
22	green	1,0	55	green	0,75	110	green	0,75
22e	green	1,0	56	black	0,75	111	red	0,75
23a	yellow	1,0	57	blue	0,75	112	blue	1,0
23ae	yellow	1,0	57a	blue	0,75	115	yellow	0,75
23b	white	1,0	58	green	0,75	118	white	1,0
23bwhite	1,0		58b	green	0,75	121	green	0,75
24a	yellow	1,0	59	green	0,75	122	white	0,75
24ae	yellow	1,0	60	green	0,75	130	brown	1,0
24b	white	1,0	61	red	0,75	131	white	1,5
24bwhite	1,0		62	grey	0,75	136	black	1,0
25a	blue	1,0	63	red	1,0	138	black	1,0
25b	grey	1,0	64	grey	0,75	139	black	1,5
28	red	1,0	65	red	0,75	139a	black	1,0
28e	red	1,0	66	white	0,75	139b	black	1,0
28f	red	0,75	67	red	1,5	140	black	1,5
29	grey	0,75	68	red	1,0	141	brown	0,75
29e	green	0,75	69	black	1,0	141e	brown	0,75
30	brown	0,75	70	black	1,5	142	grey	2,5
30e	brown	0,75	71	black	1,5	147	black	0,75
32	red	0,75	72	red	1,0	190	yellow	0,75
33	yellow	1,0	72e	red	1,0	191	grey	0,75
35	grey	1,0	73	yellow	1,0	192	black	0,75

Key to numbers in Fig.

- Parking light and direction indicators
- Headlights
- Horn
- Ignition coil
- Spark plugs
- Distributor
- Voltage regulator
- Alternator
- Starter
- Battery
- Fuse box
- Temperature transmitter
- Oil pressure switch
- Back-up light switch
- Stop light switch
- Brake warning contact
- Heater fan motor
- Windshield washer pump
- Windshield wiper motor
- Cigarette lighter
- Contact for warning buzzer
- Buzzer
- Clock
- Speedometer with odometer
- High beam indicator light
- Direction indicator repeater light
- Brake warning light
- Temperature and fuel gauges
- Indicator light, fuel amount
- Oil pressure warning light
- Charge indicator light
- Flasher unit
- Dimmer relay
- Ignition and starter switch
- Hazard warning flasher switch
- Instrument illumination rheostat
- Headlight switch
- Heater fan switch
- Dome lamp switch
- Dome lamp with switch
- Switch for windshield wiper, and washer
- Signal horn contact
- Direction indicator switch with headlight flasher and dimmer switch
- Fuel transmitter
- Back-up light
- Stop lights, direction indicators and tail light
- Number plate light
- Trunk light

4 TRANSMISSION

DIFFERENTIAL AND PINION-RING GEAR

Pinion shaft with ring gear

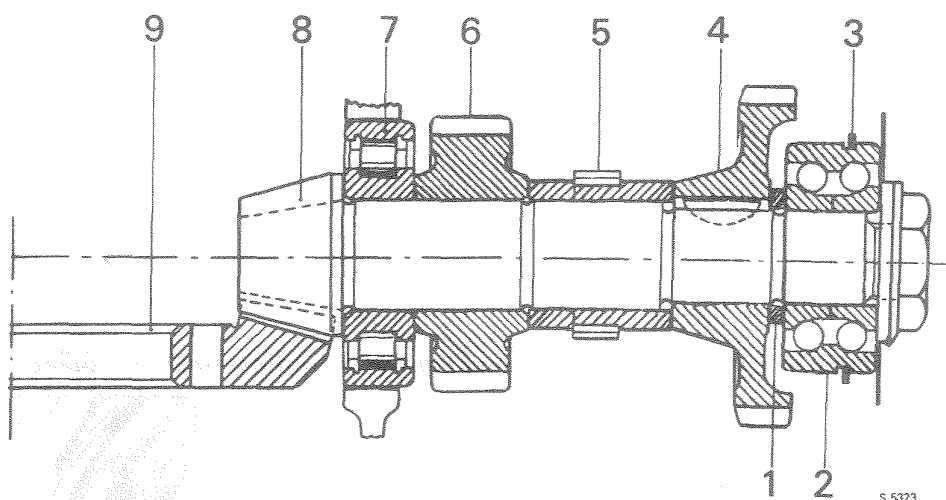
Shimming

If the measured value deviates from the correct one more than permitted by the tolerance, the pinion shaft must be adjusted.

