

Hinterachse
Rear Axle
Essieu AR
Assale posteriore

5

5

5

5

5

5

5

5

5

5

CONTENTS

0 - GENERAL INFORMATION, DESCRIPTION, TECHNICAL DATA

0.0 General Information

0.1 Description

Rear Axle	0.1 - 1/1
-----------	-----------

0.2 Technical Data

General Data	0.2 - 1/1
--------------	-----------

General Data - 1975 Models	0.2 - 1/3
----------------------------	-----------

Tightening Torques	0.2 - 2/1
--------------------	-----------

0.3 Special Tools

Special Tool List	0.3 - 1/1
-------------------	-----------

1 - REAR AXLE ALIGNMENT

1.1 Checking Alignment

Checking Rear Axle Alignment	1.1 - 1/1
------------------------------	-----------

2 - REAR AXLE

2.1 Suspension Strut and Control Arm

Suspension Strut, remove and install	2.1 - 1/1
--------------------------------------	-----------

Control Arm, remove and install	2.1 - 1/1
---------------------------------	-----------

Stabilizer, from 1973-model, remove and install	2.1 - 2/1
---	-----------

2.2 Suspension Strut

Suspension Strut, disassemble and reassemble	2.2 - 1/1
--	-----------

Tolerance Ratings for Rear Springs	2.2 - 1/5
------------------------------------	-----------

3 - DRIVE (UNIVERSAL) SHAFTS

3.1 Drive (Universal) Shaft

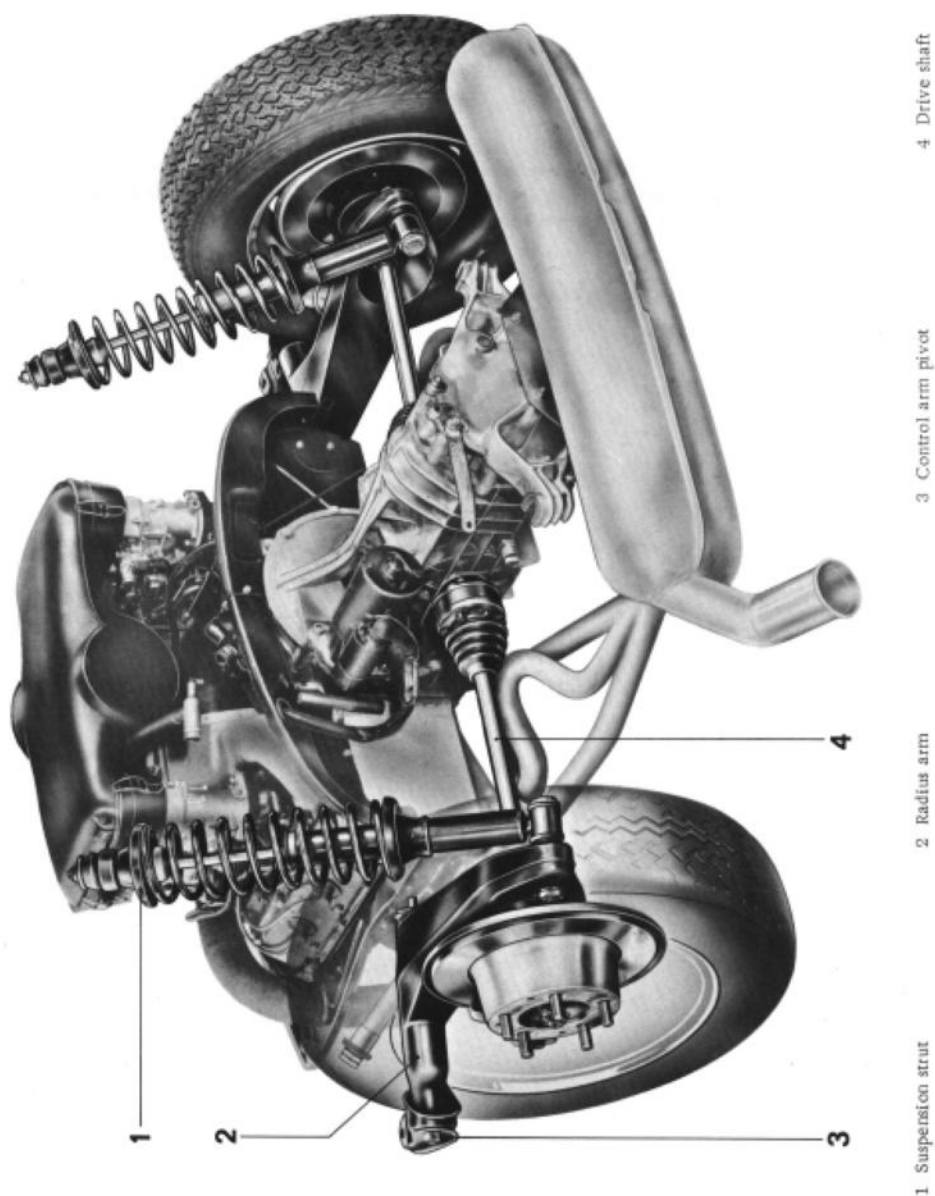
Drive (Universal) Shaft, remove and install	3.1 - 1/1
---	-----------

3.2 Constant velocity (Universal) Joint

Constant velocity (Universal) Joint, remove and install	3.2 - 1/1
---	-----------

3.3 Constant Velocity Joint

Disassemble and assemble	3.3 - 1/1
--------------------------	-----------



DESCRIPTION OF REAR AXLE

The rear wheel suspension incorporates radius arms, the geometry of which provides favorable camber and the best possible tracking characteristics.

Wheel springing is by suspension struts. These are combined assemblies consisting of coil springs, double-action shock absorbers, and rubber buffers.

The pivoting of the suspension strut assembly at the radius arm and at the anchor point on the body causes a constantly changing ratio between spring compression and wheel movement. This provides progressive increase in suspension stiffness on the wheel bump stroke.

Power is transferred to the rear wheels by two drive shafts, each with two CV joints.

