REAR WHEEL SUSPENSION

General

The rear wheels are independently suspended. The splined ends of the torsion bars fit into a splined socket which is welded to the central chassis tube. The rubber mounted trailing radius arms are connected to the splined outer ends of the torsion bars. The axle tube flanges are bolted to the trailing ends of the radius arms. Suspension adjustment is accomplished by engaging the desired splines of the torsion bars. The suspension is controlled by double acting adjustable shock absorbers.

22 RA

Removing and Installing Torsion Bars

(See also group W, Wheel Alignment)

Special Tools:

P 53 Radius arm compressor

Removal

1. Hoist car and support on level dolly. Remove rear wheels.
2. Lift radius arm with tool P 53 until the shock absorber is free.
3. Remove shock absorbers and release holding clamps for brake hoses from axle tubes.
4. Remove three bolts from bearing flange on axle tube. The buffer bracket is fastened to the two upper bolts.
5. Move axle tube rearward out of radius arm.
6. Remove special tool P 53.

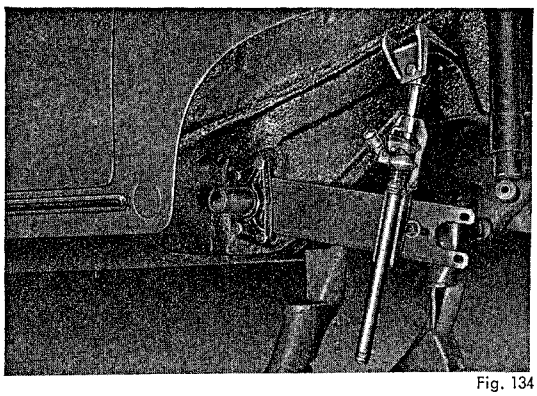

Fig. 134

7. Remove bolts from radius arm cover and remove cover.

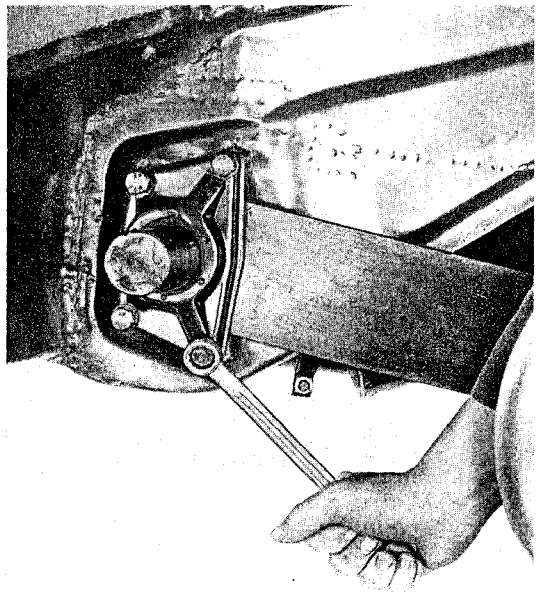

Fig. 135

8. Remove rubber bearing.
9. Remove radius arm and inner rubber bearing.

10. Remove torsion bar through the hole provided in the body.

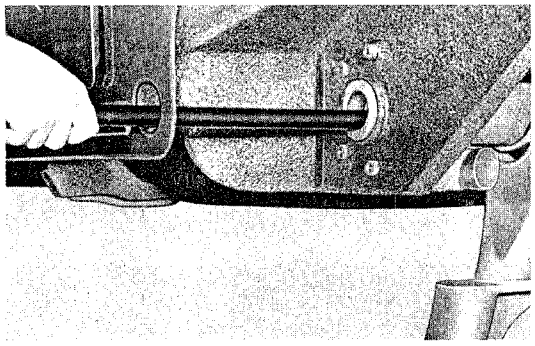

Fig. 136

Note

If the torsion bar has fractured, the broken end can be driven out of the internally splined central tube by a steel rod after the opposite torsion bar has been removed.

Installation

The installation is accomplished in the reverse order of removal observing the following points:

1. Inspect torsion bars for damaged splines and condition of paint, especially for traces of rust. Replace if necessary.
2. Grease the splines of the torsion bar.
3. Install torsion bar and engage radius arm splines enough to hold without fouling stop stud. Adjust correct angle (23 RA).
4. Dust rubber mount with graphite powder and install.
5. Raise radius arm and push in together with torsion bar until the radius arm rests against lower stop stud.
6. Install outer rubber mount and bolt on cover of radius arm.
7. Clean surfaces on radius arm and axle tube flange (remove traces of paint, rust etc.). Tighten bolts on axle tube flange 9 to 10 mkg (65 to 72 ft. lb.) torque.

Note

Torsion bars with 23 mm (.91 in.) and 24 mm (.94 in.) diameter are installed. Cars without compensating spring use 24 mm (.94 in.) bars and cars with compensating spring 23 mm (.91 in.) bars. If a compensating spring is installed later on, the 24 mm (.94 in.) must be exchanged for 23 mm (.91 in.) bars.
When removing torsion bars it is not necessary to mark them left or right, since this will not affect their elastic quality or shorten their life.

23 RA

Adjusting Rear Wheel Suspension

Special Tools:

VW 245a Protractor

The correct adjustment of the torsion bar may be obtained by measuring the angle of the radius arm with respect to the horizontal position of the automobile. The radius arm must be unloaded.

Make sure the chassis is level by placing the protractor VW 245a on the floor tunnel. The unloaded radius arm should give the following reading:

Vehicle type 356 B 1600, 1600 S (without compensating spring)

Coupe, Cabriolet/Hardtop
16° 30'

Roadster
14° 30'

Vehicle type 356 B 1600 S-90 (with compensating spring)

Coupe, Cabriolet/Hardtop
15° 30'

Roadster
13° 30'

These values are valid for cars with compensating springs which where not orignial equipment.