The adjustment is to be made with spacer and shims, which shall be placed between the rear thrust bearing and the 2nd-and-reverse gear. See fig.

When doing this, always place the shims next to the bearing and the spacer against the gear. The spacers are available in two thicknesses and the shims can be had in three different thicknesses. See table. When adjusting, take only one of the spacers plus maximum three shims in a suitable combination. This covers the adjustment range from 3.1 mm up to 4.2 mm with intervals of 0.05 mm.

NOTE! If the gear box is equipped with the new, rear pinion bearing with split inner ring, the spacer washer has to be placed next to the bearing.



ADJUSTMENT OF PINION SHAFT WITH SHIMS AND SPACER

- | | | |
|---------------------|----------------------|-------------------|
| 1. Spacer and shims | 4. 3rd gear | 7. Roller bearing |
| 2. Ball bearing | 5. Speedometer drive | 8. Pinion gear |
| 3. Lock ring | 6. 4th gear | 9. Ring gear |

Gearbox	Location	Spacers		Shims	
		Thickness mm	Spare part No.	Thickness mm	Spare part No.
Up to and including model 1967	Pinion shaft between thrust bearing and gear	3.1	782207	0.1 0.15 0.3	782208 782209 782210
		3.6	782215		
As from model 1968		3.1	783953		
		3.6	783954		

FRONT ASSEMBLY, 6 STEERING COLUMN SHIFT GEAR

STEERING

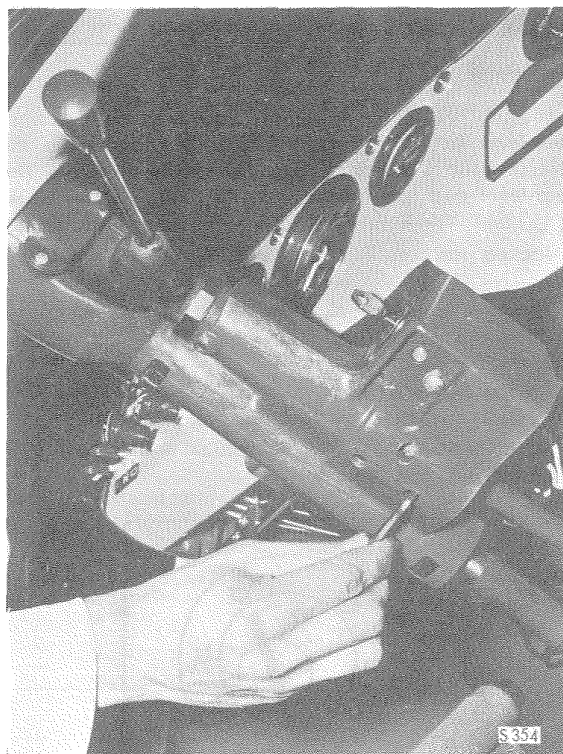
Steering wheel and column shift gear

Removal of twist stop

1. Engage 1st gear, thus providing access to two clamping screws on the twist stop through the holes (2) on the bottom of the steering-column stand — see fig. Undo these internal-hexagon screws with a 3/16" spanner.
2. Engage reverse gear and turn the ignition key to the locked position (L), enabling the stop screw which holds the twist stop to be backed off through the lower hole 2, in the steering column stand. See fig. on this and the preceding page.
3. The gear positions can now be adjusted by moving the steering-column stand in the ordinary way. If the ignition key is turned to position G, thereby releasing the twist stop, the gear-shift mechanism can then be dismantled.