GENERAL DATA

Vehicle Type	914	914/6
Wheel base	2,450 mm (96.5")	2,450 mm (96.5")
Track width rear (at dead weight acc. to DIN)	1371 mm (4 1/2Jx15) (54,0 ") 1381 mm (5 1/2Jx15) (54,4 ")	1379 mm (5 1/2Jx15) (54,3 ") 1381 mm (5 1/2Jx14) (54,4 ")
Permissible rear axle load	650 kp (1,433 lbs)	700 kp (1,543 lbs)
Tire size	155 SR 15	165 HR 15 or 185 HR 14
Rim size	4 1/2 J x 15	5 1/2 J x 15 or 5 1/2 J x 14
Track	0° + 15' per wheel	0° + 15' per wheel
Camber (at dead weight)	-30' ± 20'	-30' ± 20'
	Difference left to right max. 20'	
Wheel load difference	The wheel load difference left to right may be max. 15 kp (33 lbs). Required corrections can be made by adjusting the front axle torsion bars. However, the settings of the required height tolerances must be insured.	
Wheel Suspension		
Coil springs:		
Length of unloaded spring "Lo"	461 mm (18.1")	431 mm (17.0")
Mean coil dia.	95 mm (3.7")	95 mm (3.7")
Wire dia.	9.6 mm (.378")	10 mm (.394")
Total number of windings	11.5	11.5
Resilient windings	10	10

GENERAL SPECIFICATIONS - 1973 MODELS

General Specifications	1,7 liter 76 HP	2,0 liter 91 HP
Wheelbase	2450 mm	
Track, rear (when empty according to DIN)	1371 mm with 155x15 on 4 1/2 x 15 1383 mm with 165x15 on 5 1/2 x 15	
Permissible rear axle load	650 kp	
Rim size	4 1/2 Jx15	5 1/2 Jx15
Tire size	155 SR 15	165 HR 15
Toe-in	0° + 15' per wheel	
Camber, when empty	-30' ± 20' (max. deviation left to right = 20')	
Wheel load variation	Permissible wheel load variation left to right may be 15 kp. If corrections are necessary, readjust front axle torsion bars; however, the required height adjustment specifications must be maintained.	
Wheel Suspension (coil springs)		
Free length "Lo"	471 mm	
Mean coil diameter	95 mm	
Bar diameter	9,6 mm	
Number of coils	11,5	
Number of active coils	10	

GENERAL DATA - 1975 MODELS

Vehicle Type	914 - 1.8 liter	914 - 2.0 liter
Wheelbase at DIN curb weight at full load	2451.5 mm/96.51 in. 2448 mm/96.37 in.	2451.5 mm/96.51 in. 2448 mm/96.37 in.
Rear track width (5 1/2 J x 15 wheels) at DIN curb weight at full load	1383 mm/54.44 in. 1399 mm/55.07 in.	1383 mm/54.44 in. 1399 mm/55.07 in.
Max. rear axle load	650 kp/1430 lb	650 kp/1430 lb
Specifications (at DIN curb weight)		
Toe	0° + 15' (each wheel)	0° + 15' (each wheel)
Camber (at curb weight)	-30' ± 20' Max. difference left and right: 20'	-30' ± 20' Max. difference left and right: 20'
Wheel load difference	Max. load difference between left and right wheels is 15 kp. Corrections, if required, can be made on the torsion bars. Adjustments must, however, be made within height tolerances.	
Wheel suspension	Independent on trailing arms	
Springs	One coil spring with double action hydraulic shock absorber per wheel	
Coil springs:		
Unloaded spring length	471 mm/18.54 in.	
Center coil dia.	95 mm/3.74 in.	
Wire thickness	9.6 mm/0.37 in.	
No. of coils (total)	11.5	
No. of spring coils	10.0	
Stabilizer dia., front/rear (optional extra)	15 mm/16 mm (0.59 in./0.62 in.)	

TIGHTENING TORQUES FOR REAR AXLE

Location	Designation	Threads	Grade	Tightening mkp	Torque ft.lbs.
Spring strut bottom on control arm	Hex. nut	M 18x1,5	6 S	10-12	72-87
Spring strut top on body	Self-locking hex. nut	M 12x1,5	6 S	5-6	36-43
Threaded bushing on piston rod	Threaded bushing	M 12x1,5		1,5-2	11-14
Castle nut on universal shaft	Castle nut	M 20x1,5		30-35	217-253
Synchronizing joint on universal flange	Cheesehead screw (hex. socket)	M 8x45	12 K	4,3	31
Control arm bearing on body	Hex. bolt	M 10x55	10 K	6,9	50
Control arm bearing on control arm outside *, inside **	Self-locking hex. nut	M 14x1,5	8 G	15,0 * 12,0 **	108 87
Bearing cover on control arm	Hex. bolt	M 8x15	8 G	2,5	18
Wheel bolt 914	Hex. bolt 25	M 14x1,5	Ck 35	15	108
Wheel bolt 914 for LM-rim	Hex. bolt 39	M 14x1,5	8 G	13	94
Wheel nut 914/6	Hex. nut	M 14x1,5	Ck 35	13	94

LIST OF REQUIRED SPECIAL TOOLS

Clamping fixture for coil springs	VW 340
Claws for clamping fixture VW 340	P 303
Removing mandrel	P 297a
Assembly fixture	P 298b
Thrust piece	P 302
Punch	VW 410
Pipe tool	VW 416b

MEASURING OF REAR AXLE

General

Measuring the position of the rear wheels requires using the pertinent optical axle measuring equipment. The following prerequisites prior to measuring are expected:

1. Dead weight of vehicle acc. to DIN 70 020, that is, vehicle ready for driving, with fuel tank filled and equipped with spare wheel.
2. Height adjustment of front axle must be completed.
3. All moving parts of the wheel guiding system must have the correct running play.
4. Rims should have no non-permissible vertical or lateral wobble.
5. The tire pressure should be as specified and the tires should be worn to a more or less uniform degree.