Vehicle type 356 B 1600 GS (with compensating spring)

12° to 13°
Camber: – 0.5° to – 1.5°

To insure proper radius arm travel as well as road-holding qualities of the automobile, the adjustment of both radius arms should be identical. When adjusting one side, always check the other and correct if necessary.

The adjustment is made as follows:

1. Install torsion bar so that its splines engage the socket in the frame.
2. Install radius arm on outer end of torsion bar.
3. Place protractor VW 245a on unloaded radius arm.
4. Adjust pendulum on protractor so that the level is horizontal.

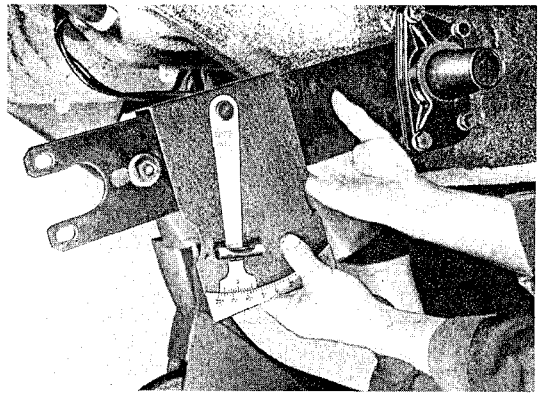

Fig. 137

If the protractor shows a noticeable variation between the actual angle of radius arm and the specified angle, the position of the radius arm should be corrected. The different number of splines on either end of the torsion bar permits such an adjustment. The number of splines are:

Inner end: 40 splines
Outer end: 44 splines

When the inner end of the torsion bar is advanced one spline it turns 9°. When the radius arm is moved one spline it gives a change of 8° 10'. As a result the minimum adjustment of the radius arm is 0° 50'. If this procedure does not result in the same radius arms inclination on both sides of the vehicle, the adjustment must be repeated with a different radius arm.

The adjustment of the right and left radius arms may vary up to ± 30'. Depending on right-hand or left-hand drive, the greater angle should be on the driver side.

Note

Correct adjustment of the rear wheels can be obtained only on an optical alignment device. (See Group W — Wheel Alignment.)

Removing and Installing Shock Absorbers

Special Tools:

P 53 Radius arm compressor

General

For proper suspension and road holding, shock absorber adjustment is next in importance to the radius arm adjustment.

Maintenance

Shock absorbers require no maintenance. A slight loss of fluid does not necessitate replacement of the shock absorber since small losses are replenished from an internal oil reservoir.

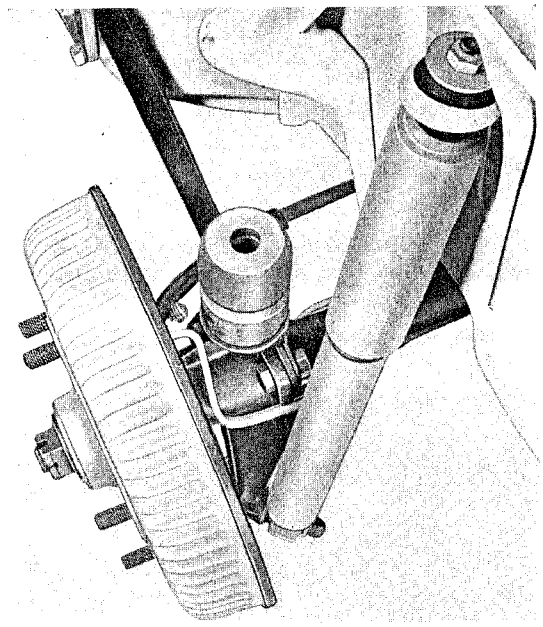

Fig. 138

Testing

The shock absorbers are double acting and are designed to match the suspension characteristics of the car. Therefore changes in adjustment are not recommended. An operational check can be made by manually bouncing the car up and down. The car should return to the neutral position without passing it. A road test is also effective. Exact testing requires special testing machines. Hand operation can merely indicate whether a shock absorber is working and gives no indication of its effectiveness.

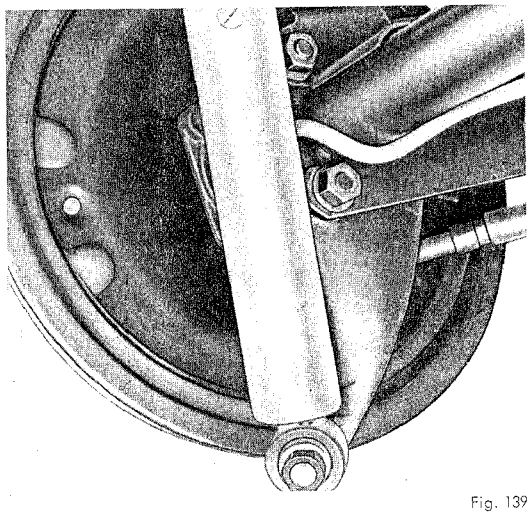

Fig. 139

Removal

1. Jack up car.
2. Raise radius arm using tool P 53 until shock absorber is free.
3. Remove shock absorber mounting nuts.
4. Remove shock absorber.

Installation

The installation is accomplished in the reverse order of removal observing the following points:

1. Check shock absorber for proper operation. If necessary replace, observing the instructions given in paragraph (17 ST).
2. Check bushings and rubber mounts for wear. Replace if necessary (18 ST).