NOTE

The clamping screws of the twist stop are always accessible when 1st gear is engaged and the stop screws when reverse gear is engaged.



ADJUSTMENT OF TWIST STOP

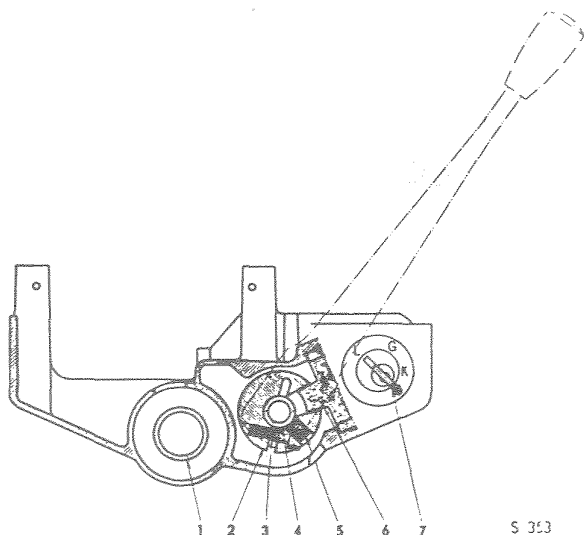
Adjustment of twist stop

After adjustment of gear positions, readjustment of the twist stop is called for. The procedure is the following:

1. The twist stop is marked on the side that is to face upwards towards the steering wheel. The marking shows for which version the twist stop is designed, e.g. V-4 means left-hand drive, 4-speed.

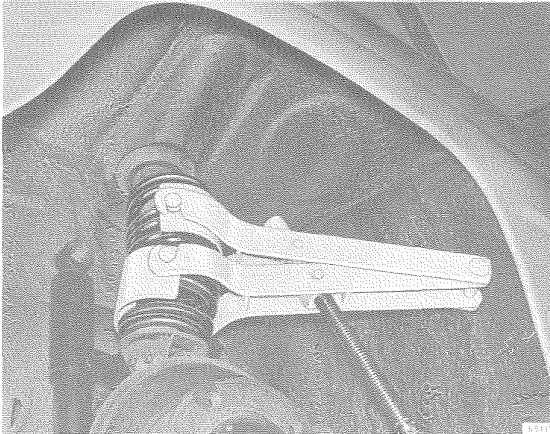
2. Engage reverse gear and push the twist stop up. At the same time, turn the ignition key to the locked position (L) and check that the lock plunger finds its position in the twist stop.
3. The twist stop now hangs on the lock plunger. Move the twist stop up about 0.08 in. (2 mm) and tighten the stop screw slightly. NOTE! Do not tighten the screw up too hard, its purpose being merely to hold the twist stop during adjustment.
4. Turn the ignition key to position G and engage 1st gear, enabling two clamping screws on the twist stop to be tightened. Then engage reverse gear and slacken the stop screw. Return to 1st gear and tighten the clamping screws permanently. Now engage reverse gear again and tighten the stop screw enough to prevent it from working loose.

Note! On righthand drive cars there is a spring on the gear-shift shaft which serves as a reverse catch. This spring must be in place when the twist stop is adjusted.