Track and camber of the rear wheels can be changed as follows:

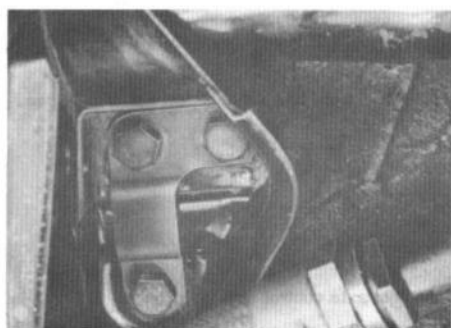
In order to adjust the track values, the outer bearing of the rear axle control arm is shifted in longitudinal direction of the vehicle. Camber can be adjusted by placing shims between control arm bearing and body.



Adjusting the Track

1. Loosen hex. bolts for control arm bearing slightly and push rear axle control arm outside back or forward as required until the specified track value is attained.

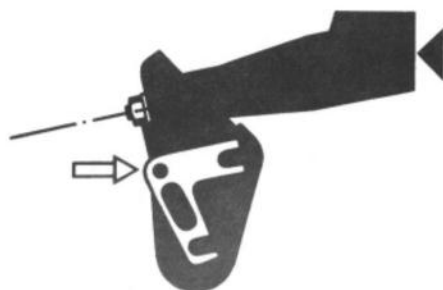
2. Tighten hex. bolts to specified torque. Replace lock washers if required.



Adjusting the Camber

1. Mark position of rear axle control arm on base plate (track setting) and unscrew central hex. bolt. The other two hex. bolts are only slightly slackened.

2. Mount pertinent intermediate shims to obtain the specified camber. Intermediate shims are available 2,3 and 4 mm thick, a 1 mm shim results in approx. 10° change of camber. A bore at the outside permits pulling out of shims.



3. Tighten hex. bolts to specified torque. Replace lock washers, if required.

4. Check camber and track values once again.

SAMPLE OF MEASURING CARD

Small triangles are used to mark the permissible adjusting values on the measuring cards for a fast check-up and evaluation of measuring results.

Name:	Vehicle: PORSCHE type 914 and 914/6		
Chassis N°:	License plate No:	miles:	
Date:	measured by:		

Tires:
Make:
Condition:

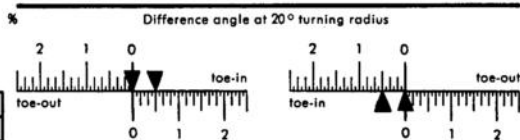
MEASURING CHART

Please note:

15" rim:

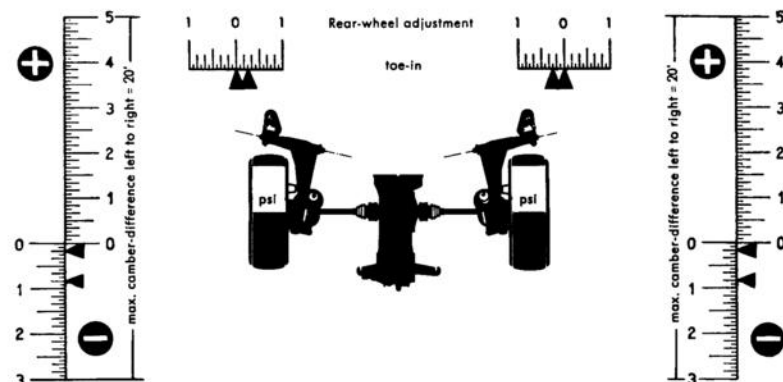
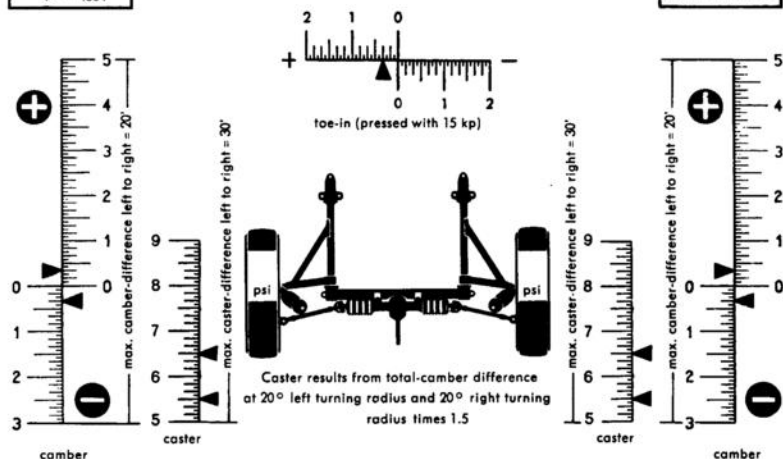
10' = 0.473"

1° = .284

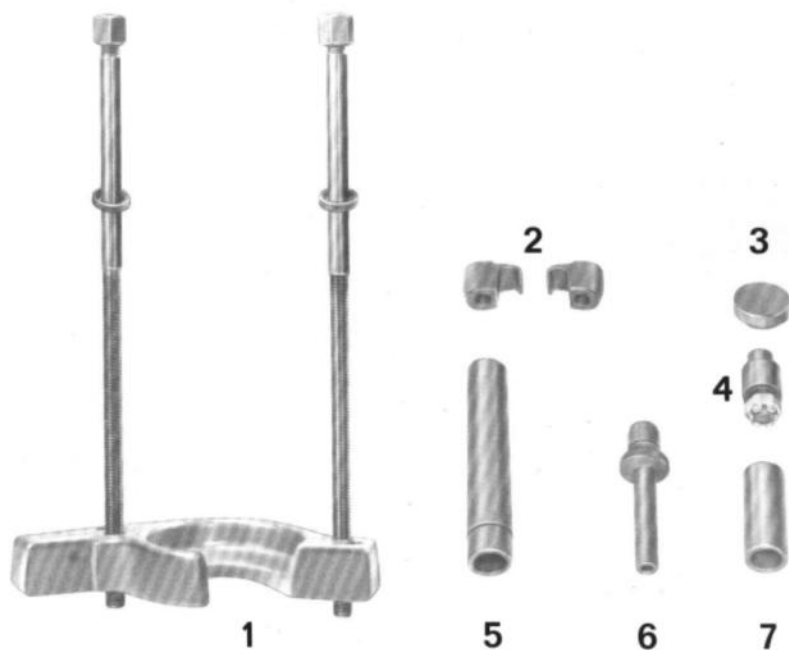


Vehicle:
Empty weight
according to
DIN 70020

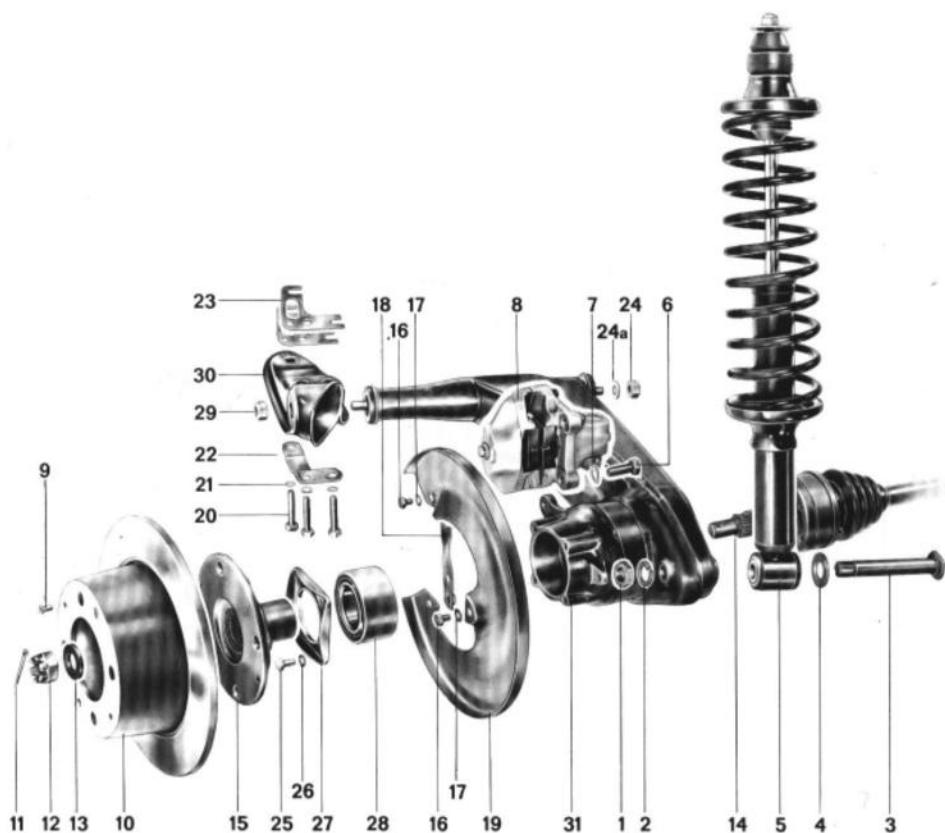
shock absorber
strut adjustment
value: 1 mm = 6'



TOOLS



No.	Designation	Special Tools	Explanations
1	Clamping fixture for coil spring	VW 340	
2	Claws for clamping fixture VW 340	P 303	
3	Thrust piece	P 302	
4	Assembly fixture	P 298b	
5	Pressing-out Mandrel	P 297a	
6	Punch	VW 410	
7	Pipe tool	VW 416b	



No.	Designation	Each	Observe during:		Special Instr.
			Removal	Installation	
1	Hex. nut	1		Tighten to spec. torque	
2	Spring ring	1		Replace, if requ.	
3	Bearing bolt	1			
4	Washer	1			
5	Spring strut	1			
6	Hex. bolt	3		Tighten to spec. torque	
7	Spring washer	2		Replace, if requ.	
8	Caliper	1	Only at ambient temperature		
9	Hex. bolt	2			
10	Brake disk	1	Pressed off alternately by means of two 8 mm hex. bolts, if required.		
11	Cotter pin	1		Replace	
12	Castle nut	1		Tighten to spec. torque	
13	Washer	1			
14	Universal shaft	1	Unscrew heat exchang er		
15	Wheel hub	1	Force out with special tool P 297a	Install with special tool P 298b	2.1-1/7
16	Hex. bolt	1		Tighten to spec. torque	
17	Spring washer	3		Replace, if requ.	
18	Holding plate	1			

No.	Designation	Each	Observe during:		Special Instr.
			Removal	Installation	
19	Protective cover	1			
20	Hex. bolt	3		Tighten to spec. torque	
21	Lock washer	3		Replace and install with hollow end facing shim plate	
22	Shim plate	1			
23	Shim	x		For adj. camber	1.1-1/2
24	Self-locking hex. nut	1		Replace and tighten to spec. torque	
24a	Washer	1			
25	Hex. bolt	4		Tighten to spec. torque	
26	Spring ring	4		Replace, if requ.	
27	Bearing cap	1			
28	Radial taper ball bearing	1	Remove with suitable thrust piece	Replace and install with special tool P 302	2.1-1/8
29	Self-locking hex. nut	1		Replace and tighten to spec. torque	
30	Control arm bearing	1	Mark for reinstallation	Bearing surfaces must be in parallel with connecting line of both control arm shafts	2.1-1/8
31	Rear axle control arm	1		Check and replace, if required	2.1-1/8

REMOVAL AND INSTALLATION OF SPRING STRUT

Removal

1. Loosen hex. nut for bearing bolt on spring strut (bottom) and remove bearing bolt.
2. Loosen self-locking hex. nut on spring strut (top) and remove spring strut in downward direction.

Installation

1. Renew self-locking hex. nut.
2. Tighten self-locking hex. nut as well as hex. nut for bearing bolt to specified torque.