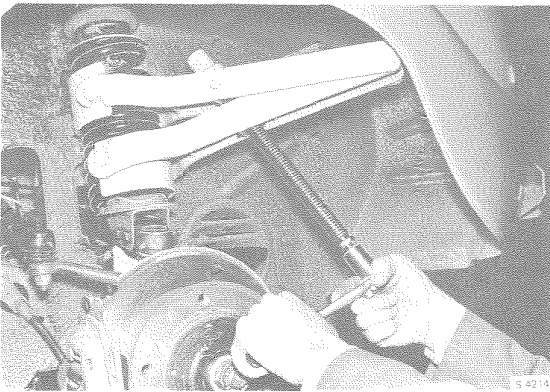


TWIST STOP AND LOCK PLUNGER

1. Steering column
2. Twist stop
3. Clamping screw
4. Gear-shift shaft
5. Stop screw
6. Lock plunger
7. Lock cylinder with key



THE POSITION OF THE SPRING SCISSORS AND THE SPRING CUPS ON THE LEFT SIDE

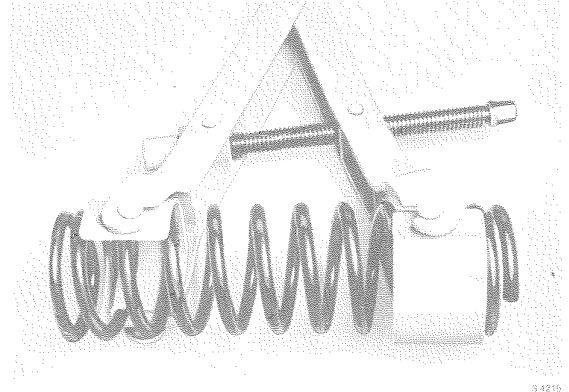


THE POSITION OF THE SPRING SCISSORS AND THE SPRING CUPS ON THE RIGHT SIDE

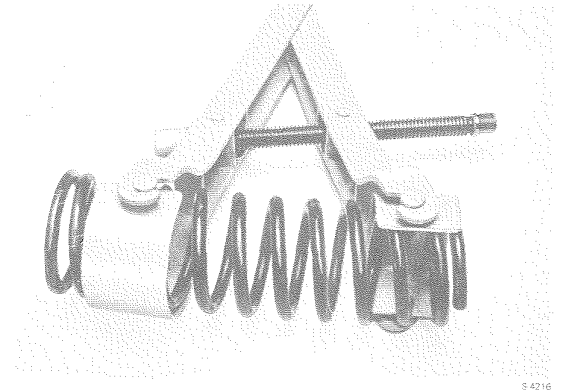
4. Remove the lower spring seat to facilitate removal and fitting of the spring.
5. Remove the spring.
6. Check and, if necessary, replace the rubber spacer on the upper spring support.
7. Check the two rubber buffers under the upper control arm, which limit the downward movement of the control arm, and replace them if necessary.

Installation, alternative 2

1. Place the spring in the tool as shown in the pictures below and compress the spring. Avoid tightening with a nut runner. The shanks of the spring scissors should not be brought together completely.



THE POSITION OF THE SPRING IN THE TOOL ON THE RIGHT SIDE



THE POSITION OF THE SPRING IN THE TOOL ON THE LEFT SIDE.

2. Check that the rubber spacer and the washer for the upper spring seat and the rubber buffers under the upper control arm have been fitted.
3. Put the compressed spring into place.
4. Fit the lower spring seat and the ball joint to the control arm.
5. Release the spring scissors and make sure that the spring assumes the proper position. The lower end of the spring coil should butt up against the stop in the spring support.
6. Fit the shock absorber on the right side.
7. Mount the wheel and lower the car.

REAR SPRINGS AND RUBBER BUMPERS**Replacement of rear coil springs and/or rubber bumpers****Removal**