REMOVAL AND INSTALLATION OF REAR AXLE CONTROL ARM

Removal

1. Loosen brake line on brake hose.

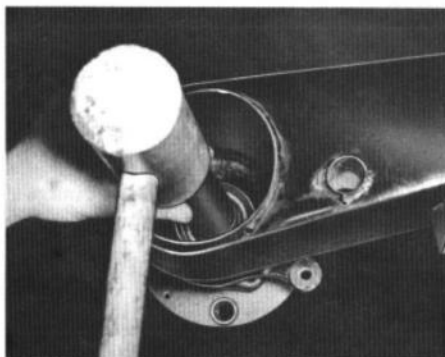
2. Disconnect hand brake cable.

3. Remove caliper.

4. Remove brake disk.

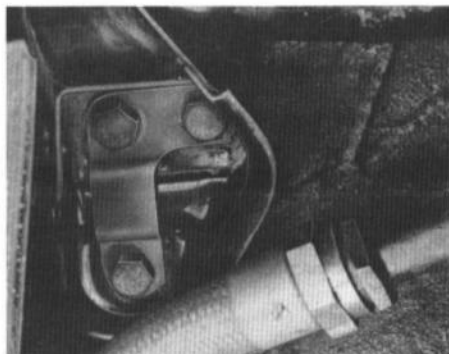
5. Remove universal shaft (unscrew heat exchanger first).

6. Remove rear wheel hub with special tool P 297a.



7. Mark position of rear axle control arm on shim plate and hold shims for adjusting camber in position.

8. Loosen bolts or self-locking hex. nut on rear axle control arm and remove control arm.



9. Remove bearing cover and force out radial taper ball bearing with suitable thrust piece.

10. Loosen self-locking hex. nut for control arm bearing and remove control arm bearing.

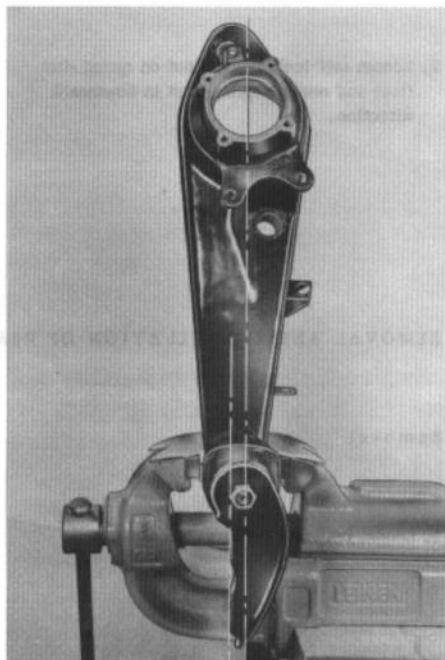
Inspection

Check rear axle control arm for visible damage and distortion and replace, if required.

The rubber bearings of the rear axle control arm cannot be replaced. Replace rear axle control arm, if required.

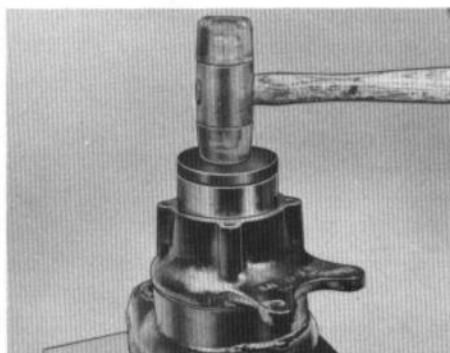
Installation

1. Attach control arm bearing on rear axle control arm in such a manner that the bearing surface of the control arm bearing is in parallel with the connecting line of the two control arm shafts.

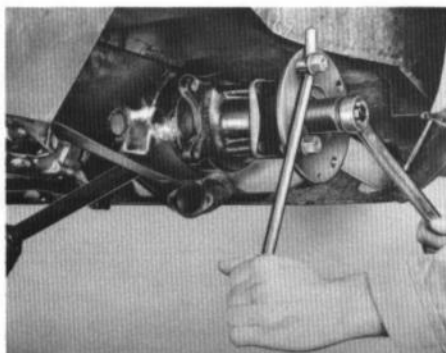


2. Replace self-locking hex. nuts and tighten to specified torque.

3. Install radial taper ball bearing with special tool P 302.

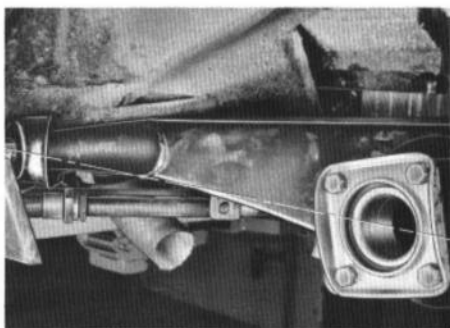


4. Tighten hex. bolts for bearing cover to specified torque.



7. Install universal shaft.

5. Tighten rear axle control arm in horizontal position on inner bearing bolt (observe tightening torque).



8. Connect hand brake cable and adjust hand brake.

9. Bleed brake.

10. Measure rear axle optically.

6. Install rear wheel hub with special tool P 298b in taper ball bearing.

REMOVING AND INSTALLING STABILIZER

General

Beginning with the 1973 models, Type 914 vehicles can optionally be equipped with rear axle stabilizers of 16 mm bar diameter.

Removal

1. Remove muffler.
2. Force the stabilizer shackle off the ball stud in lower part of the strut with the aid of a tire iron.
3. Remove mounting clamp.

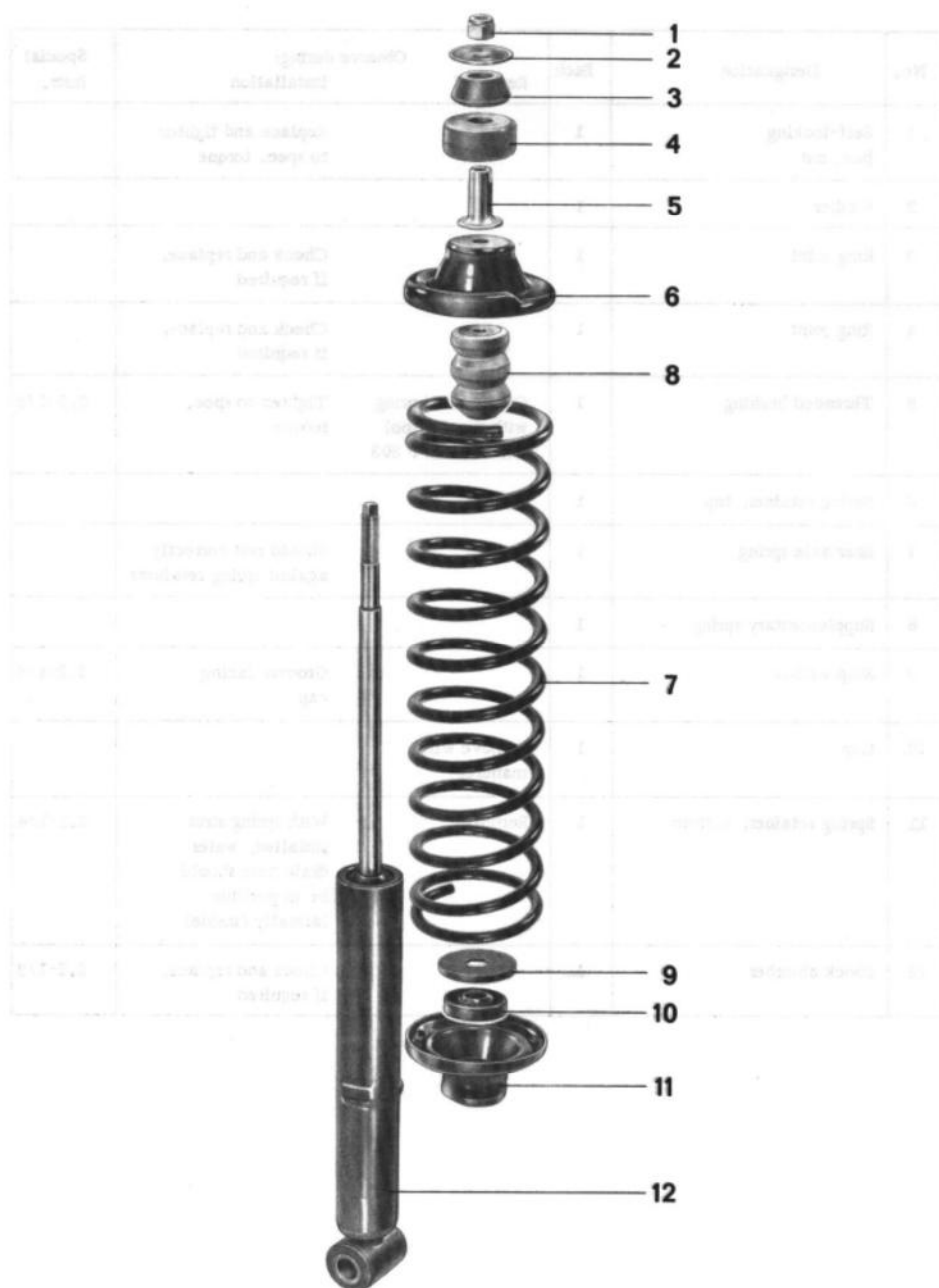
Inspection

Check rubber bushings and shackle grommets for signs of wear.



Installation

1. Coat rubber bushings of stabilizer with glycerine paste such as CONTI FIX, and shackle grommets with MoS₂ multi-purpose grease.
2. Press stabilizer shackles onto the ball stud with the aid of a tire iron.

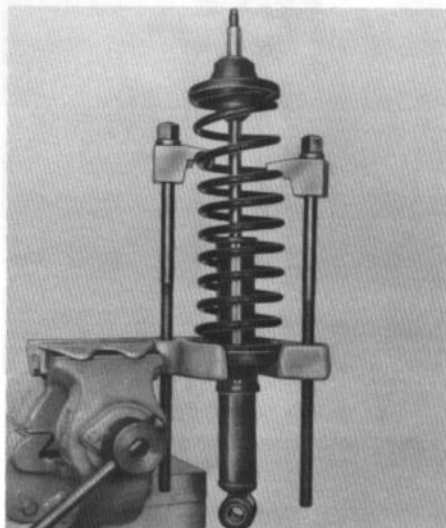


No.	Designation	Each	Observe during:		Special Instr.
			Removal	Installation	
1	Self-locking hex. nut	1		Replace and tighten to spec. torque	
2	Washer	1			
3	Ring joint	1		Check and replace, if required	
4	Ring joint	1		Check and replace, if required	
5	Threaded bushing	1	Clamp coil spring with special tool VW 340 and P 303	Tighten to spec. torque	2.2-1/3
6	Spring retainer, top	1			
7	Rear axle spring	1		Should rest correctly against spring retainers	
8	Supplementary spring	1			
9	Stop washer	1		Grooves facing cap	2.2-1/4
10	Cap	1	Remove with mandrel		
11	Spring retainer, bottom	1	Remove	With spring strut installed, water drain hole should be in position laterally (inside)	2.2-1/4
12	Shock absorber	1		Check and replace, if required	2.2-1/3

DISASSEMBLY AND ASSEMBLY OF SPRING STRUT

Disassembly

1. Clamp coil spring with special tool VW 340 and P 303, loosen threaded bushing and remove spring retainer on top.
2. Slacken coil spring by alternately screwing back clamping bolts, remove coil spring, supplementary spring and stop washer from piston rod.
3. Knock cap from shock absorber with mandrel.
4. Remove bottom spring retainer in direction of piston rod.