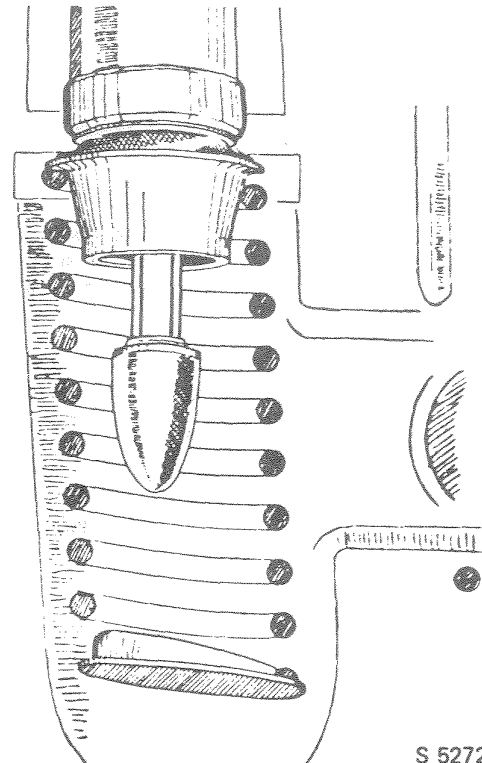
1. Jack up one side of the car, applying the jack under the rear end of the sill.
2. Remove the rear wheel.
3. Unfasten the stop strap at its rear bracket and allow the axle to fall down, thus enabling the spring to be removed without the use of tools. On the Saab 95 first remove the shock-absorber link.
4. If the rubber buffer needs changing, unscrew it with a suitable pair of pliers, gripping the steel washer at the thick end.
5. Check the condition of the stop strap to see if a new one is required.

Reassembly

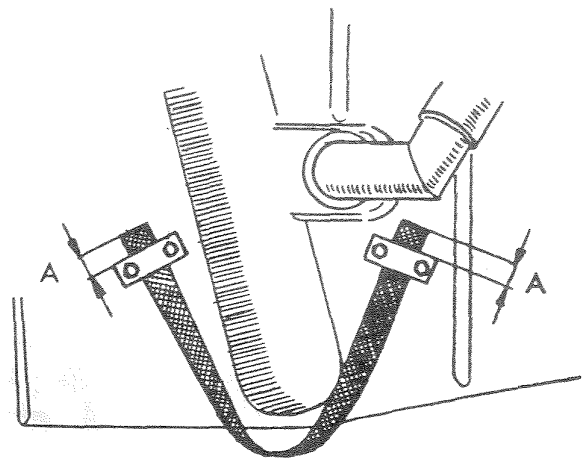
1. If the rubber buffer has been removed, screw a new one in place.
2. Refit the spring. Fit the spring with the unground end facing downwards and turn until it is correctly located in the lower spring seat.
3. If the stop strap has been removed, fix a new one to the front bracket, bearing in mind that the end should project 0.6 in. (15 mm) beyond the bracket.
4. Refit the wheel and lower the car to the floor.
5. Secure the stop strap at the rear end, again bearing in mind that the end of the strap should project 0.6 in (15 mm) beyond the bracket. See fig.

Replacement of stop strap

When fitting a new rear-axle stop strap, make sure that the ends project 0.6 in. (15 mm) beyond the brackets. See fig.



S 5272

REAR COIL SPRING SEATS AND RUBBER BUMPERS**FITTING THE REAR-AXLE STOP STRAPS**

A = Max. 0.1 in. (2.5 mm)