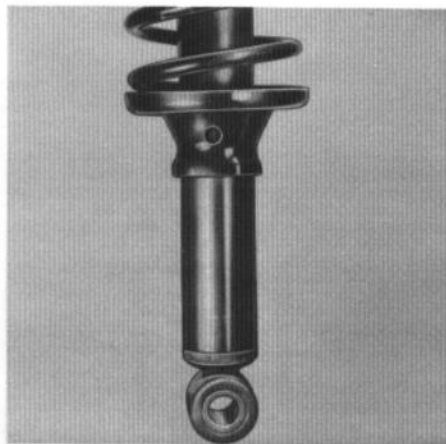
Checking the Shock Absorber

The shock absorber is checked manually by pulling and pushing, while holding damper in installation position. The damper should move under uniform load and free of jerks along its entire stroke. Compare with new damper, if required. The damping effect while pushing or pulling must be clearly felt up to end position. Dampers which have been in storage for extended periods may require some pumping action until their full effect shows up.

While driving, defective dampers are noticed by a rumbling noise.

Shock absorbers require no servicing and have an adequate supply of shock absorber oil to compensate for small oil losses. If only slight amounts of shock absorber oil are leaking out but the shock absorber operates otherwise perfectly, no exchange is required. Shock absorber oil cannot be replenished. Defective shock absorbers must be replaced.

Assembly



1. Mount bottom spring retainer on shock absorber in such a manner that the water drain hole is in lateral (inside) position with the spring strut installed.



2. Fit cap.
Caution!
Mount stop plate with grooves facing cap, so that no oil will be sucked out of shock absorber.

3. Coil spring should rest correctly against spring retainers.

4. Tighten threaded bushings to specified torque.

MODIFIED REAR SUSPENSION SPRINGS

Beginning with May 19, 1972 production (chassis No. 47 22 917885), Type 914 vehicles receive 10 mm longer rear suspension springs as standard equipment. The springs are available in three stiffness groups and are thus marked with one, two, or three green paint dots.

Group	P at $L_1 = 239$ mm	Paint dots
1	220 - 227 kp	1 green
2	227 - 233 kp	2 green
3	233 - 240 kp	3 green

Individual springs of same tolerance or marking group may be replaced in the course of repairs. However, since the spring tension decreases with accumulating mileage so that installation of a single spring may lead to considerable difference in spring force between the new and used springs, we recommend that replacements are made in pairs.

NOTE:

The new spring version may also be installed in vehicles of older vintage, although springs of the old and new versions must not be intermixed in a given vehicle.

REMOVAL AND INSTALLATION OF UNIVERSAL SHAFT

Removal

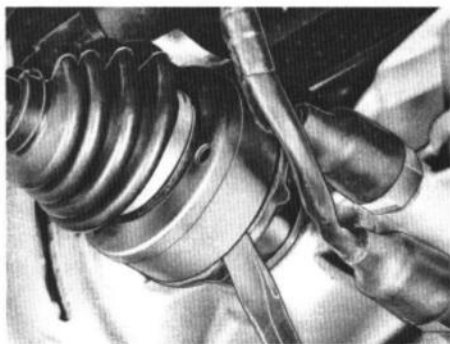
1. Unlock castle nut of universal shaft and loosen.
2. Remove heat exchanger.
3. Loosen cheesehead screws of universal shaft on universal flange. Use flat chisel to separate universal shaft from universal flange in range of flange seal and remove universal shaft.

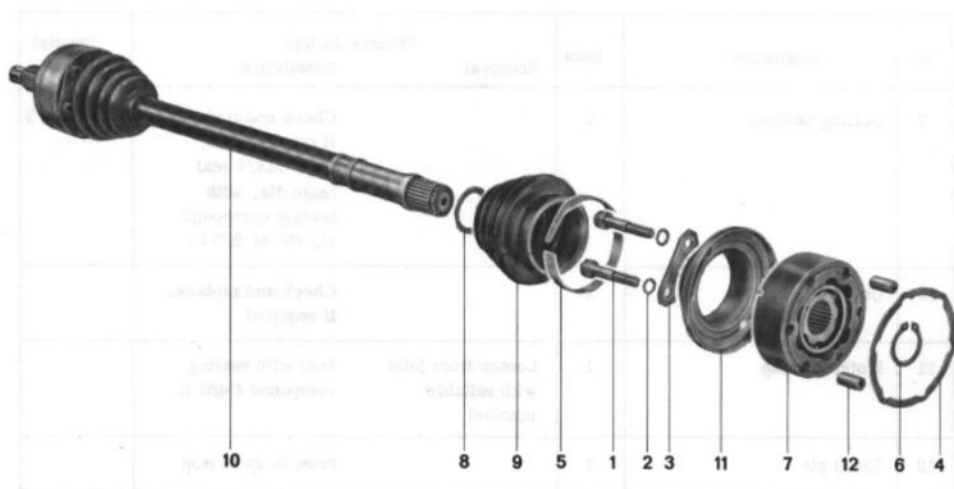
Caution!

Do not damage flange surfaces.

Installation

1. Use new seal for flange and note that the flange surfaces are without burr and absolutely free of grease.
2. Tighten cheesehead screws to specified torque, using new lock washers and making sure that the lock washers will rest with their hollow end against the shim plate.
3. Tighten castle nut of universal shaft to specified torque.