REAR SHOCK ABSORBERS

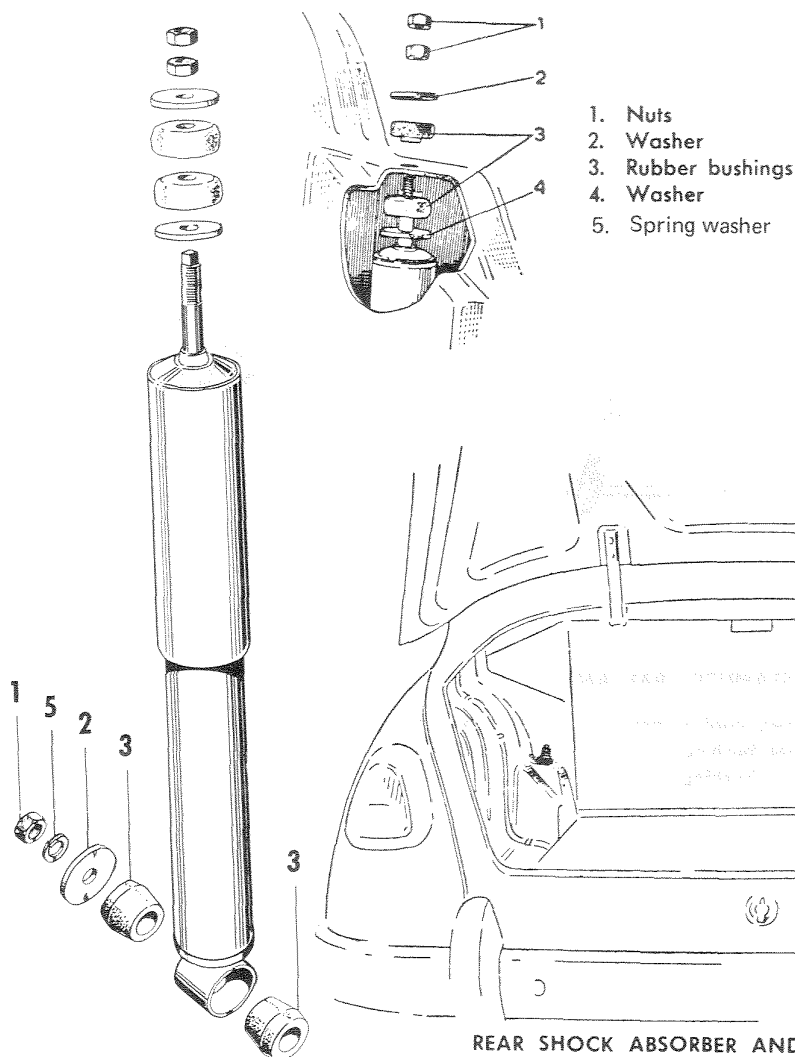
Saab 96

Removal

1. Jack up the car and remove the wheel.
2. Disconnect the shock absorber from its upper and lower brackets.
3. Remove the shock absorber, collecting the washers and rubber items.

Reassembly

Install rubber bushings and washers, and fit the shock absorber to the car — see fig. Make sure that the rubber bushings in the upper connection are correctly located: then ease the upper bushing flange into the hole in the body so that the shock absorber is properly centered in the hole. Negligence in this respect may result in noise. Smear the pin threads with grease before screwing on the nuts. Tighten the nuts hard.