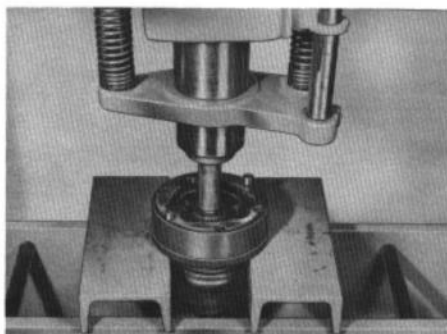
No.	Designation	Each	Observe during:		Special Instr.
			Removal	Installation	
1	Cheesehead screw	4		Tighten to spec. torque	
2	Lock washer	4		Hollow end facing shim plate	
3	Shim plate	2			
4	Seal	1		Replace	
5	Clamping strap	1			
6	Locking ring	1		Must be properly seated in groove of universal shaft	
7	Synchronizing joint	1	Press with VW 410 from universal shaft	Grease capacity per joint Type 914 - 90 grams Type 914/6 - 70 grams Lithium grease with MoS ₂ addition	3.2-1/4
8	Spring retainer	1		Hollow end facing joint section	

No.	Designation	Each	Observe during:		Special Instr.
			Removal	Installation	
9	Sealing bellows	1		Check and replace, if required. On Type 914/6 seal large dia. with sealing compound EC 750 M-2 G 51	3.2-1/3
10	Universal Shaft	1		Check and replace, if required	
11	Protective cap	1	Loosen from joint with suitable mandrel	Seal with sealing compound Curil K	
12	Spiral pin	1		Press in up to stop	

REMOVAL AND INSTALLATION OF SYNCHRONIZING JOINT

Removal

1. Loosen clamping strap of sealing bellows and push bellows back.
2. Remove locking ring from ball hub.
3. Press joint from universal shaft with VW 410.



4. Remove plate spring and pull off sealing bellows.

Caution!

The protective sheet metal cap is sealed with Curil K against the joint. When the cap is removed, do not swivel ball hub more than 20° since otherwise the balls may fall out.

Installation

1. Check universal shaft, sealing bellows, synchronizing joint, protective cap and plate springs for wear or damage and replace, if required.
2. Glue plate spring with specified grease to joint, with the hollow end facing the joint. If the cap has been removed from the joint, seal again with sealing compound Curil K.



3. On vehicle Type 914/6 seal sealing bellows on large diameter with sealing compound (EC 750 M - 2 G 51).

Manufacturer of glue:

The Minnesota Mining Manufacturing Company
Düsseldorf

4. Attach hose clips in such a manner that the clamping points are at the level of the spiral pins.

5. Grease or regrease synchronizing joints. Use lithium grease with MoS_2 addition, such as Molykote BR 2 or Shell-Retinax AM.
Capacity per joint: Type 914 = 90 grams
Type 914/6 = 70 grams

6. Fill 2/3 of the specified grease quantity through smaller diameter of sealing bellows.

7. Slide joint with sealing bellows on universal shaft. Be sure that the plate spring fits correctly and widen ball hub with special tool VW 416b.



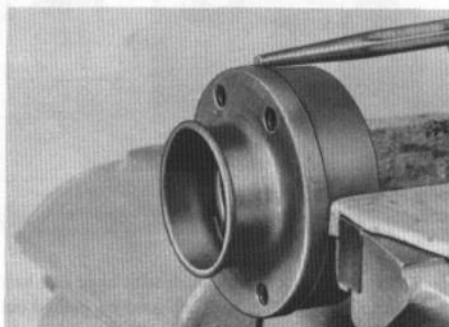
8. Install locking ring and make sure that the ring is correctly located in groove of universal shaft.

9. Push remaining grease from outside into joint and squeeze sealing compound somewhat, so that grease will enter the joint also from inside.

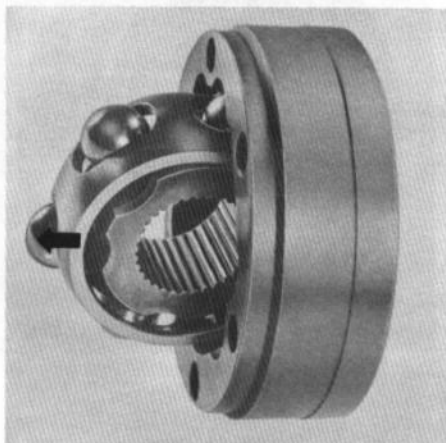
DISASSEMBLY AND ASSEMBLY OF SYNCHRONIZING JOINT

Disassembly

1. Loosen protective cap from joint by means of mandrel.



2. Swivel ball hub with ball cage by 90° and push out of joint.

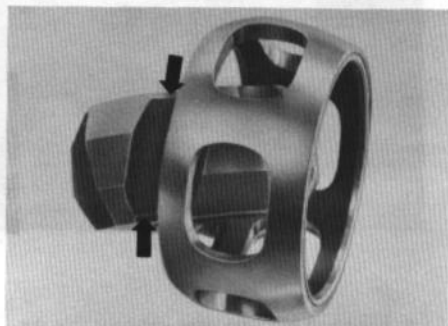


3. Push balls out of cage.

4. Remove ball hub via ball races.

Caution!

The ball hub and the joint are mated and should not be interchanged. The 6 balls for each joint are also included in one tolerance group. Exchange ball hub, joint, ball cage and balls only together.



5. Knock spiral pins out with a mandrel.

Assembly

1. Check joint, ball hub, ball cage and balls for wear. Excessive radial play in joint is noticed by knocks during load changes. In such cases, replace pertinent joint.

2. Press spiral pins in against stop.

3. Insert ball hub via both ball races into the ball cage. The mounting position is at choice.

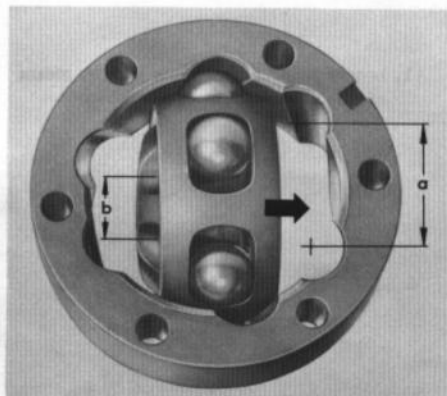
4. Press balls into the cage.



5. Insert ball hub with cage and balls into the joint as follows:

- a. The bevel at the inside diameter of the ball hub (toothed wheel work) must point at the bearing surface on the universal joint.

6. Insert edgewise ball hub with cage and balls into the joint. Be sure that a large distance "a" of the ball races at the joint lies together on one side with a small distance "b" of the ball hub after swivelling the ball hub into the joint.



7. In order to swivel ball hub with cage and balls into the joint the ball hub must be pushed out of the cage so far that the balls have the distance of the ball races.