S 2964

REAR SHOCK ABSORBER AND CONNECTING PARTS,
SAAB 96

HUBS

General

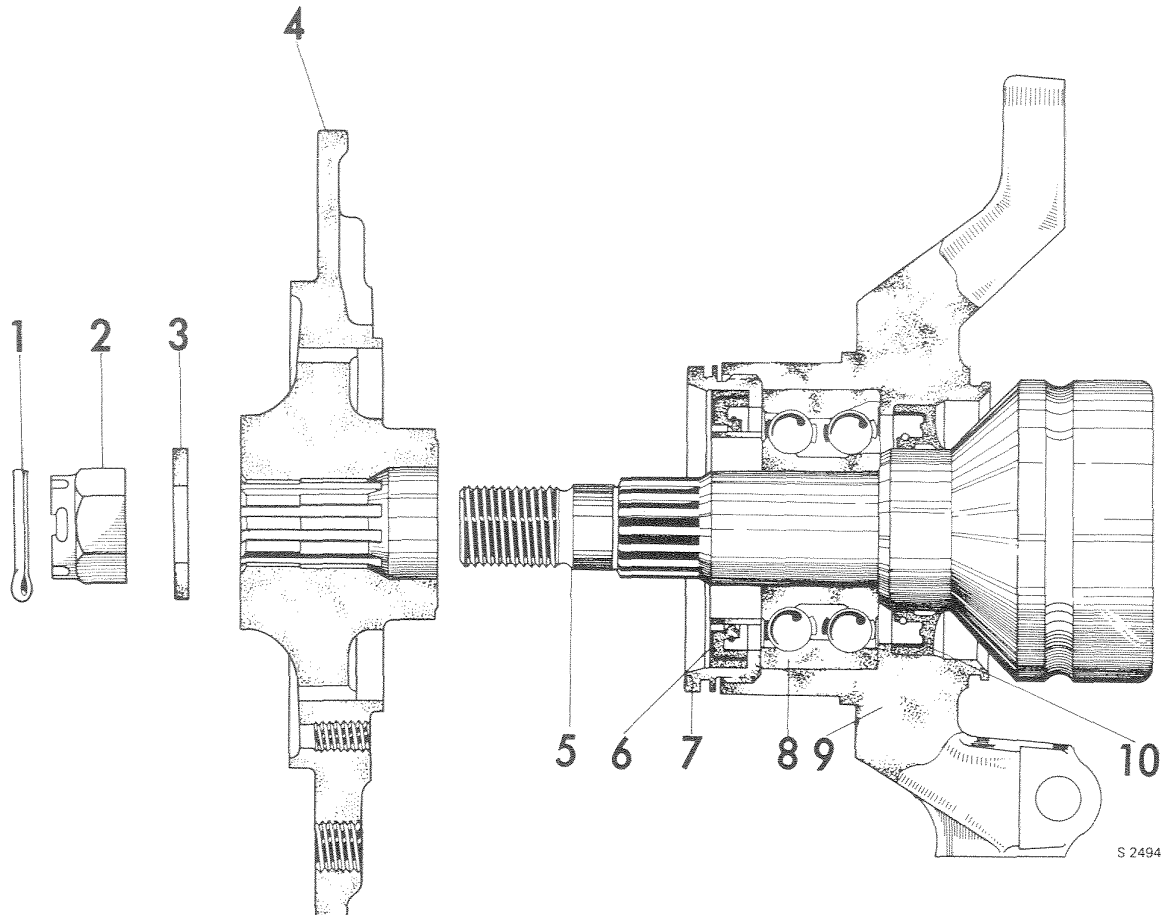
The hub and brake drum on the rear wheels are made as an integral casting, while the front wheels feature a special hub.

After considerable mileage, especially if lubrication has not been satisfactory, the wheel bearings may become worn and play will develop. Since this has a highly detrimental effect on the steering characteristics, the bearings must be renewed. Bearing play is easily checked if the car is jacked up. Hold the wheel at top and bottom and try to wiggle it: this will immediately reveal any unwanted play. If the play, measured at the edge of the rim, exceeds 0.08 in. (2 mm), the bearing must be changed. Do not subject the bearings to blows under any circumstances, since such treatment could easily damage them. In addition to the tools mentioned in the instructions, an arbor press will be needed for removal and installation of wheel bearings.

Front wheel hub

The front wheel hub is splined to the outer drive shaft and secured by means of a castle nut and cotter pin. The sliding surface on the inside of the hub must be well protected against scratches and blow marks when the hub is removed. It must seal properly against the shaft seal, and its rounded edge towards the end face must also be protected. If the sliding surface is scratched or otherwise damaged it must be trimmed and polished. This job should be done in a lathe, but great pains must be taken to avoid appreciable reduction of the diameter of the sliding surface.

Due attention of these precautionary measures is of the utmost importance, as neglect in this respect results in rapid wear of the shaft seal: grease from the ball bearings may enter the wheel hub and be carried to the brake drum where it will ruin the brake linings. Instructions for replacement of front-wheel bearings and seal are given in chapter 6.



S 2494

FRONT WHEEL HUB

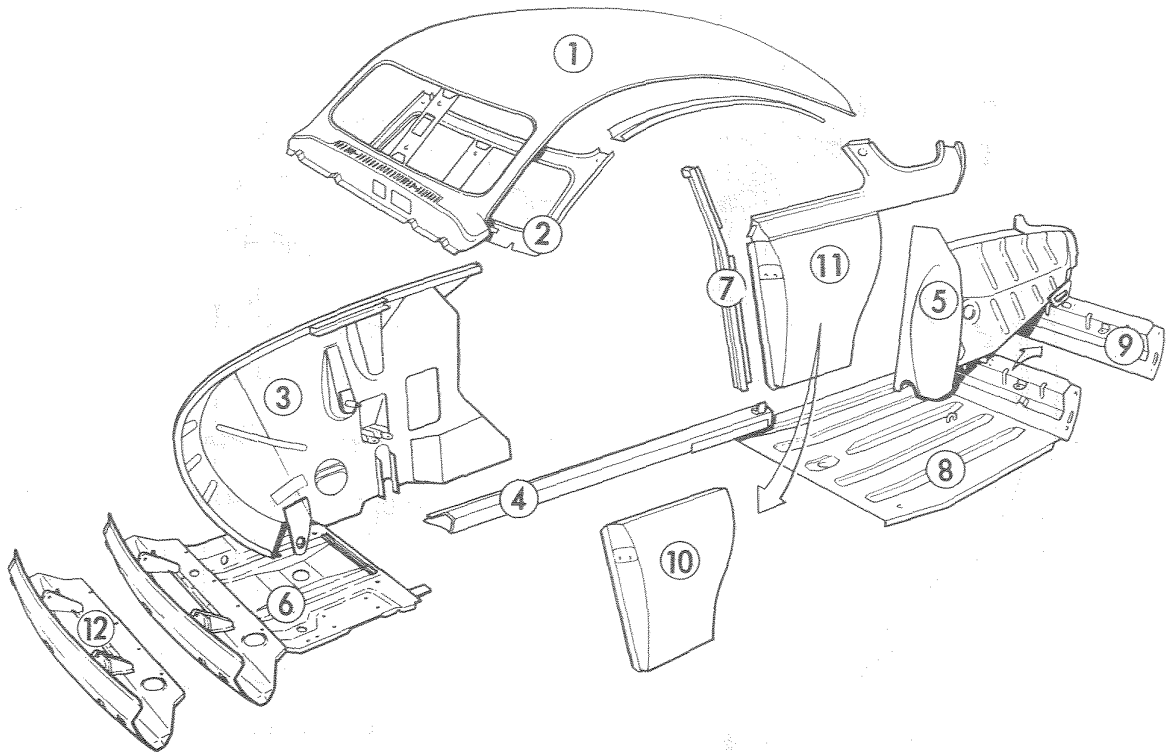
- | | |
|----------------|-----------------------------|
| 1. Cotter pin | 6. Shaft seal |
| 2. Castle nut | 7. Nut |
| 3. Washer | 8. Ball bearing |
| 4. Hub | 9. Steering knuckle housing |
| 5. Drive shaft | 10. Sealing ring |

BODY ASSEMBLY**General**

Any parts of the body assembly that have been so seriously damaged as the result of a collision or other accident that correction by beating or realigning is not

suitable should be replaced by new ones. In many cases, even minor damage may be more quickly and cheaply repaired, and with better results, if the affected parts are replaced rather than repaired.

Some of the body panels available as spare parts are shown in the illustration below.



S 3045

**BODY ASSEMBLY COMPONENTS AVAILABLE AS
SPARE PARTS**

- | | |
|------------------------------|--------------------------------|
| 1. Roof sheet, water channel | 7. Rear pillar |
| 2. Windshield frame | 8. Floor sheet, rear floor |
| 3. Front wheelhouse | 9. Rear part |
| 4. Sill | 10. External valance, lower |
| 5. Rear wheel house | 11. External valance, complete |
| 6. Front floor | 12. Front sheet |